BARKER LEMAR
ENGINEERING CONSULTANTS

CON 12-15
Doc #29344

March 18, 2014

Mr. Matt Culp
Senior Environmental Specialist
Iowa Department of Natural Resources
900 East Grand Avenue
Des Moines, Iowa 50319

RE: Newton Mall – Groundwater Sampling
1501 First Avenue East, Newton, IA
Project No. HYVEN 13013

Dear Sir:

BARKER LEMAR ENGINEERING CONSULTANTS (BARKER LEMAR) has completed groundwater sampling activities at the Newton Mall site. The work was conducted to verify the absence of chlorinated solvent groundwater concentrations above statewide standards for the site. The ultimate goal of this work is the removal of the environmental easement from this property.

1.0 BACKGROUND

An environmental easement was executed on the aforementioned property in August 2000 after tetrachloroethylene (PCE) was discovered on site. A copy of the Environmental Protection Easement including the legal description of the easement area, dated August 24, 2000, and filed September 7, 2000, was included in Attachment B of the soil sampling report submitted to the IDNR dated September 8, 2008. The PCE contamination is associated with an assumed subsurface release of PCE along the sewer line, possibly caused by the disposal of PCE into the sewer by a former drying cleaning business that operated in the mall until 1964.

Soil sampling was conducted at the site between September 9, 2006, and April 3, 2007, in conjunction with the new construction at the site. Soil sampling conducted in the vicinity of the storm and sanitary sewer lines within the on-site environmental easement area did not indicate impact to the site from tetrachloroethylene (PCE), trichloroethylene (TCE), dichloroethylene (DCE), or vinyl chloride. Soil sampling conducted by BARKER LEMAR at the site to date has not identified concentrations of the above compounds in excess of statewide standards.

A Soil Sampling Report dated September 8, 2008, was submitted to the Iowa Department of Natural Resources (IDNR) summarizing the sampling activities that occurred during construction. A request that no further soil assessment for chlorinated solvents be required for the property and the easement requirements for the site in regard to soil be waived, was made by BARKER LEMAR on behalf of Hy-Vee Inc. The IDNR accepted the request for no further soil assessment for chlorinated solvents via letter dated December 11, 2008. The IDNR letter indicated that the current easement would remain in effect for groundwater until groundwater contamination is demonstrated below the applicable state standards.

Groundwater sampling conducted in October 2003, indicated monitoring well TMW-2/BH-2 had concentrations of TCE (309 µg/L) and PCE (907 µg/L) above statewide standards and TMW-9/BH-9, had a vinyl chloride concentrations (54.2 µg/L) above statewide standards.

The groundwater analytical results obtained during the April 2006 sampling event indicated concentrations of PCE, TCE, DCE, and vinyl chloride were below statewide standards in the sample from TMW-2. The groundwater sample from TMW-9 indicated concentrations of PCE (160 µg/L) and TCE (908 µg/L) above statewide standards, but concentrations of vinyl chloride were below statewide standards.

Groundwater monitoring well TMW-9 was reinstalled and a groundwater sample collected on April 27, 2009. A Groundwater Sampling Report completed in September 2009 was re-submitted to the IDNR in June 2010. The report concluded that groundwater sampling conducted by BARKER LEMAR at the site in April 2009 had not identified concentrations of the above compounds in excess of statewide standards and no further groundwater assessment for chlorinated solvents was warranted for the site. On behalf of Hy-Vee, Inc., BARKER LEMAR requested that the easement be removed from the property.

The IDNR issued a letter dated June 23, 2010, requesting the collection of a split (closure) sample to verify the April 2009 groundwater sampling results. The IDNR collected a confirmation sample from TMW-9 on July 20, 2010. PCE and TCE concentrations remained below method detection limits however, the IDNR analyzed the groundwater sample for additional chlorinated solvents and concentrations of DCE and vinyl chloride above statewide standards were observed. BARKER LEMAR collected a confirmation sample on December 23, 2010, to verify the IDNR sampling, and the laboratory results were consistent with those obtained by the IDNR. As a result of sample analysis the IDNR decided groundwater sampling was necessary.

BARKER LEMAR recommended localized treatment of the groundwater plume around monitoring well TMW-9 with an electron donor material via email on March 14, 2010. In an email on March 14, 2011 the IDNR indicated that the electron donor method and groundwater sampling six months following application was acceptable as a remedial method to be implemented at the site.

Three applications of Hydrogen Release Compound (HRC), an electron donor material created by Regenesis Bioremediation Products of California, have been injected at the site. The applications were completed on October 31, 2011, November 20, 2012, and August 12, 2013. HRC is a proprietary, food quality, polylactate ester that, upon being deposited into the subsurface, slowly degrades to lactic acid. Lactic acid is then metabolized to hydrogen, which in turn drives the reductive dechlorination of chlorinated hydrocarbons. This has been demonstrated effectively in the laboratory and in the field. Supporting documentation was included in the October 2011 Remedial Work Plan. Groundwater samples were obtained six months after the completion of each HRC treatment; the results of the most recent analysis have been included below.

2.0 SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Groundwater sampling was conducted at the site on February 18, 2014. Groundwater was collected from monitoring well TMW-9, the only location exhibiting concentrations of PCE and TCE above statewide standards during the April 2006 sampling event.

Analytical results indicated concentrations of vinyl chloride were below the statewide standard for a non-protected groundwater source and equivalent to the limits for a protected groundwater source. Concentrations of cis-1,2-dichloroethylene were above laboratory detection limits, but below statewide standards for both protected and non-protected groundwater sources. Concentrations of trans-1,2-

dichloroethylene, TCE, and PCE were below laboratory detection limits and below statewide standards for both protected and non-protected groundwater sources A table summarizing the pre-remediation (June 2012) and post-remediation (November 2012, May 2013, and February 2014) analytical results and standards has been included below.

Sample Dates	cis-1,2-dichloro-ethylene (µg/L)	trans-1,2-dichloro-ethylene (µg/L)	Vinyl Chloride(µg/L)	PCE (µg/L)	TCE (µg/L)
June 20, 2012 (IDNR)	170		43	<5	<5
June 20, 2012 (BARKER LEMAR)	322	7.4	94.8	<1	<1
November 15, 2012	NA	NA	NA	<5	<5
May 24, 2013	16.3	2.1	5.5	<2	<2
February 18, 2014	8.6	1.4	2.0	3.3	1.0
Protected Groundwater Source Standard (µg/L)	70	100	2	5	5
Non-Protected Groundwater Source Standard (µg/L)	350	700	10	1,700	76

"NA" denotes not analyzed

3.0 CONCLUSIONS

Based on the above information, it is the opinion of BARKER LEMAR that the HRC applications administered on October 2011, November 2012, and August 2013 have decreased the contaminants in the groundwater and an additional HRC application is not warranted.

Concentrations of vinyl chloride in monitoring well TMW-9 are equivalent (2.0 µg/l) to the statewide standards for protected groundwater sources. The goal of the HRC injections was to reduce the contaminant areas in the subsurface. The HRC has been successful and as the source of the contaminant has been removed it is expected that the level of vinyl chloride will degenerate below the statewide standards for protected groundwater sources; therefore, it is requested that further remedial action and post-remediation groundwater sampling be discontinued.

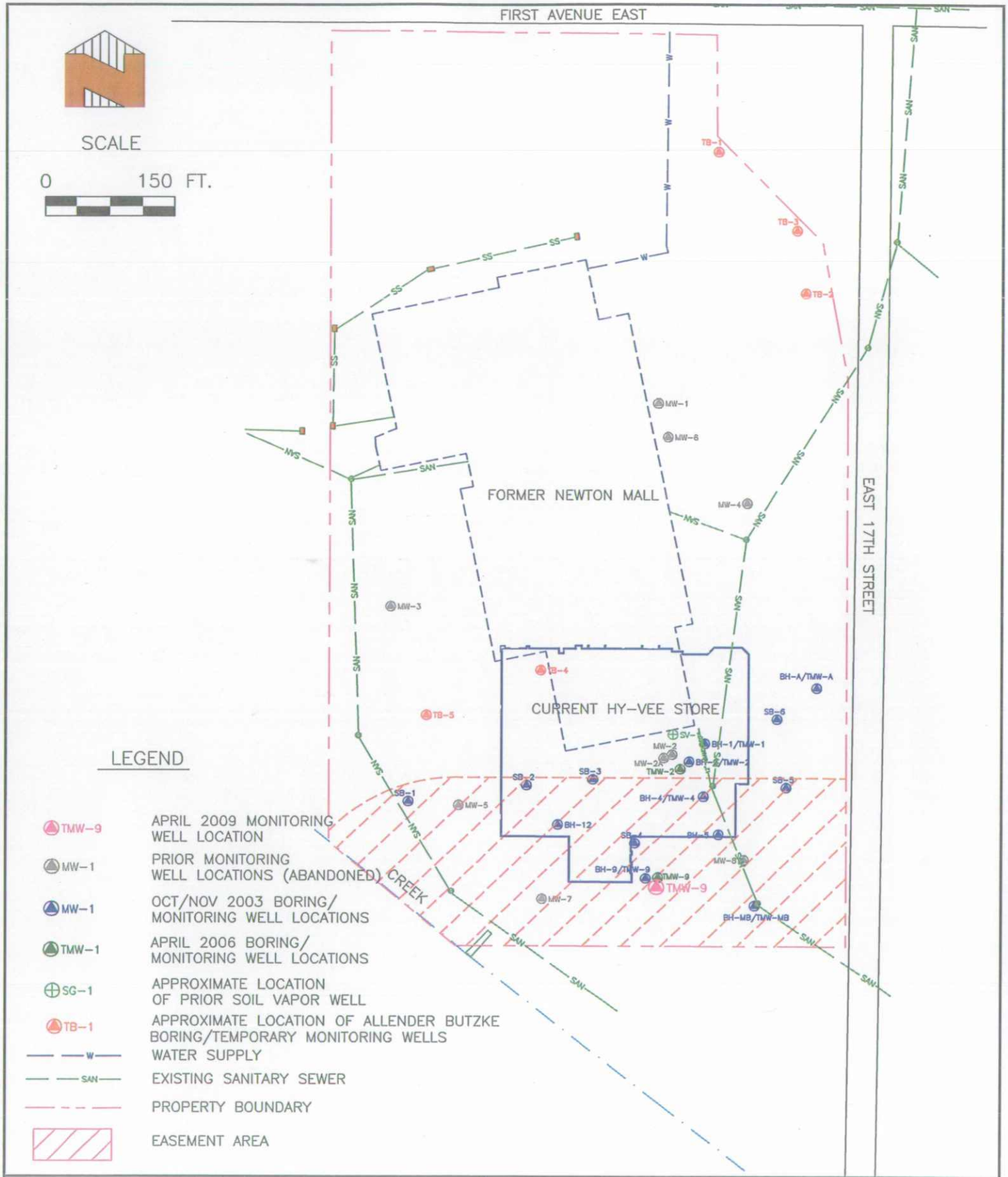
If you have any questions or concerns about this project, please contact BARKER LEMAR at 515-256-8814.

Sincerely,
BARKER LEMAR ENGINEERING CONSULTANTS

Stefani Hanson
Project Manager
shanson@barkerlemar.com

Leah Calvert, P.G.
Professional Geologist
lcalvert@barkerlemar.com

Figure 1: Site Map



SAMPLE LOCATIONS MAP
HY-VEE NEWTON MALL
NEWTON, IOWA
PROJECT NO. HYVEN 09003
DRAWING DATE: SEPTEMBER 2009

BARKER LEMAR
ENGINEERING CONSULTANTS
1801 Industrial Circle - West Des Moines, Iowa - 50265
Phone: 515.256.8814 - Fax: 515.256.0152 - www.barkerlemar.com

FIGURE 1

Attachment A: Laboratory Analytical Report

Keystone
LABORATORIES, INC.

MEMBER ACIL

3/11/2014

Leah Calvert
Barker Lemar Engineering Consultants
1801 Industrial Circle
West Des Moines, IA 50265

Project: HYVEN 11012
Project Number: Newton

This analytical report is for the samples received on 2/18/2014 1:36:00PM. If you have any questions concerning this report please feel free to contact me at 1-800-858-5227. The samples included in this analytical report are as follows:

Sample Description	Laboratory ID	Matrix	Date Sampled
TMW-9	1B40796-01	Water	02/18/14 13:00

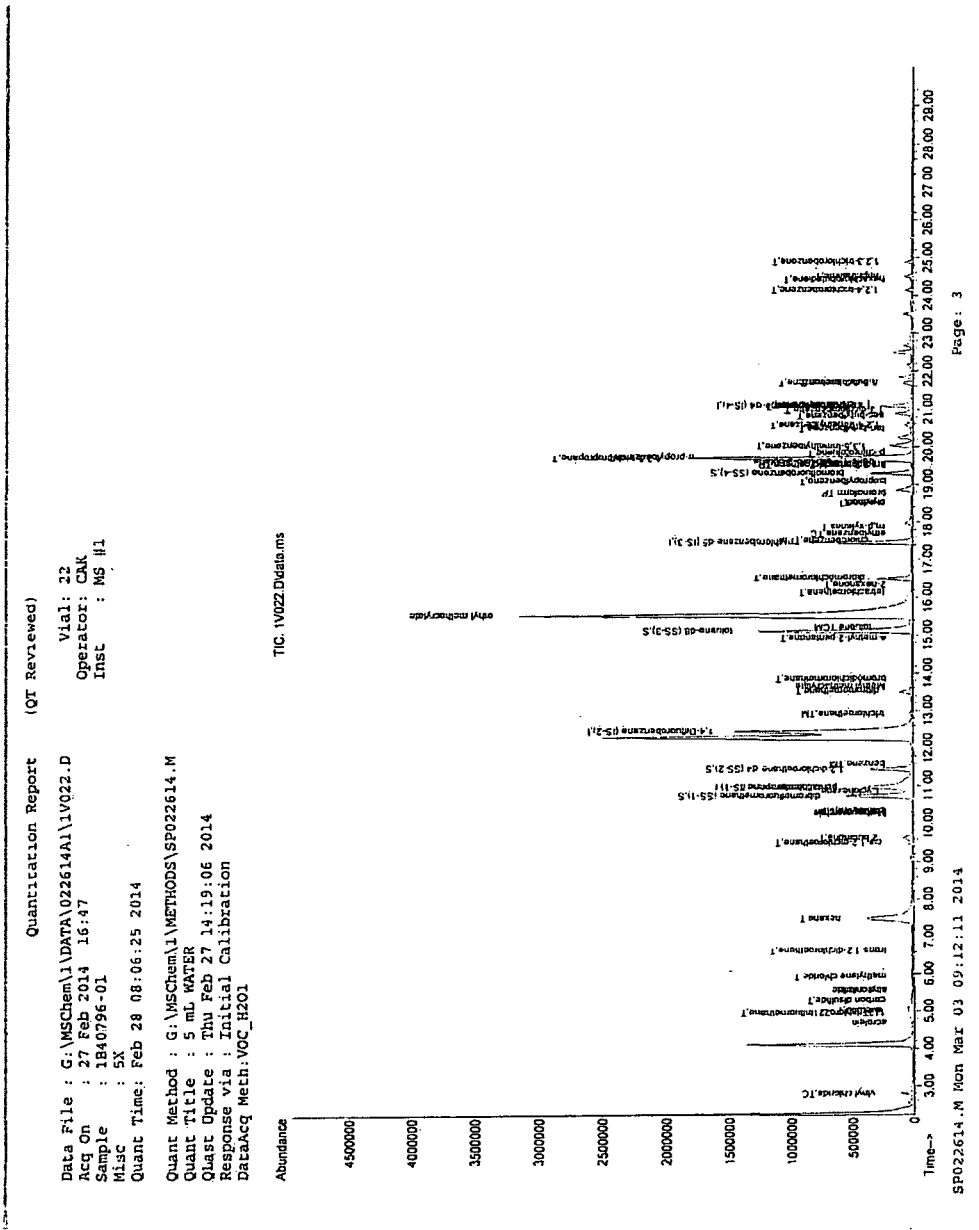
Sincerely,

Sue Thompson

Sue Thompson, Project Manager II

Phone: 1-800-858-5227
600 East 17th Street South
Newton, IA 50208
Fax: 641-792-7989

Barker Lemar Engineering Consultants	Project: HYVEN 11012	
1801 Industrial Circle	Project Number: Newton	**Reported:**
West Des Moines, IA 50265	Project Manager: Leah Calvert	03/11/14 15:54



Phone: 1-800-858-5227

600 East 17th Street South
Newton, IA 50208

Fax: 641-792-7989

CHAIN OF CUSTODY RECORD

Keystone LABORATORIES, INC.

600 East 17th Street South
Newton, IA 50208
641-792-8451

Page 1 of 1
Printed: 2/10/2014 3:29:06PM
www.keystonelabs.com

SITE INFORMATION
Sampler: ZACHARY S DENNY
Project: HYVEN 11012
Newton

REPORT TO
Leah Calvert
Barker Lemar Engineering Consultants
1801 Industrial Circle
West Des Moines, IA 50265

INVOICE TO
Leah Calvert
Barker Lemar Engineering Consultants
1801 Industrial Circle
West Des Moines, IA 50265

SPECIAL INSTRUCTIONS
None

Turn Around Time
☑ Standard ☐ RUSH, need by __/__/__

LAB USE ONLY
Work Order 1B40796
Temperature
Turn-Cooler: No

☐ Custody Seal
☐ Containers Intact
☐ COC/Labels Agree
☐ Preservation Confirmed
☐ Received on Ice

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses	Lab Sample Number
01-001	TMW-9	Water	GRAB	2/18/14	13:00	3	8260@cis-1,2-dce; 8260@tce; 8260@vc; 8260@pce; 8260@trans-1,2-dce; 8260-base-analysis	01

Relinquished By: Zachary S Denny — Date/Time: 20140218 13:35

Received By — Date/Time

Relinquished By — Date/Time

Received for Lab By: Sue Thompson — Date/Time: 2/18/14 @ 1330

Remarks:

Original - Return with Report • Yellow - Lab Copy • Pink - Sampler Copy

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Phone: 1-800-858-5227
600 East 17th Street South
Newton, IA 50208
Fax: 641-792-7989

Barker Lemar Engineering Consultants	Project: HYVEN 11012	
1801 Industrial Circle	Project Number: Newton	**Reported:**
West Des Moines, IA 50265	Project Manager: Leah Calvert	03/11/14 15:54

Keystone Laboratories, Inc. Cooler Receipt Form

Cooler I.D. # N/A

Delivered By: UPS / FedEx / Speedy / Mail / (Walk-in) Courier / Other: _____ Date Received: 2-28-14 By: LRM

Tracking #: _____ Custody Seal: ☐ Present ☒ Absent ☐ Broken Seal # _____

Type of packing material: (Bubble) Foam / Paper / Peanuts / (Other) gloves COC signed and date: (Yes) No

Samples cooled by : Ice/ Ice pack (NA) Cooler Temp. (Includes correction factor): 17.4

Sample Receipt Discrepancies: ☐ No ☐ Yes (If Yes, see detail below)

☐ Chain of Custody not present ☐ Information obtained from PO/ letter received with samples	☐ Description on container label different from COC: _____	☐ Sample listed on COC but not received: ☐ Trip Blank Custody seals absent ☐ Trip Blank Custody seals broken
☐ Container Problems: ☐ Label Absent ☐ Incorrect Containers for tests indicated ☐ Insufficient amount of sample for tests indicated ☐ Broken or leaking containers: _____		
☐ COC incomplete ☐ COC missing time sampled, time obtained from sample container. ☐ COC missing date sampled, date obtained from sample container ☐ Sample excluded from COC: _____	☐ Air bubbles in VOA vials: _____	

Detailed Comments: _____

Client contacted regarding cooler/sample receipt conditions: Yes / No Contacted by _____ Date/Time: _____

Who was contacted: _____ Remarks: _____

IB40796 Barker Lemar Engineering Con
02/28/14 17:00 Sue Thompson
HYVEN 11012
Newton
A : N P

Revision 2, 02/06/07
Keystone Laboratories, Inc.

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Phone: 1-800-858-5227 600 East 17th Street South Newton, IA 50208 Fax: 641-792-7989

Barker Lemar Engineering Consultants	Project: HYVEN 11012	
1801 Industrial Circle	Project Number: Newton	**Reported:**
West Des Moines, IA 50265	Project Manager: Leah Calvert	03/11/14 15:54

TMW-9

1B40796-01(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Keystone Laboratories, Inc. - Newton										
Determination of Volatile Organic Compounds										
cis-1,2-Dichloroethylene	**8.6**	0.3	5.0	ug/L	5	1XB0732	02/26/14	02/27/14	EPA 8260B	
Trichloroethylene	**1.0**	0.4	5.0	"	"	"	"	"	"	J
trans-1,2-Dichloroethylene	**1.4**	0.4	5.0	"	"	"	"	"	"	J
Vinyl Chloride	**2.0**	1.0	5.0	"	"	"	"	"	"	J
Surrogate: Dibromofluoromethane			*82.5 %*		*82-124*	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			*74.8 %*		*78-129*	"	"	"	"	*S-GC*

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600 East 17th Street South
Newton, IA 50208

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Barker Lemar Engineering Consultants	Project: HYVEN 11012	
1801 Industrial Circle	Project Number: Newton	**Reported:**
West Des Moines, IA 50265	Project Manager: Leah Calvert	03/11/14 15:54

TMW-9

1B40796-01RE1(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Keystone Laboratories, Inc. - Newton										
Determination of Volatile Organic Compounds										
Tetrachloroethylene	<3.3	3.3	50.0	ug/L	50	1XB0732	02/26/14	02/26/14	EPA 8260B	R-01
Surrogate: Dibromofluoromethane			*99.2 %*	*82-124*		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			*96.8 %*	*78-129*		"	"	"	"	
Surrogate: Toluene-d8			*98.8 %*	*88-113*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene			*92.2 %*	*72-142*		"	"	"	"	

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1801 Industrial Circle	Project Number: Newton	**Reported:**
West Des Moines, IA 50265	Project Manager: Leah Calvert	03/11/14 15:54

Determination of Volatile Organic Compounds - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1XB0732 - EPA 5030B											
Blank (1XB0732-BLK1)					Prepared & Analyzed: 02/26/14						
Vinyl Chloride	ND	0.2	1.0	ug/L							
trans-1,2-Dichloroethylene	ND	0.09	1.0	"							
cis-1,2-Dichloroethylene	ND	0.07	1.0	"							
Trichloroethylene	ND	0.08	1.0	"							
Tetrachloroethylene	ND	0.07	1.0	"							
Surrogate: Dibromofluoromethane	*49.2*			"	*50.0000*		*98.5*	*82-124*			
Surrogate: 1,2-Dichloroethane-d4	*48.2*			"	*50.0000*		*96.3*	*78-129*			
Surrogate: Toluene-d8	*49.6*			"	*50.0000*		*99.2*	*88-113*			
Surrogate: 4-Bromofluorobenzene	*48.0*			"	*50.0000*		*96.1*	*72-142*			
LCS (1XB0732-BS1)					Prepared & Analyzed: 02/26/14						
Vinyl Chloride	129.6	0.2	1.0	ug/L	99.9000		130	85-143			
trans-1,2-Dichloroethylene	55.91	0.09	1.0	"	50.0000		112	85-124			
cis-1,2-Dichloroethylene	54.54	0.07	1.0	"	50.0000		109	81-123			
Trichloroethylene	54.97	0.08	1.0	"	50.0000		110	87-122			
Tetrachloroethylene	54.62	0.07	1.0	"	50.0000		109	88-124			
Surrogate: Dibromofluoromethane	*49.8*			"	*50.0000*		*99.5*	*82-124*			
Surrogate: 1,2-Dichloroethane-d4	*51.3*			"	*50.0000*		*103*	*78-129*			
Surrogate: Toluene-d8	*49.6*			"	*50.0000*		*99.3*	*88-113*			
Surrogate: 4-Bromofluorobenzene	*50.3*			"	*50.0000*		*101*	*72-142*			
Matrix Spike (1XB0732-MS1)		**Source: 1B41164-01**			Prepared & Analyzed: 02/26/14						
Vinyl Chloride	6482	10.3	50.0	ug/L	4995.00	ND	130	81-140			
trans-1,2-Dichloroethylene	2838	4.4	50.0	"	2500.00	0.52	113	82-125			
cis-1,2-Dichloroethylene	2845	3.3	50.0	"	2500.00	118.8	109	79-127			
Trichloroethylene	2804	4.0	50.0	"	2500.00	22.56	111	86-122			
Tetrachloroethylene	2716	3.3	50.0	"	2500.00	65.55	106	87-123			
Surrogate: Dibromofluoromethane	*49.7*			"	*50.0000*		*99.4*	*82-124*			
Surrogate: 1,2-Dichloroethane-d4	*50.9*			"	*50.0000*		*102*	*78-129*			
Surrogate: Toluene-d8	*50.7*			"	*50.0000*		*101*	*88-113*			
Surrogate: 4-Bromofluorobenzene	*50.8*			"	*50.0000*		*102*	*72-142*			

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Barker Lemar Engineering Consultants	Project: HYVEN 11012	
1801 Industrial Circle	Project Number: Newton	**Reported:**
West Des Moines, IA 50265	Project Manager: Leah Calvert	03/11/14 15:54

Determination of Volatile Organic Compounds - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1XB0732 - EPA 5030B											
Matrix Spike Dup (1XB0732-MSD1)		**Source: 1B41164-01**			Prepared & Analyzed: 02/26/14						
Vinyl Chloride	6524	10.3	50.0	ug/L	4995.00	ND	131	81-140	0.646	14	
trans-1,2-Dichloroethylene	2822	4.4	50.0	"	2500.00	0.52	113	82-125	0.530	10	
cis-1,2-Dichloroethylene	2900	3.3	50.0	"	2500.00	118.8	111	79-127	1.93	13	
Trichloroethylene	2790	4.0	50.0	"	2500.00	22.56	111	86-122	0.501	10	
Tetrachloroethylene	2744	3.3	50.0	"	2500.00	65.55	107	87-123	1.03	10	
Surrogate: Dibromofluoromethane	*51.0*			"	*50.0000*		*102*	*82-124*			
Surrogate: 1,2-Dichloroethane-d4	*51.8*			"	*50.0000*		*104*	*78-129*			
Surrogate: Toluene-d8	*49.9*			"	*50.0000*		*99.8*	*88-113*			
Surrogate: 4-Bromofluorobenzene	*51.9*			"	*50.0000*		*104*	*72-142*			

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1801 Industrial Circle	Project Number: Newton	**Reported:**
West Des Moines, IA 50265	Project Manager: Leah Calvert	03/11/14 15:54

Certified Analyses included in this Report

Method/Matrix	Analyte	Certifications
EPA 8260B in Water		
	Vinyl Chloride	KS-NT,NELAC,SIA1X
	trans-1,2-Dichloroethylene	KS-NT,NELAC,SIA1X
	cis-1,2-Dichloroethylene	SIA1X
	Trichloroethylene	KS-NT,NELAC,SIA1X
	Tetrachloroethylene	KS-NT,NELAC,SIA1X

Code	Description	Number	Expires
KS-KC	Kansas Department of Health and Environment-KC	E-10110	04/30/2014
KS-NT	Kansas Department of Health and Environment	E-10287	10/30/2014
MO-KC	Missouri Department of Natural Resources	140	04/30/2014
NELAC	New Jersey Department of Environmental Protection	IA001	06/30/2014
SIA1X	Iowa Department of Natural Resources	95	02/01/2014

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Notes and Definitions

S-GC	Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.
R-01	The Reporting Limit for this analyte has been raised to account for matrix interference.
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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