

KANSAS CORPORATION COMMISSION  
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**

**ORIGINAL**

OPERATOR: License # 33711  
Name: B-C STEEL, LLC  
Address 1: 209 n FRY  
Address 2: P.O. BOX 326  
City: YATES CENTER State: KS Zip: 66783 +  
Contact Person: BERT CARLSON  
Phone: (620) 485-6064  
CONTRACTOR: License # 33734  
Name: HAT DRILLING  
Wellsite Geologist: MARK BRECHISEN  
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 #: \_\_\_\_\_

4/4/2011    4/7/2011  
Spud Date or    Date Reached TD    Completion Date or  
Recompletion Date    Recompletion Date

API No. 15 - 035-2479-0000  
Spot Description: \_\_\_\_\_  
\_\_\_\_\_<sup>NW4</sup> Sec. 19 Twp. 31 S. R. 8  East  West  
970 Feet from  North /  South Line of Section  
10,078 Feet from  East /  West Line of Section  
Footages Calculated from Nearest Outside Section Corner:  
 NE  NW  SE  SW  
County: COWLEY  
Lease Name: COPPER HIATT Well #: 19-2  
Field Name: RADCLIFF NORTHEAST  
Producing Formation: ALTAMONT  
Elevation: Ground: 1428 Kelly Bushing: \_\_\_\_\_  
Total Depth: 2834 Plug Back Total Depth: 1156  
Amount of Surface Pipe Set and Cemented at: 455 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: 3000 bbls  
Dewatering method used: EVAPORATED  
Location of fluid disposal if hauled offsite: \_\_\_\_\_  
Operator Name: \_\_\_\_\_  
Lease Name: \_\_\_\_\_ License #: \_\_\_\_\_  
Quarter \_\_\_\_\_ Sec. \_\_\_\_\_ Twp. \_\_\_\_\_ S. R. \_\_\_\_\_  East  West  
County: \_\_\_\_\_ Permit #: \_\_\_\_\_

**INSTRUCTIONS:** An original and two copies of this form shall be filed with the Kansas Corporation Commission, 130 S. Market - Room 2078, Wichita, Kansas 67202, within 120 days of the spud date, recompletion, workover or conversion of a well. Rule 82-3-130, 82-3-106 and 82-3-107 apply. Information of side two of this form will be held confidential for a period of 12 months if requested in writing and submitted with the form (see rule 82-3-107 for confidentiality in excess of 12 months). One copy of all wireline logs and geologist well report shall be attached with this form. ALL CEMENTING TICKETS MUST BE ATTACHED. Submit CP-4 form with all plugged wells. Submit CP-111 form with all temporarily abandoned wells.

**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.

Signature: [Signature]  
Title: Agent Date: July 20 2011

**KCC Office Use ONLY**

- Letter of Confidentiality Received  
Date: \_\_\_\_\_  
 Confidential Release Date: \_\_\_\_\_  
 Wireline Log Received  
 Geologist Report Received  
 UIC Distribution  
\_\_\_\_\_ Alt-Dr-7/27/11  
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**JUL 22 2011**  
**KCC WICHITA**

Operator Name: B-C STEEL, LLC Lease Name: COPPER HIATT Well #: 19-2  
 Sec. 19 Twp. 31 S. R. 8  East  West County: COWLEY

**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  Yes  No  
*(Attach Additional Sheets)*

Samples Sent to Geological Survey  Yes  No

Cores Taken  Yes  No

Electric Log Run  Yes  No

Electric Log Submitted Electronically  Yes  No  
*(If no, Submit Copy)*

Log Formation (Top), Depth and Datum  Sample

Name Top Datum

List All E. Logs Run:  
**DUAL INDUCTION LL3/GR LOG & GAMMA RAY**  
**NEUTRON CEMENT BOND LOG**

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
LONGSTRING	8 1/4	6 3/4	9.5	2428	THICKSET	80	KOL-SEAL
SURFACE		8.625		455	THICKSET	135	KOL-SEAL

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 (Amount and Kind of Material Used)	Depth
29	2300-2350	3 1/8 SLICK SHOT	

TUBING RECORD: Size: 4 1/2 Set At: 2428 Packer At: \_\_\_\_\_ Liner Run:  Yes  No

Date of First, Resumed Production, SWD or ENHR. **STILL COMP.ETING** Producing Method:  Flowing  Pumping  Gas Lift  Other (Explain) \_\_\_\_\_

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 (Specify) _____	PRODUCTION INTERVAL <b>RECEIVED</b> <b>JUL 22 2011</b>
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**CONSOLIDATED**  
Oil Well Services, LLC



**ENTERED**

TICKET NUMBER 30318

LOCATION Eureka, KS

FOREMAN Shannon Felk

PO Box 884, Chanute, KS 66720  
620-431-9210 or 800-467-8676

**FIELD TICKET & TREATMENT REPORT**

**CEMENT API # 035-24392**

DATE	CUSTOMER #	WELL NAME & NUMBER	SECTION	TOWNSHIP	RANGE	COUNTY																
4-8-11		Cooper-Hiatt 19-2	19	31	8 E	Cowley																
CUSTOMER <u>B.C. Steel LLC</u>			<table border="1"> <thead> <tr> <th>TRUCK #</th> <th>DRIVER</th> <th>TRUCK #</th> <th>DRIVER</th> </tr> </thead> <tbody> <tr> <td>485</td> <td>Alan</td> <td></td> <td></td> </tr> <tr> <td>479</td> <td>Chris</td> <td></td> <td></td> </tr> <tr> <td>437</td> <td>Jim</td> <td></td> <td></td> </tr> </tbody> </table>				TRUCK #	DRIVER	TRUCK #	DRIVER	485	Alan			479	Chris			437	Jim		
TRUCK #	DRIVER	TRUCK #					DRIVER															
485	Alan																					
479	Chris																					
437	Jim																					
MAILING ADDRESS <u>209 N Fry</u>																						
CITY <u>Yates Center</u>																						
STATE <u>KS</u>		ZIP CODE <u>66783</u>																				

JOB TYPE 4/5 HOLE SIZE 6 3/4 HOLE DEPTH 2834' CASING SIZE & WEIGHT 4 1/2" 9.5#  
 CASING DEPTH 2428 DRILL PIPE \_\_\_\_\_ TUBING \_\_\_\_\_ OTHER \_\_\_\_\_  
 SLURRY WEIGHT 13.5# SLURRY VOL 25 BBL WATER gal/sk 8.0 gal/sk CEMENT LEFT IN CASING None  
 DISPLACEMENT 39.7 DISPLACEMENT PSI 500-1000 MIX PSI 200 psi RATE 4 1/2 BBL/min

REMARKS: Safety Meeting, Rig up to 4 1/2" casing. Break circulation with 10 BBL Fresh water. Mixed 80 SKS thick set cement w/5# Kol-seal/sk & 1/2# Phenoseal/sk. Wash out pump & lines. Shut down release 4 1/2" rubber plug. Displace with 39.7 BBL Fresh water. Final pumping pressure of 500 psi bumped plug to 1000 psi. Wait 2 minutes. Good circulation @ all times, Float & plug held. Rig down. Job Complete

"Thanks Shannon & Crew"

ACCOUNT CODE	QUANTITY or UNITS	DESCRIPTION of SERVICES or PRODUCT	UNIT PRICE	TOTAL
5401	1	PUMP CHARGE	975.00	975.00
5406	55	MILEAGE	4.00	220.00
1126 A	80 SKS	Thick Set Cement	18.30	1464.00
1110 A	400#	5# Kol-Seal/sk	.44	176.00
1107 A	40#	1/2# Phenoseal/sk	1.22	48.80
5407	4.4 tons	Ton mileage bulk truck	m/l	330.00
5502C	6 hrs	80 BBL Vac Truck	90.00/HR	540.00
1123	3000 gal	City Water	15.60/1000	46.80
4404	1	4 1/2 Rubber Plug	42.00	42.00
			RECEIVED	
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			KCC WICHITA	
			6.8%	SALES TAX
				ESTIMATED TOTAL

Rev'n 3737

040108

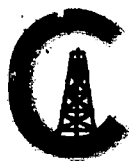
AUTHORIZATION [Signature]

TITLE \_\_\_\_\_

DATE 4-8-11

I acknowledge that the payment terms, unless specifically amended in writing on the front of the form or in the customer's account records, at our office, and conditions of service on the back of this form are in effect for services identified on this form.

3842.60  
180.88  
3963.48



**CONSOLIDATED**  
Oil Well Services, LLC

**REMIT TO**  
Consolidated Oil Well Services, LLC  
Dept. 970  
P.O. Box 4346  
Houston, TX 77210-4346

MAIN OFFICE  
P.O. Box 884  
Chanute, KS 66720  
620/431-9210 • 1-800/467-8676  
FAX 620/431-0012

**INVOICE**

Invoice # 240708

Invoice Date: 04/25/2011 Terms:

Page 1

B.C. STEEL GAS LLC  
209 N. FRY  
P.O. BOX 326  
YATES CENTER KS 66783  
(620) 625-2999

COOPER HIATT 19-2  
30318  
19-31-8E  
04-08-11  
KS

Part Number	Description	Qty	Unit Price	Total
1126A	THICK SET CEMENT	80.00	18.3000	1464.00
1110A	KOL SEAL (50# BAG)	400.00	.4400	176.00
1107A	PHENOSEAL (M) 40# BAG)	40.00	1.2200	48.80
1123	CITY WATER	3000.00	.0156	46.80
4404	4 1/2" RUBBER PLUG	1.00	42.0000	42.00

Description	Hours	Unit Price	Total
437 80 BBL VACUUM TRUCK (CEMENT)	6.00	90.00	540.00
479 MIN. BULK DELIVERY	1.00	330.00	330.00
485 CEMENT PUMP	1.00	975.00	975.00
485 EQUIPMENT MILEAGE (ONE WAY)	55.00	4.00	220.00

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Parts:	1777.60	Freight:	.00	Tax:	120.88	AR	3963.48
Labor:	.00	Misc:	.00	Total:	3963.48		
Sublt:	.00	Supplies:	.00	Change:	.00		

Signed \_\_\_\_\_

Date \_\_\_\_\_

BARTLESVILLE, Ok  
918/338-0808

ELDORADO, KS  
316/322-7022

EUREKA, KS  
620/583-7664

GILLETTE, WY  
307/686-4914

OAKLEY, KS  
785/672-2227

OTTAWA, KS  
785/242-4044

THAYER, KS  
620/839-5269

WORLAND, WY  
307/347-4577



# Invoice

## McPherson Drilling Co.

15256 112th Road  
Winfield, Kansas 67156

Phone/Fax: 620-221-3560

**Customer:**

BC Management Services Corp.  
1432 Nighthawk Rd  
Yates Center, KS 66783

**Date:**

2/15/2011

**Invoice No.:**

20110215

**Terms:**

Due on receipt

DESCRIPTION	QTY	RATE	AMOUNT
Lease name: Cooper Hiatt 19-2	455	12.50	5,687.50
Drilled to 455'; 450' 8 5/8" casing			
Cementing: 135 sax pos mix 60/40		3,000.00	3,000.00
<i>Paid Previous 8642</i>			

**Total** \$8,687.50

**Payments/Credits** \$-8,687.50

**Balance Due** \$0.00

**Thank you for your business!**

*Bill McPherson*

If mailing payment please send to:  
McPherson Drilling Co.  
PO Box 41  
Burden, KS 67019

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Geological Report

Cooper Hiat #19-2  
970' FNL; 10,078' FEL  
Cowley County, KS

**Operator:** B-C Steel, LLC., C/O Bert Carlson, 209 North Fry, Yates Center, KS, 66783.

**Drilling Contractor:** Hat Drilling. Midway Mud Rotary Rig #2.

**Wellsite Geologist:** Mark Brecheisen.

**Dates Drilled:** April 4<sup>th</sup>, 2011 to April 7<sup>th</sup>, 2011.

**Size Hole:** 8 1/4"

**Total Depth:** 2834'

**Elevation:** 1428'

**Drilling Fluid:** Freshwater bentonite and additives.

**Surface Casing:** 450' of 8-5/8" casing cemented with 135 sx of cement to surface.

**Formation Tops:** Formation tops were picked from the electric logs.

**Field Name:** Radcliff, Northeast.

**Status:** Oil/Gas Well.

**Oil Shows:** Layton Sandstone @2020'-2030' & 2040'-2050'.  
Kansas City Limestone @2072'-2076'.  
Hertha Limestone @2237'-2240'.

**Gas Shows:** Layton Sandstone @2022'-2024', 47 unit gas kick on hot wire.  
Layton Sandstone @2026'-2036', 60 unit gas kick on hot wire.  
Kansas City Limestone @2072'-2075', 76 unit gas kick on hot wire.  
Hertha Limestone @2223'-2225' & 2237'-2240', 38 and 15 unit gas kick on hot wire respectively.  
Cleveland Sandstone @2314'-2354', 380 unit gas kick on hot wire.

**Water Encountered:** No appreciable water encountered upon drilling.

**On Location:** April 4<sup>th</sup>, 2011, 3:40 pm. Left location @ TD, Well Depth of 2834' @ 10:28 am, April 7<sup>th</sup>, 2011.

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0'-1500': Samples not examined.

1500'-1537': Shale, medium to medium dark gray, silty to sandy in part with visible sand laminations scattered throughout. Traces of red shale present. No fluorescence no petroliferous odor/show.

1537'-1569': Shale, medium to dark gray, soft, greasy silty to sandy in part.

**Top of Iatan Limestone @1569'(-141'), top of the Pedee Group**

1569'-1573': Limestone, pale yellowish brown, fine crystalline, fairly friable, some traces of inter-crystalline porosity present. No visible oil stain. No fluorescence, no petroliferous odor/show.

1573'-1593': Shale, medium to dark gray, silty to sandy in part, slightly micaceous.

1593'-1602': Stalnaker Sandstone, very light gray to medium gray, very fine grained, well sorted with sub-angular to well-rounded grains. Fair to excellent friability. Micaceous, and pyritic in part. No visible oil stain present. No fluorescence. No petroliferous odor/show.

1602'-1609': Shale, medium gray, silty to sandy.

1609'-1610': Coal, thinly banded with alternating vitreous and dull bands. Conchoidal fracturing present. Less than 10% flat cleat faces.

1610'-1626': Shale, medium to medium dark gray, silty with some visible sandstone laminae. No fluorescence. No petroliferous odor/show.

1626'-1637': Stalnaker Sandstone, very light to light gray, very fine grained, well-sorted with sub angular to well-rounded grains. Very friable, very clean. No visible oil stain present. Very homogenous sandstone. Trace of mottled, dull, yellow mineral fluorescence. No petroliferous odor/show.

1637'-1717': Shale, medium to medium dark gray, soft and greasy to silty and sandy. Few sandstone partings present. Traces of pale green and red shale present. Overall, no fluorescence, no petroliferous odor/show.

**Top of Lansing Group @1717'(-289')**

1717'-1740': Limestone, pale yellowish brown to olive gray, fine to medium crystalline, mottled in part, fossiliferous. From 1730'-1736' some visible porosity present from Oolitic Limestone. This section exhibited good friability, however there was no oil present. Overall, 50% even, dull yellow mineral fluorescence. No petroliferous odor/show.

1740'-1784': Shale, medium-dark to dark gray, calcareous in part. Few scattered limestone partings present. 5-10% mottled to even, variegated yellow mineral fluorescence. No petroliferous odor/show.

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- 1784'-1790': Limestone, olive gray, fine to medium crystalline, mottled, hard. No visible porosity. 20% mottled to even, variegated yellow mineral fluorescence. No petroliferous odor/show.
- 1790'-1809': Shale, medium-dark gray, with few limestone partings.
- 1809'-1818': Limestone, olive gray, fine to medium crystalline, hard dense. No fluorescence. No petroliferous odor/show.
- 1818'-1868': Shale, medium dark gray. Traces of pyrite present. Scattered limestone partings throughout.
- 1868'-1882': Limestone, dark yellowish brown to olive gray, fine to medium crystalline, hard, dense, sucrosic, fossiliferous. Traces of pyrite present. Traces of dark gray shale present. 5% mottled to even, bright yellow mineral fluorescence. No petroliferous odor/show.

**Base of the Lansing Group @1882' (-452)**

- 1882'-1956': Shale, medium to medium dark gray, soft, slightly silty, with traces of red shale present. Few scattered limestone partings present. Sample overall exhibited no fluorescence. No petroliferous odor/show.
- 1956'-1959': Limestone, olive gray, fine to medium crystalline, mottled, hard, fossiliferous. No fluorescence. No petroliferous odor/show.
- 1959'-1980': Shale, medium to medium dark gray, silty to sandy, micaceous. Trace sandstone, medium gray, very fine grained, well sorted with sub-angular to sub-rounded grains, micritic. No visible oil stain present.

**Top of Iola Limestone @1980' (-552')**

- 1980'-1982': Limestone, pale yellowish-brown to olive gray, fine to coarse crystalline, mottled, hard. Trace pyrite. No fluorescence. No petroliferous odor/show.
- 1982'-1992': Shale, medium-dark gray. Limestone parting from 1990'-1991'. No fluorescence. No petroliferous odor/show.
- 1992'-2017': Layton (A) Sandstone, light to medium gray, very fine grained, well-sorted with sub-angular to well-rounded grains, fairly friable, micaceous in part, argillaceous in part. Traces of black bitumen on few sample surfaces-no cut observed. Shale partings present. No fluorescence. No petroliferous odor/show. This sandstone is very shaley and is of no commercial value.
- 2017'-2054': Layton (B) Sandstone, light gray to light brown, very fine grained, well-sorted with sub-angular to well-rounded grains. Fair to good friability. Oil shows are as follows:
- 2020'-2030': Nice visible oil stain on many samples. Wet acetone cut left visible oil floating in dimple tray from several samples. Overall, samples exhibited a slow, even, fair, milky-blue cut. Fair oil saturation in rock samples. 20% even, bright yellow hydrocarbon

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fluorescence. Good petroliferous odor, fair to good show. A 47 unit gas kick was observed when this interval was drilled.

- 2030'-2040': Trace of visible light brown oil stain on few samples. Trace, even, bright yellow hydrocarbon fluorescence. No petroliferous odor/show. A 60 unit gas kick was observed that spanned this and part of previous interval.
- 2040'-2050': Sandstone samples exhibited a 10% even, bright yellow hydrocarbon fluorescence. Slow, even, fair, milky-blue cut. No residual show to tray after cut. Strong petroliferous odor, fair show.

This entire section has good permeability, as well as strong gas and oil indications. It should definitely be considered for commercial oil and gas production.

#### **Top of Kansas City Limestone @2054'(-626')**

2054'-2076': Limestone, pale yellowish brown, fine crystalline, mottled, no visible inter-crystalline porosity. Few visible shale partings present. Overall, 60% pinpoint to mottled, variegated mineral fluorescence. No petroliferous odor/show. A drilling break was encountered from 2072'-2075'. A description of that interval is as follows:

- 2072'-2076': Limestone, pale yellowish brown, fine to coarse crystalline, fair to excellent friability. Good vugular and oolitic porosity present in some samples. Visible light brown oil stain on oolitic limestone samples. Some gas bubbles observed in voids between oolites. Oil saturation fair to good in oolitic samples. 40% mottled to even variegated hydrocarbon and mineral fluorescence present. Wet acid cut revealed fair to good residual oil show to tray, after sample was dissolved. Approximately 20% of sample has vugular and oolitic porosity—these samples have the oil saturation. Strong petroliferous odor, fair show. It should be noted that oil was visible on the mud pits after cutting this zone, as well as a strong petroliferous odor observed from the drilling platform. A 76 unit gas kick was observed when drilling this interval.

2076'-2127': Shale, medium-dark gray, silty, calcareous in part. Inter-bedded limestone throughout section—olive gray, fine crystalline, hard, gritty texture. No visible porosity. Overall, 10% even, dull, bluish yellow mineral fluorescence. No petroliferous odor/show.

2127'-2164': Limestone, dark yellowish brown to olive gray, fine crystalline, mottled, hard, sucrosic. No visible inter-crystalline porosity. Some inter-bedded shale present. 40% mottled, dull, bluish yellow mineral fluorescence. No petroliferous odor/show.

2164'-2167': Stark shale, black, gritty texture, fissile, carbonaceous.

2167'-2185': Limestone, dark yellowish brown to olive gray, fine crystalline, hard. Traces of inter-bedded shale present. 25% mottled to even, very dull to bright, yellow mineral fluorescence. No petroliferous odor/show.

2185'-2190': Sandstone, light to medium gray, very fine grained, well-sorted with sub-angular to sub-rounded grains, very friable, micaceous. Traces of black bitumen on few samples. No fluorescence. No petroliferous odor/show.

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JUL 22 2011

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2190'-2216': Limestone, pale yellowish brown to olive black, fine to medium crystalline, fairly friable. Some pinpoint porosity is visible on few rock samples. No oil stain present. Trace mottled, very dull, bluish yellow mineral fluorescence. No petroliferous odor/show.

2216'-2220': Shale, dark gray.

2220'-2222': Hushpuckney Shale, black, slightly gritty, carbonaceous, trace of vitrain coal present.

**Top of the Hertha Limestone@2222'(-794')**

2222'-2291': Limestone, pale yellowish brown to olive gray, fine crystalline, fairly friable, mottled, slightly sucrosic. A drilling break was observed from 2233'-2235'. Samples contained no oil, but a 38 unit gas kick was observed on the hotwire. From 2237'-2240' a second drilling break was observed. A few samples from this interval had light brown oil stain covering their surface. Poor to fair oil saturation within samples. Vugular porosity in samples with oil stain. Slow, uneven, fair milky blue cut. No residual oil to tray after cut. Less than 10% mottled to even, bright yellow hydrocarbon fluorescence. Fair petroliferous odor, poor show. A 15 unit gas kick was observed after drilling this interval.

2291'-2302': Shale, dark gray to black, carbonaceous. Trace vitrain coal present. No fluorescence. No petroliferous odor/show.

**Top of Lenepah Limestone @2302'(-874')**

2302'-2306': Limestone, pale yellowish brown to olive gray, fine crystalline, hard, dense, sucrosic, glauconitic. No visible porosity. 30% mottled to even, variegated mineral fluorescence. No petroliferous odor/show.

2306'-2314': Shale, light to medium gray, silty to sandy.

2314'-2359': Cleveland Sandstone, very light gray to light gray, fine grained, well-sorted with sub-angular to well-rounded grains, excellent friability, very glauconitic. 2340'-2350' interval was only sample interval with a show of oil, but only one rock sample was found that had oil stain. It had a fast, even, fair milky blue cut, but no real saturation within that sample. At 2337' the hotwire alarm went off—a 380 unit gas kick was observed for a few minutes before dropping back to 100 units. The hotwire stayed at 100 units throughout the drilling of the rest of the Cleveland section and below the Altamont Limestone until approximately 2400'. Overall, sandstone exhibited good to strong petroliferous odor, with no oil show. Because of hotwire and electric log indicators, I would complete this zone for commercial gas production.

2359'-2373': Shale, medium to medium dark gray, silty in part.

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**Top of Altamont Limestone @2373'(-945')**

2373'-2390': Limestone, pale yellowish-brown to olive gray, fine crystalline, fairly friable with traces of pinpoint porosity present. 25% pinpoint to mottled, variegated yellow mineral fluorescence. No petroliferous odor/show.

2390'-2406': Shale, medium to medium dark gray, silty to sandy, pyritic in part, inter-bedded limestone present.

2406'-2442': Peru Sandstone, light to medium gray, very fine grained, well-sorted with sub-angular to sub-rounded grains, very friable, argillaceous, micaceous in part. Shale laminae present. No visible oil stain present. Traces of black bitumen on few samples. Overall, trace of mottled, very dull, yellow mineral fluorescence. No petroliferous odor/show.

**Swivel Failure @ 4:30 am on April 5<sup>th</sup>, 2011.** Shut down to repair. Resume drilling at 5:45 am Wednesday April 6<sup>th</sup>, 2011.

**Hotwire** stopped working at 2432'—down until TD'd.

2442'-2452': Shale, medium gray to red, soft, greasy, fissile in part, pale yellowish brown limestone present. Overall, less than 3% mottled to even, bright yellow mineral fluorescence. No petroliferous odor/show.

**Top of the Pawnee Limestone @ 2452' (-1026')**

2452'-2484': Limestone, grayish red to dark yellowish brown, fine crystalline, hard dense, sucrosic, no visible porosity present. Black shale break from 2474'-2476'.

2484'-2488': Lexington Shale and Coal, black, carbonaceous. Coal, very pyritic, thinly banded.

2488'-2496': Shale, dark gray, fairly hard.

**Top of the Fort Scott Limestone @ 2496' (-1068')**

2496'-2516': Limestone, graying red to pale yellowish brown, fine crystalline, hard, dense, sucrosic. No visible porosity on any sample surfaces. Few scattered shale laminae present. 20% even, variegated, yellow mineral fluorescence. No petroliferous odor/show.

2516'-2522': Summit Shale, dark gray to black, slightly carbonaceous, fissile in part.

2522'-2529': Limestone, pale red to pale yellowish brown, fine to medium crystalline, hard, sucrosic, fossiliferous. No visible oil stain on rock samples. 15% even, medium bright yellow mineral fluorescence. No petroliferous odor/show.

2529'-2534': Mulky Shale and Coal, shale black, carbonaceous, traces of vitrain coal in sample.

2534'-2541': Calcareous Shale, pale yellowish brown, fine crystalline, hard. Trace dark brown oil on one sample surface. No saturation within rock itself. Appears to have a contact surface with oil-bearing formation, possibly the mulky coal. Fast, uneven, fair

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milky blue cut. No residual oil show to tray after cut. Very poor saturation. Trace of mottled, very dull yellow mineral fluorescence. No petroliferous odor, very slight show.

**Top of the Cherokee Group @ 2541' (-1113)**

2541'-2602': Shale, medium dark gray and red, soft, greasy. Calcareous shale present—dark yellowish brown, very hard, many flat surfaces exhibited on rock samples. No porosity, extremely tight. Minute pinpoint traces of oil liberated from these rock samples with hydrochloric acid cut. Oil is totally immobile, as there is no porosity in these samples. No fluorescence. No petroliferous odor/show.

**Top of the Ardmore (Verdigris) Limestone @ 2602' (-1174')**

2602'-2604': Limestone, olive gray, fine to medium crystalline, mottled, very hard, very dense, very fossiliferous. No visible porosity. 35% even, variegated, yellow mineral fluorescence. No petroliferous odor/show.

2604'-2608': Croweburg Shale and Coal, Shale—black, carbonaceous. Coal—durain to fusain, very dull with no vitrinite present. No fluorescence. No petroliferous odor/show.

2608'-2640': Shale, medium to medium dark gray with red shale present. Traces of limestone, sandstone, and pyrite present. Overall, less than 2% mottled to even, variegated, yellow mineral fluorescence. No petroliferous odor/show.

2640'-2641': Scammon Coal, finely banded vitrain coal, with many conchoidal fractures.

2641'-2658': Shale, light to dark gray with red and pale green shale present, soft, greasy, silty/sandy. Sandstone present in small quantities, light gray, very fine grained, well-sorted, with sub-angular to well-rounded grains. Very friable, very clean. Trace pyrite in limestone present. Overall, trace even, bright yellow mineral fluorescence. No petroliferous odor/show.

2658'-2662': Tebo Shale, dark gray, fairly soft, fissile in part, trace coal.

2662'-2687': Shale, medium gray to red, soft and greasy to silty/sandy. Sandstone laminae present, light to medium gray, very fine grained, well-sorted, with sub-angular to sub-rounded grains, very friable, no oil staining present. Trace pinpoint to mottled, variegated, yellow mineral fluorescence. No petroliferous odor/show.

2687'-2690': Weir Shale and Coal, shale—black, carbonaceous, traces of thinly banded vitrain coal present.

2690'-2720': Shale, medium to dark gray with red and pale green shale present. Scattered sandstone and limestone laminae present. Trace mottled to even, variegated, yellow mineral fluorescence. No petroliferous odor/show.

2720'-2742': Shale, medium dark gray with red shale present. Trace limestone—pale yellowish brown, fine crystalline, fairly hard. Trace sandstone. No fluorescence. No petroliferous odor/show.

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2742'-2774': Shale, medium dark to dark gray with red shale. Scattered traces of sandstone, black shale, and pyrite present.

**Jet Pits @ 2770' 1:30 am April 7<sup>th</sup>, 2011. Resumed drilling @ 6:35 am.**

2774'-2798': Shale, medium to medium dark gray with red shale present. Traces of sandstone and limestone present. Trace even, medium, bright yellow mineral fluorescence. No petroliferous odor/show.

2798'-2800': Riverton Coal, thinly banded vitraine coal, many conchoidal fractures, less than 10% flat cleat faces.

2800'-2803': Shale, dark gray, soft, greasy.

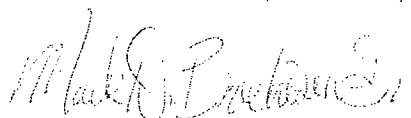
**Top of the Mississippian @ 2803' (-1375')**

2803'-2820': Shale, (60%) medium dark gray to dark gray, soft, greasy. Chert (30%) off-white to moderate yellow, hard, massive, amorphous, no porosity, no surface staining. Tripolitic Chert (10%) off-white to pale yellow, hard, vugular porosity present. No visible oil stain present. Sandstone (tr) light gray, fine grained. No oil staining present. No fluorescence. No petroliferous odor/show.

2820'-2834': Shale, (60%) medium dark gray. Limestone (35%) pale yellowish brown, fine to coarse crystalline, fairly hard, glauconitic in part, pinpoint and vugular porosity in few samples. No oil stain present. Pyritic in part. Chert (5%). 10% pinpoint to even, very dull, bluish yellow mineral fluorescence. No petroliferous odor/show.

TD 2834' @ 10:28 am, Thursday, April 7<sup>th</sup>, 2011.

**Note:** Oil was circulated out of annulus when cementing 4 1/2" casing—Brent Whiteman observing.



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(Mark D. Brecheisen)

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