July 9, 2015

Ms. Michelle Kaysen
USEPA Region 5, Mail Code LU-9J
77 West Jackson Boulevard
Chicago, IL 60604

RE: Second Quarter 2015 Sentinel Well Monitoring Summary Report, Hartford Petroleum Release Site, Hartford, Illinois

Dear Ms. Kaysen,

Trihydro Corporation (Trihydro) has prepared the following letter report describing groundwater monitoring activities conducted by Apex Oil Company, Inc. (Apex) for the five sentinel groundwater monitoring wells located at the Hartford Petroleum Release Site (Hartford Site). On September 18, 2014, the United States Environmental Protection Agency (USEPA) sent Apex and the Hartford Working Group a letter describing reassignment of activities at the Hartford Site, which included Apex resuming groundwater monitoring within the sentinel well network beginning in the first quarter 2015. Monitoring activities were performed by Apex on May 27 and 28, 2015. A representative from the Illinois Environmental Protection Agency (Illinois EPA) accompanied Apex during the second quarter 2015 monitoring event to collect split samples for independent analyses.

BACKGROUND

The five sentinel wells (HMW-25 through HMW-29) were installed in 2003 to provide an early indication of petroleum hydrocarbon migration towards the well head protection area for the Hartford drinking water well field (McGuire et al. 2001). As shown on Figure 1, the well head protection area is located approximately 600 feet to the southwest of petroleum hydrocarbons present in soil and groundwater attributed to historical releases from the refineries and petroleum storage facilities situated to the north and east of the Village of Hartford. The sentinel groundwater monitoring wells are located between the well head protection area and the distribution of petroleum hydrocarbons beneath the Hartford Site.

The Village of Hartford drinking water wells are screened within deeper portions of the Main Sand stratum because of the high groundwater transmissivity within this aquifer. The two most recently installed groundwater production wells (No. 3 and No. 4) were installed by the Village of Hartford to a total depth of approximately 105 ft-bgs and were constructed with between 20 and 35 feet of screen.

In the absence of groundwater pumping (rates exceed 10,000 gallons per minute) by the various facilities around the Hartford Site (e.g., British Petroleum, Phillips 66, Premcor, etc.), groundwater flow within the Main Sand under typical river stage conditions may flow to the south and southwest, parallel to surface water flow within the Mississippi River (USEPA 2010). However, natural flow of groundwater in the Main Sand aquifer has been altered beneath the Village of Hartford such that during periods of high river stage, groundwater flow is generally towards the east to northeast due to recharge from the river and bank

storage within the Main Sand. During moderate river elevations, the groundwater flow direction is northward and during low river stages, groundwater flow trends westerly to northwesterly.

GROUNDWATER ELEVATIONS

The depth to groundwater within the sentinel wells is measured quarterly as part of the site-wide fluid level gauging event performed at the Hartford Site. In addition, the depth to water is gauged immediately prior to purging and groundwater sample collection. The depth to groundwater was measured using a Solonist™ water level indicator, decontaminated prior to and immediately following gauging within each sentinel well. The water level indicator is decontaminated using isopropyl alcohol in accordance with Hartford Working Group Standard Operating Procedure No. 05 (Equipment Decontamination). The depth to groundwater measurements were made from the pre-marked (surveyed) measuring point on the north side of the well casing. Fluid level measurements were recorded on digital field forms using Trihydro's environmental information management system.

Table 1 summarizes the depth to water measurements and groundwater elevations measured within the sentinel wells from November 2013 through April 2015. As shown on Figure 2, groundwater flow during the second quarter 2015 was generally to the north and northwest, and the sentinel wells and Village of Hartford Production Wells are situated up-gradient of the distribution of petroleum hydrocarbons attributed to the Hartford Site.

GROUNDWATER SAMPLING PROCEDURES

Groundwater was purged and samples collected using a low-flow (minimal drawdown) groundwater sampling methodology (Puls and Barcelona 1996). A ProActive™ Monsoon® submersible pump with a flow controller and dedicated low-density polyethylene (LDPE) tubing was utilized for purging and sample collection. The pumps were installed so that the intake was located approximately five feet below the saturated portion of the screened interval. The flow rate was maintained between 0.1 and 0.5 liters per minute to minimize drawdown and to avoid undue pressure, temperature, or other physical disturbances to groundwater over the sampling interval.

Prior to purging each sentinel well, the submersible pump was decontaminated in the following manner:

- External surfaces were brushed free of loose material, washed with a phosphate free decontamination solution and potable water, and rinsed with deionized or distilled water.
- Internal surfaces were cleaned by placing the pump in a 5-gallon bucket containing a phosphate-free decontamination solution and allowing the pump to operate for several minutes to circulate the decontamination solution through the impellers and pump housing. The pump was then rinsed by circulating with potable water, followed by a distilled water rinse.

Decontamination fluids and purge water were collected and disposed of in accordance with state and federal regulations.

Field Analyses

Field parameters (including specific conductivity, pH, temperature, dissolved oxygen, oxygen reduction potential, and turbidity) were measured using a Horiba™ U-53G® multi-parameter meter over five-minute intervals during purging to ensure a representative groundwater sample was collected. The multi-parameter water quality meters were calibrated daily, in accordance with the manufacturer's guidelines, using a factory-prepared calibration standard. In general, the following stabilization criteria were achieved over three successive readings before collecting groundwater samples:

- Temperature: ± 3%
- pH: ± 0.1
- Specific Conductance: ± 3%
- DO: ± 10% or <10 nephelometric turbidity units
- ORP: ± 0.3 milligrams per liter
- Turbidity: ± 10 millivolts

Sample Collection and Analyses

Once the stabilization criteria were achieved, groundwater samples were collected in 40-milliliter glass vials preserved with hydrochloric acid and immediately placed in a cooler with ice. Groundwater samples were carefully filled during sample collection to minimize headspace and agitation. The lids on each sample container were tightly secured. The sample labels and chain of custody were filled out completely including sample identification, date and time of collection, project name, client name, field personnel initials, requested analyses, and preservation methods.

A blind duplicate sample was collected from monitoring well HMW-026 during the second quarter 2015 monitoring event. An equipment blank was collected following sampling activities at HMW-026.

The samples were collected and analyzed in general accordance with the Test Methods for Evaluating Solid Waste (U.S. EPA 1997). The groundwater samples collected from the sentinel wells were transported separate from other samples to TekLab, Inc. located in Collinsville, Illinois for analysis of benzene, toluene, ethylbenzene, xylenes (BTEX), and methyl tert-butyl ether (MTBE) via USEPA Method 8260B.

GROUNDWATER ANALYTICAL RESULTS

A summary of the groundwater analytical results are provided in Table 2. The laboratory analytical results and data validation review are included in Attachment A. The laboratory analytical results were validated in accordance with the USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review (USEPA 2014) with additional reference to the USEPA CLP National Functional Guidelines for Organic Data Review (USEPA 1999). Review of field duplicates was conducted according to the USEPA New England Environmental Data Review Supplement for Regional Data Review Elements and Superfund Specific Guidance/Procedures (USEPA 2013). The analytical results were determined to be acceptable as reported by the laboratory.

Concentrations of BTEX and MTBE were below the laboratory reporting limits within all of the groundwater samples collected from the sentinel wells during the second quarter 2015. The equipment blank collected following sample activities at HMW-026 had an estimated benzene concentration of 0.5 µg/L, which was below the reporting limit for that constituent. As such, qualification of the groundwater samples was not required for benzene as the constituent was not detected in associated samples.

The second quarter 2015 monitoring results indicate that groundwater within the Main Sand stratum is not flowing from the Hartford Site towards the sentinel monitoring wells, nor the Village of Hartford well head protection area. Furthermore, dissolved phase petroleum hydrocarbons were not detected in groundwater samples collected from the sentinel wells during this monitoring event. If you have any questions regarding the second quarter 2015 sentinel well monitoring results, please contact me at (513) 429-7452.

Sincerely,
Trihydro Corporation

Paul Michalski, P.G.
Team Leader

24S-007-001

Attachments

cc: James F. Sanders, Apex Oil Company, Inc.
Kevin Turner, United States Environmental Protection Agency
Tom Miller, Illinois Environmental Protection Agency
Chris Cahnovsky, Illinois Environmental Protection Agency

TABLES

TABLE 1. SENTINEL WELL GAUGING RESULTS
HARTFORD PETROLEUM RELEASE SITE, HARTFORD, ILLINOIS

Location	Date	Measuring Point Elevation (ft-amsl)	Depth to Water (ft-bmp)	Groundwater Elevation (ft-amsl)
HMW-025	10/02/2013	427.45	28.92	398.53
	1/16/2014		30.78	396.67
	5/15/2014		26.40	401.05
	8/05/2014		24.14	403.31
	10/30/2014		23.95	403.50
	3/06/2015		31.14	396.31
	4/06/2015		29.38	398.07
	5/27/2015		26.14	401.31
HMW-026	10/02/2013	425.20	25.06	400.14
	1/16/2014		27.70	397.50
	5/15/2014		24.70	400.50
	8/05/2014		20.95	404.25
	10/30/2014		21.25	403.95
	3/06/2015		NM	NM
	4/06/2015		26.88	398.32
	5/27/2015		24.61	400.59
HMW-027	10/02/2013	430.51	30.00	400.51
	1/16/2014		32.52	397.99
	5/15/2014		29.83	400.68
	8/05/2014		25.53	404.98
	10/30/2014		26.20	404.31
	3/05/2015		32.62	397.89
	4/07/2015		31.72	398.79
	5/27/2015		29.71	400.80
HMW-028	10/02/2013	430.97	30.42	400.55
	1/16/2014		32.61	398.36
	5/15/2014		29.50	401.47
	8/05/2014		26.26	404.71
	10/30/2014		26.50	404.47
	3/05/2015		32.60	398.37
	4/07/2015		31.41	399.56
	5/28/2015		29.12	401.85
HMW-029	10/02/2013	429.13	28.20	400.93
	1/16/2014		30.39	398.74
	5/15/2014		28.77	400.36
	8/05/2014		24.96	404.17
	10/30/2014		25.09	404.04
	3/05/2015		30.56	398.57
	4/07/2015		29.88	399.25
	5/28/2015		28.25	400.88

Notes:
ft - feet
ft-amsl - feet above mean sea level
ft-bmp - feet below measuring point
NM - not measured

TABLE 2. SENTINEL WELL GROUNDWATER ANALYTICAL RESULTS SUMMARY
HARTFORD PETROLEUM RELEASE SITE, HARTFORD, ILLINOIS

Location	Date	Benzene (µg/L)	Ethylbenzene (µg/L)	MTBE (µg/L)	Toluene (µg/L)	m,p-Xylene (µg/L)	o-Xylene (µg/L)	Xylenes, Total (µg/L)
HMW-025	11/11/13	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(5.0)	ND(10)
HMW-025	2/12/14	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(5.0)	ND(10)
HMW-025	2/12/14	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(5.0)	ND(10)
HMW-025	5/12/14	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(5.0)	ND(10)
HMW-025	5/12/14	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(5.0)	ND(10)
HMW-025	8/11/14	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(5.0)	ND(5.0)	ND(10)
HMW-025	8/11/14	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(5.0)	ND(5.0)	ND(10)
HMW-025	1/29/15	2.8	1.6	ND(2.0)	ND(1.0)	ND(5.0)	ND(5.0)	5.4 J
HMW-025 Dup	1/29/15	ND(2.0)	ND(1.0)	ND(2.0)	ND(1.0)	ND(5.0)	ND(5.0)	2.3 J
HMW-025	5/27/15	ND(2.0)	ND(1.0)	ND(2.0)	ND(1.0)	ND(5.0)	ND(5.0)	ND(5.0)
HMW-026	11/11/13	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(5.0)	ND(10)
HMW-026	2/12/14	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(5.0)	ND(10)
HMW-026	5/12/14	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(5.0)	ND(10)
HMW-026	8/11/14	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(5.0)	ND(5.0)	ND(10)
HMW-026	1/29/15	ND(2.0)	1.0 J	ND(2.0)	ND(1.0)	ND(5.0)	ND(5.0)	2.6 J
HMW-026	5/27/15	ND(2.0)	ND(1.0)	ND(2.0)	ND(1.0)	ND(5.0)	ND(5.0)	ND(5.0)
HMW-026 Dup	5/27/15	ND(2.0)	ND(1.0)	ND(2.0)	ND(1.0)	ND(5.0)	ND(5.0)	ND(5.0)
HMW-027	11/11/13	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(5.0)	ND(10)
HMW-027	11/11/13	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(5.0)	ND(10)
HMW-027	2/12/14	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(5.0)	ND(10)
HMW-027	5/12/14	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(5.0)	ND(10)
HMW-027	8/11/14	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(5.0)	ND(5.0)	ND(10)
HMW-027	1/29/15	ND(2.0)	ND(1.0)	ND(2.0)	ND(1.0)	ND(5.0)	ND(5.0)	2.3 J
HMW-027	5/27/15	ND(2.0)	ND(1.0)	ND(2.0)	ND(1.0)	ND(5.0)	ND(5.0)	ND(5.0)
HMW-028	11/11/13	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(5.0)	ND(10)
HMW-028	2/12/14	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(5.0)	ND(10)
HMW-028	5/12/14	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(5.0)	ND(10)
HMW-028	8/11/14	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(5.0)	ND(5.0)	ND(10)
HMW-028	1/29/15	ND(2.0)	ND(1.0)	ND(2.0)	ND(1.0)	ND(5.0)	ND(5.0)	1.8 J
HMW-028	5/28/15	ND(2.0)	ND(1.0)	ND(2.0)	ND(1.0)	ND(5.0)	ND(5.0)	ND(5.0)
HMW-029	8/27/13	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(5.0)	ND(10)
HMW-029	11/11/13	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(5.0)	ND(10)
HMW-029	2/12/14	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(5.0)	ND(10)
HMW-029	5/12/14	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(5.0)	ND(10)
HMW-029	8/11/14	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(5.0)	ND(5.0)	ND(10)
HMW-029	1/29/15	ND(2.0)	ND(1.0)	ND(2.0)	ND(1.0)	ND(5.0)	ND(5.0)	1.4 J
HMW-029	5/28/15	ND(2.0)	ND(1.0)	ND(2.0)	ND(1.0)	ND(5.0)	ND(5.0)	ND(5.0)
Tier 1 Class 1 GRO[1]		5.0	700	70	1,000	NA	NA	10,000

Notes:
[1]Tier 1 Class 1 Groundwater Remediation Objectives from Illinois EPA's Tiered Approach to Corrective Action Objectives (35 IAC Part 742)
Dup - duplicate sample
MTBE - methyl tert-butyl ether
J - estimated concentration
ND(1.0) - non detect at the indicated reporting limit
NA - not applicable
µg/L - micrograms per liter

FIGURES

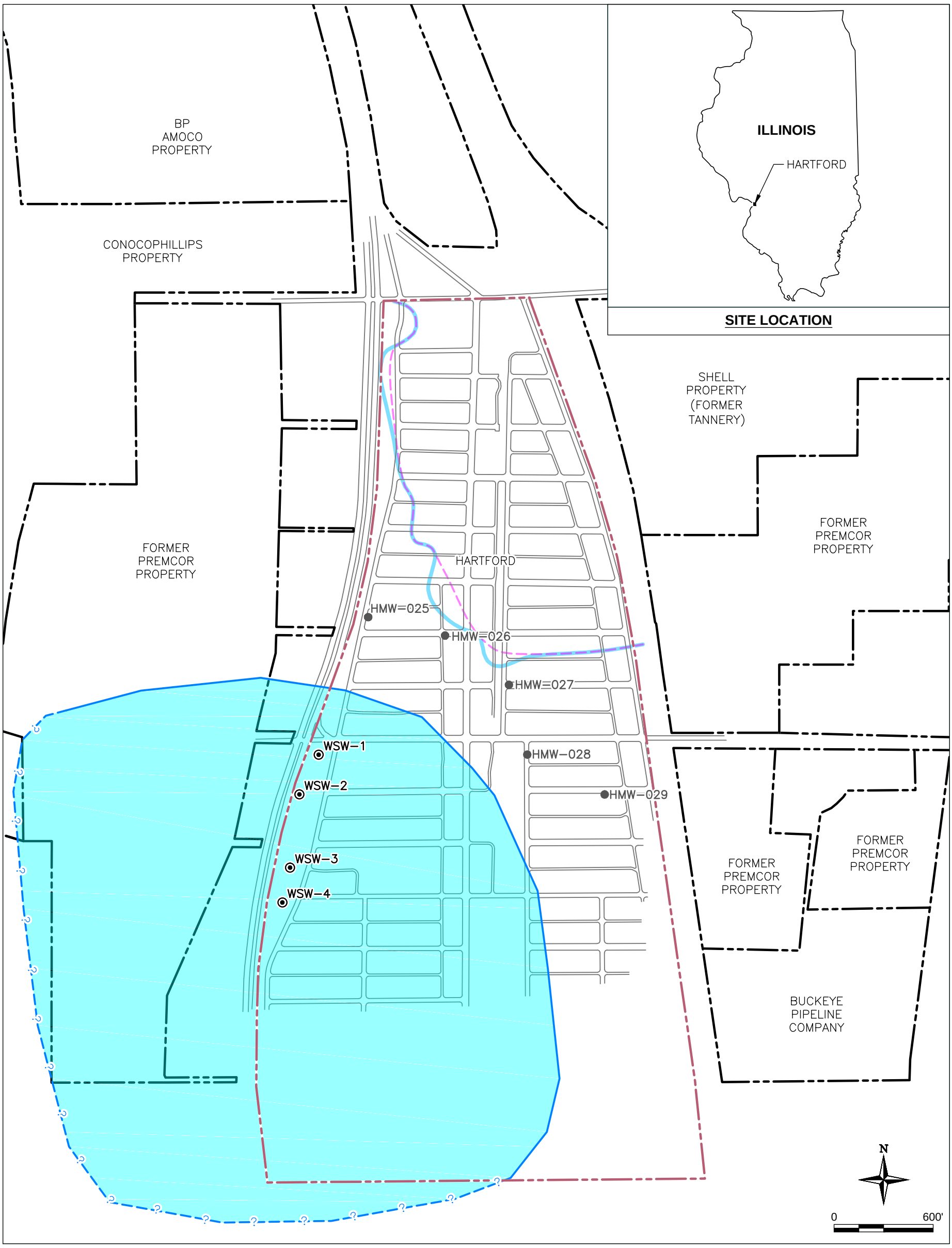


Image Cite: MapMart, Satellite Provider – DigitalGlobe, Image Capture Date – March 9, 2012

EXPLANATION

- WSW-1 — PUBLIC WATER SUPPLY WELL AND DESIGNATION
- HMW-029 — GROUNDWATER MONITORING SENTINEL WELL AND DESIGNATION
- PROPERTY BOUNDARY (APPROXIMATE)
- HARTFORD PROPERTY BOUNDARY (APPROXIMATE)
- PUBLIC WATER SUPPLY WELL HEAD PROTECTION AREA (UNKNOWN)
- PUBLIC WATER SUPPLY WELL HEAD PROTECTION AREA
- INTERPRETED EXTENT OF LIF RESPONSE (ALL STRATA)
- INTERPRETED EXTENT OF DISSOLVED PHASE BENZENE (2012, MAIN SAND)

NOTE: INTERPRETED EXTENT OF LIF RESPONSE FROM APPENDIX A OF "ACTIVE LNAPL RECOVERY SYSTEM 90% DESIGN REPORT", CLAYTON GROUP SERVICES, INC., JULY 31, 2006, AND UPDATED USING 2013 LIF RESULTS.

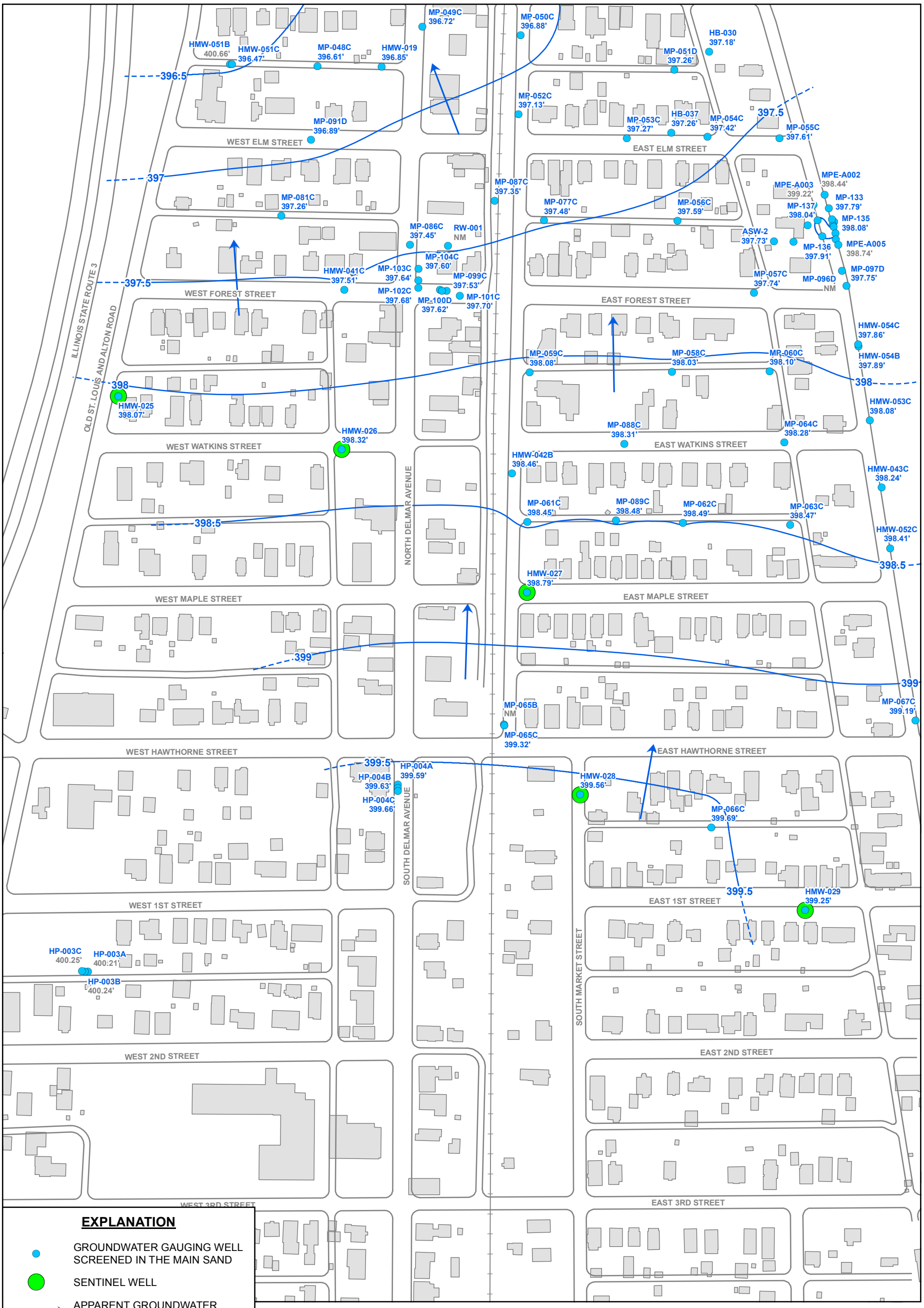
Trihydro CORPORATION
1252 Commerce Drive
Laramie, Wyoming 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

FIGURE 1

SITE LAYOUT

HARTFORD PETROLEUM RELEASE SITE
HARTFORD, ILLINOIS

Drawn By: KBW	Checked By: PM	Scale: 1" = 1,000'	Date: 4/13/15	File: 24S_WELLFIELDSZ_201505



Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

FIGURE 2

POTENTIOMETRIC SURFACE MAP
MAIN SAND HYDROSTRATIGRAPHIC UNIT
APRIL 2015

HARTFORD PETROLEUM RELEASE SITE
HARTFORD, ILLINOIS

Drawn By: BR	Checked By: TA	Scale: 1" = 200'	Date: 6/26/15	File: Fig2_AOC_2Q15_Sand.mxd

ATTACHMENT A

(PLEASE SEE ATTACHED CD)

June 03, 2015

Justin Pruis, P.E.
Trihydro Corporation
1252 Commerce Drive
Laramie, WY 82070
TEL: (307) 755-4861
FAX:

RE: Sentinal Well Monitoring/24S-007-001 **WorkOrder:** 15051593

Dear Justin Pruis, P.E.:

TEKLAB, INC received 8 samples on 5/28/2015 1:25:00 PM for the analysis presented in the following report.

Samples are analyzed on an as received basis unless otherwise requested and documented. The sample results contained in this report relate only to the requested analytes of interest as directed on the chain of custody. NELAP accredited fields of testing are indicated by the letters NELAP under the Certification column. Unless otherwise documented within this report, Teklab Inc. analyzes samples utilizing the most current methods in compliance with 40CFR. All tests are performed in the Collinsville, IL laboratory unless otherwise noted in the Case Narrative.

All quality control criteria applicable to the test methods employed for this project have been satisfactorily met and are in accordance with NELAP except where noted. The following report shall not be reproduced, except in full, without the written approval of Teklab, Inc.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Marvin L. Darling II

Marvin L. Darling
Project Manager
(618)344-1004 ex 41
mdarling@teklabinc.com

Report Contents

http://www.teklabinc.com/

Client: Trihydro Corporation

Work Order: 15051593

Client Project: Sentinal Well Monitoring/24S-007-001

Report Date: 03-Jun-15

This reporting package includes the following:

Cover Letter	1
Report Contents	2
Definitions	3
Case Narrative	4
Laboratory Results	5
Quality Control Results	13
Receiving Check List	15
Chain of Custody	Appended

Definitions

http://www.teklabinc.com/

Client: Trihydro Corporation **Work Order:** 15051593

Client Project: Sentinal Well Monitoring/24S-007-001 **Report Date:** 03-Jun-15

Abbr	Definition
CCV	Continuing calibration verification is a check of a standard to determine the state of calibration of an instrument between recalibration.
DF	Dilution factor is the dilution performed during analysis only and does not take into account any dilutions made during sample preparation. The reported result is final and includes all dilutions factors.
DNI	Did not ignite
DUP	Laboratory duplicate is an aliquot of a sample taken from the same container under laboratory conditions for independent processing and analysis independently of the original aliquot.
ICV	Initial calibration verification is a check of a standard to determine the state of calibration of an instrument before sample analysis is initiated.
IDPH	IL Dept. of Public Health
LCS	Laboratory control sample, spiked with verified known amounts of analytes, is analyzed exactly like a sample to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system. The acceptable recovery range is in the QC Package (provided upon request).
LCSD	Laboratory control sample duplicate is a replicate laboratory control sample that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MBLK	Method blank is a sample of a matrix similar to the batch of associated sample (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences should present at concentrations that impact the analytical results for sample analyses.
MDL	Method detection limit means the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero.
MS	Matrix spike is an aliquot of matrix fortified (spiked) with known quantities of specific analytes that is subjected to the entire analytical procedures in order to determine the effect of the matrix on an approved test method's recovery system. The acceptable recovery range is listed in the QC Package (provided upon request).
MSD	Matrix spike duplicate means a replicate matrix spike that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MW	Molecular weight
ND	Not Detected at the Reporting Limit
NELAP	NELAP Accredited
PQL	Practical quantitation limit means the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operation conditions. The acceptable recovery range is listed in the QC Package (provided upon request).
RL	The reporting limit the lowest level that the data is displayed in the final report. The reporting limit may vary according to customer request or sample dilution. The reporting limit may not be less than the MDL.
RPD	Relative percent difference is a calculated difference between two recoveries (ie. MS/MSD). The acceptable recovery limit is listed in the QC Package (provided upon request).
SPK	The spike is a known mass of target analyte added to a blank sample or sub-sample; used to determine recovery deficiency or for other quality control purposes.
Surr	Surrogates are compounds which are similar to the analytes of interest in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.
TIC	Tentatively identified compound: Analytes tentatively identified in the sample by using a library search. Only results not in the calibration standard will be reported as tentatively identified compounds. Results for tentatively identified compounds that are not present in the calibration standard, but are assigned a specific chemical name based upon the library search, are calculated using total peak areas from reconstructed ion chromatograms and a response factor of one. The nearest Internal Standard is used for the calculation. The results of any TICs must be considered estimated, and are flagged with a "T". If the estimated result is above the calibration range it is flagged "ET"
TNTC	Too numerous to count (> 200 CFU)

Qualifiers

# -	Unknown hydrocarbon	B -	Analyte detected in associated Method Blank
E -	Value above quantitation range	H -	Holding times exceeded
J -	Analyte detected below quantitation limits	M -	Manual Integration used to determine area response
ND -	Not Detected at the Reporting Limit	R -	RPD outside accepted recovery limits
S -	Spike Recovery outside recovery limits	T -	TIC(Tentatively identified compound)
X -	Value exceeds Maximum Contaminant Level		

Case Narrative

http://www.teklabinc.com/

Client: Trihydro Corporation

Work Order: 15051593

Client Project: Sentinal Well Monitoring/24S-007-001

Report Date: 03-Jun-15

Cooler Receipt Temp: 5.22 °C

Locations and Accreditations

	Collinsville	Springfield	Kansas City	Collinsville Air
Address	5445 Horseshoe Lake Road	3920 Pintail Dr	8421 Nieman Road	5445 Horseshoe Lake Road
	Collinsville, IL 62234-7425	Springfield, IL 62711-9415	Lenexa, KS 66214	Collinsville, IL 62234-7425
Phone	(618) 344-1004	(217) 698-1004	(913) 541-1998	(618) 344-1004
Fax	(618) 344-1005	(217) 698-1005	(913) 541-1998	(618) 344-1005
Email	jhriley@teklabinc.com	KKlostermann@teklabinc.com	dthompson@teklabinc.com	EHurley@teklabinc.com

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2016	Collinsville
Kansas	KDHE	E-10374	NELAP	7/31/2015	Collinsville
Louisiana	LDEQ	166493	NELAP	6/30/2015	Collinsville
Louisiana	LDEQ	166578	NELAP	6/30/2015	Collinsville
Texas	TCEQ	T104704515-12-1	NELAP	7/31/2015	Collinsville
Arkansas	ADEQ	88-0966		3/14/2016	Collinsville
Illinois	IDPH	17584		5/31/2015	Collinsville
Kentucky	KDEP	98006		12/31/2015	Collinsville
Kentucky	UST	0073		1/31/2016	Collinsville
Missouri	MDNR	00930		5/31/2015	Collinsville
Oklahoma	ODEQ	9978		8/31/2015	Collinsville

Laboratory Results

http://www.teklabinc.com/

Client: Trihydro Corporation
Work Order: 15051593
Client Project: Sentinal Well Monitoring/24S-007-001
Report Date: 03-Jun-15
Lab ID: 15051593-001
Client Sample ID: HMW-025, 052715
Matrix: GROUNDWATER
Collection Date: 05/27/2015 8:50

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 5030, 8260B, VOLATILE ORGANIC COMPOUNDS BY GC/MS								
Benzene	NELAP	2.0		**ND**	µg/L	1	06/02/2015 11:05	109443
Ethylbenzene	NELAP	1.0		**ND**	µg/L	1	06/02/2015 11:05	109443
m,p-Xylenes	NELAP	5.0		**ND**	µg/L	1	06/02/2015 11:05	109443
Methyl tert-butyl ether	NELAP	2.0		**ND**	µg/L	1	06/02/2015 11:05	109443
o-Xylene	NELAP	5.0		**ND**	µg/L	1	06/02/2015 11:05	109443
Toluene	NELAP	1.0		**ND**	µg/L	1	06/02/2015 11:05	109443
Xylenes, Total	NELAP	5.0		**ND**	µg/L	1	06/02/2015 11:05	109443
Surr: 1,2-Dichloroethane-d4		74.7-129		**108.4**	%REC	1	06/02/2015 11:05	109443
Surr: 4-Bromofluorobenzene		86-119		**106.5**	%REC	1	06/02/2015 11:05	109443
Surr: Dibromofluoromethane		81.7-123		**101.6**	%REC	1	06/02/2015 11:05	109443
Surr: Toluene-d8		84.3-114		**98.7**	%REC	1	06/02/2015 11:05	109443

Laboratory Results

http://www.teklabinc.com/

Client: Trihydro Corporation
Work Order: 15051593
Client Project: Sentinal Well Monitoring/24S-007-001
Report Date: 03-Jun-15
Lab ID: 15051593-002
Client Sample ID: HMW-026, 052715
Matrix: GROUNDWATER
Collection Date: 05/27/2015 10:05

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 5030, 8260B, VOLATILE ORGANIC COMPOUNDS BY GC/MS								
Benzene	NELAP	2.0		**ND**	µg/L	1	06/02/2015 11:32	109443
Ethylbenzene	NELAP	1.0		**ND**	µg/L	1	06/02/2015 11:32	109443
m,p-Xylenes	NELAP	5.0		**ND**	µg/L	1	06/02/2015 11:32	109443
Methyl tert-butyl ether	NELAP	2.0		**ND**	µg/L	1	06/02/2015 11:32	109443
o-Xylene	NELAP	5.0		**ND**	µg/L	1	06/02/2015 11:32	109443
Toluene	NELAP	1.0		**ND**	µg/L	1	06/02/2015 11:32	109443
Xylenes, Total	NELAP	5.0		**ND**	µg/L	1	06/02/2015 11:32	109443
Surr: 1,2-Dichloroethane-d4		74.7-129		**108.1**	%REC	1	06/02/2015 11:32	109443
Surr: 4-Bromofluorobenzene		86-119		**105.2**	%REC	1	06/02/2015 11:32	109443
Surr: Dibromofluoromethane		81.7-123		**101.3**	%REC	1	06/02/2015 11:32	109443
Surr: Toluene-d8		84.3-114		**102.2**	%REC	1	06/02/2015 11:32	109443

Laboratory Results

http://www.teklabinc.com/

Client: Trihydro Corporation
Work Order: 15051593
Client Project: Sentinal Well Monitoring/24S-007-001
Report Date: 03-Jun-15
Lab ID: 15051593-003
Client Sample ID: HMW-027, 052715
Matrix: GROUNDWATER
Collection Date: 05/27/2015 14:25

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 5030, 8260B, VOLATILE ORGANIC COMPOUNDS BY GC/MS								
Benzene	NELAP	2.0		**ND**	µg/L	1	06/02/2015 11:59	109443
Ethylbenzene	NELAP	1.0		**ND**	µg/L	1	06/02/2015 11:59	109443
m,p-Xylenes	NELAP	5.0		**ND**	µg/L	1	06/02/2015 11:59	109443
Methyl tert-butyl ether	NELAP	2.0		**ND**	µg/L	1	06/02/2015 11:59	109443
o-Xylene	NELAP	5.0		**ND**	µg/L	1	06/02/2015 11:59	109443
Toluene	NELAP	1.0		**ND**	µg/L	1	06/02/2015 11:59	109443
Xylenes, Total	NELAP	5.0		**ND**	µg/L	1	06/02/2015 11:59	109443
Surr: 1,2-Dichloroethane-d4		74.7-129		**110.0**	%REC	1	06/02/2015 11:59	109443
Surr: 4-Bromofluorobenzene		86-119		**106.1**	%REC	1	06/02/2015 11:59	109443
Surr: Dibromofluoromethane		81.7-123		**100.8**	%REC	1	06/02/2015 11:59	109443
Surr: Toluene-d8		84.3-114		**101.0**	%REC	1	06/02/2015 11:59	109443

Laboratory Results

http://www.teklabinc.com/

Client: Trihydro Corporation
Work Order: 15051593
Client Project: Sentinal Well Monitoring/24S-007-001
Report Date: 03-Jun-15
Lab ID: 15051593-004
Client Sample ID: HMW-028, 052815
Matrix: GROUNDWATER
Collection Date: 05/28/2015 10:10

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 5030, 8260B, VOLATILE ORGANIC COMPOUNDS BY GC/MS								
Benzene	NELAP	2.0		**ND**	µg/L	1	06/02/2015 12:25	109443
Ethylbenzene	NELAP	1.0		**ND**	µg/L	1	06/02/2015 12:25	109443
m,p-Xylenes	NELAP	5.0		**ND**	µg/L	1	06/02/2015 12:25	109443
Methyl tert-butyl ether	NELAP	2.0		**ND**	µg/L	1	06/02/2015 12:25	109443
o-Xylene	NELAP	5.0		**ND**	µg/L	1	06/02/2015 12:25	109443
Toluene	NELAP	1.0		**ND**	µg/L	1	06/02/2015 12:25	109443
Xylenes, Total	NELAP	5.0		**ND**	µg/L	1	06/02/2015 12:25	109443
Surr: 1,2-Dichloroethane-d4		74.7-129		**110.8**	%REC	1	06/02/2015 12:25	109443
Surr: 4-Bromofluorobenzene		86-119		**109.4**	%REC	1	06/02/2015 12:25	109443
Surr: Dibromofluoromethane		81.7-123		**102.1**	%REC	1	06/02/2015 12:25	109443
Surr: Toluene-d8		84.3-114		**100.8**	%REC	1	06/02/2015 12:25	109443

Laboratory Results

http://www.teklabinc.com/

Client: Trihydro Corporation
Work Order: 15051593
Client Project: Sentinal Well Monitoring/24S-007-001
Report Date: 03-Jun-15
Lab ID: 15051593-005
Client Sample ID: HMW-029, 052815
Matrix: GROUNDWATER
Collection Date: 05/28/2015 11:25

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 5030, 8260B, VOLATILE ORGANIC COMPOUNDS BY GC/MS								
Benzene	NELAP	2.0		**ND**	µg/L	1	06/02/2015 12:52	109443
Ethylbenzene	NELAP	1.0		**ND**	µg/L	1	06/02/2015 12:52	109443
m,p-Xylenes	NELAP	5.0		**ND**	µg/L	1	06/02/2015 12:52	109443
Methyl tert-butyl ether	NELAP	2.0		**ND**	µg/L	1	06/02/2015 12:52	109443
o-Xylene	NELAP	5.0		**ND**	µg/L	1	06/02/2015 12:52	109443
Toluene	NELAP	1.0		**ND**	µg/L	1	06/02/2015 12:52	109443
Xylenes, Total	NELAP	5.0		**ND**	µg/L	1	06/02/2015 12:52	109443
Surr: 1,2-Dichloroethane-d4		74.7-129		**108.9**	%REC	1	06/02/2015 12:52	109443
Surr: 4-Bromofluorobenzene		86-119		**105.5**	%REC	1	06/02/2015 12:52	109443
Surr: Dibromofluoromethane		81.7-123		**101.0**	%REC	1	06/02/2015 12:52	109443
Surr: Toluene-d8		84.3-114		**99.7**	%REC	1	06/02/2015 12:52	109443

Laboratory Results

http://www.teklabinc.com/

Client: Trihydro Corporation
Work Order: 15051593
Client Project: Sentinal Well Monitoring/24S-007-001
Report Date: 03-Jun-15
Lab ID: 15051593-006
Client Sample ID: BD-1, 052715
Matrix: GROUNDWATER
Collection Date: 05/27/2015 0:00

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 5030, 8260B, VOLATILE ORGANIC COMPOUNDS BY GC/MS								
Benzene	NELAP	2.0		**ND**	µg/L	1	06/02/2015 13:18	109443
Ethylbenzene	NELAP	1.0		**ND**	µg/L	1	06/02/2015 13:18	109443
m,p-Xylenes	NELAP	5.0		**ND**	µg/L	1	06/02/2015 13:18	109443
Methyl tert-butyl ether	NELAP	2.0		**ND**	µg/L	1	06/02/2015 13:18	109443
o-Xylene	NELAP	5.0		**ND**	µg/L	1	06/02/2015 13:18	109443
Toluene	NELAP	1.0		**ND**	µg/L	1	06/02/2015 13:18	109443
Xylenes, Total	NELAP	5.0		**ND**	µg/L	1	06/02/2015 13:18	109443
Surr: 1,2-Dichloroethane-d4		74.7-129		**108.5**	%REC	1	06/02/2015 13:18	109443
Surr: 4-Bromofluorobenzene		86-119		**106.5**	%REC	1	06/02/2015 13:18	109443
Surr: Dibromofluoromethane		81.7-123		**101.2**	%REC	1	06/02/2015 13:18	109443
Surr: Toluene-d8		84.3-114		**99.9**	%REC	1	06/02/2015 13:18	109443

Laboratory Results

http://www.teklabinc.com/

Client: Trihydro Corporation
Work Order: 15051593
Client Project: Sentinal Well Monitoring/24S-007-001
Report Date: 03-Jun-15
Lab ID: 15051593-007
Client Sample ID: EB-1, 052715
Matrix: AQUEOUS
Collection Date: 05/27/2015 0:00

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 5030, 8260B, VOLATILE ORGANIC COMPOUNDS BY GC/MS								
Benzene	NELAP	2.0	J	**0.5**	µg/L	1	06/02/2015 13:45	109443
Ethylbenzene	NELAP	1.0		**ND**	µg/L	1	06/02/2015 13:45	109443
m,p-Xylenes	NELAP	5.0		**ND**	µg/L	1	06/02/2015 13:45	109443
Methyl tert-butyl ether	NELAP	2.0		**ND**	µg/L	1	06/02/2015 13:45	109443
o-Xylene	NELAP	5.0		**ND**	µg/L	1	06/02/2015 13:45	109443
Toluene	NELAP	1.0		**ND**	µg/L	1	06/02/2015 13:45	109443
Xylenes, Total	NELAP	5.0		**ND**	µg/L	1	06/02/2015 13:45	109443
Surr: 1,2-Dichloroethane-d4		74.7-129		**106.5**	%REC	1	06/02/2015 13:45	109443
Surr: 4-Bromofluorobenzene		86-119		**108.9**	%REC	1	06/02/2015 13:45	109443
Surr: Dibromofluoromethane		81.7-123		**100.4**	%REC	1	06/02/2015 13:45	109443
Surr: Toluene-d8		84.3-114		**100.4**	%REC	1	06/02/2015 13:45	109443

Laboratory Results

http://www.teklabinc.com/

Client: Trihydro Corporation
Work Order: 15051593
Client Project: Sentinal Well Monitoring/24S-007-001
Report Date: 03-Jun-15
Lab ID: 15051593-008
Client Sample ID: Trip Blank
Matrix: TRIP BLANK
Collection Date: 05/28/2015 13:25

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
SW-846 5030, 8260B, VOLATILE ORGANIC COMPOUNDS BY GC/MS								
Benzene	NELAP	2.0		**ND**	µg/L	1	06/02/2015 14:11	109443
Ethylbenzene	NELAP	1.0		**ND**	µg/L	1	06/02/2015 14:11	109443
m,p-Xylenes	NELAP	5.0		**ND**	µg/L	1	06/02/2015 14:11	109443
Methyl tert-butyl ether	NELAP	2.0		**ND**	µg/L	1	06/02/2015 14:11	109443
o-Xylene	NELAP	5.0		**ND**	µg/L	1	06/02/2015 14:11	109443
Toluene	NELAP	1.0		**ND**	µg/L	1	06/02/2015 14:11	109443
Xylenes, Total	NELAP	5.0		**ND**	µg/L	1	06/02/2015 14:11	109443
Surr: 1,2-Dichloroethane-d4		74.7-129		**108.8**	%REC	1	06/02/2015 14:11	109443
Surr: 4-Bromofluorobenzene		86-119		**108.3**	%REC	1	06/02/2015 14:11	109443
Surr: Dibromofluoromethane		81.7-123		**100.4**	%REC	1	06/02/2015 14:11	109443
Surr: Toluene-d8		84.3-114		**100.2**	%REC	1	06/02/2015 14:11	109443

Quality Control Results

http://www.teklabinc.com/

Client: Trihydro Corporation
Client Project: Sentinal Well Monitoring/24S-007-001

Work Order: 15051593
Report Date: 03-Jun-15

SW-846 5030, 8260B, VOLATILE ORGANIC COMPOUNDS BY GC/MS

Batch 109443 **SampType: MBLK** Units **µg/L**
SampID: MBLK-N150602-1

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Benzene	2.0		**ND**						06/02/2015
Ethylbenzene	5.0		**ND**						06/02/2015
m,p-Xylenes	5.0		**ND**						06/02/2015
Methyl tert-butyl ether	2.0		**ND**						06/02/2015
o-Xylene	5.0		**ND**						06/02/2015
Toluene	5.0		**ND**						06/02/2015
Xylenes, Total	5.0		**ND**						06/02/2015
Surr: 1,2-Dichloroethane-d4			**54.2**	50.00		108.3	74.7	129	06/02/2015
Surr: 4-Bromofluorobenzene			**53.2**	50.00		106.3	86	119	06/02/2015
Surr: Toluene-d8			**49.8**	50.00		99.6	84.3	114	06/02/2015

Batch 109443 **SampType: LCSD** Units **µg/L** RPD Limit **40**
SampID: LCSD-N150602-1

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Benzene	2.0		**49.4**	50.00	0	98.7	47.09	4.71	06/02/2015
Ethylbenzene	5.0		**51.9**	50.00	0	103.8	49.79	4.13	06/02/2015
m,p-Xylenes	5.0		**104**	100.0	0	103.9	100.7	3.17	06/02/2015
Methyl tert-butyl ether	2.0		**45.4**	50.00	0	90.8	45.35	0.11	06/02/2015
o-Xylene	5.0		**50.1**	50.00	0	100.3	48.35	3.63	06/02/2015
Toluene	5.0		**50.2**	50.00	0	100.3	48.83	2.67	06/02/2015
Xylenes, Total	5.0		**154**	150.0	0	102.7	149.0	3.32	06/02/2015
Surr: 1,2-Dichloroethane-d4			**51.6**	50.00		103.2			06/02/2015
Surr: 4-Bromofluorobenzene			**51.4**	50.00		102.9			06/02/2015
Surr: Toluene-d8			**50.4**	50.00		100.7			06/02/2015

Batch 109443 **SampType: LCS** Units **µg/L**
SampID: LCS-N150602-1

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Benzene	2.0		**47.1**	50.00	0	94.2	80	114	06/02/2015
Ethylbenzene	5.0		**49.8**	50.00	0	99.6	77.2	113	06/02/2015
m,p-Xylenes	5.0		**101**	100.0	0	100.7	79.6	113	06/02/2015
Methyl tert-butyl ether	2.0		**45.4**	50.00	0	90.7	76.8	117	06/02/2015
o-Xylene	5.0		**48.4**	50.00	0	96.7	80.1	111	06/02/2015
Toluene	5.0		**48.8**	50.00	0	97.7	77.5	113	06/02/2015
Xylenes, Total	5.0		**149**	150.0	0	99.4	80.1	111	06/02/2015
Surr: 1,2-Dichloroethane-d4			**51.5**	50.00		103.0	74.7	129	06/02/2015
Surr: 4-Bromofluorobenzene			**51.5**	50.00		103.0	86	119	06/02/2015
Surr: Toluene-d8			**50.2**	50.00		100.3	84.1	114	06/02/2015

Client: Trihydro Corporation **Work Order:** 15051593

Client Project: Sentinal Well Monitoring/24S-007-001 **Report Date:** 03-Jun-15

SW-846 5030, 8260B, VOLATILE ORGANIC COMPOUNDS BY GC/MS

Batch 109443 **SampType: LCSGD** Units **%REC** RPD Limit **0**

SampID: LCSGD-N150602-1

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Surr: 1,2-Dichloroethane-d4			**52.8**	50.00		105.6			06/02/2015
Surr: 4-Bromofluorobenzene			**52.1**	50.00		104.2			06/02/2015
Surr: Toluene-d8			**51.0**	50.00		102.0			06/02/2015

Batch 109443 **SampType: LCSG** Units **%REC**

SampID: LCSG-N150602-1

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Surr: 1,2-Dichloroethane-d4			**53.6**	50.00		107.2	74.7	129	06/02/2015
Surr: 4-Bromofluorobenzene			**52.2**	50.00		104.4	86	119	06/02/2015
Surr: Toluene-d8			**49.9**	50.00		99.7	84.3	114	06/02/2015

Batch 109443 **SampType: MS** Units **µg/L**

SampID: 15060005-002CMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Benzene	50.0		**5470**	1250	4173	103.9	62.5	121	06/02/2015
Ethylbenzene	50.0		**3800**	1250	2505	103.6	74.4	130	06/02/2015
m,p-Xylenes	50.0		**4950**	1250	3618	106.2	70.5	126	06/02/2015
o-Xylene	50.0		**1170**	1250	32.25	91.2	71.2	124	06/02/2015
Toluene	50.0		**1280**	1250	144.2	91.1	69.5	118	06/02/2015
Xylenes, Total	125		**6120**	2500	3651	98.7	71.1	125	06/02/2015
Surr: 1,2-Dichloroethane-d4			**1280**	1250		102.1	74.7	129	06/02/2015
Surr: 4-Bromofluorobenzene			**1300**	1250		104.1	86	119	06/02/2015
Surr: Toluene-d8			**1270**	1250		101.4	84.3	114	06/02/2015

Batch 109443 **SampType: MSD** Units **µg/L** RPD Limit **20**

SampID: 15060005-002CMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Benzene	50.0	SE	**5850**	1250	4173	134.3	5471	6.72	06/02/2015
Ethylbenzene	50.0		**4090**	1250	2505	126.7	3800	7.33	06/02/2015
m,p-Xylenes	50.0	S	**5290**	1250	3618	133.8	4946	6.73	06/02/2015
o-Xylene	50.0		**1270**	1250	32.25	98.6	1172	7.67	06/02/2015
Toluene	50.0		**1390**	1250	144.2	99.7	1283	8.06	06/02/2015
Xylenes, Total	125		**6560**	2500	3651	116.2	6118	6.91	06/02/2015
Surr: 1,2-Dichloroethane-d4			**1270**	1250		101.6			06/02/2015
Surr: 4-Bromofluorobenzene			**1310**	1250		104.7			06/02/2015
Surr: Toluene-d8			**1260**	1250		100.6			06/02/2015

Receiving Check List

http://www.teklabinc.com/

Client: Trihydro Corporation

Client Project: Sentinal Well Monitoring/24S-007-001

Work Order: 15051593

Report Date: 03-Jun-15

Carrier: Chris Martin

Received By: KM

Completed by: Emily Pohlman
On: 28-May-15

Reviewed by: Marvin L. Darling
On: 28-May-15

Pages to follow: Chain of custody 1 Extra pages included 1

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	Temp °C 5.22
Type of thermal preservation?	None ☐	Ice ☑	Blue Ice ☐	Dry Ice ☐
Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☑	No ☐		
Reported field parameters measured:	Field ☐	Lab ☐	NA ☑	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐		

When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.

Water – at least one vial per sample has zero headspace?	Yes ☑	No ☐	No VOA vials ☐
Water - TOX containers have zero headspace?	Yes ☐	No ☐	No TOX containers ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	NA ☐
NPDES/CWA TCN interferences checked/treated in the field?	Yes ☐	No ☐	NA ☑

Any No responses must be detailed below or on the COC.

Trip Blank collection date and time will be reported as the received date and time (end of trip).

CHAIN OF CUSTODY

pg. 1 of 1 Work order # 15051593

TEKLAB, INC. 5445 Horseshoe Lake Road - Collinsville, IL 62234 - Phone: (618) 344-1004 - Fax: (618) 344-1005

Client: Trihydro Corporation
Address: 1252 Commerce Drive
City / State / Zip Laramie, WY 82070
Contact: Justin Pruis, P.E. **Phone:** (307) 755-4861
E-Mail: jpruis@trihydro.com **Fax:**

Samples on: [X] ICE [ ] BLUE ICE [ ] NO ICE 5.22 °C
Preserved in: [ ] LAB [ ] FIELD
FOR LAB USE ONLY
Lab Notes
OIL headspace 5/28/15

Client Comments: VOC's include MTBE, BTEX, m,p-xylene, o-xylene, total xylene

Are these samples known to be involved in litigation? If yes, a surcharge will apply [ ] Yes [X] No
Are these samples known to be hazardous? [ ] Yes [X] No
Are there any required reporting limits to be met on the requested analysis?. If yes, please provide limits in the comment section. [X] Yes [ ] No Trihydro specific - see attached sheet

Project Name/Number
Sentinel Well Monitoring 1245-007-001

Sample Collector's Name
Chris Martin

Results Requested
[X] Standard [ ] 1-2 Day (100% Surcharge)
[ ] Other ____ [ ] 3 Day (50% Surcharge)

Billing Instructions

Lab Use Only	Sample Identification	Date/Time Sampled	UNPRES	HNO3	NaOH	H2SO4	HCL	MeOH	NaHSO4	OTHER	Aqueous	Drinking Water	Soil	Sludge	Special Waste	Groundwater	BTEX/MTBE
15051593 101	HMW-025,052715	5/27/15 0850					2										✓
102	HMW-026,052715	5/27/15 1005					2										✓
103	HMW-027,052715	5/27/15 1425					2										✓
104	HMW-028,052815	5/28/15 1010					2										✓
105	HMW-029,052815	5/28/15 1125					2										✓
106	BD-1,052715	5/27/15 —					2										✓
107	EB-1,052715	5/27/15 —					2										✓
108	Trip Blank	5/26/15 1045					2										✓

NOT USED CM

Relinquished By	Date/Time	Received By	Date/Time
CM	5/28/15 1325	Kalyn M	5.28.15 1325

The individual signing this agreement on behalf of the client, acknowledges that he/she has read and understands the terms and conditions of this agreement, and that he/she has the authority to sign on behalf of the client.

BottleOrder: 25268

KM 5.28.15

Trihydro Corporation

Hartford Petroleum Release Site

Sentinel Well Monitoring

Reporting Limits

Constituent	Reporting Limit (ug/L)
Benzene	2.0
Toluene	1.0
Ethylbenzene	1.0
m,p-xylene	5.0
o-xylene	5.0
Xylene (total)	5.0
MTBE	2.0

Tier II Data Validation Report Summary

Client: Apex Oil Company, Inc.	Laboratory: Teklab, Inc.
Project Name: 2Q2015 Sentinel Well Monitoring	Sample Matrix: Groundwater
Project Number: 24S-007-001	Sample Start Date: 05/27/2015
Date Validated: 06/08/2015	Sample End Date: 05/28/2015
Parameters Included: • Volatile Organic Compounds (VOC) by Test Methods for Examining Solid Waste (SW-846) Method 8260B	
Laboratory Project ID: 15051593	
Data Validator: James Gianakon, Environmental Chemist	
Reviewer: Mike Phillips, Senior Chemist	

DATA EVALUATION CRITERIA SUMMARY

A Tier II Data Validation was performed by Trihydro Corporation's Chemical Data Evaluation Services Group on the analytical data report package generated by Teklab, Inc. in Collinsville, Illinois, evaluating samples from the Apex Oil Company Hartford Petroleum Release site, located in Hartford, Illinois.

Precision, accuracy, method compliance, and completeness of this data package were assessed during this data review. Precision was determined by evaluating the calculated relative percent difference (RPD) values from:

- Field duplicate pairs
- Matrix spike (MS) and matrix spike duplicate (MSD) pairs
- Laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) pairs

Laboratory accuracy was established by reviewing the demonstrated percent recoveries (%R) of the following items to verify that data are not biased.

- MS/MSD samples
- LCS/LCSD samples
- Organic system monitoring compounds (surrogates)

Field accuracy was established by collecting and analyzing the following samples to monitor for possible ambient or cross contamination during sampling and transportation.

- Trip blanks
- Equipment blanks

Method compliance was established by reviewing sample integrity, holding times, detection limits, surrogate recoveries, laboratory blanks, initial and continuing calibrations (where applicable), and the LCS/LCSD percent recoveries against method-specific requirements.

Completeness was evaluated by determining the overall ratio of the number of samples and analyses planned versus the number of samples with valid analyses. Determination of completeness included a review of the chain-of-custody (CoC), laboratory analytical methods, and other laboratory and field documents associated with this analytical data set.

Revision Date: June 2015

Tier II Data Validation Report Summary

SAMPLE NUMBERS TABLE

Client Sample ID	Laboratory Sample Number
HMW-025, 052715	15051593-001
HMW-026, 052715	15051593-002
HMW-027, 052715	15051593-003
HMW-028, 052815	15051593-004
HMW-029, 052815	15051593-005
BD-1, 052715	15051593-006
EB-1, 052715	15051593-007
Trip Blank	15051593-008

Tier II Data Validation Report Summary

The laboratory data were reviewed to evaluate compliance with the methods and the quality of the reported data. Assessment of CoC completeness is included in Item 3 of the Data Validation Checklist. A check mark (✓) indicates that the referenced validation criteria were deemed acceptable, whereas a crossed circle (⊗) indicates validation criteria for which the data have been qualified by the data validator. An empty circle (○) indicates that the specified criterion does not apply to the reviewed data. Details are noted in the tables below.

Validation Criteria

- ✓ Data Completeness
- ✓ CoC Documentation (Item 3)
- ✓ Holding Times and Preservation (Items 6 and 7)
- ○ Initial and Continuing Calibrations (Item 9)
- ✓ Laboratory Blanks (Item 10)
- ✓ MS/MSD (Item 12)
- ✓ LCS/LCSD (Item 14)
- ✓ System Monitoring Compounds (i.e., Surrogates) (Item 16)
- ✓ Equipment and Trip Blanks (Item 17)
- ✓ Field Duplicates (Item 19)
- ○ Laboratory Duplicates (Item 21)

Guidance References

Chemical data validation was conducted in accordance with the United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines for the analyses listed below, or by the appropriate method if not covered in the National Functional Guidelines.

- Data for organic analyses were evaluated according to validation criteria set forth in the USEPA CLP National Functional Guidelines for Superfund Organic Methods Data Review, document number EPA-540-R-014-002, August 2014 with additional reference to the USEPA CLP National Functional Guidelines for Organic Data Review, document number EPA 540/R-99/008, October 1999.
- Review of field duplicates was conducted according to the USEPA New England Environmental Data Review Supplement for Regional Data Review Elements and Superfund Specific Guidance/Procedures, EQADR-Supplement0, April 2013.
- Trihydro Data Validation Variance Documentation, June 2015.

Tier II Data Validation Report Summary

OVERALL DATA PACKAGE ASSESSMENT

Based on a data validation review, the data are acceptable as delivered. Data qualified by the laboratory are discussed in Item 2 of the Validation Criteria Checklist.

The purpose of validating data and assigning qualifiers is to assist in proper data interpretation. Data that are not qualified meet the site data quality objectives. If values are assigned qualifiers other than an R (rejected, data not usable), the data may be used for site evaluation; however, consideration should be given to the reasons for qualification when interpreting sample concentrations. Data points that are assigned an R qualifier should not be used for site evaluation purposes.

Text identified in **bold font** in the Validation Criteria Checklist indicates that further action and/or qualification of the data were required. Data were qualified with J data flags by the laboratory if the result was greater than or equal to the method detection limit (MDL) but less than the reporting limit (RL). Laboratory J flags were preserved in the data and included in the Data Qualification Summary table at the end of this report. Additional data validation qualifiers were added for the items noted with crossed circles in the Validation Criteria section above. Please see the Data Qualification Summary table at the end of this report for a complete list of samples and analytes qualified.

Data qualifiers used during this validation are included in the following table.

Qualifier	Definition
J	Estimated concentration

Data Completeness

The analyses were performed as requested on the CoC records. The associated samples were received by the laboratory and analyzed properly unless otherwise noted in the Criteria Checklist below. The complete data package consisted of 42 data points excluding blank samples. No data points were rejected. The data completeness measure for this data package is calculated to be 100% and is acceptable.

VALIDATION CRITERIA CHECKLIST	
1. Was the report free of non-conformances identified by the laboratory?	Yes
Comments: The laboratory did not identify non-conformances regarding the analytical data.	
2. Were the data free of data qualification flags and/or notes used by the laboratory? If no, define.	No
Comments: The laboratory used the following data qualification flags in the laboratory report. J – Analyte detected below quantitation limits. S – Spike Recovery outside recovery limits. E – Value above quantitation range.	
3. Were sample CoC forms and procedures complete?	Yes
Comments: The CoC records from field to laboratory were complete and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.	
4. Were detection limits in accordance with the quality assurance project plan (QAPP), permit, or method, or indicated as acceptable?	Yes
Comments: The detection limits appeared to be acceptable. Dilutions were not applied for the sample analyses.	
5. Were the reported analytical methods and constituents in compliance with the QAPP, permit, or CoC? Were any analytes reported by more than one method?	Yes
Comments: The reported analytical methods were in compliance with the CoC and the laboratory reported the requested constituents in accordance with the CoC.	
6. Were samples received in good condition within method-specified requirements?	Yes
Comments: Samples were received on ice, in good condition, and with the cooler temperature within the recommended temperature range of 4°C ± 2°C at a temperature of 5.22°C as noted in the Case Narrative, CoC, and Receiving Check List. The laboratory noted that the shipping containers were sealed and custody seals were present.	
7. Were samples extracted/digested and analyzed within method-specified or technical holding times?	Yes
Comments: The samples were extracted and analyzed within method-specific holding times.	
8. Were reported units appropriate for the sample matrix/matrices and analytical method(s)? Specify if wet or dry units were used for soil.	Yes
Comments: The results were reported in concentration units of micrograms per liter (µg/L), which was acceptable for the sample matrix and the analyses requested.	
9. Was there indication from the laboratory that the initial or continuing calibration verification results were within acceptable limits?	N/A
Comments: Initial and continuing calibration data were not included as part of this data set; however, these data were assumed to be acceptable as the laboratory did not note that any calibration verification results were outside acceptable limits.	
10. Was the total number of laboratory blank samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method?	Yes
Comments: The total number of laboratory blank samples prepared was equal to at least 5% of the total number of samples.	
11. Were laboratory blank samples reported to be free of target analyte contamination?	Yes
Comments: The laboratory blank sample was reported to be free of target analyte contamination.	

VALIDATION CRITERIA CHECKLIST	
12. Was the total number of MS samples prepared equal to at least 5% of the total number of samples or analyzed as required by the method?	Yes
Comments: The total number of matrix spike samples prepared was equal to at least 5% of the total number of samples. Matrix spike samples were prepared for batch 109443 from a sample source not associated with this data set.	
13. For MS/MSDs prepared from project samples, were percent recoveries and RPDs within data validation or laboratory quality control (QC) limits?	N/A
Comments: MS/MSD pairs were not prepared from sample sources associated with this data set. The percent recoveries and RPD values for MS/MSDs prepared from non-project samples were evaluated and considered but data were not qualified based on those results since matrix similarity to project samples could not be guaranteed.	
14. Was the total number of LCSs analyzed equal to at least 5% of the total number of samples or analyzed as required by the method?	Yes
Comments: The total number of LCS samples analyzed was equal to at least 5% of the total number of samples.	
15. Were LCS/LCSD percent recoveries and LCS/LCSD RPDs within data validation or laboratory QC limits?	Yes
Comments: The LCS/LCSD percent recoveries and LCS/LCSD RPDs were within laboratory QC limits.	
16. Were surrogate recoveries within laboratory QC limits?	Yes
Comments: Surrogate recoveries were within laboratory QC limits.	
17. Were the number of trip blank, field blank, and/or equipment blank samples collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit?	Yes
Comments: The number of trip, field, and equipment blanks collected was equal to (*not equal to*) at least 10% of the total number of samples. One trip blank sample, Trip Blank, and one equipment blank sample, EB-1, 052715, were collected as part of this sample set.	
18. Were the trip blank, field blank, and/or equipment blank samples reported to be free of target analyte contamination?	No
Comments: The trip blank and equipment blank samples were reported to be free of target analyte contamination with the following exception. Benzene was detected in the equipment blank, EB-1, 052715, at a concentration of 0.5 µg/L. Benzene was not detected in the associated samples and qualification of data was not required.	
19. Was the number of field duplicates collected equal to at least 10% of the total number of samples or as required by the project guidelines, QAPP, SAP, or permit?	Yes
Comments: The number of field duplicates collected was equal to at least 10% of the number of samples. Sample BD-1, 052715 was collected as a field duplicate of sample HMW-026, 052715.	
20. Were field duplicate RPD values within data validation QC limits (soil 0-50%, water 0-30%, or air 0-25%)?	Yes
Comments: The parent and duplicate samples, HMW-026, 052715 and BD-1, 052715, were reported to be free of target analytes and RPD values could not be calculated. This was an acceptable result.	
21. For laboratory duplicates prepared from project samples, were RPDs within laboratory QC limits?	N/A
Comments: Laboratory duplicate samples were not prepared for this sample set.	

DATA QUALIFICATION SUMMARY

Abbreviation	Reason
MDLRL	Flagged by the laboratory: The result was greater than the MDL but less than the RL.

Analyte	Method	Field Sample ID	Lab Sample ID	Result	Limit	Units	Reviewer Qualifier	DV Flag Reasons
Benzene	SW8260B	EB-1, 052715	15051593-007A	0.5	2	µg/L	J	MDLRL