AECOM
1555 N. RiverCenter Drive, Suite 214
Milwaukee, WI 53212

414.944.6080 tel
414.944.6081 fax

Letter of Transmittal

Attention:	Mr. Tauren Beggs Hydrogeologist, WDNR 2984 Shawano Ave Green Bay, WI 54313	Date:	8/1/16
Project reference:	Former Newton Pit BRRTS No. 02-36-000268	Project number:	60135471

We are sending you the following:

Number of originals:	Number of copies:	Description:
One	Zero	2015 Task 32; LNAPL Characterization and Contaminant Mass Analysis Technical Memorandum

Mr. Beggs,

Attached is the LNAPL Characterization and Contaminant Mass Analysis Technical Memorandum letter report for the Former Town of Newton Gravel Pit, Manitowoc Wisconsin.

Please let me know if you have any questions.

Thank you.

D.S. Henderson

David Henderson, P.E.
Senior Project Manager
D 414.944.6190 C 414.429.8304
dave.henderson@aecom.com

Cc: Kathleen M. McDaniel, City Attorney, City of Manitowoc
Dan Koski, Director of Public Infrastructure, City of Manitowoc
Elizabeth Heinen, Drinking Water Specialist, WDNR

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Technical Memorandum

To	Ms. Kathleen M. McDaniel, City of Manitowoc Mr. Dan Koski, City of Manitowoc	Page 1 of 8
CC	Mr. Tauren Beggs, WDNR	
Subject	Former Town of Newton Gravel Pit, BRRTS No. 02-36-000268 2015 Task 32; LNAPL Characterization and Contaminant Mass Analysis Technical Memorandum	
From	Dave Henderson, AECOM	
Date	August 1, 2016	

The objective of this technical memorandum is to provide the laboratory analytical results for characterization of the Light Non-Aqueous Phase Liquid (LNAPL) and the estimated quantities of contaminants as determined by a contaminant mass analysis associated with the environmental impacts in Western Source Area of the Former Newton Gravel Pit site, Manitowoc Wisconsin (See Figures 1 & 2).

The data and analysis is being published to meet the general requirement of Wisconsin Administrative Code (WAC) NR 716.11(d), provide reference information for possible use in a future remedial equipment design, to support future LNAPL (i.e. free product) disposal activities, and for possible use in remediation system operational efficiency monitoring.

Presented below are a summary of the LNAPL characterization activities conducted to date along with the contaminant mass analysis that was performed utilizing this data.

LNAPL Characterization

Anecdotal evidence of historical dumping suggests that a variety of waste materials were disposed of within the Western Source Area. This would make for an in-situ mix of LNAPL that may or may not be a homogeneous mixture of the materials as they were disposed.

The LNAPL has been sampled for laboratory analysis twice. The first sampling event occurred in September 1994. Product was obtained from monitoring well WT-02. The laboratory results were originally reported in a 1996 site investigation report[1].

The second sampling event occurred in September 2015, when a composite sample was collected from wells WT-02 and WT-09. A photo log of the 2015 free product sample is provided in Attachment A.

[1] Site Investigation and Remedial Action Options Report, Rust Environment & Infrastructure, June 1996.

The laboratory testing identified both physical and chemical characteristics of the LNAPL. In general, the physical characteristics of the mixture indicate:

- An acidic liquid with a measured pH of 6.2 (September 1994) and 5.89 (September 2015).
- Flash points greater than 100 ^{0}F, which makes it a combustible liquid (a flammable liquid would have a flash point less than 100 ^{0}F).
- Specific gravities of 0.96 (September 1994) and 0.8856 (September 2015), which makes it a liquid that is less dense than water. As they relate to petroleum products, the specific gravities are indicative of a medium to heavy weight motor oil.
- Viscosity described as "medium" and measured as 13.81 centistokes @ 40 ^{0}C, which makes it a liquid that flows similar to an SAE 40 weight motor oil.

The chemical characteristic's indicate that the LNAPL constituents include volatile organic compounds (VOCs) consisting of chlorinated (including both parent and daughter compounds) and petroleum compounds. The VOCs are mixed with semi-volatile organic compounds (SVOCs) that appear to be principally petroleum based along with polychlorinated biphenyls (PCBs) and heavy metals.

The individual VOC compounds that were identified are typically found in solvents, degreasers, and paints. The SVOCs identified are typically petroleum compounds found in solvents and lubricants (wear oils or lubricating oils). PCBs are generally found in older transformer oils and lubricating oils where heat resistance was important. The metals may be associated with used solvents (i.e. used to clean metals), associated with used lubrication oils, or other manufacturing wastes' (i.e. paint sludge's).

The characteristics of the contaminants appear to be consistent with materials identified as historically disposed of in the Western Source Area. The LNAPL analytical laboratory results are summarized on Table 1 and copies of the laboratory reports are provided in Attachment B.

Contaminant Mass Analysis

The contaminant mass analysis for the Western Source Area includes calculated estimates for vadose zone VOCs, LNAPL mass, and an estimate for PCBs contained within the LNAPL.

The analysis was completed to meet the general requirement of WAC NR 716.11(d) and for use as a baseline estimate of contaminant mass present in the subsurface. The baseline estimate provides for comparison to a possible total mass removal measurement if an active remediation system is installed and operated at the site.

The analysis is presented on the enclosed Contaminant Mass Analysis Worksheet, Attachment C. The worksheet includes notes and assumptions, supporting data, and calculations. It is important to note that these calculations serve as a conceptual estimate. Due to the unknown nature of the historic dumping activities and the limited investigation data there is a significant degree of variability in these estimates.

The results of the contaminant mass calculations are summarized as follows:

Sub-Total VOC Mass for Vadose Zone* -	2,550	pounds (lbs.)
Sub-Total Mass for LNAPL* -	196,757	lbs.
Total Contaminant Mass (VOCs & LNAPL)* -	199,307	lbs.
Total Mass for PCBs in LNAPL* -	77.7	lbs.

*All contaminant mass calculations are considered estimates. These estimates may vary from actual conditions by +/- 50% or more. Estimates are based upon the field data available, laboratory analytical data, the assumptions made, and the engineer's judgement at the time of calculation.

Please contact me if you have any questions or if you would like to set up a conference call to discuss the content of this technical memorandum.

_____

Attachments:

Figures:

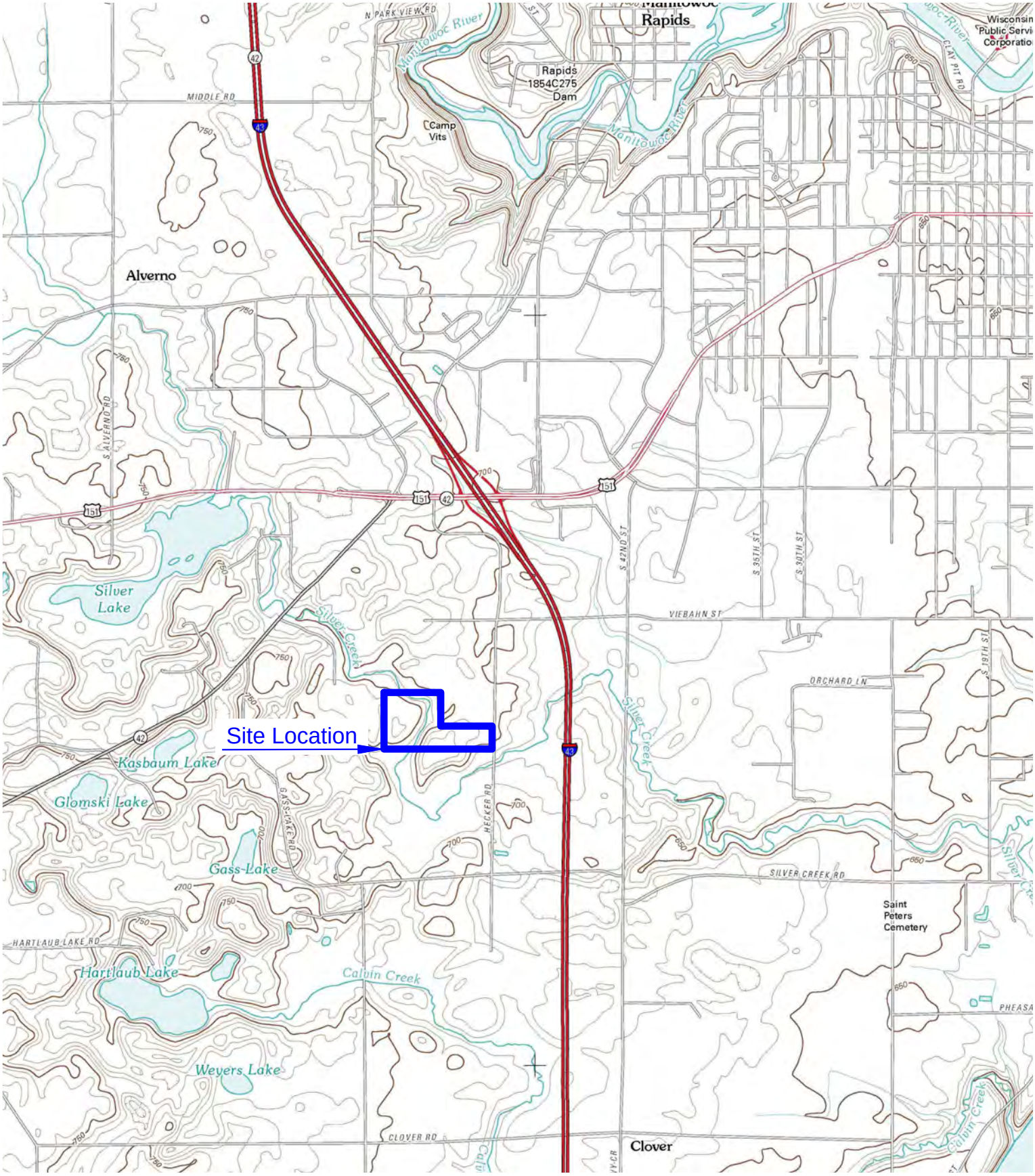
Figure 1, Site Location
Figure 2, Western Source Area

Tables:

Table 1, Summary of LNAPL Analytical Data

Attachment A: Photo Log
Attachment B: Laboratory Analytical Data
Attachment C: Contaminant Mass Analysis Worksheet

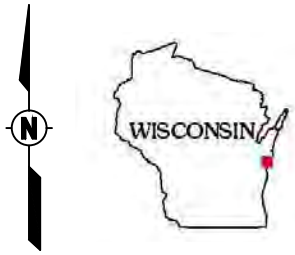
Figures



3000 4000 5000 6000
FEET

APPROXIMATE SCALE

NOTES:
Topographic Map courtesy of the United States Geological Survey
http://store.usgs.gov
Map Date: 2010

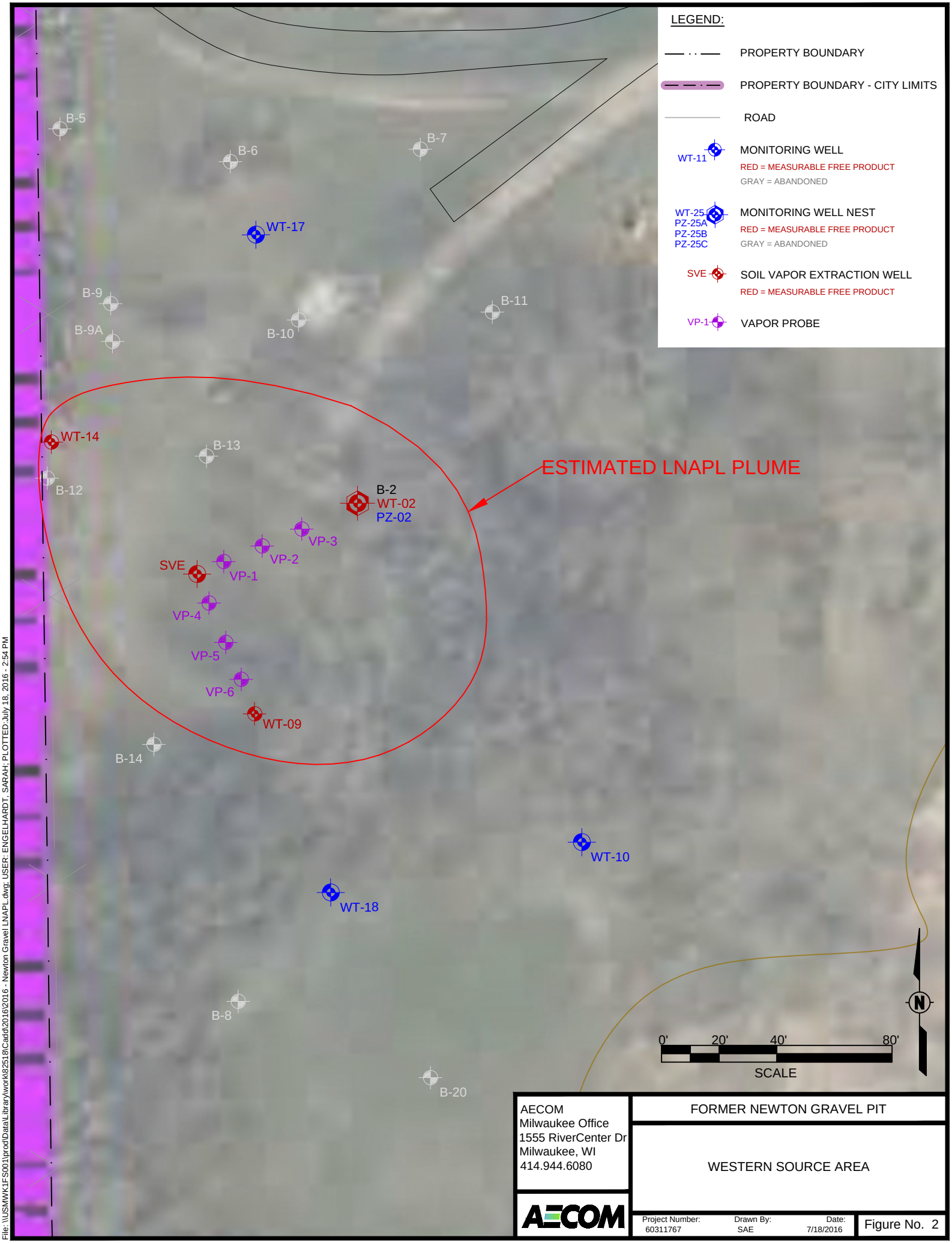


AECOM
Milwaukee Office
1555 RiverCenter Dr
Milwaukee, WI
414.944.6080

FORMER NEWTON GRAVEL PIT

SITE LOCATION

Project Number:	Drawn By:	Date:	Figure No. 1
60311767	SAE	7/18/2016	



File: \\USMWK1FS001\prod\DataLibrary\work\62518\Cadd\2016\2016 - Newton Gravel LNAPL.dwg; USER: ENGELHARDT, SARAH; PLOTTED:July 18, 2016 - 2:54 PM

AECOM
Milwaukee Office
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FORMER NEWTON GRAVEL PIT

WESTERN SOURCE AREA

Project Number:	Drawn By:	Date:	Figure No. 2
60311767	SAE	7/18/2016	

Tables

TABLE 1

Summary of LNAPL Analytical Data
Newton Gravel Pit - Manitowoc, Wisconsin
Project No. 60135471

Parameters	Units	Precision Analytical Laboratory WT-02 9/7/1994	Pace Analytical Composite WT-02 & WT-09 9/15/2015
General			
Color	---	Brown	NA
Ph	---	6.2	5.89
Acid Reactivity	---	negative	NA
Water Reactivity	---	negative	NA
Oxidizer, screen	---	negative	NA
Flash Point, Closed Cup	deg F	140	132
Ash	%	0.15	NA
Specific Gravity	g/ml	0.96	0.8856
BTU	BTU/lb	19,000	19,223
Viscosity	CST @ 40 deg C	Medium	13.81
Cyanide, screen	mg/l	<10	NA
Cyanide, total	mg/l	5.0	NA
Sulfide, screen	mg/l	positive, >2 mg/l	NA
Sulfide, total	mg/kg	9.0	NA
Fluoride, total	mg/l	4.9	NA
Total Phenolics	mg/l	17	NA
Total Organic Halogens	mg/l	6.19	NA
DRO	%	24	NA
Detected VOCs			
Benzene	mg/kg	NA	68.14
1,1-Dichloroethene	mg/kg	NA	3.29
cis-1,2-Dichloroethene	mg/kg	NA	5,173.06
Ethylbenzene	mg/kg	NA	533.45
Heptanes	mg/kg	NA	900.00
Hexanes	mg/kg	NA	368.11
Methyl Isobutyl Ketone	mg/kg	NA	48.29
Styrene	mg/kg	NA	49.78
Tetrachloroethene	mg/kg	NA	55.12
Toluene	mg/kg	NA	1,443.93
1,1,1-Trichloroethane	mg/kg	NA	134.77
Trichloroethene	mg/kg	NA	4.08
1,2,3-Trimethylbenzene	mg/kg	NA	3,383.00
1,2,4-Trimethylbenzene	mg/kg	NA	3,000.00
1,3,5-Trimethylbenzene	mg/kg	NA	10,300.00
Xylenes (total)	mg/kg	NA	3,300.18
Detected SVOCs			
Acenaphthylene	mg/kg	NA	301.09
Anthracene	mg/kg	NA	244.92
Benzo(a)pyrene	mg/kg	NA	86.29
Benzo(b)fluoranthene	mg/kg	NA	24.62
Benzo(g,h,I)perylene	mg/kg	NA	39.21
Indeno(1,2,3-cd)pyrene	mg/kg	NA	40.96
Chrysene	mg/kg	NA	100.19
Fluoranthene	mg/kg	NA	69.07
Fluorene	mg/kg	NA	248.7
Naphthalene	mg/kg	NA	1,492.93
Phenanthrene	mg/kg	NA	386.55
Pyrene	mg/kg	NA	299.09
Metals			
Aluminum	mg/kg	34	NA
Arsenic	mg/kg	1	<0.50
Barium	mg/kg	1.8	10.07
Cadmium	mg/kg	<0.20	<0.10
Calcium	mg/kg	150	NA
Chromium	mg/kg	1.8	11.47
Copper	mg/kg	2.1	NA
Iron	mg/kg	59	NA
Lead	mg/kg	2.8	17.69
Magnesium	mg/kg	200	NA
Mercury	mg/kg	<0.02	<0.17
Nickel	mg/kg	<0.75	NA
Potassium	mg/kg	<11	NA
Selenium	mg/kg	<0.05	<0.63
Silver	mg/kg	<0.50	0.26
Sodium	mg/kg	59	NA
Zinc	mg/kg	1.4	NA
PCBs			
Aroclor 1242	µg/kg	<970	148,000
Aroclor 1248	µg/kg	77,000	148,000
Aroclor 1254	µg/kg	<970	98,700
Total PCBs	µg/kg	77,000	394,700

Notes:
PCBs = PolyChlorinated Biphenyls
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
BTU/lb = British Thermal Unit per Pound
mg/kg = miligrams per kilogram
µg/kg = micrograms per kilogram
deg F = Degrees Fahrenheit
CST @ 40 deg C = Cetistokes at 40 Degrees Celsius
NA = Not analyzed

Attachment A
Photo Log

PHOTOGRAPH LOG

Facility Name:	Site Location:	Project No.
Former Newton Gravel Pit	Manitowoc, Wisconsin	60135471

Photo No.	Date:
1	9/16/15

Direction Photo Taken:

South

Description:

Bailer of free product recovered from monitoring well WT-09 during SVE pilot study work.

Photo No.	Date:
2	9/16/15

Direction Photo Taken:

West

Description:

Composite free product samples obtained from monitoring wells WT-09 and WT-02 during SVE pilot study work.

Attachment B
Laboratory Analytical Data

PRECISION ANALYTICAL LABORATORY
205 WEST GALENA
MILWAUKEE, WI 53212
(414) 272-5222

10/28/94
15:07

Analytical Report

Attn: Jeff Maletzke
Client: Rust Environmental
4738 N. 40th Street
Sheboygan, WI 53081

WORK ID: 70416.202 Newton Gravel Pit

Date Received: 09/08/94
Date Reported: 10/28/94

PAL ORDER #: 9409071

SAMPLE DESCRIPTION	LAB ID	DATE COLLECTED
NG-WT02-01	01A	09/07/94
NG-WT02-01	01B	09/07/94

Laboratory ID Number (Wisconsin DNR): 241369260

Reviewed By

Rosemary L. Dineen

Laboratory Director

PRECISION ANALYTICAL LABORATORY

CLIENT:**Rust Environmental**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method
Sample ID: NG-WT02-01			Lab ID: 9409071-01A			Collected: 09/07/94	
% Water	1.46		% By Volume	10/27/94		SF	ASTM D1744
Acid Reactivity	NEGATIVE		-	09/19/94		BHZ	
Color	BROWN		-	09/19/94		BHZ	ASTM D4979
Cyanide, Screen	BQL	10	mg/l	09/19/94		BHZ	ASTM D5049
Flash Point, Closed Cup	140		degrees F	09/19/94		BHZ	1010
Free Liquids	99		%	09/22/94		BHZ	9095
Layers	NONE		-	09/19/94		BHZ	ASTM D4979
Odor	MODERATE		-	09/19/94		BHZ	ASTM D4979
Oxidizer, Screen	NEGATIVE		-	09/19/94		BHZ	ASTM D4981
Percent Viscosity, Visual	MEDIUM		-	09/19/94		BHZ	ASTM D4979
pH	6.2		units	09/13/94		DW	150.1
Specific Gravity	0.96		g/ml	09/19/94		BHZ	ASTM D5057
Sulfide, Screen	POSITIVE	2.0	mg/l	09/19/94		BHZ	ASTM D4978
Total Phenolics	17	0.5	mg/l	09/26/94		BHZ	420.1
Total Solid, Visual	99		%	09/19/94		BHZ	
Water Reactivity	NEGATIVE		-	09/19/94		BHZ	ASTM D5058
Sample ID: NG-WT02-01			Lab ID: 9409071-01B			Collected: 09/07/94	
BTU	19000		BTU/lb	10/14/94		BHZ	md D215-85
Chloride	BQL	100	mg/l	09/21/94		BHZ	325.3
Cyanide, Total	5.0	0.2	mg/l	09/16/94		BHZ	335.2
Fluoride, Total	4.9	1.0	mg/l	09/12/94		BHZ	340.2
Sulfide, Total	9.0	2.0	mg/kg	09/13/94		MHM	376.1
Total Organic Halogens	6.19		mg/l	10/18/94		BHZ	
Aluminum	34	2.0	mg/kg	09/22/94		SLM	6010
Arsenic, Low Level	1	0.50	mg/kg	09/26/94		SRS	7060
Barium	1.8	0.40	mg/kg	09/22/94		SLM	6010
Cadmium	BQL	0.20	mg/kg	09/22/94		SLM	6010
Calcium	150	1.5	mg/kg	09/27/94		SLM	6010
Chromium in Waste	1.8	0.22	mg/kg	09/22/94		SLM	6010
Copper	2.1	0.1	mg/kg	09/27/94		SLM	6010
Iron in Waste	59	3.2	mg/kg	09/22/94		SLM	6010
Lead	2.8	1.2	mg/kg	09/22/94		SLM	6010
Magnesium	200	4.5	mg/kg	09/22/94		SLM	6010
Mercury in Waste	BQL*	0.02	mg/kg	10/05/94		SLM	7471
Metals Digestion	-		-		09/19/94	SRS	
Metals Digestion-Furnace	-		-		09/22/94	SRS	3050
Nickel	BQL	0.75	mg/kg	09/22/94		SLM	6010
Potassium in Waste	BQL	11	mg/kg	09/27/94		SLM	6010
Selenium, Low Level	BQL	0.05	mg/kg	09/27/94		SRS	7740
Silver	BQL	0.50	mg/kg	09/22/94		SLM	6010

BQL - Below Quantification Limit NP - Not Present P - Present

CLIENT:**Rust Environmental**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method
Sodium	59	1.8	mg/kg	09/22/94		SLM	6010
Zinc	1.4	0.20	mg/kg	09/22/94		SLM	6010
Ash (Fixed Residue)	.15		%	10/04/94		DW	160.4
PCB, Waste							8081
Aroclor-1016	BQL	970	ug/kg	09/23/94	09/21/94	JRH	
Aroclor-1221	BQL	2000	ug/kg	09/23/94	09/21/94	JRH	
Aroclor-1232	BQL	970	ug/kg	09/23/94	09/21/94	JRH	
Aroclor-1242	BQL	970	ug/kg	09/23/94	09/21/94	JRH	
Aroclor-1248	77000	970	ug/kg	09/23/94	09/21/94	JRH	
Aroclor-1254	BQL	970	ug/kg	09/23/94	09/21/94	JRH	
Aroclor-1260	BQL	970	ug/kg	09/23/94	09/21/94	JRH	

BQL - Below Quantification Limit NP - Not Present P - Present

PRECISION ANALYTICAL LABORATORY

11/02/94

Report Comments

CLIENT: Rust Environmental

PAL Order #: 9409071

All analysis performed at Precision Analytical Laboratory according to approved methods cited in the following references:

Standard Methods for Evaluation of Water and Wastewater, APHA, 17th Edition, 1989
Methods for Chemical Analysis for Water and Wastes,EPA 600/4-79-020,
USEPA, Revised March, 1983 and 1979.
Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Edition, Final Update I, July 1991

Sample is capable of being pumped, and does not ignite to the match test.

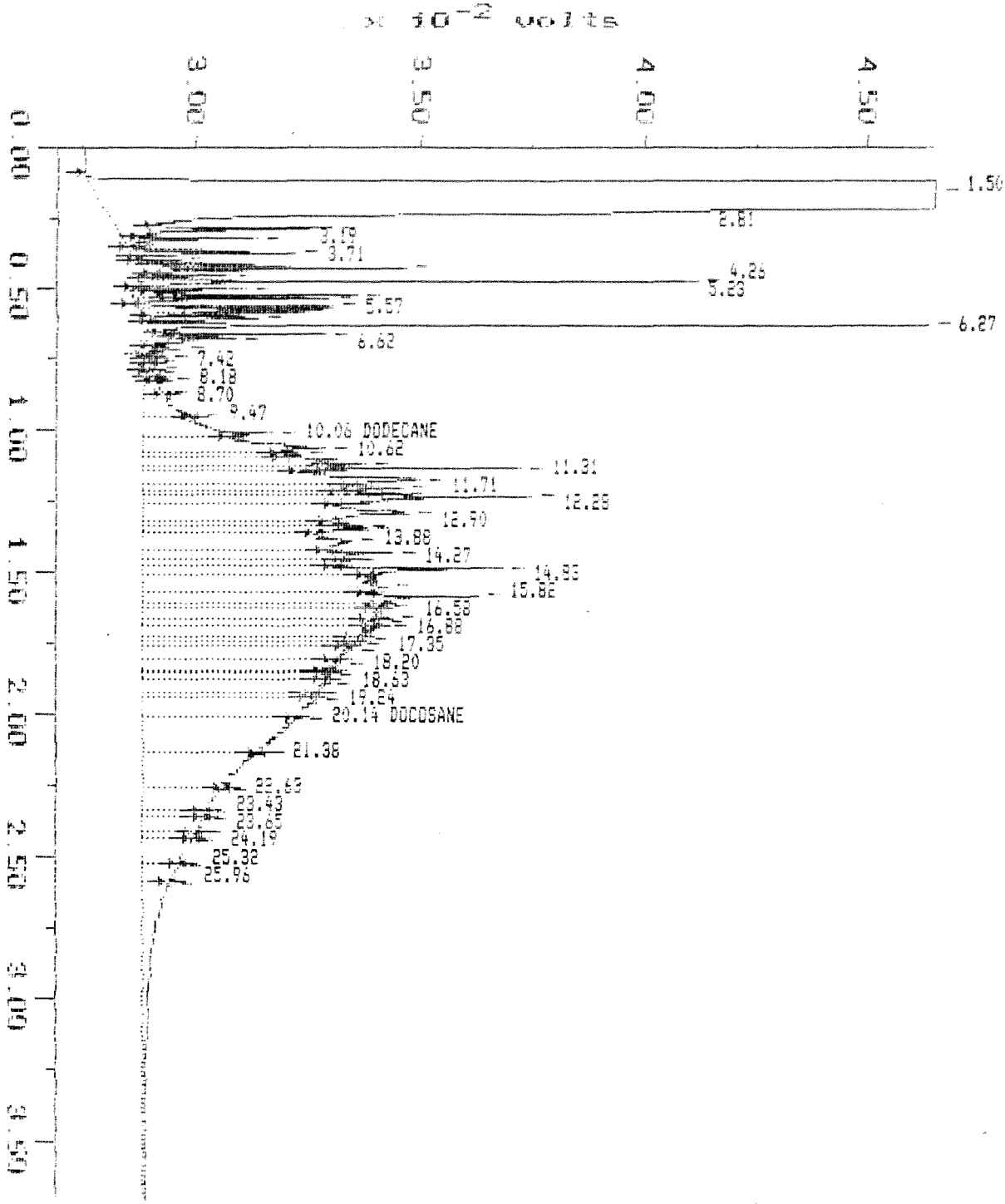
* Matrix spike recovery = 29%.

A portion of the sample was extracted with methylene chloride and analyzed using the WDNRDRO method. The presence of gasoline and diesel fuel was noted at a concentration of approximately 24 %. (Please see attached chromatogram)

Sample: 9409071-01
Acquired: 07-OCT-94 13:34
Dilution: 1 : 500.000

Channel: DRO/FID
Method: D:\DRO1\OCT94\OILSAMPL
Inj Vol: 1.00

Filename: 410DROIL
Operator: AYM



~ 240,000 PPM

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

October 13, 2015

DAVE HENDERSON
AECOM, Inc. - MILWAUKEE
1555 N River Center Drive
Suite 214
Milwaukee, WI 53212

RE: Project: 60135471 NEWTON PIT
Pace Project No.: 40121929

Dear DAVE HENDERSON:
Enclosed are the analytical results for sample(s) received by the laboratory on September 30, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Christopher Hyska
christopher.hyska@pacelabs.com
Project Manager

Enclosures

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

CERTIFICATIONS

Project: 60135471 NEWTON PIT
Pace Project No.: 40121929

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
Virginia VELAP ID: 460263
North Dakota Certification #: R-150
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
US Dept of Agriculture #: S-76505
Virginia VELAP ID: 460263
Virginia VELAP Certification ID: 460263
Wisconsin Certification #: 405132750

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: 60135471 NEWTON PIT
Pace Project No.: 40121929

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40121929001	**FREE PRODUCT**	Non Aqueous	09/14/15 12:00	09/30/15 09:15

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 60135471 NEWTON PIT
Pace Project No.: 40121929

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40121929001	**FREE PRODUCT**	EPA 8082A	LT	11	PASI-M
		ASTM D240	DJT	1	PASI-MNG
		EPA 1010	DEY	1	PASI-G

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 60135471 NEWTON PIT
Pace Project No.: 40121929

Sample: FREE PRODUCT **Lab ID: 40121929001** Collected: 09/14/15 12:00 Received: 09/30/15 09:15 Matrix: Non Aqueous Liquid

Results reported on a "wet-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8082A GCS PCB Oil	Analytical Method: EPA 8082A Preparation Method: EPA 3580								
PCB-1016 (Aroclor 1016)	**<7170**	ug/kg	50000	7170	10	10/05/15 10:37	10/05/15 21:09	12674-11-2	
PCB-1221 (Aroclor 1221)	**<9480**	ug/kg	50000	9480	10	10/05/15 10:37	10/05/15 21:09	11104-28-2	
PCB-1232 (Aroclor 1232)	**<7070**	ug/kg	50000	7070	10	10/05/15 10:37	10/05/15 21:09	11141-16-5	
PCB-1242 (Aroclor 1242)	**148000**	ug/kg	50000	13100	10	10/05/15 10:37	10/05/15 21:09	53469-21-9	
PCB-1248 (Aroclor 1248)	**148000**	ug/kg	50000	5550	10	10/05/15 10:37	10/05/15 21:09	12672-29-6	
PCB-1254 (Aroclor 1254)	**98700**	ug/kg	50000	5490	10	10/05/15 10:37	10/05/15 21:09	11097-69-1	
PCB-1260 (Aroclor 1260)	**<8590**	ug/kg	50000	8590	10	10/05/15 10:37	10/05/15 21:09	11096-82-5	
PCB-1262 (Aroclor 1262)	**<8910**	ug/kg	50000	8910	10	10/05/15 10:37	10/05/15 21:09	37324-23-5	
PCB-1268 (Aroclor 1268)	**<8470**	ug/kg	50000	8470	10	10/05/15 10:37	10/05/15 21:09	11100-14-4	
Surrogates									
Tetrachloro-m-xylene (S)	100	%.	69-150		10	10/05/15 10:37	10/05/15 21:09	877-09-8	D3
Decachlorobiphenyl (S)	121	%.	33-150		10	10/05/15 10:37	10/05/15 21:09	2051-24-3	
ASTM D240 BTU, by Calorimeter	Analytical Method: ASTM D240								
BTU	**19223**	BTU/lb	0.0050	0.0050	1		10/06/15 12:53		
1010 Flashpoint,Closed Cup	Analytical Method: EPA 1010								
Flashpoint	**132**	deg F			1		10/02/15 18:56		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 60135471 NEWTON PIT
Pace Project No.: 40121929

QC Batch: OEXT/31054
QC Batch Method: EPA 3580
Analysis Method: EPA 8082A
Analysis Description: 8082A GCS PCB Oil
Associated Lab Samples: 40121929001

METHOD BLANK: 2098819
Matrix: Non Aqueous Liquid
Associated Lab Samples: 40121929001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	<717	5000	10/05/15 19:18	
PCB-1221 (Aroclor 1221)	ug/kg	<948	5000	10/05/15 19:18	
PCB-1232 (Aroclor 1232)	ug/kg	<707	5000	10/05/15 19:18	
PCB-1242 (Aroclor 1242)	ug/kg	<1310	5000	10/05/15 19:18	
PCB-1248 (Aroclor 1248)	ug/kg	<555	5000	10/05/15 19:18	
PCB-1254 (Aroclor 1254)	ug/kg	<549	5000	10/05/15 19:18	
PCB-1260 (Aroclor 1260)	ug/kg	<859	5000	10/05/15 19:18	
PCB-1262 (Aroclor 1262)	ug/kg	<891	5000	10/05/15 19:18	
PCB-1268 (Aroclor 1268)	ug/kg	<847	5000	10/05/15 19:18	
Decachlorobiphenyl (S)	%.	104	33-150	10/05/15 19:18	
Tetrachloro-m-xylene (S)	%.	106	69-150	10/05/15 19:18	

LABORATORY CONTROL SAMPLE: 2098820

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	100000	94000	94	75-136	
PCB-1260 (Aroclor 1260)	ug/kg	100000	99100	99	75-137	
Decachlorobiphenyl (S)	%.			110	33-150	
Tetrachloro-m-xylene (S)	%.			115	69-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2098821 2098822

Parameter	Units	10324659001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
PCB-1016 (Aroclor 1016)	ug/kg	ND	100000	100000	154000	152000	154	152	30-150	1	30	M6
PCB-1260 (Aroclor 1260)	ug/kg	ND	100000	100000	130000	124000	130	124	30-150	5	30	
Decachlorobiphenyl (S)	%.						130	126	33-150			
Tetrachloro-m-xylene (S)	%.						118	115	69-150			D3

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 60135471 NEWTON PIT
Pace Project No.: 40121929

QC Batch: WET/23361
QC Batch Method: EPA 1010
Analysis Method: EPA 1010
Analysis Description: 1010 Flash Point, Closed Cup
Associated Lab Samples: 40121929001

LABORATORY CONTROL SAMPLE: 1231738

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Flashpoint	deg F		81.6			

SAMPLE DUPLICATE: 1231755

Parameter	Units	40122039002 Result	Dup Result	RPD	Max RPD	Qualifiers
Flashpoint	deg F	95.6	97.6			

SAMPLE DUPLICATE: 1231793

Parameter	Units	40121929001 Result	Dup Result	RPD	Max RPD	Qualifiers
Flashpoint	deg F	132	132			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALIFIERS

Project: 60135471 NEWTON PIT
Pace Project No.: 40121929

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor and percent moisture.

LOQ - Limit of Quantitation adjusted for dilution factor and percent moisture.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-G	Pace Analytical Services - Green Bay
PASI-M	Pace Analytical Services - Minneapolis
PASI-MNG	Pace Analytical Services - Virginia Mining

ANALYTE QUALIFIERS

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60135471 NEWTON PIT
Pace Project No.: 40121929

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40121929001	**FREE PRODUCT**	EPA 3580	OEXT/31054	EPA 8082A	GCSV/16890
40121929001	**FREE PRODUCT**	ASTM D240	MING/3697		
40121929001	**FREE PRODUCT**	EPA 1010	WET/23361		

Pace Analytical®
www.pacelabs.com

UPPER MIDWEST REGION
MN: 612-607-1700 WI: 920-469-2436

Page 1 of

CHAIN OF CUSTODY

*Preservation Codes
A=None B=HCL C=H2SO4 D=HNO3 E=DI Water F=Methanol G=NaOH
H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

(Please Print Clearly)	
Company Name:	AECOM
Branch/Location:	Milwaukee
Project Contact:	David Henderson
Phone:	414 944 6190
Project Number:	60135471
Project Name:	Newton Pit
Project State:	WI
Sampled By (Print):	DSH
Sampled By (Sign):	DSH
PO #:	—
Regulatory Program:	

Quote #:	See Attached email 40121929
Mail To Contact:	David Henderson
Mail To Company:	AECOM
Mail To Address:	1555 N River Center Dr Milw WI 53212
Invoice To Contact:	
Invoice To Company:	Same
Invoice To Address:	
Invoice To Phone:	

Data Package Options (billable)
☐ EPA Level III
☐ EPA Level IV

MS/MSD
☐ On your sample (billable)
☒ NOT needed on your sample

Matrix Codes

A = Air	W = Water
B = Biota	DW = Drinking Water
C = Charcoal	GW = Ground Water
O = Oil	SW = Surface Water
S = Soil	WW = Waste Water
SI = Sludge	WP = Wipe

FILTERED? (YES/NO) Y/N: N
PRESERVATION (CODE)* Pick Letter: A

PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	Analyses Requested: PCB's	Viscosity	pH	Flash Point	Density / Sp. G.	RCRA Metals	VOC's	SVOC's	CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)	Profile #
001	Free Product	9/14/15	12-	Oil	9	X	X	X	X	X	X	X	BTU X → 3-11oz bell jars	3 sample JARS	

Rush Turnaround Time Requested - Prelims
(Rush TAT subject to approval/surcharge)
Date Needed:

Transmit Prelim Rush Results by (complete what you want):
Email #1:
Email #2:
Telephone:
Fax:

Samples on HOLD are subject to special pricing and release of liability

Relinquished By:	Date/Time:	Received By:	Date/Time:
D.S. Henderson	9/29/15 10:10	Mary Jannin	9/29/15 10:10
Mary Jannin	9/29/15 1415		
C.S Logistics	9/29 9/30/15 0915	Jake Schramm Pace GB	9/30/15 0915
	KB 9/30/15		

PACE Project No.: 40121929
Receipt Temp = 2.2 °C
Sample Receipt pH OK / Adjusted
Cooler Custody Seal: Present / Not Present; Intact / Not Intact

Version 6.0 06/14/06

C019a(27Jun2006)

ORIGINAL

Sample Condition Upon Receipt

Pace Analytical Services, Inc.
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

Project #: **WO# : 40121929**

40121929

Client Name: AECOM-Milwaukee

Courier: ☐ Fed Ex ☐ UPS ☐ Client ☐ Pace ☑ Other: CS Logistics

Tracking #:

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Custody Seal on Samples Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other

Thermometer Used SR-56 **Type of Ice:** Wet Blue Dry (None) ☐ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 2.2 /Corr: 2.2 **Biological Tissue is Frozen:** ☐ yes ☐ no

Temp Blank Present: ☐ yes ☑ no

Person examining contents:
Date: 9/30/15
Initials: KS

Temp should be above freezing to 6°C for all sample except Biota.
Frozen Biota Samples should be received ≤ 0°C.

				Comments:
Chain of Custody Present:	☑Yes	☐No	☐N/A	1.
Chain of Custody Filled Out:	☑Yes	☐No	☐N/A	2.
Chain of Custody Relinquished:	☑Yes	☐No	☐N/A	3.
Sampler Name & Signature on COC:	☑Yes	☐No	☐N/A	4. initials only KS 9/30/15
Samples Arrived within Hold Time:	☑Yes	☐No	☐N/A	5.
- VOA Samples frozen upon receipt	☐Yes	☐No		Date/Time:
Short Hold Time Analysis (<72hr):	☐Yes	☑No	☐N/A	6.
Rush Turn Around Time Requested:	☐Yes	☑No	☐N/A	7.
Sufficient Volume:	☐Yes	☐No	☐N/A	8.
Correct Containers Used:	☐Yes	☑No	☐N/A	9. arrived in 3 bell jars
-Pace Containers Used:	☐Yes	☑No	☐N/A	
-Pace IR Containers Used:	☐Yes	☐No	☑N/A	KS 9/30/15
Containers Intact:	☑Yes	☐No	☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes	☐No	☑N/A	11.
Sample Labels match COC:	☐Yes	☑No	☐N/A	12. No ID, time, date
-Includes date/time/ID/Analysis Matrix: O				KS 9/30/15
All containers needing preservation have been checked. (Non-Compliance noted in 13.)	☐Yes	☐No	☑N/A	13. ☐ HNO3 ☐ H2SO4 ☐ NaOH ☐ NaOH +ZnAct
All containers needing preservation are found to be in compliance with EPA recommendation. (HNO3, H2SO4 ≤2; NaOH+ZnAct ≥9, NaOH ≥12)	☐Yes	☐No	☑N/A	
exceptions: VOA, coliform, TOC, TOX, TOH, O&G, WIDROW, Phenolics, OTHER:	☐Yes	☑No		Initial when completed / Lab Std #ID of preservative / Date/ Time:
Headspace in VOA Vials (>6mm):	☐Yes	☐No	☑N/A	14.
Trip Blank Present:	☐Yes	☐No	☑N/A	15.
Trip Blank Custody Seals Present	☐Yes	☐No	☑N/A	
Pace Trip Blank Lot # (if purchased):				

Client Notification/ Resolution: If checked, see attached form for additional comments ☐

Person Contacted: Date/Time:

Comments/ Resolution: Samples are free product and will be placed in the free product refridgerator KS 9/30/15

Project Manager Review: **Date:** 10/1/15

PRECISION PETROLEUM LABS, INC.

CERTIFICATE OF ANALYSIS

LABORATORY ADDRESS
5915 Star Lane, Houston, TX 77057
Ph. 713-680-9425 Fax: 713-680-9564
Website: precisionlabs.org

Client Name: Pace Analytical Systems-Green Bay, WI
Street Address: 1241 Bellevue St. Ste 9
City, State, Zip: Green Bay, WI 54302

INVOICE No.	66936	DATE RECEIVED	10-02-2015
LAB REFERENCE No.	2015-10-061	DATE/TIME COLLECTED	09-14-2015@12:00
AUTHORIZED BY	Christopher Hyska	MATRIX TYPE	Liquid
PRODUCT ID	Free Product Lab Id: 40121929001		

Volatile Organic Compounds	Test Method	Reporting Limit, PPM	Results PPM
Acetone	S.W. 8260/5030	0.01	BRL
Acetonitrile	S.W. 8260/5030	0.01	BRL
Benzene	S.W. 8260/5030	0.01	68.14
Bromobenzene	S.W. 8260/5030	0.01	BRL
Bromodichloromethane	S.W. 8260/5030	0.01	BRL
Bromoform	S.W. 8260/5030	0.01	BRL
Bromomethane	S.W. 8260/5030	0.01	BRL
n-Butylbenzene	S.W. 8260/5030	0.01	BRL
sec-Butylbenzene	S.W. 8260/5030	0.01	BRL
tert-Butylbenzene	S.W. 8260/5030	0.01	BRL
Butyl acetate	S.W. 8260/5030	0.01	BRL
Butyl alcohol	S.W. 8260/5030	0.01	BRL
n-Butanol	S.W. 8260/5030	0.01	BRL
Carbon tetrachloride	S.W. 8260/5030	0.01	BRL
Chlorobenzene	S.W. 8260/5030	0.01	BRL
Chloroethane	S.W. 8260/5030	0.01	BRL
2-Chloroethylvinyl ether	S.W. 8260/5030	0.01	BRL
Chloroform	S.W. 8260/5030	0.01	BRL
Chloromethane	S.W. 8260/5030	0.01	BRL
2-Chlorotoluene	S.W. 8260/5030	0.01	BRL
4-Chlorotoluene	S.W. 8260/5030	0.01	BRL
1-Dibromo-3-chlorpropane	S.W. 8260/5030	0.01	BRL
Dibromochloromethane	S.W. 8260/5030	0.01	BRL
Dichlorobromomethane	S.W. 8260/5030	0.01	BRL
1,2-Dibromoethane	S.W. 8260/5030	0.01	BRL
Dibromomethane	S.W. 8260/5030	0.01	BRL
1,2-Dichlorobenzene	S.W. 8260/5030	0.01	BRL
1,3-Dichlorobenzene	S.W. 8260/5030	0.01	BRL
1,4-Dichlorobenzene	S.W. 8260/5030	0.01	BRL
Dichlorodifluoromethane	S.W. 8260/5030	0.01	BRL
1,1-Dichloroethane	S.W. 8260/5030	0.01	BRL
1,2-Dichloroethane	S.W. 8260/5030	0.01	BRL
1,1-Dichloroethene	S.W. 8260/5030	0.01	3.29
cis-1, 2-Dichloroethene	S.W. 8260/5030	0.01	5,173.06
trans-1,2-Dichloroethene	S.W. 8260/5030	0.01	BRL
1,2-Dichloropropane	S.W. 8260/5030	0.01	BRL
1,3-Dichloropropane	S.W. 8260/5030	0.01	BRL
2,2-Dichloropropane	S.W. 8260/5030	0.01	BRL
1,1-Dichloropropene	S.W. 8260/5030	0.01	BRL
cis-1,3-Dichloropropene	S.W. 8260/5030	0.01	BRL
trans-1,3-dichloropropene	S.W. 8260/5030	0.01	BRL
Diisopropyl ether	S.W. 8260/5030	0.01	BRL
Ethyl alcohol	S.W. 8260/5030	0.01	BRL

Daniel Zabihi **Date: 10-09-2015**
QA Manager

PRIMARY ACCREDITATION TCEQ, #T104704203-TX
ARIZONA LICENSE # AZ0630

QUALIFIERS & ABBREVIATIONS: BRL - Below Reporting Limit; SCL - Test performed by an approved subcontract laboratory; B - Analyte was detected in the associated method blank; Matrix spike/matrix spike duplicate (M), Laboratory control sample (L), Calibration criteria (C), and Surrogate (S) recoveries were outside acceptance limits. Test deviation applied to Method 8260 (VOCS).

COMMENTS: This certificate is Confidential Business Information and will only be provided to designated customer point-of-contact(s). Other production of this report requires prior authorization from the customer. There were no quality assurance anomalies associated with these tests.

PRECISION PETROLEUM LABS, INC.

CERTIFICATE OF ANALYSIS

LABORATORY ADDRESS	Client Name: Pace Analytical Systems-Green Bay, WI
5915 Star Lane, Houston, TX 77057	Street Address: 1241 Bellevue St. Ste 9
Ph. 713-680-9425 Fax: 713-680-9564	City, State, Zip: Green Bay, WI 54302
Website: precisionlabs.org	

INVOICE No.	66936	DATE RECEIVED	10-02-2015
LAB REFERENCE No.	2015-10-061	DATE/TIME COLLECTED	09-14-2015@12:00
AUTHORIZED BY	Christopher Hyska	MATRIX TYPE	Liquid
PRODUCT ID	Free Product Lab Id: 40121929001		

Volatile Organic Compounds	Test Method	Reporting Limit, PPM	Results PPM
Ethyl acetate	S.W. 8260/5030	0.01	BRL
Ethyl benzene	S.W. 8260/5030	0.01	533.45
Ethyl ether	S.W. 8260/5030	0.01	BRL
Ethyl mercaptan	S.W. 8260/5030	0.01	BRL
Heptane and heptanes	S.W. 8260/5030	0.01	900.00
Hexachloro-1,3-butadiene	S.W. 8260/5030	0.01	BRL
2-Hexanone	S.W. 8260/5030	0.01	BRL
Hexane and hexanes	S.W. 8260/5030	0.01	368.11
Isobutyl acetate	S.W. 8260/5030	0.01	BRL
Isobutyl alcohol	S.W. 8260/5030	0.01	BRL
Isopropyl acetate	S.W. 8260/5030	0.01	BRL
Isopropyl alcohol	S.W. 8260/5030	0.01	BRL
Isopropyl benzene	S.W. 8260/5030	0.01	BRL
p-Isopropyltoluene	S.W. 8260/5030	0.01	BRL
Methyl acetate	S.W. 8260/5030	0.01	BRL
Methyl alcohol	S.W. 8260/5030	0.01	BRL
Methyl Ethyl Ketone	S.W. 8260/5030	0.01	BRL
Methylene chloride	S.W. 8260/5030	0.01	BRL
4-Methyl-2-pentanone	S.W. 8260/5030	0.01	BRL
Methyl-tert-butyl ether	S.W. 8260/5030	0.01	BRL
Methyl Isobutyl Ketone	S.W. 8260/5030	0.01	48.29
Nitrobenzene	S.W. 8260/5030	0.01	BRL
Propyl acetate	S.W. 8260/5030	0.01	BRL
Propyl alcohol	S.W. 8260/5030	0.01	BRL
n-Propyl-benzene	S.W. 8260/5030	0.01	BRL
Styrene	S.W. 8260/5030	0.01	49.78
1,1,1,2-Tetrachloroethane	S.W. 8260/5030	0.01	BRL
1,1,2,2-Tetrachloroethane	S.W. 8260/5030	0.01	BRL
Tetrachloroethene	S.W. 8260/5030	0.01	55.12
Toluene	S.W. 8260/5030	0.01	1,443.93
1,2,3-Trichlorobenzene	S.W. 8260/5030	0.01	BRL
1,2,4-Trichlorobenzene	S.W. 8260/5030	0.01	BRL
1,1,1-Trichloroethane	S.W. 8260/5030	0.01	134.77
1,1,2-Trichloroethane	S.W. 8260/5030	0.01	BRL
Trichloroethene	S.W. 8260/5030	0.01	4.08
Trichlorofluoromethane	S.W. 8260/5030	0.01	BRL
1,2,3-Trichloropropane	S.W. 8260/5030	0.01	BRL
1,2,3-Trimethylbenzene	S.W. 8260/5030	0.01	3,383.00
1,2,4-Trimethylbenzene	S.W. 8260/5030	0.01	3,000.00
1,3,5-Trimethylbenzene	S.W. 8260/5030	0.01	10,300.00
Vinyl acetate	S.W. 8260/5030	0.01	BRL
Vinyl chloride	S.W. 8260/5030	0.01	BRL
Vinyl ethyl ether	S.W. 8260/5030	0.01	BRL
Vinyl methyl ether	S.W. 8260/5030	0.01	BRL
Xylenes	S.W. 8260/5030	0.01	3,300.18

Daniel Zabihi **Date: 10-09-2015**
QA Manager

PRIMARY ACCREDITATION TCEQ, #T104704203-TX
ARIZONA LICENSE # AZ0630

QUALIFIERS & ABBREVIATIONS: BRL - Below Reporting Limit; SCL - Test performed by an approved subcontract laboratory; B - Analyte was detected in the associated method blank; Matrix spike/matrix spike duplicate (M), Laboratory control sample (L), Calibration criteria (C), and Surrogate (S) recoveries were outside acceptance limits. Test deviation applied to Method 8260 (VOCS).

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PRECISION PETROLEUM LABS, INC.

CERTIFICATE OF ANALYSIS

LABORATORY ADDRESS	Client Name: Pace Analytical Systems-Green Bay, WI
5915 Star Lane, Houston, TX 77057 Ph. 713-680-9425 Fax: 713-680-9564 Website: precisionlabs.org	Street Address: 1241 Bellevue St. Ste 9 City, State, Zip: Green Bay, WI 54302

INVOICE No.	66936	DATE RECEIVED	10-02-2015
LAB REFERENCE No.	2015-10-061	DATE/TIME COLLECTED	09-14-2015@12:00
AUTHORIZED BY	Christopher Hyska	MATRIX TYPE	Liquid
PRODUCT ID	Free Product Lab Id: 40121929001		

Total Semi-Volatiles	Test Method	Reporting Limit, PPM	Results PPM
Acenaphthene	EPA-8270	0.10	BRL
Acenaphthylene	EPA-8270	0.10	301.09
Acrolein	EPA-8270	0.10	BRL
Acrylonitrile	EPA-8270	0.10	BRL
Allyl Alcohol	EPA-8270	0.10	BRL
Aldrin	EPA-8270	0.10	BRL
Anthracene	EPA-8270	0.10	244.92
Benzo(k)fluoranthene	EPA-8270	0.10	BRL
Benzo(b)fluoranthene	EPA-8270	0.10	24.62
Benzo(a)anthracene	EPA-8270	0.10	BRL
Benzoic acid	EPA-8270	0.10	BRL
Benzo(g,h,i) perylene	EPA-8270	0.10	39.21
Benzyl alcohol	EPA-8270	0.10	BRL
Benzo(a)pyrene	EPA-8270	0.10	86.29
4-Bromophenyl phenyl ether	EPA-8270	0.10	BRL
Benzyl butyl phthalate	EPA-8270	0.10	BRL
Carbon disulfide	EPA-8270	0.10	BRL
4-Chloro-3-methylphenol	EPA-8270	0.10	BRL
4-Chloroaniline	EPA-8270	0.10	BRL
ß-BHC	EPA-8270	0.10	BRL
d-BHC	EPA-8270	0.10	BRL
Bis(2-chloroethoxy)methane	EPA-8270	0.10	BRL
Bis(2-chloroethy)ether	EPA-8270	0.10	BRL
Bis(2-Chloroisopropyl)ether	EPA-8270	0.10	BRL
Bis(2-ethylhexyl)phthalate	EPA-8270	0.10	BRL
2-Chloronaphthalene	EPA-8270	0.10	BRL
2-Chlorophenol	EPA-8270	0.10	BRL
4-Chlorophenyl phenyl ether	EPA-8270	0.10	BRL
M-Cresol	EPA-8270	0.10	BRL
O-Cresol	EPA-8270	0.10	BRL
P-Cresol	EPA-8270	0.10	BRL
Chrysene	EPA-8270	0.10	100.19

Daniel Zabihi **Date: 10-09-2015**
QA Manager

PRIMARY ACCREDITATION TCEQ, #T104704203-TX
ARIZONA LICENSE # AZ0630

QUALIFIERS & ABBREVIATIONS: BRL - Below Reporting Limit; SCL - Test performed by an approved subcontract laboratory; B - Analyte was detected in the associated method blank; Matrix spike/matrix spike duplicate (M), Laboratory control sample (L), Calibration criteria (C), and Surrogate (S) recoveries were outside acceptance limits. Test deviation applied to Method 8260 (VOCS).

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PRECISION PETROLEUM LABS, INC.

CERTIFICATE OF ANALYSIS

LABORATORY ADDRESS	Client Name: Pace Analytical Systems-Green Bay, WI
5915 Star Lane, Houston, TX 77057	Street Address: 1241 Bellevue St. Ste 9
Ph. 713-680-9425 Fax: 713-680-9564	City, State, Zip: Green Bay, WI 54302
Website: precisionlabs.org	

INVOICE No.	66936	DATE RECEIVED	10-02-2015
LAB REFERENCE No.	2015-10-061	DATE/TIME COLLECTED	09-14-2015@12:00
AUTHORIZED BY	Christopher Hyska	MATRIX TYPE	Liquid
PRODUCT ID	Free Product Lab Id: 40121929001		

Total Semi-Volatiles	Test Method	Reporting Limit, PPM	Results PPM
4,4'-DDD	EPA-8270	0.10	BRL
4,4'-DDE	EPA-8270	0.10	BRL
4,4'-DDT	EPA-8270	0.10	BRL
Dibenzo(a,h)anthracene	EPA-8270	0.10	BRL
Dibenzofuran	EPA-8270	0.10	BRL
1,2-Dichlorobenzene	EPA-8270	0.10	BRL
1,3-Dichlorobenzene	EPA-8270	0.10	BRL
1,4-Dichlorobenzene	EPA-8270	0.10	BRL
3,3-Dichlorobenzidine	EPA-8270	0.10	BRL
24-Dichlorophenol	EPA-8270	0.10	BRL
Dieldrine	EPA-8270	0.10	BRL
Diethylamine	EPA-8270	0.10	BRL
Diethyl phthalate	EPA-8270	0.10	BRL
2,4-Dimethylphenol	EPA-8270	0.10	BRL
Dimethyl phthalate	EPA-8270	0.10	BRL
Di-n-butylphthalate	EPA-8270	0.10	BRL
4,6-Dinitro-2-methylphenol	EPA-8270	0.10	BRL
2,4-Dinitrophenol	EPA-8270	0.10	BRL
2,4-Dinitrotoluene	EPA-8270	0.10	BRL
2,6-Dinitritoluene	EPA-8270	0.10	BRL
Di-n-octylphthalate	EPA-8270	0.10	BRL
1,2-Diphenylhydrazine	EPA-8270	0.10	BRL
bis(2-Ethylhexyl)phthalate	EPA-8270	0.10	BRL
Emdosulfan sulfate	EPA-8270	0.10	BRL
Endrin aldehyde	EPA-8270	0.10	BRL
Ethyl Amine	EPA-8270	0.10	BRL
Fluoranthene	EPA-8270	0.10	69.07
Fluorene	EPA-8270	0.10	248.70
Hexachloro-1,3-butadiene	EPA-8270	0.10	BRL
Heptachlor	EPA-8270	0.10	BRL
Heptachlor epoxide	EPA-8270	0.10	BRL
Hexachlorobenzene	EPA-8270	0.10	BRL
Hexachlorocyclopentadiene	EPA-8270	0.10	BRL

Daniel Zabihi **Date: 10-09-2015**
QA Manager

PRIMARY ACCREDITATION TCEQ, #T104704203-TX
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INVOICE No.	66936	DATE RECEIVED	10-02-2015
LAB REFERENCE No.	2015-10-061	DATE/TIME COLLECTED	09-14-2015@12:00
AUTHORIZED BY	Christopher Hyska	MATRIX TYPE	Liquid
PRODUCT ID	Free Product Lab Id: 40121929001		

Total Semi-Volatiles	Test Method	Reporting Limit, PPM	Results PPM
Hexachloroethane	EPA-8270	0.10	BRL
Hexachlorobutadiene	EPA-8270	0.10	BRL
Indeno(1,2,3-cd)pyrene	EPA-8270	0.10	40.96
Isophorone	EPA-8270	0.10	BRL
Isopropyl amine	EPA-8270	0.10	BRL
Methylamine	EPA-8270	0.10	BRL
2-Methylnaphthalene	EPA-8270	0.10	BRL
2-Methylphenol (o-cresol)	EPA-8270	0.10	BRL
3 & 4-Methylphenol	EPA-8270	0.10	BRL
Naphthalene	EPA-8270	0.10	1,492.93
2-Nitroaniline	EPA-8270	0.10	BRL
3-Nitroaniline	EPA-8270	0.10	BRL
4-Nitroaniline	EPA-8270	0.10	BRL
Nitrobenzene	EPA-8270	0.10	BRL
N-Nitroso-di-n-propylamine	EPA-8270	0.10	BRL
N-Nitrosodiphenylamie	EPA-8270	0.10	BRL
Total PCB's	EPA-8270	0.10	BRL
Phentanthrene	EPA-8270	0.10	386.55
Phenol	EPA-8270	0.10	BRL
Pyrene	EPA-8270	0.10	299.09
1,2,4-Trichlorobenzene	EPA-8270	0.10	BRL
4-Chloro-3-methyphenol	EPA-8270	0.10	BRL
2-Chlorophenol	EPA-8270	0.10	BRL
2,4-Chlorophenol	EPA-8270	0.10	BRL
2,4-Dimethylphenol	EPA-8270	0.10	BRL
2,4-Dinitrophenol	EPA-8270	0.10	BRL
2-Methyl-4,6-dinitrophenol	EPA-8270	0.10	BRL
2-Nitrophenol	EPA-8270	0.10	BRL
4-Nitrophenol	EPA-8270	0.10	BRL
Pentachlorophenol	EPA-8270	0.10	BRL
Trimethylamine	EPA-8270	0.10	BRL
2,4,5-Trichlorophenol	EPA-8270	0.10	BRL
2,4,6-Trichlorophenol	EPA-8270	0.10	BRL

Daniel Zabihi **Date: 10-09-2015**
QA Manager

PRIMARY ACCREDITATION TCEQ, #T104704203-TX
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QUALIFIERS & ABBREVIATIONS: BRL - Below Reporting Limit; SCL - Test performed by an approved subcontract laboratory; B - Analyte was detected in the associated method blank; Matrix spike/matrix spike duplicate (M), Laboratory control sample (L), Calibration criteria (C), and Surrogate (S) recoveries were outside acceptance limits. Test deviation applied to Method 8260 (VOCS).

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INVOICE No.	66936	DATE RECEIVED	10-02-2015
LAB REFERENCE No.	2015-10-061	DATE/TIME COLLECTED	09-14-2015@12:00
AUTHORIZED BY	Christopher Hyska	MATRIX TYPE	Liquid
PRODUCT ID	Free Product Lab Id: 40121929001		

PARAMETER	TEST METHOD	REPORTING LIMIT	TEST RESULTS
Ph	S.W. 9040	0.01	5.89
Density @ 15°C	D-1298	-----	0.8856
Viscosity CST @ 40°C	D-445	1	13.81
Heavy Metals, PPM			
Arsenic	EPA-6010	0.50	BRL
Barium	EPA-6010	0.10	10.07
Cadmium	EPA-6010	0.10	BRL
Chromium	EPA-6010	0.15	11.47
Lead	EPA-6010	0.39	17.69
Mercury	EPA-6010	0.17	BRL
Selenium	EPA-6010	0.63	BRL
Silver	EPA-6010	0.13	0.26

Daniel Zabihi **Date: 10-09-2015**
QA Manager

PRIMARY ACCREDITATION TCEQ, #T104704203-TX
ARIZONA LICENSE # AZ0630

QUALIFIERS & ABBREVIATIONS: BRL - Below Reporting Limit; SCL - Test performed by an approved subcontract laboratory; B - Analyte was detected in the associated method blank; Matrix spike/matrix spike duplicate (M), Laboratory control sample (L), Calibration criteria (C), and Surrogate (S) recoveries were outside acceptance limits. Test deviation applied to Method 8260 (VOCS).

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Chain of Custody

Workorder: 40121929 **Workorder Name:** 60135471 NEWTON PIT **Results Requested** 10/14/2015

Report / Invoice To	Subcontract To
Christopher Hyska Pace Analytical Green Bay 1241 Bellevue Street Suite 9 Green Bay, WI 54302 Phone (920)469-2436 Email: christopher.hyska@pacelabs.com	Precision Petroleum Labs 5915 Star Ln Houston, TX 77057

Item	Sample ID	Collect Date/Time	Lab ID	Matrix	Preserved Containers: Unpreserved						Requested Analysis: Total VOCs 8260	Total SVOCs 8270	Total RCRA Metals 6010	pH	Density	Viscosity							LAB USE ONLY
1	FREE PRODUCT	9/14/2015 12:00	40121929001	Oil	2						X	X	X	X	X	X							
2																							
3																							
4																							
5																							

Transfers	Released By	Date/Time	Received By	Date/Time
1	E. Maurer	10/1/15 1600		
2			T. H OCT 02 2015	
3				

Comments

MDL reporting

~~10:10 A~~ 9:10 A

Cooler Temperature on Receipt _____ °C | **Custody Seal** Y or N | **Received on Ice** Y or N | **Samples Intact** Y or N

****In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.*

Attachment C
Contaminant Mass Analysis Worksheet

Contaminant Mass Analysis Worksheet

Western Source Area
Former Town of Newton Gravel Pit
3130 Hecker Road, Manitowoc, WI

Vadose Zone Data:

Notes & Assumptions:

Mass calculated based on laboratory results (ug/kg) of detected VOCs only. This may under estimate total VOCs.
Reviewed data from 19 soil borings located within the proposed remedial cap area and within the influence of the proposed SVE system. (B-02, B-08, B-09, B-10, B-11, B-12 B-13, B-14, WT-9, WT-10, WT-14, WT-18, SVE, VP-1, VP-2, VP-3, VP-4, VP-5, VP-6)
Used VOC data from 11 borings located within the proposed remedial cap area and within the influence of the proposed SVE system. See Table 1 attached. (B-09, B-12 B-13, WT-18, SVE, VP-1, VP-2, VP-3, VP-4, VP-5, VP-6)
Excluded data from the smear zone, approx. 30' bgs (the LNAPL/free product zone).
In borings with multiple laboratory analytical results (based on depth), selected the most contaminated results.
Volume of impacted soil, based on area of the proposed cap, (62,680 sq ft) and engineer's best estimate.

Vadose Zone Area/Volume		
Area of impact	62,680	sf
Depth to GW	30	ft
Volume of soil (area x depth)	1,880,400	ft3
Convert to cubic yards (cft/27)	69,644.44	cy
Convert to Tons (1.7 factor)	118,396	tons
Convert to lbs (2,000 lbs/ton)	236,791,111	lbs
Convert to kgs (2.205 lbs/kg)	107,406,554	kg

Contaminant Mass - Vadose Zone		
Total VOCs Based on Geometric Mean (See attached Table 1)	10,767	ug/kg
Convert to grams/kg ((ug/kg)/1000)	0.01077	g/kg
Calculate mass in grams (g/kg * kg)	1,156,491	g
Convert to lbs (g/453.59)	2,550	lbs
Sub-Total VOC Mass for Vadose Zone*	2,550	lbs

LNAPL Data:

Notes & Assumptions:

Mass calculated based on laboratory results for LNAPL specific gravity (SG) (0.8856, PACE Analytical Services, Inc. 2015 data).
LNAPL thickness (1.45 ft) based upon an average of 47 measurements from 1993 through 2016 at four wells (WT-02, WT-09, WT-14, SVE) knowing that thickness varies with groundwater elevation changes. See attached Table 2
Assumed soil porosity (n) is 30% (well to poorly graded sand).
Assumed LNAPL saturation is 50%. Ref. The Remediation Technologies Development Forum, a partnership with USEPA (https://rtdf.clu-in.org/public/napl/training/module1.pdf).
Volume of impacted soil, based on estimated area of LNAPL zone (16,370 sq ft) and engineer's best estimate.

LNAPL Area/Volume		
Area of LNAPL impact	16,370	sf
LNAPL thickness, avg value (See attached Table 2)	1.45	ft
Volume of soil (area x LNAPL thickness)	23,737	ft3
Estimated pore volume of soil (volume x 0.30)	7,121	ft3
Estimated LNAPL volume (pore volume x 0.50)	3,560	ft3

Contaminant Mass - LNAPL		
Unit weight of water (standard value)	62.4	lbs/ft3
LNAPL specific gravity (2015 lab data)	0.8856	unit less
unit weight of LNAPL (62.4 x LNAPL SG)	55.3	lbs/ft3
Calculate mass in lbs (lbs/ft3 x ft3)	196757	lbs
Sub-Total Mass for LNAPL*	196,757	lbs

Total Contaminant Mass* (Sub-Total VOC mass + Sub-Total LNAPL mass)	199,307	lbs

PCB Data:

Notes & Assumptions:

Mass calculation for PCBs is dependent on the result for "Sub-Total Mass for LNAPL" from the LNAPL mass calculation noted above.
Mass calculated based on laboratory results (394.7 mg/kg) of detected Total PCBs. PACE Analytical Services, Inc. 2015 data.

Contaminant Mass - PCBs		
Sub-Total Mass for LNAPL (see above)	196,757	lbs
Convert to kg (2.205 lbs/kg)	89,249	kg
PCB concentration (2015 lab data)	394.7	mg/kg
Calculate mass in grams (mass of LNAPL x PCB concentration/1000)	35,227	g
Convert to lbs (g/453.6)	77.66	lbs
Total Mass for PCBs in LNAPL*	77.7	lbs

Limitations:

* All contaminant mass calculations are considered estimates. These estimates may vary from actual conditions by ±50% or more. Estimates are based upon the field data available, laboratory analytical data, the assumptions made, and the engineer's judgement at the time of calculation.

Contaminant Mass Analysis, Summary of Soil Boring Data
Newton Gravel Pit - Manitowoc, Wisconsin
Project No. 60135471

Detected VOC's (ug/kg)	B-09*	B-12*	B-13*	WT-18*	SVE**	VP-1**	VP-2**	VP-3**	VP-4**	VP-5**	VP-6**	Contaminant Concentration (ug/kg)	
	20-22'	8-10'	18-20'	15-20'	10-11'	21-22'	21-22'	21-22'	21-22'	21-22'	21-22'		
	4/12/1993	4/21/1993	4/13/1993	9/6/2007	8/24/2015	8/24/2015	8/24/2015	8/24/2015	8/24/2015	8/24/2015	8/24/2015	avg	geomean
Benzene	<39	<470	<780	<5,000	0.234	< 0.016	0.166	< 0.016	< 0.016	< 0.016	< 0.016	0.20	0.20
sec-Butylbenzene	<77	2,700	2,000	6,300	1.53	< 0.036	2.38	< 0.036	< 0.036	< 0.036	< 0.036	2,200.78	165.42
n-Butylbenzene	<79	<950	<1,600	12,000	4.1	< 0.086	5.4	< 0.086	< 0.086	< 0.086	< 0.086	4,003.17	64.29
1,1-Dichloroethane	<44	<530	<880	<5,000	< 0.29	< 0.029	0.044	< 0.029	< 0.029	< 0.029	< 0.029	0.04	0.04
cis-1,2-Dicholorethene	<50	<600	<1,000	<5,000	126	1.89	60	1.12	0.295	0.56	0.302	27.17	2.60
Ethylbenzene	<57	3,700	8,300	760,000	13.9	< 0.027	5.1	< 0.027	< 0.027	< 0.027	< 0.027	154,403.80	1,105.95
Isopropylbenzene	<66	1,400	1,600	15,000	2.12	< 0.037	1.48	< 0.037	< 0.037	< 0.037	< 0.037	3,600.72	160.17
p-Isopropylbenzene	<75	<900	<1,500	<5,000	1.93	< 0.056	2.86	< 0.056	< 0.056	< 0.056	< 0.056	2.40	2.35
Naphthalene	1,600	6,700	7,900	<5,000	11.3	< 0.087	8.6	< 0.087	0.088	< 0.087	< 0.087	2,703.33	94.76
n-Propylbenzene	<70	4,000	4,100	26,700	4.3	< 0.035	3.1	< 0.035	< 0.035	< 0.035	< 0.035	6,961.48	357.47
Tetrachloroethene	; (WT-02, W	<810	<1,300	<5,000	0.99	< 0.054	0.137	< 0.054	< 0.054	< 0.054	< 0.054	0.56	0.37
Toluene	<37	2,400	13,000	3,060,000	11.9	< 0.031	3.3	< 0.031	< 0.031	< 0.031	< 0.031	615,083.04	1,302.53
Trichloroethene	<44	2,800	33,000	29,700	< 0.42	< 0.042	0.05	< 0.042	< 0.042	< 0.042	< 0.042	16,375.01	608.62
Trimethylbenzenes, Total	810	253,000	29,000	186,000	39.2	<	38.2	<	<	<	<	78,147.90	3,439.36
Xylenes, Total	173	29,200	51,000	3,230,000	72	< 0.07	28.8	< 0.07	< 0.07	< 0.07	< 0.07	551,745.63	3,463.28
											Totals	1,435,255.24	10,767.42

Notes:

* *Site Investigation Update and Remedial Action Plan Report* , AECOM Technical Services, Inc., June 2009

** *2015 Task 32; Soil Vapor Extraction Pilot Study Technical Memorandum* , AECOM Technical Services, Inc., July 2016

AECOM

TABLE 2

Contaminant Mass Analysis, Summary of Groundwater and Free Product Elevations
Newton Gravel Pit - Manitowoc, Wisconsin
Project No. 60135471

Well Identification	Ground Surface Elevation	TOC Elevation	Depth to Bottom (ft from TOC)	Depth to Groundwater (ft. BGS)	Depth to Groundwater (ft. from TOC)	Groundwater Elevation	Screened Interval - ft BGS Top	Screened Interval - ft BGS Bottom	Screened Interval ft MSL Top	Screened Interval ft MSL Bottom	Free Product depth (ft. from TOC)	Free Product thickness (ft.)	Date
WT-02	718.5	720.56					28.3	38.3					Installed 4/22/1993
			40.41	29.85	31.91	688.65	28.4	38.4	690.2	680.2	NM	--	7/1/1993
			---	33.94	36	684.56	---	---	---	---	33.49	2.51	7/2/1994
			---	33.19	35.25	685.31	---	---	---	---	34.20	1.05	2/6/1997
			---	35.14	37.2	683.36	---	---	---	---	33.19	4.01	6/5/1997
			---	34.64	36.7	683.86	---	---	---	---	34.50	2.20	10/22/1997
			---	31.56	33.62	686.94	---	---	---	---	32.71	0.91	5/4/1998
			---	33.89	35.95	684.61	---	---	---	---	33.26	2.69	7/2/1998
			40.32	33.77	35.83	684.73	28.3	38.3	690.2	680.2	33.35	2.48	5/19/1999
			40.35	37.14	39.2	681.36	28.3	38.3	690.2	680.2	36.05	3.15	10/5/1999
			40.31	37.10	39.16	681.40	28.3	38.3	690.3	680.3	36.09	3.07	12/9/1999
			40.30	32.69	34.75	685.81	28.2	38.2	690.3	680.3	34.25	0.50	4/5/2000
			40.35	37.54	39.6	680.96	28.3	38.3	690.2	680.2	36.12	3.48	4/14/2005
		720.85	---										10/1/2006
			---	33.31	35.66	685.19	---	---	---	---	34.21	1.45	9/18/2007
			---	32.97	35.32	685.53	---	---	---	---	34.31	1.01	9/19/2007
			---	32.45	34.8	686.05	---	---	---	---	34.38	0.42	9/19/2007
			---	34.41	36.76	684.09	---	---	---	---	34.38	2.38	9/20/2007
			---	33.65	36	684.85	---	---	---	---	34.39	1.61	9/21/2007
			---	31.30	33.65	687.20	---	---	---	---	---	---	1/16/2008
			40.08	33.60	35.95	684.90	27.7	37.7	690.8	680.8	34.30	1.65	9/25/2012
			---	33.10	35.45	685.40	---	---	---	---	34.01	1.44	10/21/2013
	718.8		40.35	32.95	35.05	685.80	28.3	38.3	690.5	680.5	33.80	1.25	11/17/2014
			40.35	34.01	36.11	684.74	28.3	38.3	690.5	680.5	34.13	1.98	9/14/2015
													GW not sampled since 4-5-00
PZ-02	718.2	720.29					82.0	87.0					Installed 4/26/1993
			89.00	30.00	32.09	688.20	81.9	86.9	636.3	631.3			7/1/1993
			89.17	31.93	34.02	686.27	82.1	87.1	636.1	631.1			9/7/1994
			89.92	31.83	33.92	686.37	82.8	87.8	635.4	630.4			5/13/1999
			89.02	31.77	33.86	686.43	81.9	86.9	636.3	631.3			10/5/1999
			89.03	32.20	34.29	686.00	81.9	86.9	636.3	631.3			12/9/1999
			89.04	31.85	33.94	686.35	82.0	87.0	636.3	631.3			4/4/2000
			88.94	30.87	32.96	687.33	81.9	86.9	636.4	631.4			4/18/2005
		720.58	89.00	30.62	33	687.58	81.6	86.6	636.6	631.6			10/20/2006
			88.93	31.56	33.94	686.64	81.6	86.6	636.7	631.7			9/18/2007
			88.82	31.64	34.02	686.56	81.4	86.4	636.8	631.8			9/25/2012
			---	31.25	33.63	686.95	---	---	---	---			10/21/2013
	718.7		88.93	31.42	33.32	687.26	82.0	87.0	636.7	631.7			11/18/2014
			88.93	31.98	33.88	686.70	82.0	87.0	636.7	631.7			9/14/2015
WT-09	NM	717.84					24.5	34.5					Installed 9-19-06
			36.59		33.55	684.29	---	---	691.3	681.3	30.69	2.86	10/1/2006
			---		32.85	684.99	---	---	---	---	31.34	1.51	9/18/2007
			---		32.9	684.94	---	---	---	---	31.39	1.51	9/19/2007
			---		32.51	685.33	---	---	---	---	31.44	1.07	9/19/2007
			---		32.66	685.18	---	---	---	---	31.43	1.23	9/20/2007
			---		32.6	685.24	---	---	---	---	31.40	1.20	9/21/2007
			---		33.7	684.14	---	---	---	---	30.70	3.00	1/14/2008
			---		33.2	684.64	---	---	---	---	30.65	2.55	1/15/2008
			---		32.5	685.34	---	---	---	---	30.70	1.80	1/16/2008

AECOM

TABLE 2

Contaminant Mass Analysis, Summary of Groundwater and Free Product Elevations
Newton Gravel Pit - Manitowoc, Wisconsin
Project No. 60135471

Well Identification	Ground Surface Elevation	TOC Elevation	Depth to Bottom (ft from TOC)	Depth to Groundwater (ft. BGS)	Depth to Groundwater (ft. from TOC)	Groundwater Elevation	Screened Interval - ft BGS Top	Screened Interval - ft BGS Bottom	Screened Interval ft MSL Top	Screened Interval ft MSL Bottom	Free Product depth (ft. from TOC)	Free Product thickness (ft.)	Date
			---		32.9	684.94	---	---	---	---	30.65	2.25	1/18/2008
			---		31.7	686.14	---	---	---	---	30.66	1.04	1/22/2008
			---		32.6	685.24	---	---	---	---	30.74	1.86	1/29/2008
			36.31		32.79	685.05	---	---	691.5	681.5	31.41	1.38	9/25/2012
			---		32.31	685.53	---	---	---	---	31.22	1.09	10/21/2013
	715.8		36.59	29.99	31.99	685.85	---	---	691.3	681.3	30.90	1.09	11/17/2014
			36.59	30.60	32.6	685.24	---	---	691.3	681.3	31.27	1.33	9/14/2015
													Product Present - Not Developed
WT-10	NM	727.32					35.0	45.0					Installed 9-20-06
			48.39		41.25	686.07	---	---	688.9	678.9			10/19/2006
			48.33		42.15	685.17	---	---	689.0	679.0			9/19/2007
			48.33		41.38	685.94	---	---	689.0	679.0			1/9/2008
			48.33		41.15	686.17	---	---	689.0	679.0	--	0.00	1/16/2008
			48.20		42.03	685.29	---	---	689.1	679.1			9/25/2012
			---		42.81	684.51	---	---	---	---			10/21/2013
	724.7		48.33	38.85	41.45	685.87	---	---	689.0	679.0			11/18/2014
			48.33	39.40	42	685.32	---	---	689.0	679.0			9/14/2015
WT-14	NM	722.48					27.5	37.5					Installed 9-19-06
			40.26		34.01	688.47	---	---	692.2	682.2	34.00	0.01	10/1/2006
			---		34.91	687.57	---	---	---	---		0.01	9/18/2007
			---		34.92	687.56	---	---	---	---		0.01	9/19/2007
			---		---	---	---	---	---	---		0.01	9/20/2007
			---		34.32	688.16	---	---	---	---		0.00	1/16/2008
			40.20		35.12	687.36	---	---	692.3	682.3	35.09	0.03	9/25/2012
			---		34.94	687.54	---	---	---	---	34.80	0.14	10/21/2013
	720.3		40.26	34.4	36.6	685.88	---	---	---	---		0.01	11/17/2014
			40.26	32.9	35.09	687.39	---	---	---	---		0.01	9/14/2015
													Product Present - Not Developed
WT-18	729.2	731.72					39.0	49.0					Installed 9-6-07
			51.78	43.60	46.12	685.60	39.3	49.3	689.9	679.9			9/19/2007
			51.78	43.12	45.64	686.08	39.3	49.3	689.9	679.9			1/9/2008
			51.78	42.73	45.25	686.47	39.3	49.3	689.9	679.9	--	0.00	1/16/2008
			51.73	43.42	45.94	685.78	39.2	49.2	690.0	680.0			9/25/2012
			---	43.19	45.71	686.01	---	---	---	---			10/21/2013
			51.78	42.88	45.4	686.32	39.3	49.3	689.9	679.9			11/18/2014
			51.78	43.44	45.96	685.76	39.3	49.3	689.9	679.9			9/14/2015
SVE	718.6	719.77					25.0	35.0					Installed 8/24/2015
			35.00	32.18	33.35	686.42	30.8	33.8	687.8	684.8	33.10	0.25	9/14/2015

Notes:
BGS = Below Ground Surface
TOC = Top of Casing
--- or NM = Not Measured