

Confidentiality Requested:

Yes No

KANSAS CORPORATION COMMISSION 1260423
OIL & GAS CONSERVATION DIVISION

Form ACO-1

August 2013

Form must be Typed
Form must be Signed
All blanks must be Filled

WELL COMPLETION FORM
WELL HISTORY - DESCRIPTION OF WELL & LEASE

OPERATOR: License # _____

Name: _____

Address 1: _____

Address 2: _____

City: _____ State: _____ Zip: _____ + _____

Contact Person: _____

Phone: (_____) _____

CONTRACTOR: License # _____

Name: _____

Wellsite Geologist: _____

Purchaser: _____

Designate Type of Completion:

- New Well Re-Entry Workover
- Oil WSW SWD SIOW
- Gas D&A ENHR SIGW
- OG GSW Temp. Abd.
- CM (Coal Bed Methane)
- Cathodic Other (Core, Expl., etc.): _____

If Workover/Re-entry: Old Well Info as follows:

Operator: _____

Well Name: _____

Original Comp. Date: _____ Original Total Depth: _____

- Deepening Re-perf. Conv. to ENHR Conv. to SWD
- Plug Back Conv. to GSW Conv. to Producer
- Commingled Permit #: _____
- Dual Completion Permit #: _____
- SWD Permit #: _____
- ENHR Permit #: _____
- GSW Permit #: _____

Spud Date or Recompletion Date	Date Reached TD	Completion Date or Recompletion Date
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API No. 15 - _____

Spot Description: _____

_____ - _____ - _____ Sec. _____ Twp. _____ S. R. _____ East West

_____ Feet from North / South Line of Section

_____ Feet from East / West Line of Section

Footages Calculated from Nearest Outside Section Corner:

- NE NW SE SW

GPS Location: Lat: _____, Long: _____
(e.g. xx.xxxxx) (e.g. -xxx.xxxxx)

Datum: NAD27 NAD83 WGS84

County: _____

Lease Name: _____ Well #: _____

Field Name: _____

Producing Formation: _____

Elevation: Ground: _____ Kelly Bushing: _____

Total Vertical Depth: _____ Plug Back Total Depth: _____

Amount of Surface Pipe Set and Cemented at: _____ Feet

Multiple Stage Cementing Collar Used? Yes No

If yes, show depth set: _____ Feet

If Alternate II completion, cement circulated from: _____

feet depth to: _____ w/ _____ sx cmt.

Drilling Fluid Management Plan

(Data must be collected from the Reserve Pit)

Chloride content: _____ ppm Fluid volume: _____ bbls

Dewatering method used: _____

Location of fluid disposal if hauled offsite:

Operator Name: _____

Lease Name: _____ License #: _____

Quarter _____ Sec. _____ Twp. _____ S. R. _____ East West

County: _____ Permit #: _____

AFFIDAVIT

I am the affiant and I hereby certify that all requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Submitted Electronically

KCC Office Use ONLY

- Confidentiality Requested
Date: _____
- Confidential Release Date: _____
- Wireline Log Received
- Geologist Report Received
- UIC Distribution
- ALT I II III Approved by: _____ Date: _____

1260423



Operator Name: _____ Lease Name: _____ Well #: _____

Sec. _____ Twp. _____ S. R. _____ East West County: _____

INSTRUCTIONS: Show important tops of formations penetrated. Detail all cores. Report all final copies of drill stems tests giving interval tested, time tool open and closed, flowing and shut-in pressures, whether shut-in pressure reached static level, hydrostatic pressures, bottom hole temperature, fluid recovery, and flow rates if gas to surface test, along with final chart(s). Attach extra sheet if more space is needed.

Final Radioactivity Log, Final Logs run to obtain Geophysical Data and Final Electric Logs must be emailed to kcc-well-logs@kcc.ks.gov. Digital electronic log files must be submitted in LAS version 2.0 or newer AND an image file (TIFF or PDF).

Drill Stem Tests Taken <input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Attach Additional Sheets)</i> Samples Sent to Geological Survey <input type="checkbox"/> Yes <input type="checkbox"/> No Cores Taken <input type="checkbox"/> Yes <input type="checkbox"/> No Electric Log Run <input type="checkbox"/> Yes <input type="checkbox"/> No List All E. Logs Run: _____	<input type="checkbox"/> Log Formation (Top), Depth and Datum <input type="checkbox"/> Sample Name Top Datum
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CASING RECORD <input type="checkbox"/> New <input type="checkbox"/> Used							
Report all strings set-conductor, surface, intermediate, production, etc.							
Purpose of String	Size Hole Drilled	Size Casing Set (In O.D.)	Weight Lbs. / Ft.	Setting Depth	Type of Cement	# Sacks Used	Type and Percent Additives

ADDITIONAL CEMENTING / SQUEEZE RECORD				
Purpose:	Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
<input type="checkbox"/> Perforate <input type="checkbox"/> Protect Casing <input type="checkbox"/> Plug Back TD <input type="checkbox"/> Plug Off Zone				

Did you perform a hydraulic fracturing treatment on this well? Yes No *(If No, skip questions 2 and 3)*

Does the volume of the total base fluid of the hydraulic fracturing treatment exceed 350,000 gallons? Yes No *(If No, skip question 3)*

Was the hydraulic fracturing treatment information submitted to the chemical disclosure registry? Yes No *(If No, fill out Page Three of the ACO-1)*

Shots Per Foot	PERFORATION RECORD - Bridge Plugs Set/Type Specify Footage of Each Interval Perforated	Acid, Fracture, Shot, Cement Squeeze Record <i>(Amount and Kind of Material Used)</i>	Depth

TUBING RECORD: Size: _____ Set At: _____ Packer At: _____ Liner Run: Yes No

Date of First, Resumed Production, SWD or ENHR. _____		Producing Method: <input type="checkbox"/> Flowing <input type="checkbox"/> Pumping <input type="checkbox"/> Gas Lift <input type="checkbox"/> Other <i>(Explain)</i> _____					
Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio	Gravity		

DISPOSITION OF GAS: <input type="checkbox"/> Vented <input type="checkbox"/> Sold <input type="checkbox"/> Used on Lease <i>(If vented, Submit ACO-18.)</i>	METHOD OF COMPLETION: <input type="checkbox"/> Open Hole <input type="checkbox"/> Perf. <input type="checkbox"/> Dually Comp. <input type="checkbox"/> Commingled <i>(Submit ACO-5)</i> <i>(Submit ACO-4)</i> <input type="checkbox"/> Other <i>(Specify)</i> _____	PRODUCTION INTERVAL: _____ _____
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SERVICE ORDER CONTRACT

Customer Name Tapstone Energy Ticket Number SOK 5217
Lease & Well Number Hazel 23-34-9 2H Date 7/21/2015

As consideration, the above named customer shall secure O-TEX Pumping L.L.C. shall not be responsible for and customer shall secure O-TEX pumping against any liability for damage to property of customer and of the well owner (if different from customer), unless caused by the willful misconduct or gross negligence of O-TEX pumping, this provision applying to but not limited to subsurface damage and surface damage arising from subsurface damage.

O-TEX makes no guarantee to the effectiveness of the products, supplies, or materials, nor of the results of any treatment or services. Because of the uncertainty of variable well conditions and the necessity of relying on facts and supporting services furnished by others, O-TEX personnel will use their best efforts in gathering such information and their best judgment in interpreting it, but because of the uncertainty of variable well conditions and the necessity of relying on facts and supporting services furnished by others except where due to O-TEX gross negligence or willful misconduct in the preparation or furnishing it.

Upon customers default in payment of the customers account by the last day of the month following the month in which the invoice is dated, Customer agrees to pay interest thereon after at the highest lawful contract rate applicable but never to exceed 18% per annum in the event it becomes necessary to employ an attorney to enforce collection of said account.

Customer agrees to pay all collection costs and attorney fees in the amount of 25% of the unpaid account. Service order: I authorize work to begin per service instructions in accordance with terms and conditions printed on this form and represent that I have authority to accept and sign this order.

I HAVE READ AND UNDERSTAND THIS CONTRACT AND REPRESENT THAT I AM AUTHORIZED TO SIGN THE SAME AS CUSTOMERS AGENT.

Customer Authorized Agent: _____

O-TEX PUMPING LLC

Service Location Fairview, Oklahoma
 Service Address 601 Industrial Blvd 73737

Phone number 580-227-2727
 FIELD RECEIPT
 580-227-2727

Project Number: SOK 5217

Service Date: 7/21/2015
 Customer Tapstone Energy
 Address: Hazel 23-34-9
 City Harper
 State Kansas
 St
 Customer Rep 0
 Phone 0
 AFE # 15-077-22151-01-00
 PERMIT # 0

Well Name: Hazel 23-34-9
 Well Number: 2H
 County: Harper
 State: Kansas
 API # 15-077-22151-01-00
 AFE # 0
 PERMIT # 0

Job Type 0
 Serv. Sup. Mike Hall
 Page 1 of 1

Item #	DESCRIPTION	U OF MEAS.	UNIT PRICE	QUAN	GROSS	%DISC	disc	NET
ML001	Pickup Mileage	per mile/ per Unit	\$ 4.26	100.0	\$426.00	75%	\$319.50	\$106.50
ML002	Pump Truck/Heavy Vehicle Mileage	per mile/ per Unit	\$ 7.32	100.0	\$732.00	75%	\$549.00	\$183.00
ML003	Bulk Cement Delivery/Return	per Ton-Mile	\$ 2.95	1,130.0	\$3,333.50	75%	\$2,500.13	\$833.38
MX001	Bulk Material Mixing Service Charge	per cuft	\$ 3.27	496.0	\$1,621.92	75%	\$1,216.44	\$405.48
C0001	Pump Charge 0-1000'	(per 4 hrs)	\$ 2,038.61	1.0	\$2,038.61	75%	\$1,528.96	\$509.65
ML014	Fuel Surcharge *	per unit perjob	\$ 653.40	1.0	\$653.40	100%	\$0.00	\$0.00
AE014	Environmental Fee*	per job	\$ 228.69	1.0	\$228.69	100%	\$0.00	\$0.00
PC003	Employee/Supervisor Retention/perdiem	per job	\$ 1,306.80	4.0	\$5,227.20	75%	\$3,920.40	\$1,306.80
JN001	Data Acquisition System	Per Job	\$ 1,437.48	1.0	\$1,437.48	75%	\$1,078.11	\$359.37
AE002	Cement Head with manifold	per job	\$ 1,176.12	1.0	\$1,176.12	75%	\$882.09	\$294.03
AE003	Circulation Equipment(40' of equipment)	per job	\$ 1,633.50	1.0	\$1,633.50	75%	\$1,225.13	\$408.38
CL017	9 5/8" Top Rubber Plug	Each	\$ 338.80	1.0	\$338.80	35%	\$219.22	\$119.58
CP001	C (Premium Plus Cement) (94 lbs/ft3)	per sk	\$ 30.80	470.0	\$14,476.00	72%	\$10,422.72	\$4,053.28
CP010	Cello Flake	per lb	\$ 4.20	118.0	\$495.60	72%	\$356.83	\$138.77
CP016	Calcium Chloride	per lb	\$ 1.22	884.0	\$1,078.48	72%	\$776.51	\$301.97
CP031	Sugar	per lb	\$ 3.39	50.0	\$169.50	0%	\$0.00	\$169.50
CP001	C (Premium Plus Cement) (94 lbs/ft3)	per sk	\$ 30.80	-	\$0.00	72%	\$0.00	\$0.00
CP018	Calcium Chloride	per lb	\$ 1.22	-	\$0.00	72%	\$0.00	\$0.00
AE022	1" Pipe for Top-Out*	per ft	\$ 7.90	-	\$0.00	20%	\$0.00	\$0.00
ML003	Bulk Cement Delivery/Return	per Ton-Mile	\$ 2.95	-	\$0.00	75%	\$0.00	\$0.00
MX001	Bulk Material Mixing Service Charge	per cuft	\$ 3.27	-	\$0.00	75%	\$0.00	\$0.00
C0015	Pump Charge Additional Hours	per hour/per unit	\$ 588.06	1.0	\$588.06	50%	\$294.03	\$294.03
AE012	Bulk Unit Additional Hours	Per unit/per hour	\$ 130.68	1.0	\$130.68	50%	\$65.34	\$65.34
							\$26,135.85	\$9,649.69

I HAVE READ AND UNDERSTAND THIS CONTRACT AND REPRESENT THAT I AM AUTHORIZED TO SIGN THE SAME AS CUSTOMERS AGENT.
 Customer Authorized Agent:

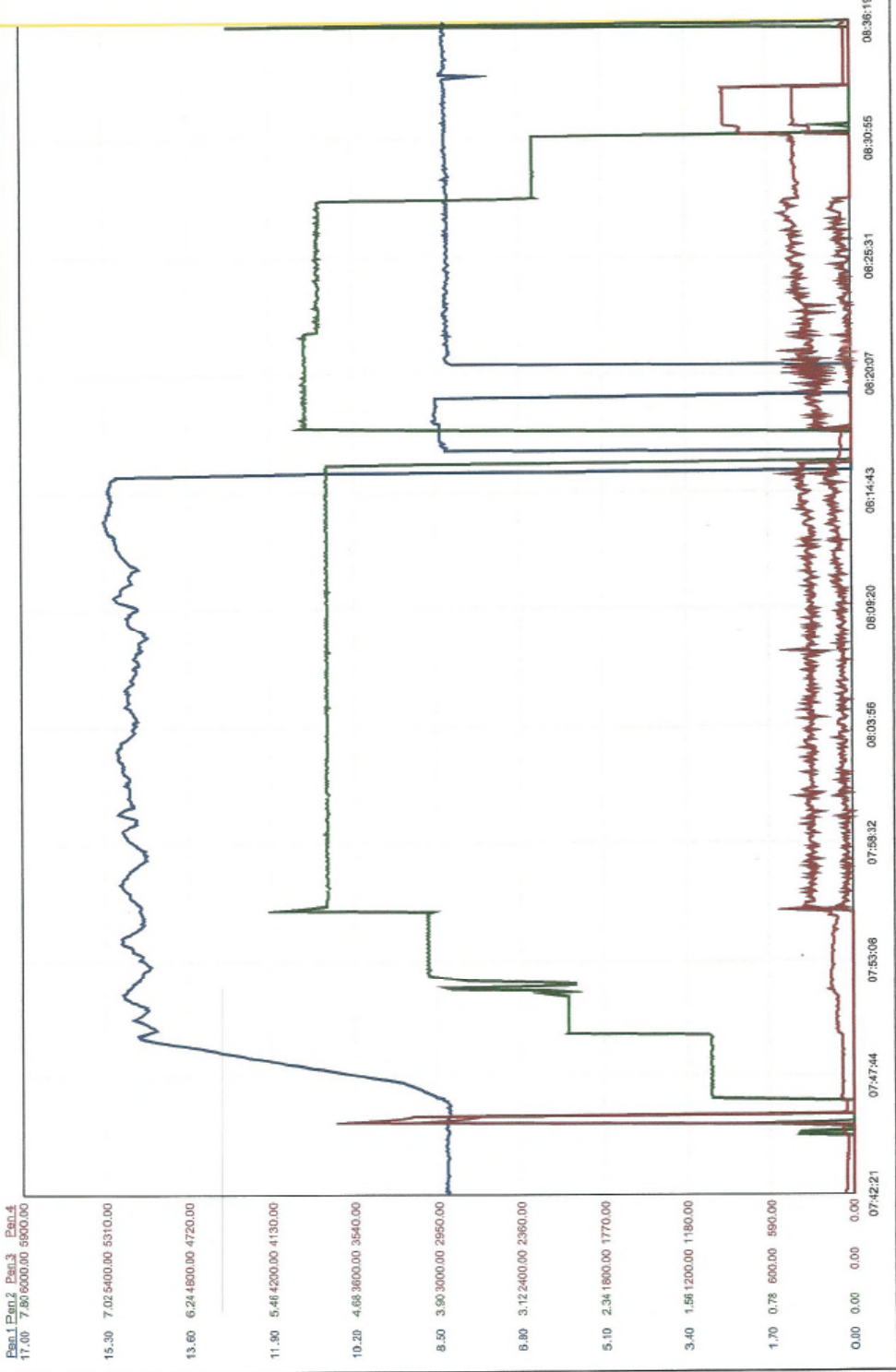


SERVICE COMPANY: O-Tex
TICKET NO: SOK 5217
CUSTOMER NAME: Tapstone Energy
WELL NAME: Hazel 23349 2H
WELL LOCATION: Harper County

DATE RECORDED: 07/21/2015
JOB NO: SOK 5217
UNIT DESCRIPTION: Namac 7
UNIT NOTES: 9.58" Surface
FILE NAME: Tapstone Energy_Hazel 23349 2H_15_07_21_#1.csv

Pen 1: Density 1 (Density: lb/gal)
Pen 2: Calc. Slurry Rate (Density: lb/gal)
Pen 3: Pressure 1 (Pressure: psi)
Pen 4: Pressure 2 (Pressure: psi)

08:36:19 PC Data Recording Stopped



Job Data Sheet



COMPANY Tapstone Energy			PROJECT NUMBER SOK 5232		AFE/WORK ORDER 0		DATE 7/27/2015			
CONTRACTOR Nomac #7			Owner Same		LEGAL DESCRIPTION 23/34S/9W		API 15-077-22151-01-00			
LEASE & WELL # Hazel 23-34-9 2H			COUNTY Harper		STATE Kansas		MILEAGE 100			
DIRECTIONS BYRON OK - TAKE HWY 58 NORTH TO STATE LINE - NORTH 4 MILES - 2 MILES EAST - 1 MILE NORTH - WEST INTO										
Pumping Services	<input type="checkbox"/> Surface <input checked="" type="checkbox"/> Intermediate <input type="checkbox"/> Long String <input type="checkbox"/> Plug Back <input type="checkbox"/> Squeeze <input type="checkbox"/> Acid <input type="checkbox"/> PTA <input type="checkbox"/> Other () H2S									
	Casing Size	Casing Weight	Thread	Tbng/DP Size	Thread	Plug. Cont.	Swage	Top Plug	Bottom Plug	% Excess
	7"	26#	LTC			YES	YES	YES	NO	40%
	Number and Type Units Pump Truck & Bulk Materials							Casing Depth	Hole Depth	Hole Size
								5,102	5,102	8 3/4"
Remarks					Est. BHST	KOP	Depth-TVD	Mud Weight/Type		
					155			9.2ppg WBM		
Materials	LEAD	# of Sacks	Type		Additives					
	35.66	140	50/50 Poz Premium		4% Gel - 0.4% FL-17					
	H2O TO MIX	Weight PPG	Yield Ft3/Sk	Water Gal/Sk						
	22.97	13.60	1.43	6.89						
	TAIL	# of Sacks	Type		Additives					
	18.91	90	Premium H		0.4% FL-17					
	H2O TO MIX	Weight PPG	Yield Ft3/Sk	Water Gal/Sk						
	11.38	15.60	1.18	5.31						
		# of Sacks	Type		Additives					
		Weight PPG	Yield Ft3/Sk	Water Gal/Sk						
	ACID	Type		Additives						
	Inhibitor	Surfactant	clay cont.	*****TAKE 7" TOP & BOTTOM PLUG*****						
	Spacer or Flush	Quantity	Type	Additives						
		20 bbls	Mudwash	200#s SAPP - 5 gallons Plexaid 803						
	Displace	Quantity	Type	Additives						
	Other	Quantity	Type	Additives						
Crew Called	Cementer		Pumper		Bulky		Bulky		Bulky	
	John Hall		Roy Morris		Flo Helkena					
GEOL	7" 8RD SWAGE, SW, DW, BALE RACK									
Sales Items	Casing Size	7"	Casing Weight	26#	Thread	LTC				
	Guide Shoe		Float Shoe		Float Collar	Insert Float Valve				
	Centralizers - Number		Size		Type					
	Wall Cleaners - Number		Type		MSC (DV Tool)	MSC Plug Set				
	Limit Clamps		Thread lock		Other					
	Remarks									
Customer Rep.	0	Cell Phone	0	Office Phone		Fax		Time of Call		
Call Taken By	Jared Sisco						Date Ready	7/27/15		
Crew Called	John Hall						Yard Time	730am		

JOB SUMMARY			PROJECT NUMBER SOK 5232	TICKET DATE 07/27/15
COUNTY Harper	State Kansas	COMPANY Tapstone Energy	CUSTOMER REP 0	
LEASE NAME Hazel 23-34-9	Well No. 2H	JOB TYPE Intermediate	EMPLOYEE NAME John Hall	

EMP NAME	John Hall	0					
	Roy Morris						
	Flo Heikena						
	0.00						

Form. Name _____ Type: _____
 Packer Type _____ Set At **0**
 Bottom Hole Temp. **155** Pressure _____
 Retainer Depth _____ Total Depth **5102**

Date	Called Out 7/27/2015	On Location 7/27/2015	Job Started 7/27/2015	Job Completed 7/27/2015
Time	730am	1000am	1201pm	230pm

Type and Size	Qty	Make
Auto Fill Tube	0	IR
Insert Float Va	0	IR
Centralizers	0	IR
Top Plug	0	IR
HEAD	0	IR
Limit clamp	0	IR
Weld-A	0	IR
Texas Pattern Guide Shoe	0	IR
Cement Basket	0	IR

New/Used	Weight	Size	Grade	From	To	Max. Allow
Casing	26#	7"		Surface		5,000
Liner						
Liner						
Tubing		0				
Drill Pipe						
Open Hole		8 3/4"		Surface	5,102	Shots/Ft.
Perforations						
Perforations						
Perforations						

Materials			
Mud Type	WBM	Density	Lb/Gal
Disp. Fluid	Fresh Water	8.33	
Spacer type	Fresh Water BBL.	20	8.33
Spacer type	Caustic BBL.	10	8.40
Acid Type	Gal.		%
Acid Type	Gal.		%
Surfactant	Gal.		In
NE Agent	Gal.		In
Fluid Loss	Gal/Lb		In
Gelling Agent	Gal/Lb		In
Fric. Red.	Gal/Lb		In
MISC.	Gal/Lb		In
Perfpac Balls	Qty.		
Other			
Other			
Other			
Other			
Other			

Hours On Location		Operating Hours		Description of Job
Date	Hours	Date	Hours	
7/27	4.5	7/27	2.5	Intermediate
Total	4.5	Total	2.5	

Pressures			
MAX	5,000 PSI	AVG.	300 psi
Average Rates in BPM			
MAX	8 BPM	AVG	5 bpm
Cement Left in Pipe			
Feet	86	Reason	SHOE JOINT

Cement Data						
Stage	Sacks	Cement	Additives	W/Rq.	Yield	Lbs/Gal
1	140	50/50 Poz Premium	4% Gel - 0.4% FL-17	6.89	1.43	13.60
2	90	Premium H	0.4% FL-17	5.31	1.18	15.60
3	0	0		0	0.00	0.00

Summary					
Preflush Breakdown	10	Type: MAXIMUM	Preflush: BBI	30.00	Type: Mudwash
		5,000 PSI	Load & Bkdn: Gal - BBI	N/A	Pad:Bbl -Gal N/A
		NO/FULL	Excess /Return BBI	N/A	Calc. Disp Bbl 201
		3,449	Cal TO/C	4,778	Actual Disp. 201.40
Average		Bump Plug PSI: 1,150	Final Circ. PSI:	550	Disp:Bbl 201.40
ISIP 5 Min.		10 Min	Cement Slurry BBI	54.5	
		15 Min	Total Volume BBI	285.90	

CUSTOMER REPRESENTATIVE _____ SIGNATURE _____

SERVICE COMPANY: O-Tex Pumping
 TICKET NO: 0
 CUSTOMER NAME: Tapstone Energy
 WELL NAME: Hazel 23349 2H
 WELL LOCATION: Harper CO. OK
 DATE RECORDED: 07/27/2015
 JOB NO: SOK 5232
 UNIT DESCRIPTION: Nomac #7
 UNIT NOTES: 7" Intermediate
 FILE NAME: Tapstone Energy_Hazel 23349 2H_15_07_27_#1.csv

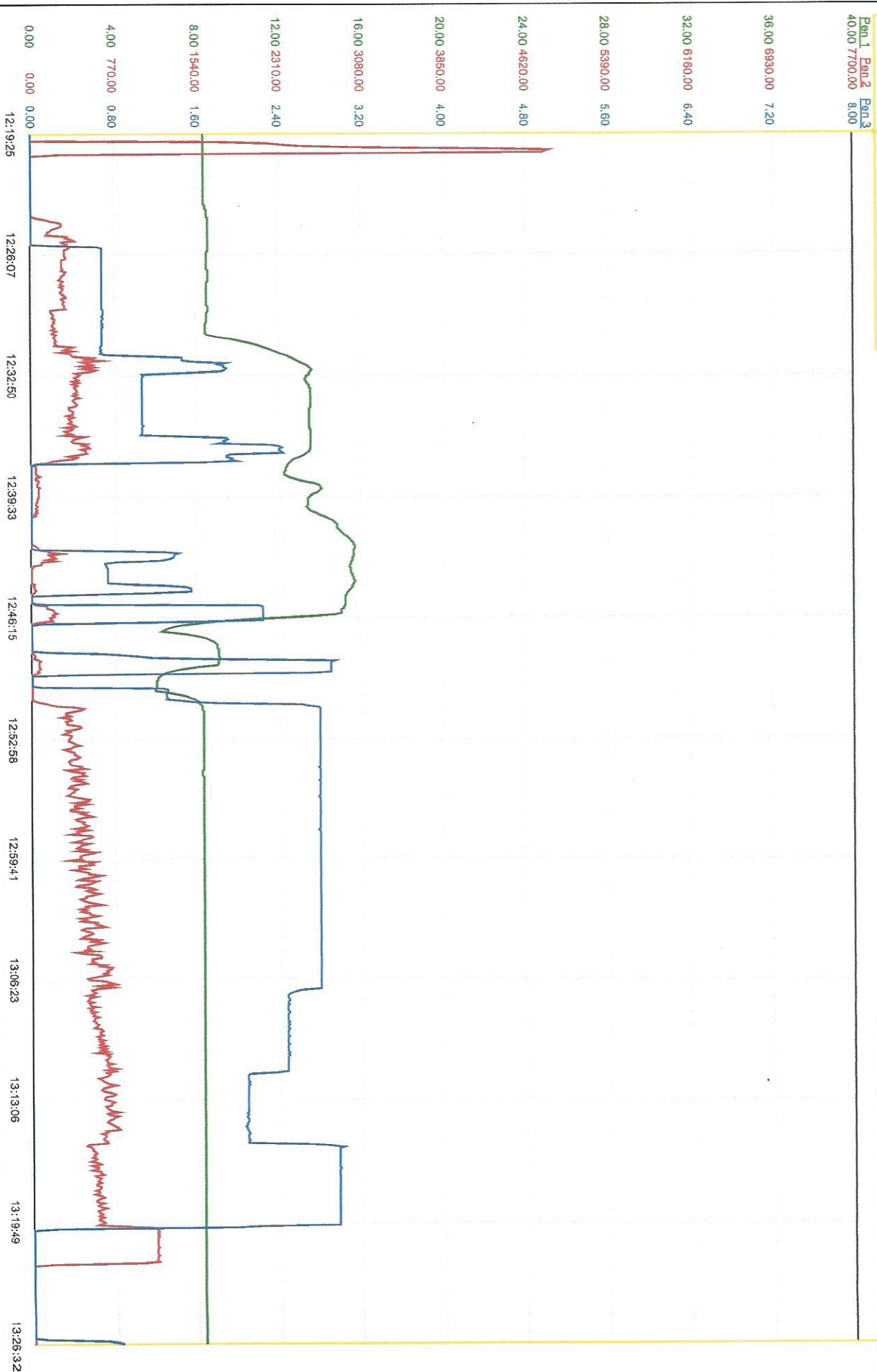


Pen 1: Density 1 (Density: lb/gal)
 12:19:25 PC Data Recording Started

Pen 2: Pressure 2 (Density: lb/gal)

Pen 3: Flowrate 2 (Pressure: psi)

13:26:32 PC Data Recording Stopped



O-TEX PUMPING LLC

Service Location Fairview, Oklahoma
 Service Address 601 Industrial Blvd 73737

FIELD RECEIPT
 Phone number 580-227-2727

Project Number: SOK 5232

Service Date: 7/27/2015
 Customer Tapstone Energy
 Address:
 City
 St
 Customer Rep 0
 Phone 0

Well Name: Hazel 23-34-9
 Well Number: 2H
 County: Harper
 State: Kansas
 API # 15-077-22151-01-00
 AFE # 0
 PERMIT #

JOB TYPE Job Type
 CASING SIZE Intermediate
 Serv. Sup. John Hall
 Page 1 of 1

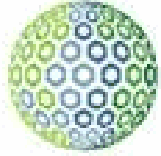
Contract Number SSC-2015-0003

Pump 1 # A245504-Serva
 Pump 2 # 0

REF #	DESCRIPTION	U OF MEAS.	UNIT PRICE	QUAN	GROSS	%DISC	disc	NET
ML001	Pickup Mileage	per mile/ per Unit	4.26	100.0	\$426.00	75%	\$319.50	\$106.50
ML002	Pump Truck/Heavy Vehicle Mileage	per mile/ per Unit	7.32	100.0	\$732.00	75%	\$549.00	\$183.00
ML003	Bulk Cement Delivery/Return	per Ton-Mile	2.95	520.0	\$1,534.00	75%	\$1,150.50	\$383.50
MX001	Bulk Material Mixing Service Charge	per cuft	3.27	239.0	\$781.53	75%	\$586.15	\$195.38
CC006	Pump Charge 5001-6000'	(per 4 hrs)	4,671.81	1.0	\$4,671.81	75%	\$3,503.86	\$1,167.95
ML014	Fuel Surcharge *	per unit perjob	653.40	1.0	\$653.40	100%	\$653.40	\$0.00
AE014	Environmental Fee*	per job	228.69	1.0	\$228.69	100%	\$228.69	\$0.00
PC003	Employee/Supervisor Retention/perdiem	per job	1,306.80	4.0	\$5,227.20	75%	\$3,920.40	\$1,306.80
JM001	Data Acquisition System	Per Job	1,437.48	1.0	\$1,437.48	75%	\$1,078.11	\$359.37
AE003	Circulation Equipment(40' of equipment)	per job	1,633.50	1.0	\$1,633.50	75%	\$1,225.13	\$408.38
AE002	Cement Head with manifold	per job	1,176.12	1.0	\$1,176.12	75%	\$882.09	\$294.03
CL011	7" Top Rubber Plug	Each	203.28	1.0	\$203.28	35%	\$71.15	\$132.13
CL012	7" Bottom Rubber Plug	Each	440.44	1.0	\$440.44	35%	\$154.15	\$286.29
CSB002	50/50 Poz with Premium (Includes 2% Gel)	per sk	22.28	140.0	\$3,119.20	72%	\$2,245.82	\$873.38
CP002	H (Premium Cement) (94 lbs/ft3)	per sk	30.80	90.0	\$2,772.00	72%	\$1,995.84	\$776.16
CP005	GEL	per lb	0.68	235.0	\$159.80	72%	\$115.06	\$44.74
CPC29	FL-17 Fluid Loss Additive 80-140F	per lb	40.00	81.0	\$3,240.00	72%	\$2,332.80	\$907.20
PS008	Mud Wash	per gal	2.04	840.0	\$1,713.60	72%	\$1,233.79	\$479.81
CC015	Pump Charge Additional Hours	per hour/per unit	588.06		\$0.00	75%	\$0.00	\$0.00
AE012	Bulk Unit Additional Hours	Per unit/per hour	130.68		\$0.00	75%	\$0.00	\$0.00
					\$30,150.05		\$22,245.43	\$7,904.62

I HAVE READ AND UNDERSTAND THIS CONTRACT AND REPRESENT THAT I AM AUTHORIZED TO SIGN THE SAME AS CUSTOMERS AGENT.

Customer Authorized Agent: _____



tapstone
ENERGY

TAPSTONE ENERGY

Harper County, KS

Hazel 23-34-9

Hazel 23-34-9 2H

OH

Survey: ProDirectional

Survey Report

03 August, 2015





Professional Directional Survey Report



Company: TAPSTONE ENERGY	Local Co-ordinate Reference: Well Hazel 23-34-9 2H
Project: Harper County, KS	TVD Reference: GL 1288 + 22' KB @ 1310.00usft (Nomac 7)
Site: Hazel 23-34-9	MD Reference: GL 1288 + 22' KB @ 1310.00usft (Nomac 7)
Well: Hazel 23-34-9 2H	North Reference: Grid
Wellbore: OH	Survey Calculation Method: Minimum Curvature
Design: OH	Database: Well_Planner1

Project Harper County, KS	
Map System: US State Plane 1927 (Exact solution)	System Datum: Mean Sea Level
Geo Datum: NAD 1927 (NADCON CONUS)	
Map Zone: Kansas South 1502	

Site Hazel 23-34-9		
Site Position:	Northing: 145,404.00 usft	Latitude: 37° 3' 56.78 N
From: Map	Easting: 2,066,610.00 usft	Longitude: 98° 16' 18.22 W
Position Uncertainty: 0.00 usft	Slot Radius: 13-3/16 "	Grid Convergence: 0.14 °

Well Hazel 23-34-9 2H		
Well Position	Northing: 150,148.00 usft	Latitude: 37° 4' 43.63 N
+N/-S 0.00 usft	Easting: 2,068,727.00 usft	Longitude: 98° 15' 51.95 W
+E/-W 0.00 usft	Wellhead Elevation: 1,310.00 usft	Ground Level: 1,288.00 usft
Position Uncertainty 0.00 usft		

Wellbore OH					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	7/14/2015	4.10	65.30	51,668

Design OH				
Audit Notes:				
Version: 1.0	Phase: ACTUAL	Tie On Depth: 0.00		
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	172.195

Survey Program Date 8/3/2015				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
830.00	8,918.00	ProDirectional (OH)	ProMWD	MWD - Standard



Professional Directional Survey Report



Company: TAPSTONE ENERGY	Local Co-ordinate Reference: Well Hazel 23-34-9 2H
Project: Harper County, KS	TVD Reference: GL 1288 + 22' KB @ 1310.00usft (Nomac 7)
Site: Hazel 23-34-9	MD Reference: GL 1288 + 22' KB @ 1310.00usft (Nomac 7)
Well: Hazel 23-34-9 2H	North Reference: Grid
Wellbore: OH	Survey Calculation Method: Minimum Curvature
Design: OH	Database: Well_Planner1

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)	
0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.000	150,148.00	2,068,727.00	
830.00	0.30	176.800	830.00	2.17	-2.17	0.12	2.17	176.800	150,145.83	2,068,727.12	
893.00	0.60	159.000	892.99	2.65	-2.64	0.25	2.65	174.622	150,145.36	2,068,727.25	
988.00	0.30	146.200	987.99	3.36	-3.31	0.57	3.36	170.317	150,144.69	2,068,727.57	
1,083.00	0.40	144.500	1,082.99	3.88	-3.79	0.90	3.89	166.695	150,144.21	2,068,727.90	
1,272.00	0.60	150.200	1,271.98	5.38	-5.19	1.77	5.48	161.143	150,142.81	2,068,728.77	
1,462.00	0.90	163.200	1,461.97	7.77	-7.48	2.70	7.95	160.167	150,140.52	2,068,729.70	
1,650.00	0.60	172.200	1,649.95	10.22	-9.87	3.26	10.39	161.730	150,138.13	2,068,730.26	
1,839.00	0.10	38.900	1,838.95	11.09	-10.72	3.50	11.27	161.940	150,137.28	2,068,730.50	
2,028.00	0.90	1.900	2,027.94	9.52	-9.11	3.65	9.81	158.170	150,138.89	2,068,730.65	
2,216.00	1.10	20.800	2,215.91	6.48	-5.94	4.34	7.36	143.879	150,142.06	2,068,731.34	
2,403.00	1.20	33.100	2,402.87	3.42	-2.63	6.04	6.59	113.478	150,145.37	2,068,733.04	
2,590.00	1.00	32.700	2,589.84	0.70	0.39	8.00	8.00	87.221	150,148.39	2,068,735.00	
2,777.00	0.90	22.100	2,776.81	-1.81	3.12	9.43	9.93	71.680	150,151.12	2,068,736.43	
2,964.00	1.00	27.300	2,963.79	-4.42	5.93	10.73	12.26	61.062	150,153.93	2,068,737.73	
3,152.00	0.80	19.100	3,151.76	-6.93	8.63	11.91	14.71	54.075	150,156.63	2,068,738.91	
3,340.00	0.40	38.400	3,339.75	-8.56	10.39	12.75	16.44	50.834	150,158.39	2,068,739.75	
3,528.00	0.40	22.400	3,527.75	-9.58	11.51	13.41	17.67	49.363	150,159.51	2,068,740.41	
3,717.00	0.10	39.600	3,716.75	-10.26	12.24	13.76	18.42	48.345	150,160.24	2,068,740.76	
3,812.00	0.50	155.400	3,811.74	-9.92	11.93	13.99	18.39	49.541	150,159.93	2,068,740.99	
3,843.00	2.20	178.200	3,842.74	-9.20	11.21	14.06	17.99	51.436	150,159.21	2,068,741.06	
3,874.00	4.00	185.200	3,873.69	-7.55	9.54	13.98	16.93	55.696	150,157.54	2,068,740.98	
3,905.00	5.60	181.800	3,904.58	-5.01	6.95	13.84	15.49	63.327	150,154.95	2,068,740.84	
3,932.00	6.80	180.600	3,931.42	-2.13	4.04	13.78	14.36	73.672	150,152.04	2,068,740.78	
3,963.00	9.20	181.700	3,962.12	2.13	-0.28	13.69	13.69	91.154	150,147.72	2,068,740.69	
3,994.00	12.80	179.600	3,992.54	7.98	-6.19	13.64	14.98	114.407	150,141.81	2,068,740.64	
4,025.00	15.70	180.900	4,022.59	15.54	-13.82	13.60	19.39	135.463	150,134.18	2,068,740.60	



Professional Directional Survey Report



Company: TAPSTONE ENERGY	Local Co-ordinate Reference: Well Hazel 23-34-9 2H
Project: Harper County, KS	TVD Reference: GL 1288 + 22' KB @ 1310.00usft (Nomac 7)
Site: Hazel 23-34-9	MD Reference: GL 1288 + 22' KB @ 1310.00usft (Nomac 7)
Well: Hazel 23-34-9 2H	North Reference: Grid
Wellbore: OH	Survey Calculation Method: Minimum Curvature
Design: OH	Database: Well_Planner1

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)	
4,056.00	18.20	179.900	4,052.24	24.48	-22.85	13.54	26.56	149.357	150,125.15	2,068,740.54	
4,087.00	21.80	178.900	4,081.36	35.00	-33.45	13.66	36.14	157.791	150,114.55	2,068,740.66	
4,118.00	25.10	177.900	4,109.80	47.26	-45.78	14.01	47.88	162.986	150,102.22	2,068,741.01	
4,149.00	28.40	176.200	4,137.48	61.16	-59.71	14.74	61.51	166.135	150,088.29	2,068,741.74	
4,181.00	31.00	175.000	4,165.27	76.99	-75.52	15.96	77.19	168.065	150,072.48	2,068,742.96	
4,212.00	33.90	174.400	4,191.43	93.60	-92.08	17.50	93.73	169.238	150,055.92	2,068,744.50	
4,244.00	36.70	173.800	4,217.54	112.08	-110.47	19.41	112.16	170.037	150,037.53	2,068,746.41	
4,275.00	38.60	173.500	4,242.09	131.01	-129.29	21.50	131.07	170.558	150,018.71	2,068,748.50	
4,307.00	40.90	172.900	4,266.69	151.47	-149.61	23.93	151.51	170.914	149,998.39	2,068,750.93	
4,338.00	43.20	173.000	4,289.70	172.23	-170.21	26.47	172.26	171.159	149,977.79	2,068,753.47	
4,370.00	45.20	173.800	4,312.64	194.53	-192.37	29.04	194.55	171.417	149,955.63	2,068,756.04	
4,401.00	46.90	174.200	4,334.16	216.84	-214.57	31.37	216.85	171.683	149,933.43	2,068,758.37	
4,431.00	49.30	174.500	4,354.19	239.15	-236.79	33.56	239.15	171.932	149,911.21	2,068,760.56	
4,462.00	51.30	174.700	4,373.99	262.98	-260.53	35.81	262.98	172.174	149,887.47	2,068,762.81	
4,494.00	53.30	174.800	4,393.56	288.27	-285.74	38.12	288.27	172.400	149,862.26	2,068,765.12	
4,525.00	55.50	174.700	4,411.61	313.45	-310.84	40.43	313.46	172.589	149,837.16	2,068,767.43	
4,556.00	57.90	174.800	4,428.62	339.33	-336.64	42.80	339.35	172.754	149,811.36	2,068,769.80	
4,587.00	60.00	174.900	4,444.61	365.86	-363.09	45.18	365.89	172.906	149,784.91	2,068,772.18	
4,618.00	61.90	175.100	4,459.66	392.93	-390.09	47.55	392.97	173.051	149,757.91	2,068,774.55	
4,649.00	62.80	175.300	4,474.05	420.35	-417.45	49.84	420.41	173.191	149,730.55	2,068,776.84	
4,681.00	63.40	175.000	4,488.53	448.85	-445.88	52.26	448.94	173.316	149,702.12	2,068,779.26	
4,712.00	62.70	174.600	4,502.58	476.45	-473.40	54.76	476.56	173.402	149,674.60	2,068,781.76	
4,743.00	62.10	174.000	4,516.94	503.91	-500.74	57.49	504.03	173.451	149,647.26	2,068,784.49	
4,774.00	62.40	174.000	4,531.37	531.33	-528.02	60.36	531.46	173.479	149,619.98	2,068,787.36	
4,806.00	63.10	174.200	4,546.03	559.76	-556.32	63.28	559.91	173.511	149,591.68	2,068,790.28	
4,837.00	63.80	174.700	4,559.88	587.47	-583.92	65.96	587.64	173.555	149,564.08	2,068,792.96	
4,868.00	66.10	174.800	4,573.01	615.52	-611.89	68.53	615.71	173.609	149,536.11	2,068,795.53	



Professional Directional Survey Report



Company: TAPSTONE ENERGY	Local Co-ordinate Reference: Well Hazel 23-34-9 2H
Project: Harper County, KS	TVD Reference: GL 1288 + 22' KB @ 1310.00usft (Nomac 7)
Site: Hazel 23-34-9	MD Reference: GL 1288 + 22' KB @ 1310.00usft (Nomac 7)
Well: Hazel 23-34-9 2H	North Reference: Grid
Wellbore: OH	Survey Calculation Method: Minimum Curvature
Design: OH	Database: Well_Planner1

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
4,900.00	68.80	174.600	4,585.28	645.05	-641.31	71.26	645.26	173.659	149,506.69	2,068,798.26
4,931.00	71.00	174.600	4,595.93	674.13	-670.29	74.00	674.36	173.700	149,477.71	2,068,801.00
4,963.00	73.90	174.400	4,605.58	704.61	-700.66	76.93	704.87	173.735	149,447.34	2,068,803.93
4,994.00	76.60	174.900	4,613.47	734.56	-730.50	79.72	734.84	173.772	149,417.50	2,068,806.72
5,025.00	77.20	175.300	4,620.50	764.72	-760.59	82.30	765.03	173.824	149,387.41	2,068,809.30
5,057.00	77.90	175.400	4,627.40	795.92	-791.73	84.83	796.26	173.884	149,356.27	2,068,811.83
5,088.00	79.00	175.700	4,633.60	826.24	-822.01	87.19	826.62	173.945	149,325.99	2,068,814.19
5,120.00	79.60	175.700	4,639.54	857.62	-853.37	89.55	858.05	174.010	149,294.63	2,068,816.55
5,151.00	80.10	176.100	4,645.01	888.07	-883.80	91.73	888.55	174.075	149,264.20	2,068,818.73
5,183.00	80.70	176.200	4,650.34	919.55	-915.28	93.85	920.08	174.146	149,232.72	2,068,820.85
5,214.00	81.30	176.600	4,655.19	950.08	-945.84	95.77	950.68	174.218	149,202.16	2,068,822.77
5,246.00	82.10	176.700	4,659.81	981.65	-977.45	97.62	982.31	174.297	149,170.55	2,068,824.62
5,278.00	82.70	177.000	4,664.04	1,013.27	-1,009.12	99.36	1,014.00	174.377	149,138.88	2,068,826.36
5,309.00	83.20	176.800	4,667.85	1,043.93	-1,039.84	101.03	1,044.74	174.451	149,108.16	2,068,828.03
5,370.00	85.60	177.300	4,673.80	1,104.41	-1,100.47	104.15	1,105.38	174.594	149,047.53	2,068,831.15
5,400.00	88.10	177.100	4,675.45	1,134.25	-1,130.38	105.61	1,135.31	174.662	149,017.62	2,068,832.61
5,431.00	89.00	177.400	4,676.23	1,165.12	-1,161.34	107.10	1,166.26	174.731	148,986.66	2,068,834.10
5,462.00	89.40	176.800	4,676.67	1,196.01	-1,192.29	108.67	1,197.24	174.792	148,955.71	2,068,835.67
5,492.00	89.70	177.200	4,676.90	1,225.90	-1,222.25	110.24	1,227.21	174.846	148,925.75	2,068,837.24
5,522.00	89.80	176.600	4,677.03	1,255.80	-1,252.21	111.86	1,257.19	174.895	148,895.79	2,068,838.86
5,551.00	89.80	176.800	4,677.13	1,284.71	-1,281.16	113.53	1,286.18	174.936	148,866.84	2,068,840.53
5,581.00	90.20	175.400	4,677.13	1,314.64	-1,311.09	115.57	1,316.17	174.963	148,836.91	2,068,842.57
5,612.00	89.80	174.200	4,677.13	1,345.60	-1,341.96	118.38	1,347.17	174.959	148,806.04	2,068,845.38
5,642.00	89.00	172.400	4,677.45	1,375.60	-1,371.75	121.88	1,377.16	174.923	148,776.25	2,068,848.88
5,673.00	88.80	172.800	4,678.04	1,406.59	-1,402.49	125.87	1,408.13	174.872	148,745.51	2,068,852.87
5,703.00	89.00	172.400	4,678.62	1,436.58	-1,432.23	129.73	1,438.10	174.824	148,715.77	2,068,856.73
5,733.00	89.50	172.800	4,679.01	1,466.58	-1,461.98	133.60	1,468.07	174.779	148,686.02	2,068,860.60



Professional Directional Survey Report



Company:	TAPSTONE ENERGY	Local Co-ordinate Reference:	Well Hazel 23-34-9 2H
Project:	Harper County, KS	TVD Reference:	GL 1288 + 22' KB @ 1310.00usft (Nomac 7)
Site:	Hazel 23-34-9	MD Reference:	GL 1288 + 22' KB @ 1310.00usft (Nomac 7)
Well:	Hazel 23-34-9 2H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Well_Planner1

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)	
5,763.00	89.80	172.800	4,679.20	1,496.58	-1,491.74	137.36	1,498.05	174.739	148,656.26	2,068,864.36	
5,793.00	91.00	172.600	4,678.99	1,526.57	-1,521.50	141.17	1,528.03	174.699	148,626.50	2,068,868.17	
5,823.00	91.70	172.900	4,678.28	1,556.56	-1,551.25	144.95	1,558.01	174.662	148,596.75	2,068,871.95	
5,853.00	91.30	171.700	4,677.49	1,586.55	-1,580.97	148.97	1,587.97	174.617	148,567.03	2,068,875.97	
5,883.00	91.60	171.000	4,676.74	1,616.54	-1,610.62	153.48	1,617.91	174.556	148,537.38	2,068,880.48	
5,913.00	91.90	171.000	4,675.82	1,646.52	-1,640.24	158.17	1,647.84	174.492	148,507.76	2,068,885.17	
5,943.00	91.30	171.300	4,674.98	1,676.50	-1,669.87	162.79	1,677.78	174.432	148,478.13	2,068,889.79	
5,974.00	90.30	171.200	4,674.55	1,707.50	-1,700.50	167.50	1,708.73	174.374	148,447.50	2,068,894.50	
6,003.00	89.80	171.100	4,674.52	1,736.49	-1,729.16	171.96	1,737.69	174.321	148,418.84	2,068,898.96	
6,034.00	89.40	170.500	4,674.74	1,767.48	-1,759.76	176.92	1,768.63	174.259	148,388.24	2,068,903.92	
6,064.00	89.20	170.300	4,675.11	1,797.46	-1,789.33	181.92	1,798.56	174.195	148,358.67	2,068,908.92	
6,095.00	89.70	170.400	4,675.40	1,828.45	-1,819.89	187.12	1,829.49	174.130	148,328.11	2,068,914.12	
6,125.00	90.00	170.000	4,675.48	1,858.43	-1,849.46	192.23	1,859.42	174.066	148,298.54	2,068,919.23	
6,155.00	89.50	170.300	4,675.61	1,888.41	-1,879.01	197.36	1,889.35	174.004	148,268.99	2,068,924.36	
6,186.00	89.00	170.000	4,676.02	1,919.39	-1,909.55	202.66	1,920.28	173.942	148,238.45	2,068,929.66	
6,216.00	88.50	170.000	4,676.67	1,949.36	-1,939.09	207.87	1,950.20	173.881	148,208.91	2,068,934.87	
6,246.00	88.60	169.800	4,677.43	1,979.32	-1,968.62	213.13	1,980.12	173.821	148,179.38	2,068,940.13	
6,276.00	88.70	169.900	4,678.14	2,009.29	-1,998.14	218.41	2,010.04	173.762	148,149.86	2,068,945.41	
6,306.00	89.30	170.300	4,678.66	2,039.26	-2,027.69	223.57	2,039.98	173.708	148,120.31	2,068,950.57	
6,337.00	89.10	170.700	4,679.10	2,070.25	-2,058.26	228.69	2,070.92	173.660	148,089.74	2,068,955.69	
6,367.00	89.30	170.100	4,679.51	2,100.23	-2,087.84	233.69	2,100.87	173.614	148,060.16	2,068,960.69	
6,397.00	89.40	170.600	4,679.86	2,130.21	-2,117.41	238.72	2,130.82	173.568	148,030.59	2,068,965.72	
6,428.00	90.00	170.900	4,680.02	2,161.20	-2,148.01	243.70	2,161.79	173.527	147,999.99	2,068,970.70	
6,459.00	89.90	170.900	4,680.04	2,192.19	-2,178.62	248.60	2,192.75	173.490	147,969.38	2,068,975.60	
6,488.00	90.20	170.400	4,680.02	2,221.18	-2,207.23	253.31	2,221.72	173.453	147,940.77	2,068,980.31	
6,519.00	91.10	171.000	4,679.67	2,252.17	-2,237.82	258.32	2,252.68	173.415	147,910.18	2,068,985.32	
6,550.00	91.20	170.900	4,679.05	2,283.16	-2,268.43	263.20	2,283.65	173.382	147,879.57	2,068,990.20	



Professional Directional Survey Report



Company:	TAPSTONE ENERGY	Local Co-ordinate Reference:	Well Hazel 23-34-9 2H
Project:	Harper County, KS	TVD Reference:	GL 1288 + 22' KB @ 1310.00usft (Nomac 7)
Site:	Hazel 23-34-9	MD Reference:	GL 1288 + 22' KB @ 1310.00usft (Nomac 7)
Well:	Hazel 23-34-9 2H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Well_Planner1

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)	
6,580.00	91.40	171.300	4,678.36	2,313.14	-2,298.06	267.84	2,313.62	173.352	147,849.94	2,068,994.84	
6,611.00	91.30	171.300	4,677.63	2,344.13	-2,328.69	272.53	2,344.59	173.325	147,819.31	2,068,999.53	
6,642.00	91.30	170.500	4,676.93	2,375.12	-2,359.30	277.43	2,375.55	173.293	147,788.70	2,069,004.43	
6,672.00	91.20	170.800	4,676.28	2,405.10	-2,388.89	282.30	2,405.51	173.260	147,759.11	2,069,009.30	
6,703.00	90.60	170.800	4,675.79	2,436.08	-2,419.49	287.26	2,436.48	173.229	147,728.51	2,069,014.26	
6,733.00	90.10	170.500	4,675.61	2,466.07	-2,449.09	292.13	2,466.45	173.198	147,698.91	2,069,019.13	
6,763.00	90.30	170.200	4,675.50	2,496.06	-2,478.66	297.16	2,496.41	173.164	147,669.34	2,069,024.16	
6,794.00	90.60	169.600	4,675.26	2,527.03	-2,509.18	302.60	2,527.36	173.124	147,638.82	2,069,029.60	
6,824.00	89.40	169.200	4,675.26	2,556.99	-2,538.67	308.11	2,557.30	173.080	147,609.33	2,069,035.11	
6,855.00	88.30	168.200	4,675.88	2,587.93	-2,569.06	314.19	2,588.20	173.028	147,578.94	2,069,041.19	
6,885.00	88.30	168.300	4,676.77	2,617.85	-2,598.42	320.29	2,618.09	172.973	147,549.58	2,069,047.29	
6,915.00	88.80	169.100	4,677.53	2,647.78	-2,627.83	326.17	2,647.99	172.925	147,520.17	2,069,053.17	
6,945.00	89.20	169.600	4,678.05	2,677.74	-2,657.31	331.71	2,677.93	172.885	147,490.69	2,069,058.71	
6,975.00	89.10	170.500	4,678.50	2,707.71	-2,686.85	336.90	2,707.89	172.853	147,461.15	2,069,063.90	
7,006.00	88.70	170.800	4,679.09	2,738.70	-2,717.44	341.93	2,738.86	172.828	147,430.56	2,069,068.93	
7,036.00	90.20	170.900	4,679.38	2,768.69	-2,747.05	346.70	2,768.84	172.807	147,400.95	2,069,073.70	
7,067.00	88.60	171.100	4,679.71	2,799.68	-2,777.67	351.55	2,799.83	172.787	147,370.33	2,069,078.55	
7,097.00	89.10	171.600	4,680.31	2,829.67	-2,807.32	356.06	2,829.81	172.772	147,340.68	2,069,083.06	
7,127.00	90.70	171.700	4,680.36	2,859.66	-2,837.00	360.42	2,859.80	172.760	147,311.00	2,069,087.42	
7,157.00	92.70	171.700	4,679.47	2,889.65	-2,866.67	364.75	2,889.78	172.749	147,281.33	2,069,091.75	
7,187.00	93.60	171.700	4,677.82	2,919.60	-2,896.31	369.07	2,919.73	172.738	147,251.69	2,069,096.07	
7,218.00	93.60	171.900	4,675.88	2,950.54	-2,926.93	373.48	2,950.67	172.728	147,221.07	2,069,100.48	
7,248.00	93.00	172.000	4,674.15	2,980.49	-2,956.59	377.68	2,980.61	172.720	147,191.41	2,069,104.68	
7,277.00	92.30	171.300	4,672.81	3,009.46	-2,985.25	381.88	3,009.58	172.710	147,162.75	2,069,108.88	
7,308.00	91.50	171.700	4,671.78	3,040.44	-3,015.89	386.46	3,040.55	172.698	147,132.11	2,069,113.46	
7,338.00	91.30	172.100	4,671.05	3,070.43	-3,045.59	390.69	3,070.54	172.690	147,102.41	2,069,117.69	
7,368.00	91.50	171.900	4,670.31	3,100.42	-3,075.28	394.86	3,100.53	172.683	147,072.72	2,069,121.86	



Professional Directional Survey Report



Company:	TAPSTONE ENERGY	Local Co-ordinate Reference:	Well Hazel 23-34-9 2H
Project:	Harper County, KS	TVD Reference:	GL 1288 + 22' KB @ 1310.00usft (Nomac 7)
Site:	Hazel 23-34-9	MD Reference:	GL 1288 + 22' KB @ 1310.00usft (Nomac 7)
Well:	Hazel 23-34-9 2H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Well_Planner1

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
7,398.00	91.30	171.400	4,669.58	3,130.41	-3,104.96	399.22	3,130.52	172.673	147,043.04	2,069,126.22
7,429.00	90.80	171.600	4,669.01	3,161.40	-3,135.61	403.80	3,161.51	172.662	147,012.39	2,069,130.80
7,460.00	90.30	171.400	4,668.72	3,192.40	-3,166.27	408.38	3,192.50	172.651	146,981.73	2,069,135.38
7,489.00	90.20	171.400	4,668.59	3,221.39	-3,194.94	412.72	3,221.49	172.639	146,953.06	2,069,139.72
7,519.00	90.00	172.400	4,668.54	3,251.39	-3,224.64	416.95	3,251.49	172.633	146,923.36	2,069,143.95
7,549.00	90.30	173.700	4,668.46	3,281.39	-3,254.42	420.58	3,281.49	172.636	146,893.58	2,069,147.58
7,580.00	90.50	173.500	4,668.24	3,312.38	-3,285.23	424.03	3,312.48	172.645	146,862.77	2,069,151.03
7,610.00	90.60	173.200	4,667.95	3,342.37	-3,315.03	427.51	3,342.48	172.652	146,832.97	2,069,154.51
7,640.00	90.00	172.300	4,667.80	3,372.37	-3,344.78	431.29	3,372.48	172.653	146,803.22	2,069,158.29
7,671.00	90.20	172.500	4,667.74	3,403.37	-3,375.51	435.39	3,403.48	172.650	146,772.49	2,069,162.39
7,703.00	91.10	173.100	4,667.38	3,435.36	-3,407.26	439.40	3,435.47	172.652	146,740.74	2,069,166.40
7,734.00	91.40	173.300	4,666.70	3,466.35	-3,438.03	443.07	3,466.46	172.657	146,709.97	2,069,170.07
7,766.00	90.90	173.000	4,666.06	3,498.34	-3,469.80	446.89	3,498.46	172.661	146,678.20	2,069,173.89
7,797.00	89.80	173.000	4,665.87	3,529.34	-3,500.56	450.66	3,529.46	172.664	146,647.44	2,069,177.66
7,829.00	89.90	173.300	4,665.96	3,561.33	-3,532.34	454.48	3,561.45	172.668	146,615.66	2,069,181.48
7,860.00	89.90	173.500	4,666.01	3,592.33	-3,563.13	458.04	3,592.45	172.675	146,584.87	2,069,185.04
7,892.00	90.20	173.600	4,665.98	3,624.32	-3,594.93	461.64	3,624.45	172.682	146,553.07	2,069,188.64
7,923.00	90.80	174.500	4,665.71	3,655.30	-3,625.76	464.85	3,655.44	172.694	146,522.24	2,069,191.85
7,955.00	91.30	174.700	4,665.12	3,687.26	-3,657.61	467.86	3,687.41	172.711	146,490.39	2,069,194.86
7,987.00	90.90	173.900	4,664.51	3,719.24	-3,689.45	471.04	3,719.40	172.724	146,458.55	2,069,198.04
8,019.00	90.90	174.200	4,664.01	3,751.22	-3,721.27	474.36	3,751.38	172.736	146,426.73	2,069,201.36
8,050.00	89.80	174.000	4,663.82	3,782.20	-3,752.11	477.54	3,782.37	172.747	146,395.89	2,069,204.54
8,082.00	90.00	173.700	4,663.87	3,814.18	-3,783.92	480.97	3,814.37	172.756	146,364.08	2,069,207.97
8,113.00	90.30	173.700	4,663.79	3,845.17	-3,814.73	484.37	3,845.36	172.764	146,333.27	2,069,211.37
8,145.00	90.50	174.200	4,663.57	3,877.16	-3,846.56	487.75	3,877.36	172.773	146,301.44	2,069,214.75
8,177.00	90.60	174.000	4,663.26	3,909.14	-3,878.38	491.04	3,909.35	172.784	146,269.62	2,069,218.04
8,209.00	90.80	174.000	4,662.87	3,941.12	-3,910.21	494.38	3,941.34	172.794	146,237.79	2,069,221.38



Professional Directional Survey Report



Company: TAPSTONE ENERGY	Local Co-ordinate Reference: Well Hazel 23-34-9 2H
Project: Harper County, KS	TVD Reference: GL 1288 + 22' KB @ 1310.00usft (Nomac 7)
Site: Hazel 23-34-9	MD Reference: GL 1288 + 22' KB @ 1310.00usft (Nomac 7)
Well: Hazel 23-34-9 2H	North Reference: Grid
Wellbore: OH	Survey Calculation Method: Minimum Curvature
Design: OH	Database: Well_Planner1

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)	
8,240.00	90.80	174.000	4,662.44	3,972.10	-3,941.03	497.62	3,972.33	172.804	146,206.97	2,069,224.62	
8,271.00	90.20	172.800	4,662.17	4,003.09	-3,971.83	501.18	4,003.32	172.808	146,176.17	2,069,228.18	
8,303.00	89.70	172.200	4,662.20	4,035.09	-4,003.55	505.36	4,035.32	172.806	146,144.45	2,069,232.36	
8,335.00	90.00	171.300	4,662.28	4,067.09	-4,035.22	509.95	4,067.32	172.797	146,112.78	2,069,236.95	
8,366.00	90.30	171.400	4,662.20	4,098.09	-4,065.87	514.61	4,098.31	172.786	146,082.13	2,069,241.61	
8,398.00	89.60	171.300	4,662.23	4,130.08	-4,097.50	519.43	4,130.30	172.775	146,050.50	2,069,246.43	
8,429.00	90.00	171.300	4,662.33	4,161.08	-4,128.15	524.12	4,161.29	172.764	146,019.85	2,069,251.12	
8,461.00	89.50	171.500	4,662.47	4,193.08	-4,159.79	528.90	4,193.28	172.754	145,988.21	2,069,255.90	
8,492.00	89.10	170.300	4,662.85	4,224.07	-4,190.39	533.80	4,224.26	172.740	145,957.61	2,069,260.80	
8,524.00	88.80	169.600	4,663.44	4,256.04	-4,221.90	539.39	4,256.21	172.719	145,926.10	2,069,266.39	
8,555.00	88.80	169.600	4,664.09	4,287.00	-4,252.38	544.98	4,287.16	172.697	145,895.62	2,069,271.98	
8,586.00	88.80	169.000	4,664.74	4,317.95	-4,282.84	550.74	4,318.10	172.672	145,865.16	2,069,277.74	
8,618.00	88.40	169.600	4,665.52	4,349.90	-4,314.27	556.68	4,350.04	172.648	145,833.73	2,069,283.68	
8,650.00	87.50	169.200	4,666.66	4,381.84	-4,345.70	562.56	4,381.96	172.624	145,802.30	2,069,289.56	
8,681.00	87.30	169.300	4,668.07	4,412.77	-4,376.13	568.33	4,412.88	172.600	145,771.87	2,069,295.33	
8,712.00	87.50	169.900	4,669.48	4,443.70	-4,406.59	573.92	4,443.80	172.579	145,741.41	2,069,300.92	
8,807.00	87.60	169.900	4,673.54	4,538.54	-4,500.03	590.57	4,538.62	172.523	145,647.97	2,069,317.57	
8,866.00	88.20	169.900	4,675.70	4,597.45	-4,558.08	600.91	4,597.51	172.490	145,589.92	2,069,327.91	
Last Survey: 8866'MD / 4675.70'TVD											
8,918.00	88.20	169.900	4,677.33	4,649.39	-4,609.24	610.02	4,649.44	172.461	145,538.76	2,069,337.02	
PTB: 8918'MD											



Professional Directional
Survey Report



Company:	TAPSTONE ENERGY	Local Co-ordinate Reference:	Well Hazel 23-34-9 2H
Project:	Harper County, KS	TVD Reference:	GL 1288 + 22' KB @ 1310.00usft (Nomac 7)
Site:	Hazel 23-34-9	MD Reference:	GL 1288 + 22' KB @ 1310.00usft (Nomac 7)
Well:	Hazel 23-34-9 2H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Well_Planner1

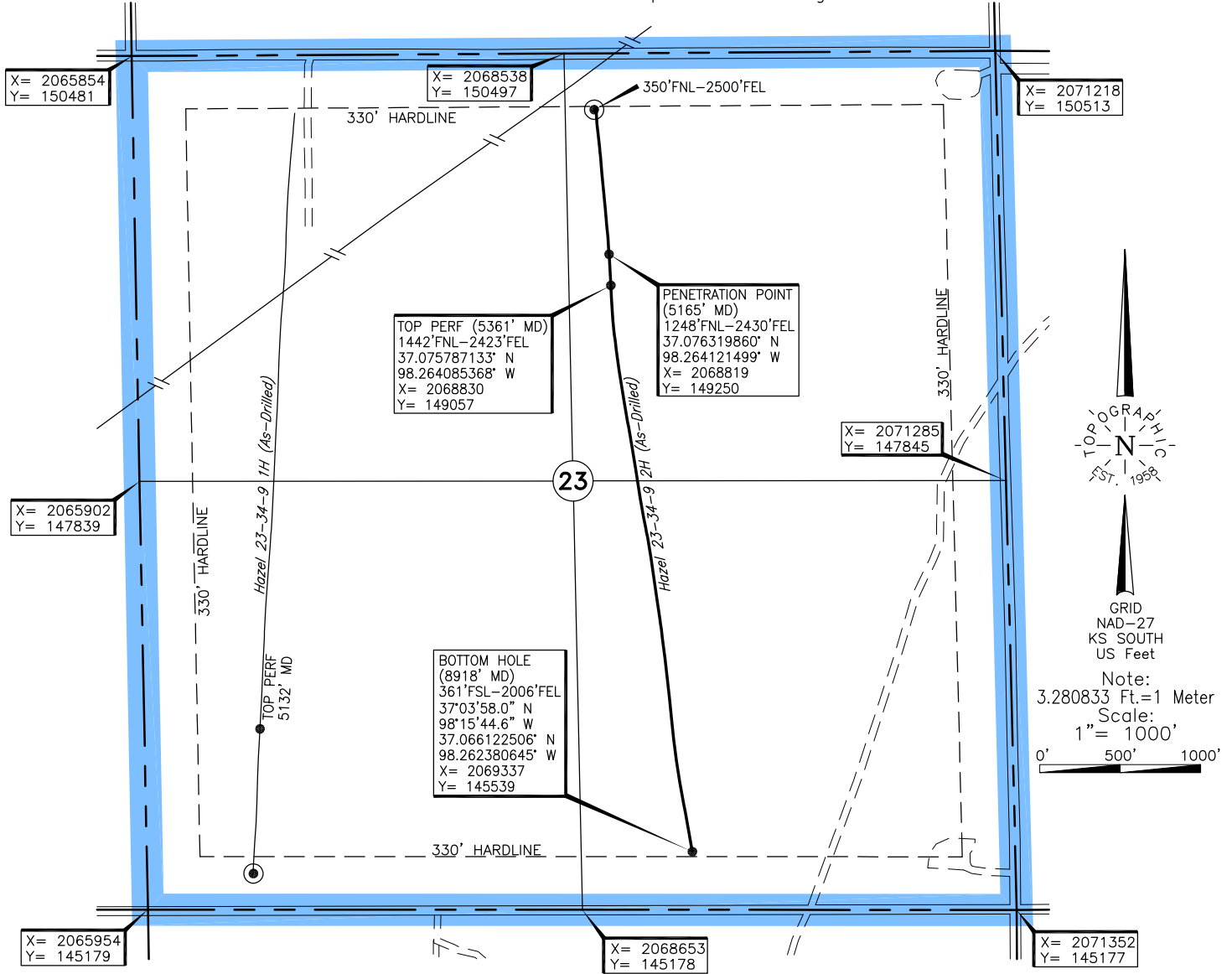
Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
8,866.00	4,675.70	-4,558.08	600.91	Last Survey: 8866'MD / 4675.70'TVD	
8,918.00	4,677.33	-4,609.24	610.02	PTB: 8918'MD	

TOPOGRAPHIC LAND SURVEYORS

6709 NORTH CLASSEN BLVD., OKLA. CITY, OKLA. 73116 * LOCAL (405) 843-4847 * OUT OF STATE (800) 654-3219
 Certificate of Authorization No. LS-99, Exp. Dec. 31, 2015

HARPER County, Kansas

350'FNL - 2500'FEL Section 23 Township 34S Range 9W P.M.



Operator: TAPSTONE ENERGY

Lease Name: HAZEL 23-34-9

Well No.: 2H

ELEVATION:
1288' Gr. at Stake

Topography & Vegetation Loc. fell in sandy grass pasture, pad under construction, ±190' South of E-W water line

Good Drill Site? Yes Reference Stakes or Alternate Location
 Stakes Set None

Best Accessibility to Location From North off county road

Distance & Direction From Anthony, KS, go ±12.5 mi. West, then ±5.0 mi. South to
the NE Cor. of Sec. 23-T34S-R9W

(This information was gathered with a GPS receiver with ±1 foot Horiz./Vert. accuracy)

DATUM: NAD-27
 LAT: 37°04'43.6"N
 LONG: 98°15'52.0"W
 LAT: 37.078785628° N
 LONG: 98.264431169° W
 STATE PLANE
 COORDINATES: (US Feet)
 ZONE: KS SOUTH
 X: 2068727
 Y: 150148

248582 Date of Drawing: Aug. 04, 2015
 Invoice # 247171 Date Staked: Jul. 02, 2015 JP

FINAL AS-DRILLED PLAT

AS-DRILLED INFORMATION
 FURNISHED BY TAPSTONE ENERGY