



KANSAS CORPORATION COMMISSION 1086511
OIL & GAS CONSERVATION DIVISION

Form ACO-1

June 2009

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
- Conv. to GSW
- Plug Back: _____ Plug Back Total Depth _____
- Commingled Permit #: _____
- Dual Completion Permit #: _____
- SWD Permit #: _____
- ENHR Permit #: _____
- GSW Permit #: _____

Spud Date or Recompletion Date Date Reached TD Completion Date or Recompletion Date

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

County: _____

Lease Name: _____ Well #: _____

Field Name: _____

Producing Formation: _____

Elevation: Ground: _____ Kelly Bushing: _____

Total 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

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



1086511

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

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

INSTRUCTIONS: Show important tops and base 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. Attach complete copy of all Electric Wire-line Logs surveyed. Attach final geological well site report.

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 Electric Log Submitted Electronically <input type="checkbox"/> Yes <input type="checkbox"/> No <i>(If no, Submit Copy)</i> 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				

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: Flowing Pumping Gas Lift Other (Explain) _____

Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio	Gravity
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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 (Specify) _____	PRODUCTION INTERVAL: _____ _____
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Form	ACO1 - Well Completion
Operator	American Warrior, Inc.
Well Name	GARVEY 4-18
Doc ID	1086511

Tops

Name	Top	Datum
Anhy	1913'	-577
B/Anhy	1954'	-536
Topeka	3463'	-973
Heebner	3709	-1219
Toronto	3728'	-1238
Lansing	3749'	-1259
B/KC	4044	-1554
Ft.Scott	4245	-1755
Mississippian	4349	-1859

ALLIED OIL & GAS SERVICES, LLC 053652

Federal Tax I.D.# 20-5975804

REMIT TO P.O. BOX 31
RUSSELL, KANSAS 67665

SERVICE POINT:
Great Bend, 10

DATE 6-6-12	SEC 18	TWB 153	RANGE 26W	CALLED OUT	ON LOCATION	JOB START 2:30pm	JOB FINISH 4:00pm
LEASE Garvey	WELL# 4-18	LOCATION Utica, KY 34 west, 7	COUNTY Gove	STATE KS			
OLD OR NEW (Circle one)		North to 5' 1/2 W 1/2 N 1/2 W		North into			

CONTRACTOR Discovery #1
TYPE OF JOB Surf lease
HOLE SIZE 12 1/4 T.D. 221
CASING SIZE 5 7/8 DEPTH 221
TUBING SIZE DEPTH
DRILL PIPE DEPTH
TOOL DEPTH
PRES. MAX MINIMUM
MEAS. LINE SHOE JOINT
CEMENT LEFT IN CSG. 15 FT
PERFS.
DISPLACEMENT 15.12 bbl

OWNER American Warrior
CEMENT AMOUNT ORDERED 150 sks Class A
20% gel 20% gel
COMMON @
POZMIX @
GEL @
CHLORIDE @
ASC @
HANDLING @
MILEAGE @
TOTAL

EQUIPMENT

PUMP TRUCK CEMENTER Greg R
766 HELPER Kevin E
BULK TRUCK DRIVER Kevin W
318
BULK TRUCK DRIVER
#

REMARKS:

Drop on bottom, circulate casing
at Rigman Hook up cement
plant, mix 150 sks Class A 20%
gel Displace w/ 15.12 bbl
fresh water shut in cement
at circ. Rigman
Plug down @ 3:45 pm

CHARGE TO: American Warrior
STREET
CITY STATE ZIP

SERVICE

DEPTH OF JOB
PUMP TRUCK CHARGE
EXTRA FOOTAGE @
MILEAGE @
MANIFOLD @
TOTAL

PLUG & FLOAT EQUIPMENT

@
@
@
@
@
TOTAL

To: Allied Oil & Gas Services, LLC.
You are hereby requested to rent cementing equipment and furnish cementer and helper(s) to assist owner or contractor to do work as is listed. The above work was done to satisfaction and supervision of owner agent or contractor. I have read and understand the "GENERAL TERMS AND CONDITIONS" listed on the reverse side.

PRINTED NAME * CLIFF MAYFIELD
SIGNATURE * Cliff Mayfield
Thank You!

SALES TAX (If Any)
TOTAL CHARGES
DISCOUNT IF PAID IN 30 DAYS

ALLIED OIL & GAS SERVICES, LLC 056426

Federal Tax I.D.# 20-5975804

REMIT TO P.O. BOX 31
RUSSELL, KANSAS 67665

SERVICE POINT:
Russell Ks.

DATE <u>6-14-12</u>	SEC. <u>18</u>	TWP. <u>15</u>	RANGE <u>26</u>	CALLED OUT	ON LOCATION	JOB START	JOB FINISH <u>9:45 AM</u>
LEASE <u>Garvey</u>		WELL# <u>4-18</u>	LOCATION <u>Utica Ks. 3W 6N</u>		COUNTY <u>Grove</u>	STATE <u>KANSAS</u>	
OLD OR NEW (Circle one)							

CONTRACTOR Discovery Drilling Rig #1

TYPE OF JOB Rotary Plug

HOLE SIZE 7 7/8 T.D. 4353

CASING SIZE 8 5/8 SURFACE DEPTH 221

TUBING SIZE _____ DEPTH _____

DRILL PIPE 4 1/2 x-H @ DEPTH 1945

TOOL _____ DEPTH _____

PRES. MAX _____ MINIMUM _____

MEAS. LINE _____ SHOE JOINT _____

CEMENT LEFT IN CSG. _____

PERFS. _____

DISPLACEMENT _____

OWNER _____

CEMENT AMOUNT ORDERED 220 SX ⁶⁰ 40 4% GEL
1/4# FIC-8 seal P&A SA

COMMON _____ @ _____

POZMIX _____ @ _____

GEL _____ @ _____

CHLORIDE _____ @ _____

ASC _____ @ _____

_____ @ _____

_____ @ _____

_____ @ _____

_____ @ _____

_____ @ _____

_____ @ _____

HANDLING _____ @ _____

MILEAGE _____ @ _____

TOTAL _____

EQUIPMENT

PUMP TRUCK CEMENTER Edward G.

417 HELPER Woody O.

BULK TRUCK _____

4 DRIVER Cody H.

BULK TRUCK _____

_____ DRIVER _____

REMARKS:

- 25 SX @ 1945'
- 10 SX @ 906'
- 40 SX @ 271'
- 10 SX @ 40'
- 30 SX @ RAT HOLE
- 15 SX @ Mouse Hole

SERVICE

DEPTH OF JOB _____

PUMP TRUCK CHARGE _____

EXTRA FOOTAGE _____ @ _____

MILEAGE _____ @ _____

MANIFOLD _____ @ _____

_____ @ _____

_____ @ _____

TOTAL _____

CHARGE TO: American Warrior Inc

STREET _____

CITY _____ STATE _____ ZIP _____

PLUG & FLOAT EQUIPMENT

CS/8 Woodm Wiper @ _____

Plug @ _____

_____ @ _____

_____ @ _____

_____ @ _____

TOTAL _____

To: Allied Oil & Gas Services, LLC.
You are hereby requested to rent cementing equipment and furnish cementer and helper(s) to assist owner or contractor to do work as is listed. The above work was done to satisfaction and supervision of owner agent or contractor. I have read and understand the "GENERAL TERMS AND CONDITIONS" listed on the reverse side.

PRINTED NAME CLIFF MAYFIELD

SIGNATURE Cliff Mayfield

SALES TAX (If Any) _____

TOTAL CHARGES _____

DISCOUNT _____ IF PAID IN 30 DAYS

Well Name: GARVEY #4-18
 Surface Location: NE SW SE Sec. 18- 15S - 26W
 Bottom Location:
 API: 15-063-21984-0000
 License Number: 4058
 Spud Date: 6/6/2012 Time: 11:30 AM
 Region: GOVE
 Drilling Completed: 2/2/2011 Time: 5:50 PM
 Surface Coordinates: 1040' FSL & 1664' FEL
 Bottom Hole Coordinates:
 Ground Elevation: 2482.00ft
 K.B. Elevation: 2490.00ft
 Logged Interval: 0.00ft To: 0.00ft
 Total Depth: 0.00ft
 Formation:
 Drilling Fluid Type: Chemical/Fresh Water Gel

OPERATOR

Company: AMERICAN WARRIOR, INC.
 Address: 3118 CUMMINGS ROAD
 P.O. BOX 399
 GARDEN CITY, KS 67846
 Contact Geologist: CECIL O'BRATE
 Contact Phone Nbr: (620) 275-2963
 Well Name: GARVEY #4-18
 Location: NE SW SE Sec. 18- 15S - 26W API: 15-063-21984-0000
 Pool: Field: GARVEY RANCH
 State: KANSAS Country: USA

SURFACE CO-ORDINATES

Well Type: Vertical
 Longitude: -100.2509426 Latitude: 38.7441648
 N/S Co-ord: 1040' FSL
 E/W Co-ord: 1664' FEL

LOGGED BY



Company: SOLUTIONS CONSULTING
 Address: 108 W 35TH
 HAYS, KS 67601
 Phone Nbr: (785)259-3737
 Logged By: Geologist Name: JEFF LAWLER

CONTRACTOR

Contractor: DISCOVERY DRILLING CO., INC.
 Rig #: 1
 Rig Type: MUD ROTARY
 Spud Date: 6/6/2012 Time: 11:30 AM
 TD Date: 2/2/2011 Time: 5:50 PM
 Rig Release: Time:

ELEVATIONS

K.B. Elevation: 2490.00ft Ground Elevation: 2482.00ft
 K.B. to Ground: 8.00ft

NOTES

DST #1 LKC "H"

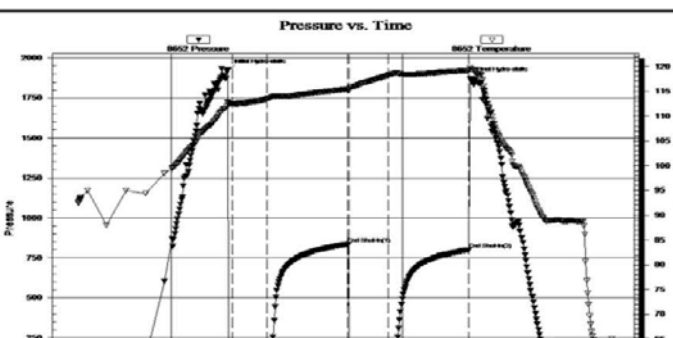
	DRILL STEM TEST REPORT	
	American Warrior P.O. Box 399 Garden City KS 67846 ATTN: Jeff Lawler	18-15s-26w Gove Co. KS Garvey #4-18 Job Ticket: 45897 DST#: 1 Test Start: 2012.06.10 @ 16:48:00

GENERAL INFORMATION:

Formation: LKC " H "
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 18:47:25
 Time Test Ended: 23:42:39
 Interval: 3898.00 ft (KB) To 3930.00 ft (KB) (TVD)
 Total Depth: 3930.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Good
 Test Type: Conventional Bottom Hole (Initial)
 Tester: Will MacLean
 Unit No: 40
 Reference Elevations: 2490.00 ft (KB)
 2482.00 ft (CF)
 KB to GR/CF: 8.00 ft

Serial #: 8652 Inside
 Press@RunDepth: 74.21 psig @ 3899.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2012.06.10 End Date: 2012.06.10 Last Calib.: 2012.06.10
 Start Time: 16:48:00 End Time: 23:42:39 Time On Btm: 2012.06.10 @ 18:44:10
 Time Off Btm: 2012.06.10 @ 21:52:09

TEST COMMENT: IF- Weak Surface Blow Built to 2 1/4"
 ISI- No Blow
 FF- Weak Surface Blow Built to 2"
 FSI- No Blow



PRESSURE SUMMARY			
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1922.43	112.76	Initial Hydro-static
4	47.25	112.52	Open To Flow(1)
31	58.11	113.42	Shut-In(1)
93	833.88	115.41	End Shut-In(1)
94	63.98	115.15	Open To Flow(2)
125	74.21	118.24	Shut-In(2)
188	799.29	119.23	End Shut-In(2)
188	1869.42	119.64	Final Hydro-static



Recovery		
Length(ft)	Description	Volume(bbl)
64.00	OGWCM 2%oil 12%g 26%w 60%m	0.62
8.00	GO 8%g 92%oil	0.11

Gas Rates		
Choke(inches)	Pressure (psig)	Gas Rate(Mcf/d)

Trilobite Testing, Inc

Ref. No: 45897

Printed: 2012.06.11 @ 15:14:06

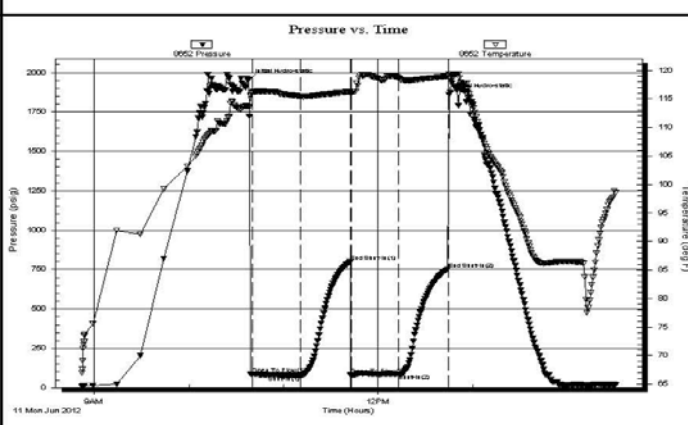
DST #2 LKC "I-J"

	DRILL STEM TEST REPORT	
	American Warrior	18-15s-26w Gove Co. KS
	P.O Box 399 Garden City KS 67846	Garvey #4-18
ATTN: Jeff Lawler	Job Ticket: 45898	DST#: 2
	Test Start: 2012.06.11 @ 08:52:00	

GENERAL INFORMATION:
 Formation: **LKC " I & J "**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 10:39:55
 Time Test Ended: 14:30:54
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Will MacLean
 Unit No: 40
 Interval: **3945.00 ft (KB) To 3990.00 ft (KB) (TVD)**
 Total Depth: 3990.00 ft (KB) (TVD)
 Reference Elevations: 2490.00 ft (KB)
 2482.00 ft (CF)
 Hole Diameter: 7.88 inchesHole Condition: Good
 KB to GR/CF: 8.00 ft

Serial #: 8652 Inside
 Press@RunDepth: 86.63 psig @ 3946.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2012.06.11 End Date: 2012.06.11 Last Calib.: 2012.06.11
 Start Time: 08:52:00 End Time: 14:30:54 Time On Btm: 2012.06.11 @ 10:37:55
 Time Off Btm: 2012.06.11 @ 12:44:55

TEST COMMENT: IF- we went down tagged bottom about 4 1/2' up, put that joint in the mouse hole put the head on went back down the tool opened and it slid all the way down, so we pulled it up put another joint on, bled it off went back to bottom had a 2" blow, opened the 2" valve bled it off came back as a weak surface blow
 FF- 1/2" blow in 3 min



PRESSURE SUMMARY			
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1953.03	113.71	Initial Hydro-static
2	86.65	116.04	Open To Flow (1)
33	79.17	115.45	Shut-In(1)
65	799.41	116.25	End Shut-In(1)
65	82.78	116.04	Open To Flow (2)
96	86.63	118.63	Shut-In(2)
127	754.27	118.98	End Shut-In(2)
127	1859.57	119.42	Final Hydro-static

Recovery		
Length (ft)	Description	Volume (bbl)
62.00	100%m with Few Oil Spots	0.60
31.00	100%m	0.43

Gas Rates		
Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)

Trilobite Testing, Inc

Ref. No: 45898

Printed: 2012.06.11 @ 14:56:58

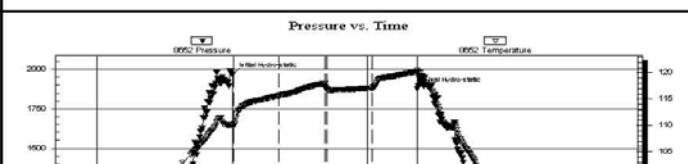
DST #3 LKC "I-L"

	DRILL STEM TEST REPORT	
	American Warrior	18-15s-26w Gove Co. KS
	PO Box 399 Garden City KS 67846	Garvey #4-18
ATTN: Jeff Lawler	Job Ticket: 45899	DST#: 3
	Test Start: 2012.06.12 @ 02:50:00	

GENERAL INFORMATION:
 Formation: **LKC " I - L "**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 04:30:55
 Time Test Ended: 08:45:09
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Will MacLean
 Unit No: 40
 Interval: **3951.00 ft (KB) To 4060.00 ft (KB) (TVD)**
 Total Depth: 4060.00 ft (KB) (TVD)
 Reference Elevations: 2490.00 ft (KB)
 2482.00 ft (CF)
 Hole Diameter: 7.88 inchesHole Condition: Good
 KB to GR/CF: 8.00 ft

Serial #: 8652 Inside
 Press@RunDepth: 104.84 psig @ 3952.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2012.06.12 End Date: 2012.06.12 Last Calib.: 2012.06.12
 Start Time: 02:50:00 End Time: 08:45:09 Time On Btm: 2012.06.12 @ 04:30:25
 Time Off Btm: 2012.06.12 @ 06:33:25

TEST COMMENT: IF- Surface Blow Built to BOB in 14 3/4min
 IS- No Blow
 FF- Strong Surface Blow Built to BOB in 40sec
 FS- No Blow

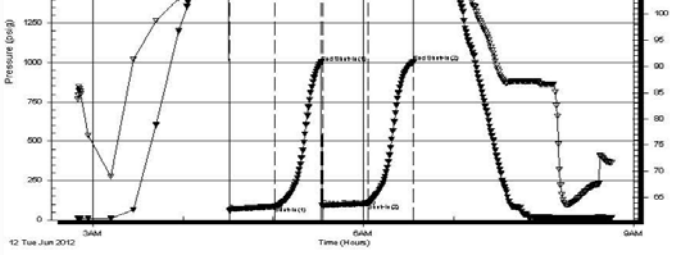


PRESSURE SUMMARY			
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1969.52	109.94	Initial Hydro-static
1	58.86	109.69	Open To Flow (1)
31	85.10	115.63	Shut-In(1)

Trilobite Testing, Inc

Ref. No: 45899

Printed: 2012.06.12 @ 02:50:00



62	1002.07	117.95	End Shut-In(1)
63	87.92	117.01	Open To Flow (2)
93	104.84	117.11	Shut-In(2)
123	1002.69	120.11	End Shut-In(2)
123	1876.73	120.54	Final Hydro-static

Length (ft)	Description	Volume (bbl)
62.00	OGCM 2%oil 12%g 86%m	0.60
62.00	OGCM 5%oil 18%g 77%m	0.87
40.00	OGCM 4%oil 8%g 88%m	0.56
0.00	558' of GIP	0.00

Choke (inches)	Pressure (psig)	Gas Rate (Mc/d)
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Recovery from multiple tests
 Trilobite Testing, Inc Ref. No: 45899 Printed: 2012.06.12 @ 09:25:29

DST #4 MISSISSIPPIAN

WELL COMPARISON SHEET

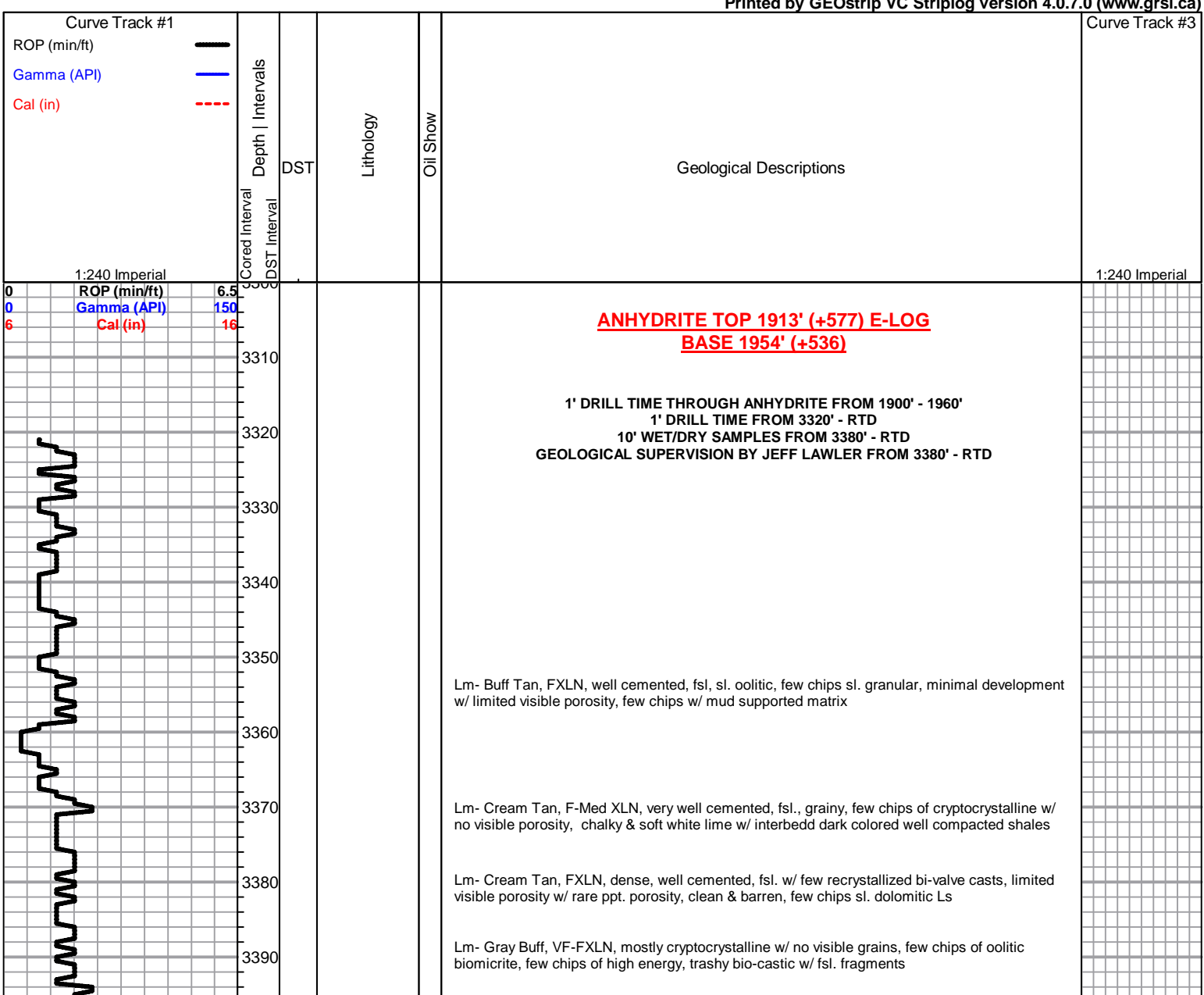
FORMATION	GARVEY #4-18				GARVEY "L" #2				GARVEY "L" #3				GARVEY "L" (MULL) #5				GARVEY RANCH #1			
	2490		2491		2480		2462		2504											
	LOG TOPS	SAMPLE TOPS	CARD/SMPL TOPS	LOG	SMPL	CARD/SMPL TOPS	LOG	SMPL	LOGS/GEOREPO RT	LOG	SMPL	DATA SOURCE	LOG	SMPL						
ANHYDRITE TOP	1913	577	1913	578	1894	586	1884	578	1924	580										
BASE	1954	536	1947	544	1934	546	1923	539												
TARKIO			3320	-829																
HOWARD			3424	-933																
TOPEKA	3463	-973	3470	-979			3435	-973												
HEEBNER SHALE	3709	-1219	3708	-1217	3698	-1218	3678	-1216	3738	-1234										
TORONTO	3728	-1238	3729	-1238	3716	-1236	3698	-1236												
LKC	3749	-1259	3749	-1258	3737	-1257	3718	-1256	3781	-1277										
MUNCIE CREEK SH	3900	-1410					3865	-1403												
STARK SHALE	3989	-1499					3955	-1493												
BKC	4044	-1554	4042	-1551	4028	-1548	4009	-1547	4074	-1570										
PAWNEE	4185	-1695	4184	-1693	4172	-1692	4150	-1688	4217	-1713										
FT. SCOTT	4245	-1755	4242	-1751	4230	-1750	4205	-1743	4280	-1776										
CHER. SHALE	4274	-1784	4268	-1777	4258	-1778	4229	-1767	4308	-1804										
CONGLOMERATE			4313	-1822			4273	-1811												
MISSISSIPPIAN	4349	-1859	4330	-1839	4321	-1841	4298	-1836	4372	-1868										
ARBUCKLE									4435	-1931										
RTD																				

	Cht vari		Lmst fw7> shale, gm		shale, gry		Carbon Sh shale, red		Ss
	Dolprim		shale, gry		Shbck		shale, red		

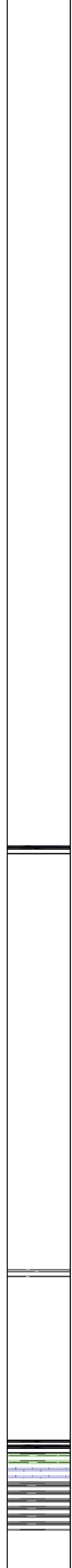
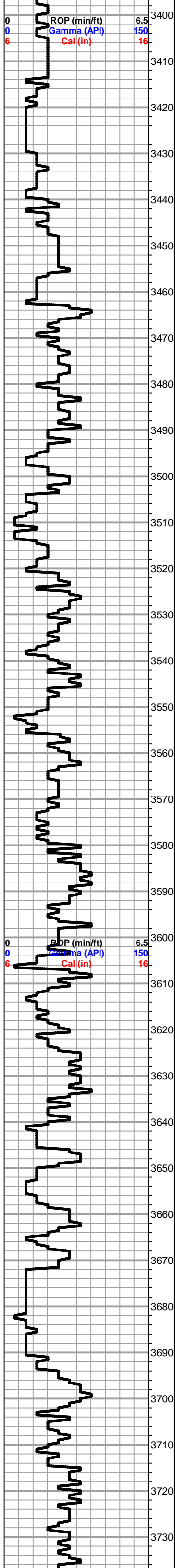
	STRINGER		TEXTURE
~~~~~	Chert	C	Chalky
—	green shale		

	DST Int
	DST alt

Printed by GEOstrip VC Striplog version 4.0.7.0 (www.grsi.ca)







Lm- Buff, VF grn., sl fsl, very well cemented argillaceous Ls w/ no visible grains or porosity

3410 Lm- Buff Gray, FXLN, semi-brittle, biomicrite w/ fusulinids, few fragments, bio-castic

3420 Sh- Gray Red Lm Green Brown, soft, smooth & rounded, gritty & earthy, few sandy lime

3430

3440 Lm- Lt & Drk Gray, FXLN, semi-brittle, trashy biomicrite, mostly fsl fragments, few fusulinids

3450

3460 Sh- Drk & Lt Gray, soft smooth, sl. sandy & gritty, sticky lt gray clumps

**TOPEKA 3463' (-973) E-LOG** Lm- Cream, FXLN, densely packed, oolitic, well cemented w/ clear siliceous cementation, poorly developed w/ little to no visible porosity,

3470

3480 Lm- Cream Tan, mix of fine gr, mudsupported, oolitic biomicrite, chalky in part, and VF-FXLN, cryptocrystalline w/ no visible grains or visible porosity

3490 Lm- Gray Buff, FXLN, dense, semi-brittle, fsl w/ fusulinids & crinoids, bio-clasts, few w/ scctrd fsl fragments

3500 Sh- Gray Red, soft, smooth, blocky & waxy red chips

3510 Lm- Cream Tan, Med-Coarse XLN, granular, oolitic, loosely cemented, ppt porosity, sl. unconsolidated, abundant fenestral porosity

3520 Chert- Gray, mottled w/ white specks, sl fsl, sharp angular bedded chert, few chips gritty & sl dolomitic

3530

3540 Sh- Gray Lm Green Black Red, soft smooth, fissile, calcareous chalk, few gritty sl sandy shale chips

3550 Lm- Cream, Med XLN, gritty & grainy, sl. dolomitic, scctrd ppt porosity, sl fsl. & oolitic, clean & barren, loosely cemented, few chips w/ sl mineral flor., no wet cut

3560 Lm- Buff Cream, F-Med XLN, gritty & grainy, mottled, sl friable, clean & barren

3570 Lm- Tan Buff, F-Med XLN, well cemented, tight, fsl packstone, limited visible porosity w/ interbedded shales

3580 Lm- Cream Tan, Med XLN, gritty & grainy, fsl, scattered wispy recrystallization, well cemented, few chips of dense mudstone, few chips of gray/white bedded chert

3590 Sh- Black Gray Red, very well compacted carbonaceous chips, soft & smooth gray & red chips

3600 Lm- Cream Tan, fine gr., chalky, mud supported matrix, mottled, sl. fsl

Lm- Tan Brown, FXLN, sl oolitic, densely packed w/ tight, well cemented siliceous matrix, sl. cherty, dense XLN porosity, some weathered in appearance w/ scctrd secondary porosity

**Sh/Ss- Gray Lm Green Dove Gray**, few chips of soft smooth shale Ss- Dove Gray, VF grn, consolidated & loosely cemented, few chips of sandy lime, all clean & barren

3610 Lm- Cream, F-Med XLN, mix of gritty & granular loosely cemented w/ chips of densely packed oolitic cryptocrystalline, scctrd ppt porosity, few chips of densely packed oolitic chert

3620 Lm- Buff Gray, VF grn., dense, well cemented, algal Ls, tight

3630 Lm/Chert- Cream Lt Gray, sl fsl, mix of biomicrite and fsl chert, sl weathered appearance

3640 Sh- Dove Gray Lm Green White, soft smooth, few sl. unconsolidated, sticky calcareous white clumps

3650 Chert- Cream, fsl, fusulinids, sharp angular bedded chert w/ conchoidal fracturing

3660 Lm- Cream Off White, Med XLN, granular & massive, well cemented, scctrd. recrystallization inclusions, small spherical oolites, few w/ dense siliceous matrix, clean & barren

3670 Lm- Cream Tan, F-Med XLN, fsl, oolitic biomicrite w/ dense matrix, sub-XLN porosity w/ scctrd secondary fenestral porosity, clean & barren

3680 Lm- Cream Tan, Med XLN, fsl, oolitic, massive, tight siliceous cementation, mostly w/ no visible matrix porosity, scctrd interparticle porosity, sl cherty

3690 Chert- Egg Shell White, gritty, massive, dolomitic chert, sl fsl, rough weathered appearance, slow bobble HCL effervescence

3700 Lm- Brown Black, fine grn., trashy biomicrite w/ fusulinids, chalky in part, some w/ mud supported matrix, mix of whole & fragments of fusulinids

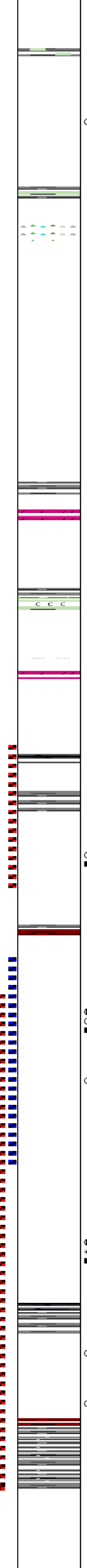
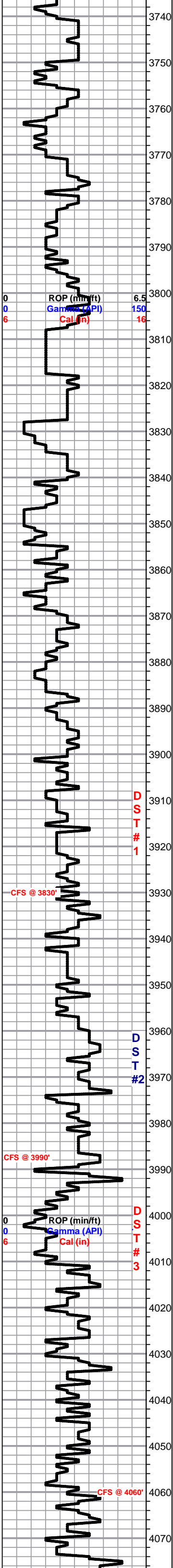
**HEEBNER 3709' (-1219) E-LOG** Sh- Black Lm Green, very dense & compacted, fissile, carbonaceous

3710 Sh- Gray, sticky calcareous clumps

**TORONTO 3728' (-1238) E-LOG** Chert- Cream Off White, mix of sharp angular bedded fsl chert, sl cherty Ls, and detrital fsl chert w/ recrystallization inclusions. Reworked- scctrd ppt porosity, LT GSY SCCTRD STN, FEW GAS DISSOLUTION BUBBLES UPON CRUSH, THIN GSY SHELVING CLIP, ENT LT GSY ODB, NO FLOB UNTIL CRUSH, SLOW STRM WET CUT

3720

3730



Lm- Cream Off White, FXLN, fsl, dense, sub-XLN, tight w/ scctrd ppt porosity, few chips of buff gritty & grainy, sl dolomitic Ls

**LKC 3749' (-1259) E-LOG** Lm- Cream Off White, VF-FXLN, oolitic, no visible matrix porosity, sub-cryptocrystalline w/ clear siliceous matrix

Lm- Cream Off White, FXLN, mix of fsl XLN Ls, tight w/ scctrd ppt porosity, VRY LT GSY SCTRD STN, VRY SL SFO UPON CRUSH, FNT ODR UPON CRUSH, and very fine, micro-sucrosic dolomitic Ls, well cemented w/ dense micro porosity, few chips w/ possible secondary porosity

Sh- Gray Lm Green Maroon, soft, smooth, gritty & earthy

Chert- Smokey Gray Semi-Translucent Bone White, sharp angular bedded chert w/ conchoidal fracturing.

Lm- Cream Tan, FXLN, dense very well cemented matrix, massive, sl. granular, tightly packed oolites, sl. siliceous w/ no visible interoolite porosity, few chips of tan bedded chert w/ clear veins

Lm- Cream Tan, VF-FXLN, tight, mostly cryptocrystalline w/ no visible grains or porosity

Lm- Cream Tan, FXLN, A/A, w/ fsl alagal Ls, well cemented w/ no visible porosity, mud matrix, trace of white calcerous chalk

Lm- Cream Off White, FXLN, mostly cryptocrystalline w/ minimal visible porosity, few w/ recrystallization inclusions, few chips of massive, loosely cemented oolitic grainstone, sub-granular

Lm- Cream Tan Semi-Translucent, A/A w/ a few chips of gritty, loosely cemented w/ constant ppt porosity, secondary fractured porosity, clean & barren, thin gray interbedded shale lense

Sh- Gray, well compacted, waxy slivers, few sl. unconsolidated

Dolomite- Cream Semi-Translucent, FXLN, micro sucrosic, visible euhedral rhombs under increased magnification, ppt porosity, few w/ dense secondary porosity, clean & barren

Dolomite- Buff Tan, Med XLN, very well cemented, dense, sucrosic w/ micro XLN porosity, clean & barren

Sh- Gray Lm Green White, thin dense slivers, white chalky clumps

Lm- Cream Tan, mostly dense, well cemented algal Ls, few chips of FXLN sucrosic dolomite, few chips of bedded chert, all clean & barren

Lm- Buff Gray Cream, FXLN, mostly dense, semi-brittle sub-cryptocrystalline, few chips of oolitic biomicrite, few chips of gray sharp angular bedded chert

Sh- Black, very well compacted, sl fissile, blocky, carbonaceous

Sh- Gray, sticky argillaceous clumps

Lm- Cream Buff, F-Med XLN, fsl, scctrd oolites, scctrd interstitial porosity, some solution recrystallization w/in solution veins, few chips of densely packed oolitic biomicrite w/ well cemented matrix, few chips of very well cemented sl. oolitic packstone w/ scctrd recrystallization inclusions, all w/ LT GSY SCTRD STN, FEW CHIPS W/ FEW GAS DISSOLUTION BUBBLES, SL SFO, FNT ODR, SLOW STRM WET CUT, 2 CHIPS W/ SAT. STN W/ SCTRD BLEEDING FO

Sh- Red Gray Lm Green, soft, smooth, earthy

Lm- Cream Tan, FXLN, oolitic packstone, densely packed oolites w/ tightly cemented matrix, limited visible porosity, chalky in part, few chips of sub-cryptocrystalline, all clean & barren

Lm- Cream Tan, FXLN, sl oolitic, few chips well developed w/ constant ppt porosity throughout, LT GSY STN, SL SFO, FAST STRM WET CUT & FLOR few chips of dolomitic Ls, sucrosic, SCTRD LT GSY STN, NO SFO, SLOW STRM WET CUT & FLOR, FR GSY ODR, few chips of semi-translucent bedded chert

Lm- Cream Tan, VF-FXLN, dense, well cemented, some sub-cryptocrystalline w/ very limited visible porosity, mostly w/ scctrd development, micro porosity, SCTRD LT STN, SL SFO, FNT ODR, SLOW STRM WET CUT & FLOR

Lm- Cream Tan, FXLN, mostly dense, well cemented, few chips sl. fsl, tight, poorly developed w/ minimal visible porosity, clean & barren

Lm- Cream Tan, FXLN, scctrd development, sl. fsl, few chips w/ scctrd ppt porosity, SCTRD LT STN, NO SFO, FNT ODR

**STARK SHALE 3989' (-1499) E-LOG** Sh- Black Gray, fissile, slaty, carbonaceous, soft sticky argillaceous gray clumps

Lm/Chert- Off White Brown, mix of cryptocrystalline brown Ls & very well cemented argillaceous Ls w/ no visible grains. Chert- Off White, some sl dolomitic & gritty, some sharp angular bedded chert w/ conchoidal fracturing

Lm- Buff White, Crs XLN, sl chalky, granular w/ constant ppt porosity, oolitic w/ scctrd spherical peals, intact w/ no apparent skeletal dissolution, some sl dolomitic, well developed, SAT GSY STN, THIN GSY FILM IN CUP, GSY FO, STRONG GSY ODR, DULL FLOR W/ SLW STNG STRM WET CUT

Sh- Black Gray, soft, fissile, carbonaceous, smooth gray slivers, some sticky argillaceous clumps

Lm- Lt Gray, F-Med XLN, mostly cryptocrystalline, semi-brittle & toght, few chips w/ abundant secondary porosity, semi-translucent, possibly fractured, white siltstone, very loosely cemented, few chips of gritty & grainy sl dolomitic Ls, SCTRD LT GST STN, NO SFO, FR GSY ODR, chips of egg shell white bedded chert & gritty dolomitic chert

Lm- Tan Brown, VF-FXLN, dense, semi-brittle, sub-cryptocrystalline, scctrd solution veins associated w/ recrystallization and secondary porosity w/in, limited visible matrix porosity, SCTRD LT STN, NO SFO, FNT ODR

**BKC 4044' (-1544) E-LOG** Sh- Red Gray, dense, well compacted, blocky, soft gray chips

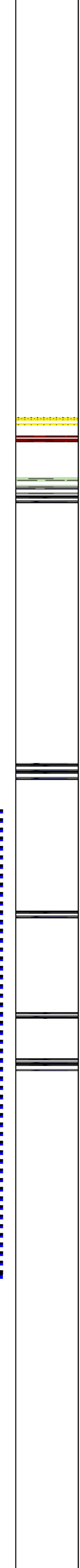
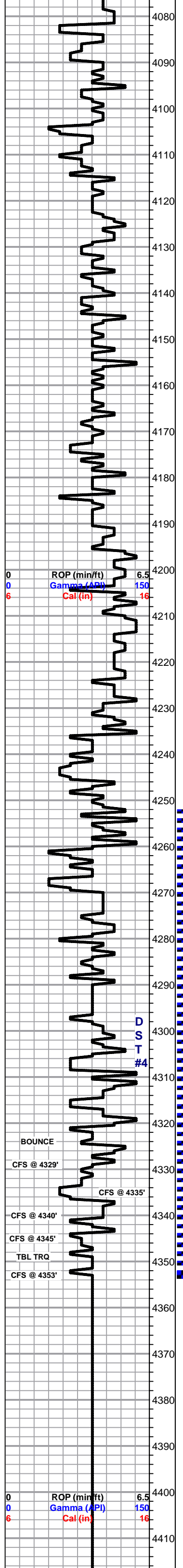
Sh- Black Drk & Lt Gray, well compacted, calcareous, few sl. uncondolidated, gray wash and sticky argillaceous clumps

Sh- Gray Lm Green, massive, blocky & dense, few sl unconsolidated

SHORT TRIP SURVEY 1 dgr.  
 DST #1  
 LKC "H"  
 3898 - 3930

STRAP +0.18  
 DST #2  
 LKC "I-J"  
 3945 - 3990

DST #3  
 LKC "I-L"  
 3951 - 4060



Sh- Brown Drk Maroon, sticky argillaceous brown clumps and maroon sandy lime, friable & consolidated

Lm- Cream Buff Tan, mix of VFXLN, sub-cryptocrystalline w/ scctrd secondary porosity & recrystallization w/in solution veins, dense well cemented algal Ls, and Med grn, sl fsl, chalky in part, crumbly Ls, SCTRD LT STN, NO SFO, NO ODR

Ls Conglomerate- Buff Gray, mix of shale mottled sl. fsl Ls, pcs of fsl detrital XLN, loosely cemented

Lm- Cream Brown, mix of FXLN, semi-brittle sl. cherty Ls w/ scctrd secondary porosity and oolitic biomicrite, loosely cemented, some interbedded gray shale lenses

Ls Conglomerate- mix of various dark colored shales, chalky mud supported Ls, various colored dense algal Ls, & densely packed sl. cherty oolitic Ls w/ tight matrix, few chips of fululinid packstone w/ calcareous cement

Lm- Tan Cream, more densely packed oolitic sl. cherty Ls, no visible matrix porosity, few chips sl. granular w/ oolite inclusions, mud supported matrix, loosely cemented w/ scctrd interstitial porosity, 1-2 chips w/ SCTTRD DRK STN, NO SFO, NO ODR, DULL FLOR.

Sh- Gray Black Lm Green Marron, dense, well compacted, sl. waxy slivers

Lm- Cream Buff Tan, MF-FXLN, tight, well cemented, mostly sub-cryptocrystalline w/ no visible matrix porosity, few chps sl. fsl, well cemented, semi-brittle w/ dense fenestral secondary porosity, clean & barren

Lm- Cream Tan, FXLN, mostly dense, minimal development, sub-cryptocrystalline, some w/ scctrd micro porosity, some gritty, vf grn., sl. sandy w/ calcareous cementation

Lm- Cream Buff, FXLN, dense, sub-cryptocrystalline w/ no to very minimal visible porosity, few chips of sl. fsl algal Ls

**PAWNEE 4185' (-1695)** Sh- Drk & Lt Gray Lm Green Maroon Off White, fissile, carbonaceous, semi-slaty, sl. unconsolidated & pebbly, gritty & earthy, gray & Lt maroon wash shale, soft sandy calcareous lime

Lm/Chert- Tan Cream, VFXLN, brittle, very well cemented, cherty Ls, some w/ small densely packed oolites, dense matrix, slick & porcelain like, chips of sharp angular bedded chert w/ conchoidal fracturing

Lm- Buff Gray, VFXLN, brittle, cryptocrystalline w/ no visible grains, scctrd dense secondary micro XLN porosity, few chips of cream sl fsl mudstone, very well cemented w/ no visible porosity

Lm- Gray Buff, Fine grn., dense poorly cemented algal Ls, soft

Sh- Drk & Lt Gray Lm Green, soft, smooth, few calcareous off white chips

Sh- Black Gray Lime Green, fissile, carbonaceous, sl. unconsolidated & pebbly, waxy

**FT. SCOTT 4245' (-1755) E-LOG** Lm- Cream Tan, FXLN, oolitic, mostly dense, slick w/ tightly cemented matrix & minimal visible porosity, LT SCTRD STN, THIN GSY SHEEN, SL GSY SFO, FNT THIN GSY ODR, few chips of oolitic biomicrite, loosely cemented w/ scctrd introolite porosity, few chips of dense, lithofied mud matrix, no visible porosity

Lm- Tan, F-Med XLN, oolitic biomicrite w/ sparry cementation, semi-brittle, fairly consistant intraoolite porosity, LT GSY STN, SL GSY SFO UPON CRUSH, FR ODR UPON CRUSH, DULL FLOR. NO STRM WET CUT

Lm- Cream Tan, Med XLN, oolitic, well developed w/ ppt & scctrd vugular porosity, dense fenestral porosity, LT GSY STN, THIN GSY SHEEN UPON CRUSH, FNT ODR, DULL FLOR, SLOW DULL STRM WET CUT

**CHEROKEE SHALE 4274' (-1784) E-LOG** Sh- Black, fissile carbonaceous, slaty

Lm- Mix of Cream FXLN, dense, loosely cemented, sl. fsl w/ scctrd ppt porosity w/ LT GOLDEN SCTRD STN. SL SH OF LIVELY FO UPON CRUSH and Off White fine gr., gritty, very well cemented, chalky in part, scctrd planar solution veins w/ sl recrystallization w/in, DRK BLK STN ALONG PLANAR EDGES, SL GILSONITIC, NO SFO, FNT ODR IN CUP

Lm- Cream Tan, FXLN, mostly sub-cryptocrystalline w/ minimal visible grains, semi-brittle, few chips of crumbly, sl. chalky Ls, w/ scctrd ppt porosity

Sh- Black, fissile, carbonaceous, thin slivers, sl gritty

Lm- Cream Tan, F-Med XLN, scctrd development, sl. fsl, scctrd ppt porosity, few chips w/ scctrd vuggy porosity, LT GSY STN, GSY FO UPON CRUSH, LT GSY ODR

Lm- Cream Tan, mix of FLXN, semi-brittle, sl. fsl. dense XLN porosity, SCTRD LT BRWN STN, SL SFO UPON CRUSH, NO ODR, lithofied, well cemented, mudstone, massive, and chips of bedded chert w/ scctrd wispy inclusions

Lm, Tan, FXLN, semi-brittle, very dense secondary XLN porosity, LT GSY STN, SL SFO UPON CRUSH, FNT ODR UPON CRUSH, few sand clusters, clear-frosted, friable, one w/ LT STN, NO SFO, NO ODR, chalky

Sh- Abundant white sticky chalk

Sh- Lm Green Maroon Gray, waxy, sl. unconsolidated slivers, maroon wash

Ss- Clear, VF Grn., white non-Ca cemented matrix, very friable, consolidated, sub-angular

**MISSISSIPPIAN 4349' (-1859) E-LOG** Dolomite- White- Buff, FXLN, sucrosic, well cemented & consolidated, good consistant ppt porosity throughout, SCTRD GOLDEN BRWN STN, FEW CHIPS W/ LIVELY FO UPON CRUSH, FR ODR  
40" Smpl- A/A, mostly barren porosity, few chips w/ STN A/A, FNT ODR

MINI TRIP SURVEY  
DST #4 MISSISSIPPIAN 4252 - 4353

