

Confidentiality Requested:

Yes No

KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION

Form ACO-1

January 2018

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

Gas DH EOR

OG GSW

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 EOR Conv. to SWD

Plug Back Liner Conv. to GSW Conv. to Producer

Commingled Permit #: _____

Dual Completion Permit #: _____

SWD Permit #: _____

EOR Permit #: _____

GSW Permit #: _____

Spud Date or Date Reached TD Completion Date or Recompletion Date

API No.: _____

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 Drill Stem Tests Received

Geologist Report / Mud Logs Received

UIC Distribution

ALT I II III Approved by: _____ Date: _____

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 Geologist Report / Mud Logs <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				

1. Did you perform a hydraulic fracturing treatment on this well? Yes No *(If No, skip questions 2 and 3)*
2. Does the volume of the total base fluid of the hydraulic fracturing treatment exceed 350,000 gallons? Yes No *(If No, skip question 3)*
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)*

Date of first Production/Injection or Resumed Production/Injection:	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) (Submit ACO-4)</i>	PRODUCTION INTERVAL: Top Bottom
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Shots Per Foot	Perforation Top	Perforation Bottom	Bridge Plug Type	Bridge Plug Set At	Acid, Fracture, Shot, Cementing Squeeze Record <i>(Amount and Kind of Material Used)</i>

TUBING RECORD:	Size:	Set At:	Packer At:	
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Form	ACO1 - Well Completion
Operator	IA Operating, Inc.
Well Name	KELLER 28-1
Doc ID	1428544

Tops

Name	Top	Datum
Anhydrite	1554	+585
Topeka	3189	-1050
Heebner	3409	-1270
Toronto	3431	-1292
Lansing	3446	-1307
BKC	3671	-1532
Arbuckle	3757	-1618
LTD	3852	-1713

QUALITY OILWELL CEMENTING, INC.

Federal Tax I.D.# 20-2886107

Phone 785-483-2025
Cell 785-324-1041

Home Office P.O. Box 32 Russell, KS 67665

No. 974

Date	11-23-18	Sec.	28	Twp.	11	Range	20	County	Ellis	State	KS	On Location		Finish	3 ⁰⁰ P.M.
Location								Ellis 10 N Wiles Rd 1/2 W Sinto							

Lease	Keller	Well No.	#28-1	Owner	To Quality Oilwell Cementing, Inc. You are hereby requested to rent cementing equipment and furnish cementer and helper to assist owner or contractor to do work as listed.
Contractor	Discovery #1				
Type Job	Surface				
Hole Size	12 1/4	T.D.	221	Charge To	IA Operating
Csg.	8 5/8	Depth	220	Street	
Tbg. Size		Depth		City	State
Tool		Depth		The above was done to satisfaction and supervision of owner agent or contractor.	
Cement Left in Csg.	20'	Shoe Joint		Cement Amount Ordered	150 20/20 3% cc 2% Gel
Meas Line		Displace	12 3/4		

EQUIPMENT

Pumptrk	17	No.	Cementer		Common	120
			Helper	Brett	Poz. Mix	30
Bulktrk	14	No.	Driver		Gel.	3
			Driver	Doug	Calcium	6
Bulktrk		No.	Driver			
			Driver	Jack		

JOB SERVICES & REMARKS

Remarks:	Hulls	
Rat Hole	Salt	
Mouse Hole	Flowseal	
Centralizers	Kol-Seal	
Baskets	Mud CLR 48	
D/V or Port Collar	CFL-117 or CD110 CAF 38	
Ran 220' 8 5/8 + Est circulation	Sand	
Mix 150 sx down 8 5/8	Handling	159
Displaced 12 3/4 bbl	Mileage	

FLOAT EQUIPMENT

Guide Shoe	
Centralizer	
Baskets	
AFU Inserts	
Float Shoe	
Latch Down	

Pumptrk Charge	Surface
Mileage	25
Tax	
Discount	
Total Charge	

X Signature 

Thanks

QUALITY OILWELL CEMENTING, INC.

Federal Tax I.D.# 20-2886107

Phone 785-483-2025
Cell 785-324-1041

Home Office P.O. Box 32 Russell, KS 67665

No. 1079

Date	12-1-18	Sec.	28	Twp.	11	Range	20	County	Ellis	State	KS	On Location		Finish	9:15 PM
								Location							
								Ellis v Wilks Rd 1/2 W Sinto							

Lease	Keller	Well No.	28-1	Owner	To Quality Oilwell Cementing, Inc.
Contractor	Discovery #1	Top Stage		You are hereby requested to rent cementing equipment and furnish cementer and helper to assist owner or contractor to do work as listed.	
Type Job	DV JOD			Charge To	J.N. Operations
Hole Size	7 7/8	T.D.	3850	Street	
Csg.	5 1/2 15.5*	Depth	3845	City	
Tbg. Size		Depth		State	
Tool	DJ Tool #57	Depth	1554	The above was done to satisfaction and supervision of owner agent or contractor.	
Cement Left in Csg.		Shoe Joint		Cement Amount Ordered 350 @ 20 QMDC 1/4 # P10	
Meas Line		Displace	378L		

EQUIPMENT				Common	350 @ 20 QMDC
Pumptrk	20	No.	Cementor Helper	Poz. Mix	
Bulktrk		No.	Driver	Gel.	
Bulktrk	9	No.	Driver	Calcium	

JOB SERVICES & REMARKS				Hulls	
Remarks:				Salt	
Rat Hole 305K				Flowseal	87#
Mouse Hole 155K				Kol-Seal	
Centralizers				Mud CLR 48	
Baskets				CFL-117 or CD110 CAF 38	
D/V or Port Collar				Sand	
Plug Ratholes mousehole.				Handling	350
Cement 5 1/2 with 3055K				Mileage	
Clean lines Displace Plug				FLOAT EQUIPMENT	
Cement Circulated				Guide Shoe	
Received APPROX 50gx TO Pit				Centralizer	
				Baskets	
				AFU Inserts	
				Float Shoe	
				Latch Down	

				Pumptrk Charge	prod string
				Mileage	25
				Tax	
				Discount	
				Total Charge	

Signature: *[Handwritten Signature]*

Top Stage

QUALITY OILWELL CEMENTING, INC.

Federal Tax I.D.# 20-2886107

Phone 785-483-2025
Cell 785-324-1041

Home Office P.O. Box 32 Russell, KS 67665

No. 1078
Bottom Stage

Date	12-1-18	Sec.	28	Twp.	11	Range	20	County	Ellis	State	KS	On Location		Finish	8:00 PM
Lease								Keller		Well No.		28-1			
Contractor								Discover #1		Bottom Stage		Owner			
Type Job								DU Job				To Quality Oilwell Cementing, Inc. You are hereby requested to rent cementing equipment and furnish cementer and helper to assist owner or contractor to do work as listed.			
Hole Size				7 7/8				T.D.		3850					
Csg.				5 1/2 15.50*				Depth		3845					
Tbg. Size								Depth							
Tool				DU Tool #57				Depth		1554					
Cement Left in Csg.				42.08				Shoe Joint		42.08					
Meas Line								Displace		90 1/2 BL					
Location								Ellis v Wiles rd 1/2w Snto							

Charge To				I. A. Operating											
Street															
City				State											
The above was done to satisfaction and supervision of owner agent or contractor.															
Cement Amount Ordered				180 10% salt 5% Calsonite											
Common				Q Pro C 500 gal mud clear											
Poz. Mix				180 Q pro C											
Gel.															
Calcium															

EQUIPMENT

Pumptrk	20	No.	Cementer	Chris		
			Helper			
Bulktrk	9	No.	Driver	Glenn		
			Driver	Tom		
Bulktrk	15	No.	Driver	Sax		

JOB SERVICES & REMARKS

Remarks:	Salt 15
Rat Hole	Flowseal
Mouse Hole	Kol-Seal 900 #
Centralizers	Mud CLR 48 500 gal
Baskets	CFL-117 or CD110 CAF 38
D/V or Port Collar	Sand
5 1/2 set @ 3845. Insert @ 3803.	Handling 204
Ex. Circulation Pump 500 gal mud clear.	Mileage
Cement 5 1/2 with 180 sk clear	
lins. Dispac Plug 900 #	
11 FT Pressure Land LATCH	
Down Plug @ 1600 # Release	
Pressure # plug (held)	

FLOAT EQUIPMENT

Guide Shoe	
Centralizer	9
Baskets	1
AFU Inserts	DU Tool
Float Shoe	1
Latch Down	1

Thanks
[Signature]

Pumptrk Charge	prod string	Bottom Stage
Mileage	25	

X Signature *[Signature]*

Tax	
Discount	
Total Charge	



Company: IA Operating, Inc.

Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
 County: ELLIS
 State: Kansas
 Drilling Contractor: Discovery Drilling
 Company, Inc. - Rig 1
 Elevation: 2131 Sur
 Field Name: Cromb South
 Pool: Pool Ext.
 Job Number: 285

Operation:
 Uploading recovery &
 pressures

DATE
 November
28
 2018

DST #1 **Formation: Lan A-D** **Test Interval: 3428 - 3504'** **Total Depth: 3504'**

Time On: 00:17 11/28 Time Off: 07:00 11/28
 Time On Bottom: 02:50 11/28 Time Off Bottom: 04:50 11/28

Electronic Volume
 Estimate:
 3'

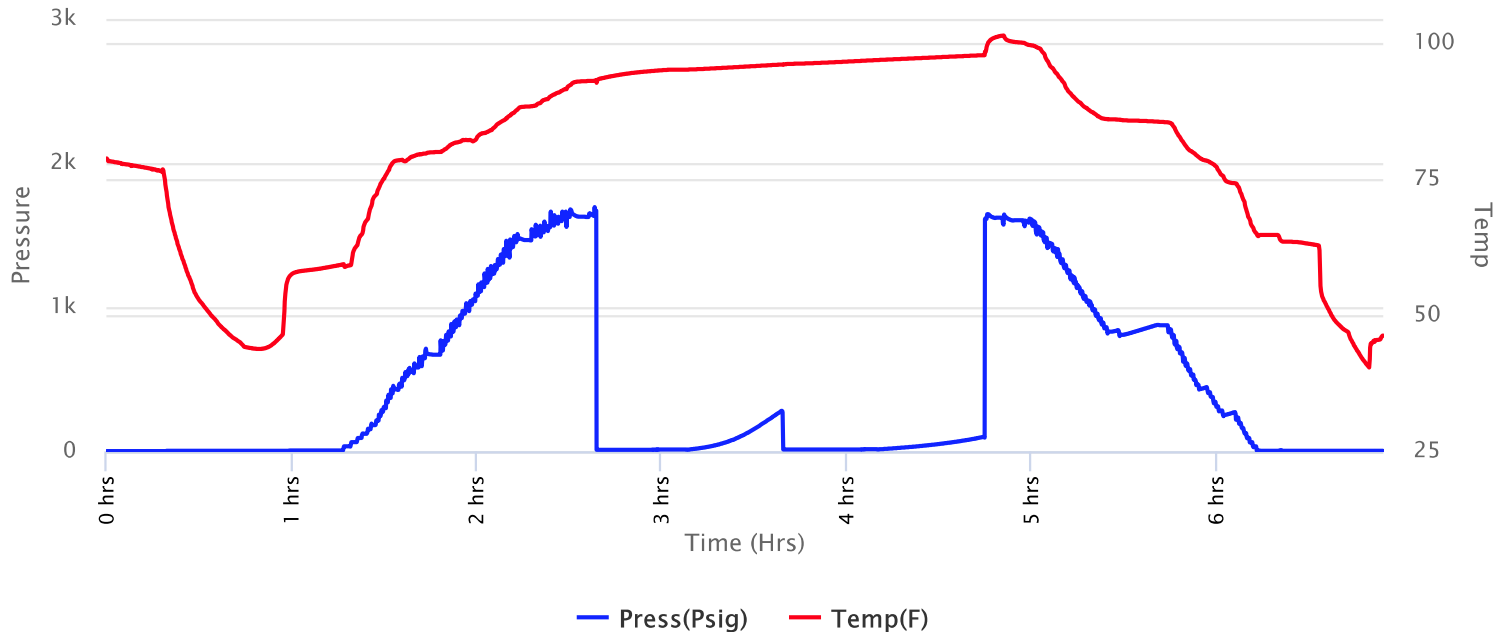
1st Open
 Minutes: 30
 Current Reading:
 .2" at 30 min
 Max Reading: .2"

1st Close
 Minutes: 30
 Current Reading:
 0" at 30 min
 Max Reading: 0"

2nd Open
 Minutes: 30
 Current Reading:
 0" at 30 min
 Max Reading: 0"

2nd Close
 Minutes: 30
 Current Reading:
 0" at 30 min
 Max Reading: 0"

Inside Recorder





Company: IA Operating, Inc.
Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
County: ELLIS
State: Kansas
Drilling Contractor: Discovery Drilling
Company, Inc. - Rig 1
Elevation: 2131 Sur
Field Name: Cromb South
Pool: Pool Ext.
Job Number: 285

Operation:
Uploading recovery &
pressures

DATE
November
28
2018

DST #1 **Formation: Lan A-D** **Test Interval: 3428 - 3504'** **Total Depth: 3504'**
Time On: 00:17 11/28 Time Off: 07:00 11/28
Time On Bottom: 02:50 11/28 Time Off Bottom: 04:50 11/28

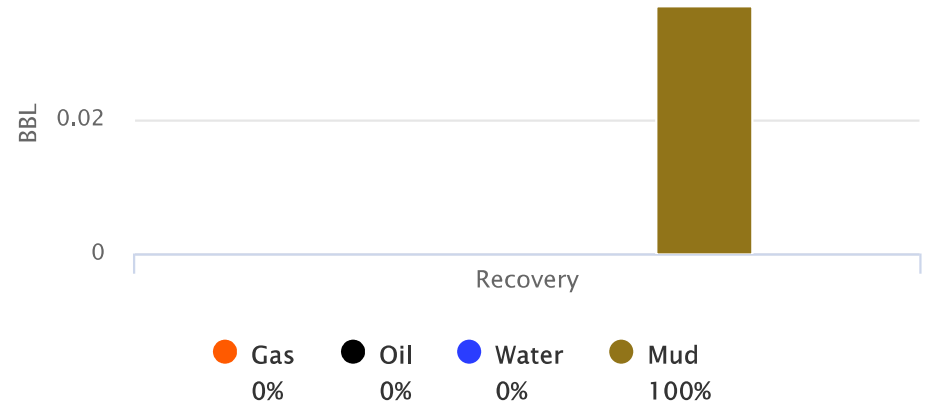
<u>Recovered</u>		<u>Description of Fluid</u>	<u>Gas %</u>	<u>Oil %</u>	<u>Water %</u>	<u>Mud %</u>
<u>Foot</u>	<u>BBLs</u>					
5	0.0371	M	0	0	0	100

Total Recovered: 5 ft
Total Barrels Recovered: 0.0371

Reversed Out
NO

Recovery at a glance

Initial Hydrostatic Pressure	1628	PSI
Initial Flow	11 to 12	PSI
Initial Closed in Pressure	280	PSI
Final Flow Pressure	13 to 14	PSI
Final Closed in Pressure	100	PSI
Final Hydrostatic Pressure	1622	PSI
Temperature	98	°F
Pressure Change Initial Close / Final Close	64.4	%





Company: IA Operating, Inc.

Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
County: ELLIS
State: Kansas
Drilling Contractor: Discovery Drilling
Company, Inc. - Rig 1
Elevation: 2131 Sur
Field Name: Cromb South
Pool: Pool Ext.
Job Number: 285

Operation:

Uploading recovery &
pressures

DATE

November
28
2018

DST #1 Formation: Lan A-D Test Interval: 3428 - Total Depth: 3504'
3504'

Time On: 00:17 11/28 Time Off: 07:00 11/28

Time On Bottom: 02:50 11/28 Time Off Bottom: 04:50 11/28

BUCKET MEASUREMENT:

Diesel in Bucket

1st Open: Built to .2

1st Close: No Blow

2nd Open: No Blow

2nd Close: No Blow

REMARKS:

Tool Sample: 0% Gas 0% Oil 0% Water 100% Mud



Company: IA Operating, Inc.
Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
County: ELLIS
State: Kansas
Drilling Contractor: Discovery Drilling
Company, Inc. - Rig 1
Elevation: 2131 Sur
Field Name: Cromb South
Pool: Pool Ext.
Job Number: 285

Operation:
Uploading recovery &
pressures

DATE
November
28
2018

DST #1 Formation: Lan A-D Test Interval: 3428 - 3504' Total Depth: 3504'
Time On: 00:17 11/28 Time Off: 07:00 11/28
Time On Bottom: 02:50 11/28 Time Off Bottom: 04:50 11/28

Down Hole Makeup

Heads Up: 21.76 FT	Packer 1: 3423.13 FT
Drill Pipe: 3104.73 FT <i>ID-3 1/2</i>	Packer 2: 3428.13 FT
Weight Pipe: 320 FT <i>ID-2 7/8</i>	Top Recorder: 3415.13 FT
	Bottom Recorder: 3502 FT
	Well Bore Size: 7 7/8

Collars: FT

ID-2 1/4

Test Tool: 26.16 FT

ID-3 1/2-FH

Total Anchor: 75.87

Anchor Makeup

Packer Sub: 1 FT

Perforations: (top): 6 FT

4 1/2-FH

Change Over: 1 FT

Drill Pipe: (in anchor): 63.87 FT

ID-3 1/2

Change Over: 1 FT

Perforations: (below): 3 FT

4 1/2-FH

Surface Choke: 1"

Bottom Choke: 5/8"



Company: IA Operating, Inc.
Lease: Keller #28-1

Operation:

SEC: 28 TWN: 11S RNG: 20W
County: ELLIS
State: Kansas
Drilling Contractor: Discovery Drilling
Company, Inc. - Rig 1
Elevation: 2131 Sur
Field Name: Cromb South
Pool: Pool Ext.
Job Number: 285

Uploading recovery &
pressures

DATE
November
28
2018

DST #1 **Formation: Lan A-D** **Test Interval: 3428 - 3504'** **Total Depth: 3504'**

Time On: 00:17 11/28

Time Off: 07:00 11/28

Time On Bottom: 02:50 11/28

Time Off Bottom: 04:50 11/28

Mud Properties

Mud Type: Chemical

Weight: 8.6

Viscosity: 56

Filtrate: 8

Chlorides: 6000 ppm



Company: IA Operating, Inc.
Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
County: ELLIS
State: Kansas
Drilling Contractor: Discovery Drilling
Company, Inc. - Rig 1
Elevation: 2131 Sur
Field Name: Cromb South
Pool: Pool Ext.
Job Number: 285

Operation:
Uploading recovery &
pressures

DATE
November
28
2018

DST #1 Formation: Lan A-D Test Interval: 3428 - Total Depth: 3504'
3504'
Time On: 00:17 11/28 Time Off: 07:00 11/28
Time On Bottom: 02:50 11/28 Time Off Bottom: 04:50 11/28

Gas Volume Report

1st Open

Time	Orifice	PSI	MCF/D
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2nd Open

Time	Orifice	PSI	MCF/D
------	---------	-----	-------



Company: IA Operating, Inc.

Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
 County: ELLIS
 State: Kansas
 Drilling Contractor: Discovery Drilling Company, Inc. - Rig 1
 Elevation: 2131 GL
 Field Name: Cromb South
 Pool: Pool Ext.
 Job Number: 285

Operation:
 Test Complete

DATE
 November
28
 2018

DST #2 Formation: Lan I-K Test Interval: 3576 - 3650' Total Depth: 3650'

Time On: 21:57 11/28 Time Off: 05:25 11/29
 Time On Bottom: 00:02 11/29 Time Off Bottom: 03:17 11/29

Electronic Volume Estimate:
 171'

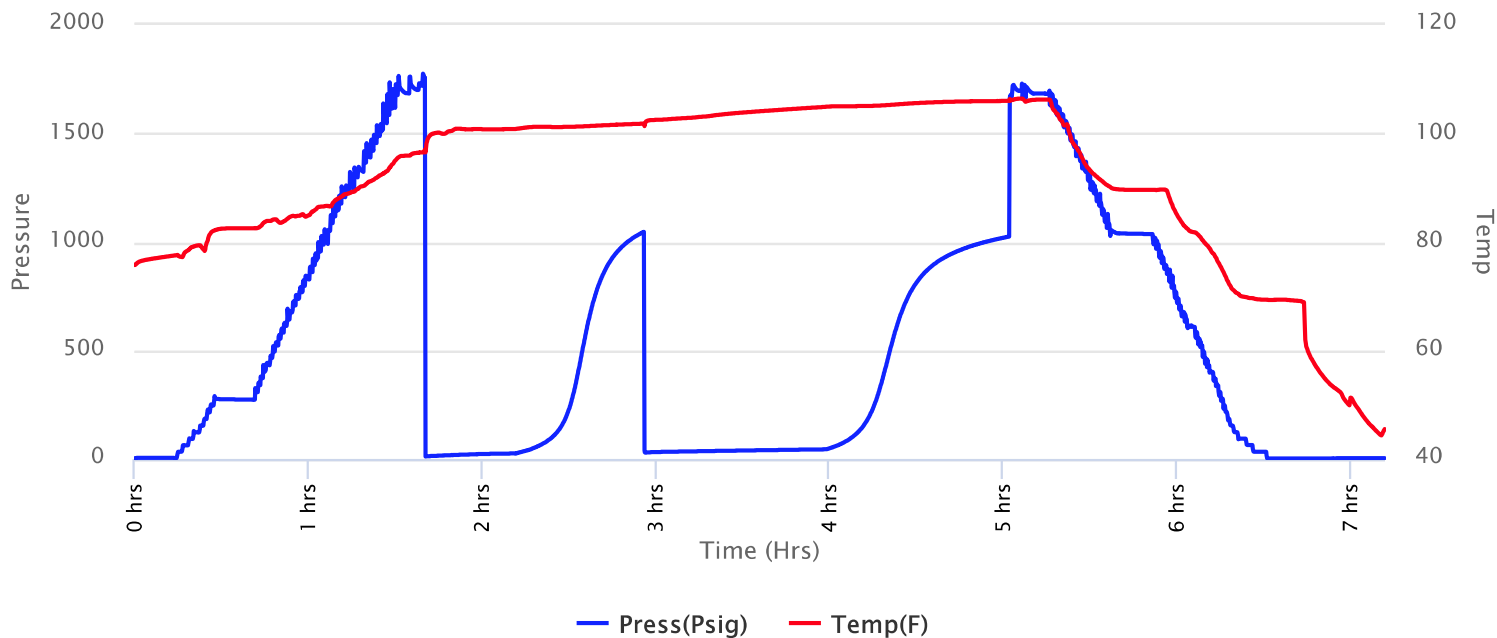
1st Open
 Minutes: 30
 Current Reading:
 3.2" at 30 min
 Max Reading: 3.2"

1st Close
 Minutes: 45
 Current Reading:
 0" at 45 min
 Max Reading: 0"

2nd Open
 Minutes: 60
 Current Reading:
 6.7" at 60 min
 Max Reading: 6.7"

2nd Close
 Minutes: 60
 Current Reading:
 0" at 60 min
 Max Reading: 0"

Inside Recorder





Company: IA Operating, Inc.
Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
County: ELLIS
State: Kansas
Drilling Contractor: Discovery Drilling
Company, Inc. - Rig 1
Elevation: 2131 GL
Field Name: Cromb South
Pool: Pool Ext.
Job Number: 285

Operation:
Test Complete

DATE
November
28
2018

DST #2 **Formation: Lan I-K** **Test Interval: 3576 - 3650'** **Total Depth: 3650'**
Time On: 21:57 11/28 Time Off: 05:25 11/29
Time On Bottom: 00:02 11/29 Time Off Bottom: 03:17 11/29

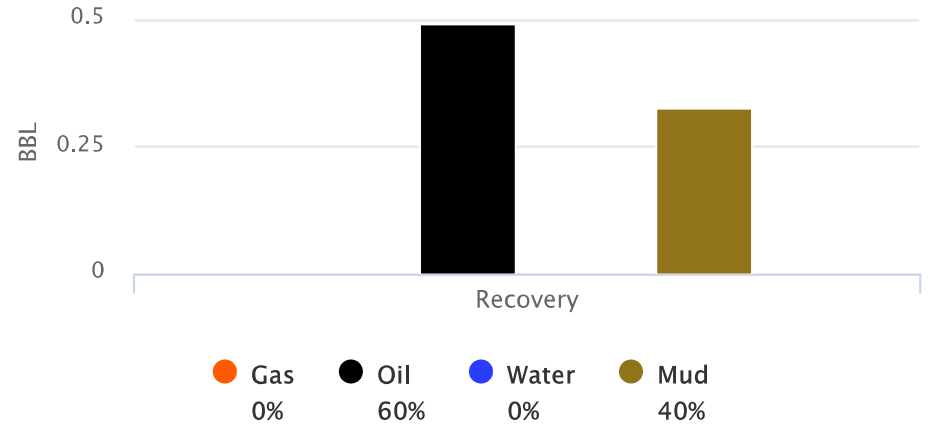
<u>Recovered</u>		<u>Description of Fluid</u>	<u>Gas %</u>	<u>Oil %</u>	<u>Water %</u>	<u>Mud %</u>
<u>Foot</u>	<u>BBLS</u>	HMCO	0	60	0	40

Total Recovered: 110 ft
Total Barrels Recovered: 0.8162

Reversed Out
NO

Recovery at a glance

Initial Hydrostatic Pressure	1723	PSI
Initial Flow	13 to 26	PSI
Initial Closed in Pressure	1047	PSI
Final Flow Pressure	29 to 45	PSI
Final Closed in Pressure	1025	PSI
Final Hydrostatic Pressure	1701	PSI
Temperature	106	°F
Pressure Change Initial Close / Final Close	2.1	%





Company: IA Operating, Inc.
Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
County: ELLIS
State: Kansas
Drilling Contractor: Discovery Drilling
Company, Inc. - Rig 1
Elevation: 2131 GL
Field Name: Cromb South
Pool: Pool Ext.
Job Number: 285

Operation:
Test Complete

DATE
November
28
2018

DST #2 **Formation: Lan I-K** **Test Interval: 3576 - 3650'** **Total Depth: 3650'**
Time On: 21:57 11/28 Time Off: 05:25 11/29
Time On Bottom: 00:02 11/29 Time Off Bottom: 03:17 11/29

Down Hole Makeup

Heads Up:	5.25000000000002 FT	Packer 1:	3571.13 FT
Drill Pipe:	3236.22 FT	Packer 2:	3576.13 FT
<i>ID-3 1/2</i>		Top Recorder:	3563.13 FT
Weight Pipe:	320 FT	Bottom Recorder:	3648 FT
<i>ID-2 7/8</i>		Well Bore Size:	7 7/8
Collars:	FT	Surface Choke:	1"
<i>ID-2 1/4</i>			

Test Tool: 26.16 FT

ID-3 1/2-FH

Bottom Choke: 5/8"

Total Anchor: 73.87

Anchor Makeup

Packer Sub: 1 FT

Perforations: (top): 5 FT

4 1/2-FH

Change Over: .5 FT

Drill Pipe: (in anchor): 63.87 FT

ID-3 1/2

Change Over: .5 FT

Perforations: (below): 3 FT

4 1/2-FH



Operation:

Test Complete

Company: IA Operating, Inc.
Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
County: ELLIS
State: Kansas
Drilling Contractor: Discovery Drilling
Company, Inc. - Rig 1
Elevation: 2131 GL
Field Name: Cromb South
Pool: Pool Ext.
Job Number: 285

DATE
November
28
2018

DST #2 **Formation: Lan I-K** **Test Interval: 3576 - 3650'** **Total Depth: 3650'**

Time On: 21:57 11/28 Time Off: 05:25 11/29

Time On Bottom: 00:02 11/29 Time Off Bottom: 03:17 11/29

Mud Properties

Mud Type: Chemical **Weight:** 8.8 **Viscosity:** 55 **Filtrate:** 8.8 **Chlorides:** 12000 ppm



Company: IA Operating, Inc.
Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
County: ELLIS
State: Kansas
Drilling Contractor: Discovery Drilling
Company, Inc. - Rig 1
Elevation: 2131 GL
Field Name: Cromb South
Pool: Pool Ext.
Job Number: 285

Operation:
Test Complete

DATE
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28
2018

DST #2 **Formation: Lan I-K** **Test Interval: 3576 - 3650'** **Total Depth: 3650'**
Time On: 21:57 11/28 Time Off: 05:25 11/29
Time On Bottom: 00:02 11/29 Time Off Bottom: 03:17 11/29

Gas Volume Report

1st Open

Time	Orifice	PSI	MCF/D
------	---------	-----	-------

2nd Open

Time	Orifice	PSI	MCF/D
------	---------	-----	-------



Company: IA Operating, Inc. Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
County: ELLIS
State: Kansas
Drilling Contractor: Discovery Drilling
Company, Inc. - Rig 1
Elevation: 2131 GL
Field Name: Cromb South
Pool: Pool Ext.
Job Number: 285

Operation:
Uploading recovery &
pressures

DATE
November
29
2018

DST #3 Formation: Arbuckle Test Interval: 3740 - 3755' Total Depth: 3755'

Time On: 20:27 11/29 Time Off: 03:54 11/30
Time On Bottom: 22:43 11/29 Time Off Bottom: 01:58 11/30

Electronic Volume
Estimate:
129'

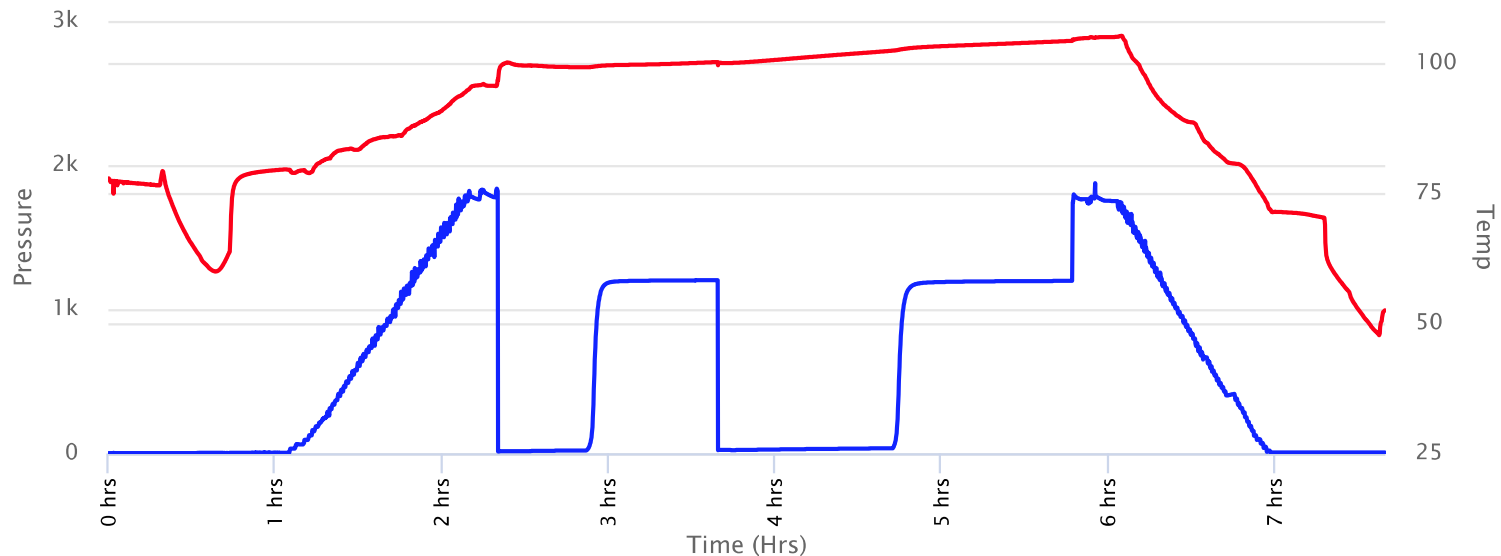
1st Open
Minutes: 30
Current Reading:
3.0" at 30 min
Max Reading: 3.0"

1st Close
Minutes: 45
Current Reading:
0" at 45 min
Max Reading: 0"

2nd Open
Minutes: 60
Current Reading:
4.1" at 60 min
Max Reading: 4.1"

2nd Close
Minutes: 60
Current Reading:
0" at 60 min
Max Reading: 0"

Inside Recorder



— Press(Psig) — Temp(F)



Company: IA Operating, Inc.
Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
 County: ELLIS
 State: Kansas
 Drilling Contractor: Discovery Drilling
 Company, Inc. - Rig 1
 Elevation: 2131 GL
 Field Name: Cromb South
 Pool: Pool Ext.
 Job Number: 285

Operation:
 Uploading recovery &
 pressures

DATE
 November
29
 2018

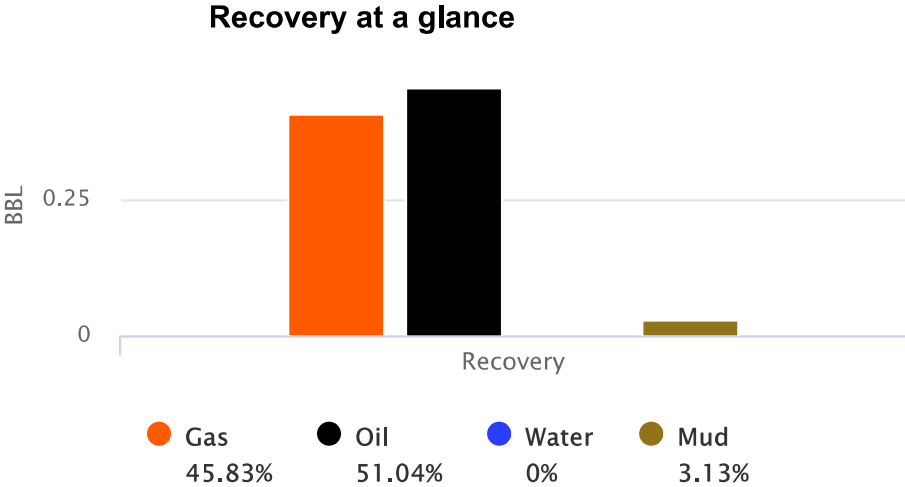
DST #3 Formation: Arbuckle Test Interval: 3740 - 3755' Total Depth: 3755'
 Time On: 20:27 11/29 Time Off: 03:54 11/30
 Time On Bottom: 22:43 11/29 Time Off Bottom: 01:58 11/30

<u>Recovered</u>		<u>Description of Fluid</u>	<u>Gas %</u>	<u>Oil %</u>	<u>Water %</u>	<u>Mud %</u>
<u>Foot</u>	<u>BBS</u>					
55	0.4081	G	100	0	0	0
60	0.4452	O	0	100	0	0
5	0.0371	OCM	0	25	0	75

Total Recovered: 120 ft
Total Barrels Recovered: 0.8904

Reversed Out
NO

Initial Hydrostatic Pressure	1780	PSI
Initial Flow	13 to 20	PSI
Initial Closed in Pressure	1201	PSI
Final Flow Pressure	23 to 36	PSI
Final Closed in Pressure	1197	PSI
Final Hydrostatic Pressure	1762	PSI
Temperature	105	°F
Pressure Change Initial Close / Final Close	0.4	%





Company: IA Operating, Inc.

Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
County: ELLIS
State: Kansas
Drilling Contractor: Discovery Drilling
Company, Inc. - Rig 1
Elevation: 2131 GL
Field Name: Cromb South
Pool: Pool Ext.
Job Number: 285

Operation:

Uploading recovery &
pressures

DATE

November
29
2018

DST #3 Formation: Arbuckle Test Interval: 3740 - Total Depth: 3755'
3755'

Time On: 20:27 11/29 Time Off: 03:54 11/30

Time On Bottom: 22:43 11/29 Time Off Bottom: 01:58 11/30

BUCKET MEASUREMENT:

Diesel in Bucket

1st Open: Built to 3"

1st Close: No Blow

2nd Open: Built to 4.1"

2nd Close: No Blow

REMARKS:

Tool Sample: 0% Gas 85% Oil 0% Water 15% Mud

Gravity: 24.5 @ 60 °F



Company: IA Operating, Inc.
Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
County: ELLIS
State: Kansas
Drilling Contractor: Discovery Drilling
Company, Inc. - Rig 1
Elevation: 2131 GL
Field Name: Cromb South
Pool: Pool Ext.
Job Number: 285

Operation:
Uploading recovery &
pressures

DATE
November
29
2018

DST #3 Formation: Arbuckle Test Interval: 3740 - 3755' Total Depth: 3755'
Time On: 20:27 11/29 Time Off: 03:54 11/30
Time On Bottom: 22:43 11/29 Time Off Bottom: 01:58 11/30

Down Hole Makeup

Heads Up: 32.69 FT	Packer 1: 3735 FT
Drill Pipe: 3427.53 FT <i>ID-3 1/2</i>	Packer 2: 3740 FT
Weight Pipe: 320 FT <i>ID-2 7/8</i>	Top Recorder: 3727 FT
	Bottom Recorder: 3753 FT
	Well Bore Size: 7 7/8

Collars: FT

ID-2 1/4

Test Tool: 26.16 FT

ID-3 1/2-FH

Total Anchor: 15

Anchor Makeup

Packer Sub: 1 FT

Perforations: (top): 11 FT

4 1/2-FH

Change Over: FT

Drill Pipe: (in anchor): FT

ID-3 1/2

Change Over: FT

Perforations: (below): 3 FT

4 1/2-FH

Surface Choke: 1"

Bottom Choke: 5/8"



Company: IA Operating, Inc.
Lease: Keller #28-1

Operation:

SEC: 28 TWN: 11S RNG: 20W
County: ELLIS
State: Kansas
Drilling Contractor: Discovery Drilling
Company, Inc. - Rig 1
Elevation: 2131 GL
Field Name: Cromb South
Pool: Pool Ext.
Job Number: 285

Uploading recovery &
pressures

DATE
November
29
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DST #3 Formation: Arbuckle Test Interval: 3740 - Total Depth: 3755'
3755'

Time On: 20:27 11/29

Time Off: 03:54 11/30

Time On Bottom: 22:43 11/29

Time Off Bottom: 01:58 11/30

Mud Properties

Mud Type: Chemical

Weight: 8.9

Viscosity: 56

Filtrate: 8.8

Chlorides: 9500 ppm



Company: IA Operating, Inc.
Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
County: ELLIS
State: Kansas
Drilling Contractor: Discovery Drilling
Company, Inc. - Rig 1
Elevation: 2131 GL
Field Name: Cromb South
Pool: Pool Ext.
Job Number: 285

Operation:
Uploading recovery &
pressures

DATE
November
29
2018

DST #3 Formation: Arbuckle Test Interval: 3740 - Total Depth: 3755'
3755'
Time On: 20:27 11/29 Time Off: 03:54 11/30
Time On Bottom: 22:43 11/29 Time Off Bottom: 01:58 11/30

Gas Volume Report

1st Open

Time	Orifice	PSI	MCF/D
------	---------	-----	-------

2nd Open

Time	Orifice	PSI	MCF/D
------	---------	-----	-------



Company: IA Operating, Inc.
Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
 County: ELLIS
 State: Kansas
 Drilling Contractor: Discovery Drilling
 Company, Inc. - Rig 1
 Elevation: 2131 GL
 Field Name: Cromb South
 Pool: Pool Ext.
 Job Number: 285

Operation:
 Uploading recovery &
 pressures

DATE
 November
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 2018

DST #4 **Formation: Arbuckle** **Test Interval: 3738 - 3758'** **Total Depth: 3758'**
 Time On: 10:43 11/30 Time Off: 18:50 11/30
 Time On Bottom: 12:43 11/30 Time Off Bottom: 15:28 11/30

Electronic Volume
 Estimate:
 1296'

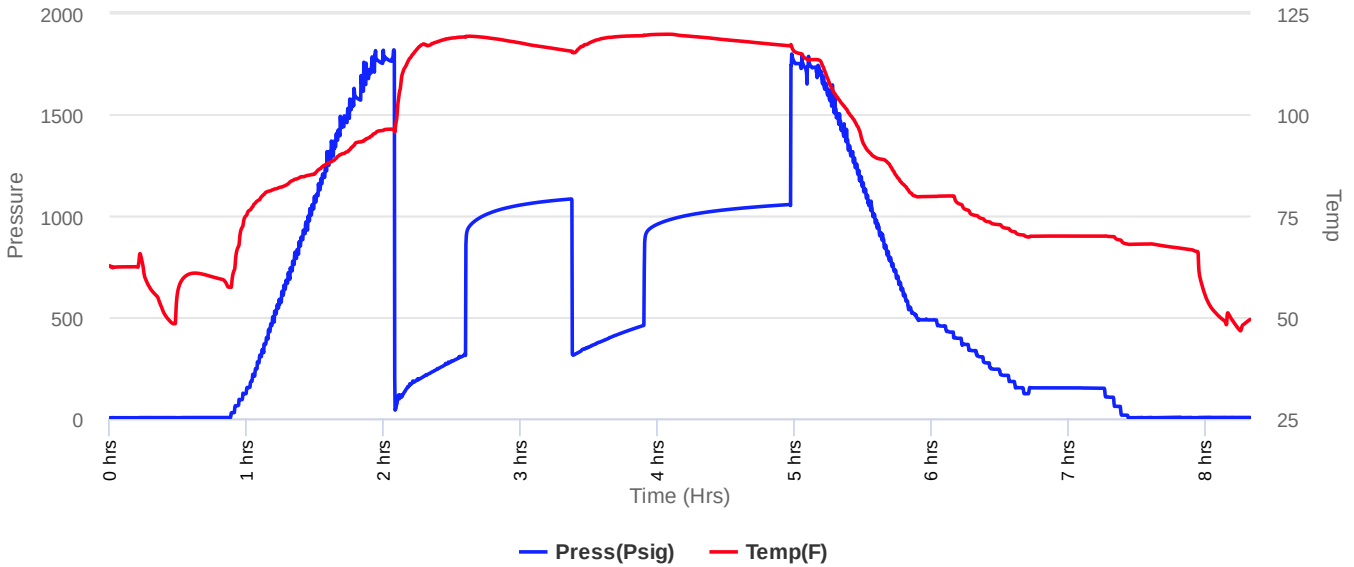
1st Open
 Minutes: 30
 Current Reading:
 70.1" at 30 min
 Max Reading: 70.1"

1st Close
 Minutes: 45
 Current Reading:
 1" at 45 min
 Max Reading: 1.0"

2nd Open
 Minutes: 30
 Current Reading:
 57.1" at 30 min
 Max Reading: 57.1"

2nd Close
 Minutes: 60
 Current Reading:
 3.5" at 60 min
 Max Reading: 3.5"

Inside Recorder





Company: IA Operating, Inc.
Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
 County: ELLIS
 State: Kansas
 Drilling Contractor: Discovery Drilling
 Company, Inc. - Rig 1
 Elevation: 2131 GL
 Field Name: Cromb South
 Pool: Pool Ext.
 Job Number: 285

Operation:
 Uploading recovery &
 pressures

DATE
 November
30
 2018

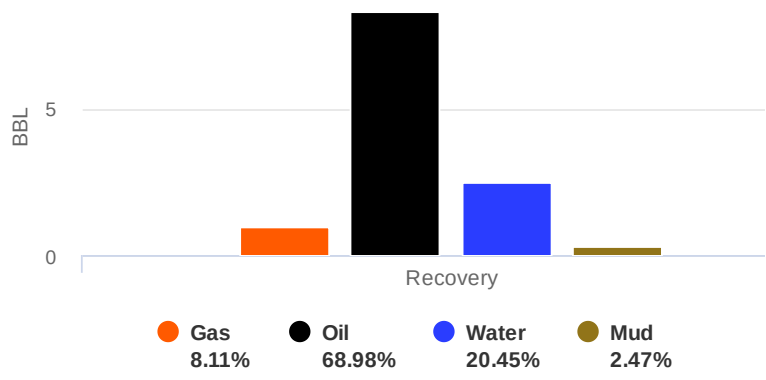
DST #4 **Formation: Arbuckle** **Test Interval: 3738 - 3758'** **Total Depth: 3758'**
 Time On: 10:43 11/30 Time Off: 18:50 11/30
 Time On Bottom: 12:43 11/30 Time Off Bottom: 15:28 11/30

Recovered						
Foot	BBLs	Description of Fluid	Gas %	Oil %	Water %	Mud %
120	0.8904	G	100	0	0	0
680	7.4972	O	0	100	0	0
120	0.8904	SLMCSLWCSLGCO	10	78	10	2
350	2.8013	SLOCSLMCW	0	5	85	10

Total Recovered: 1270 ft
 Total Barrels Recovered: 12.0793

Reversed Out
NO

Recovery at a glance



Initial Hydrostatic Pressure	1764	PSI
Initial Flow	47 to 318	PSI
Initial Closed in Pressure	1082	PSI
Final Flow Pressure	312 to 460	PSI
Final Closed in Pressure	1055	PSI
Final Hydrostatic Pressure	1759	PSI
Temperature	120	°F
Pressure Change Initial Close / Final Close	2.5	%



Company: IA Operating, Inc.
Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
 County: ELLIS
 State: Kansas
 Drilling Contractor: Discovery Drilling
 Company, Inc. - Rig 1
 Elevation: 2131 GL
 Field Name: Cromb South
 Pool: Pool Ext.
 Job Number: 285

Operation:
 Uploading recovery &
 pressures

DATE
 November
30
 2018

DST #4 **Formation: Arbuckle** **Test Interval: 3738 - 3758'** **Total Depth: 3758'**
 Time On: 10:43 11/30 Time Off: 18:50 11/30
 Time On Bottom: 12:43 11/30 Time Off Bottom: 15:28 11/30

Down Hole Makeup

Heads Up: 34.69 FT	Packer 1: 3733 FT
Drill Pipe: 3427.53 FT <i>ID-3 1/2</i>	Packer 2: 3738 FT
Weight Pipe: 320 FT <i>ID-2 7/8</i>	Top Recorder: 3725 FT
Collars: FT <i>ID-2 1/4</i>	Bottom Recorder: 3756 FT
Test Tool: 26.16 FT <i>ID-3 1/2-FH</i>	Well Bore Size: 7 7/8
Total Anchor: 20	Surface Choke: 1"
	Bottom Choke: 5/8"
<u>Anchor Makeup</u>	
Packer Sub: 1 FT	
Perforations: (top): 16 FT <i>4 1/2-FH</i>	
Change Over: FT	
Drill Pipe: (in anchor): FT <i>ID-3 1/2</i>	
Change Over: FT	
Perforations: (below): 3 FT <i>4 1/2-FH</i>	

Scale 1:240 Imperial

Well Name: KELLER #28-1
Surface Location: SE NE NW NE Sec. 28 - 11S - 20W
Bottom Location:
API: 15-051-26941
License Number: 33335
Spud Date: 11/23/2018 Time: 9:00 AM
Region: ELLIS COUNTY
Drilling Completed: 12/1/2018 Time: 1:11 AM
Surface Coordinates: 422' FNL & 1607' FEL
Bottom Hole Coordinates:
Ground Elevation: 2131.00ft
K.B. Elevation: 2139.00ft
Logged Interval: 2500.00ft To: 3850.00ft
Total Depth: 3850.00ft
Formation: LANSING-KANSAS CITY; ARBUCKLE
Drilling Fluid Type: FRESH WATER / CHEMICAL GEL

OPERATOR

Company: IA OPERATING, INC.
Address: 785 W COVELL ROAD
SUITE 200
EDMOND, OK 73003
Contact Geologist: JONATHAN ALLEN
Contact Phone Nbr: (316) 721-0036
Well Name: KELLER #28-1
Location: SE NE NW NE Sec. 28 - 11S - 20W
API: 15-051-26941
Pool: State: KANSAS Field: CROMB SOUTH
Country: USA

SURFACE CO-ORDINATES

Well Type: Vertical
Longitude: -99.5431721
Latitude: 39.0724834
N/S Co-ord: 422' FNL
E/W Co-ord: 1607' FEL

LOGGED BY



Company: BIG CREEK CONSULTING, INC.
Address: 1909 MAPLE
ELLIS, KS 67637
Phone Nbr: (785) 259-3737
Logged By: GEOLOGIST Name: JEFF LAWLER

CONTRACTOR

Contractor: DISCOVERY DRILLING
Rig #: 1
Rig Type: MUD ROTARY
Spud Date: 11/23/2018 Time: 9:00 AM
TD Date: 12/1/2018 Time: 1:11 AM
Rig Release: 12/1/2018 Time: 10:15 PM

ELEVATIONS

K.B. Elevation: 2139.00ft
K.B. to Ground: 8.00ft

Ground Elevation: 2131.00ft

NOTES

DUE TO ECONOMICAL RECOVERY ON DRILL STEM TESTS 5 1/2" PRODUCTION CASING WAS RUN TO FURTHER EVALUATE ZONES OF INTEREST WITH COMPLETION METHODS.

RESPECTFULLY SUBMITTED,
JEFF LAWLER

WELL COMPARISON SHEET

FORMATION	KELLER 28-1						P&A 11-95						P&A 11-95							
	2139		2131		2147		2149		2136		2156		2156		2156					
	KB	GL	KB	GL	KB	GL	KB	GL	KB	GL	KB	GL	KB	GL	KB	GL				
	LOG TOPS	SAMPLE TOPS	COMP. CARD	LOG	SAMPL.	COMP. CARD	LOG	SAMPL.	COMP. CARD	LOG	SAMPL.	COMP. CARD	LOG	SAMPL.	COMP. CARD	LOG	SAMPL.			
ANHYDRITE TOP	1554	585	1551	588	1566	581	+ 4	+ 7	1564	585	+ 0	+ 3	1558	578	+ 7	+ 10	1568	588	- 3	+ 0
BASE	1593	546	1600	539	1606	541	+ 5	- 2	1610	539	+ 7	+ 0	1605	531	+ 15	+ 8	1613	543	+ 3	- 4
NEVA	2666	-527			2674	-527	+ 0						2661	-525	- 2					
FORAKER	2787	-648			2795	-648	+ 0						2778	-642	- 6					
STOTLER	3007	-868			3014	-867	- 1						2999	-863	- 5					
TARKIO	3043	-904			3050	-903	- 1						3031	-895	- 9					
TOPEKA	3189	-1050	3187	-1048	3197	-1050	+ 0	+ 2	3198	-1049	- 1	+ 1	3175	-1039	- 11	- 9	3200	-1044	- 6	- 4
HEEBNER SHALE	3409	-1270	3399	-1260	3416	-1269	- 1	+ 9	3420	-1271	+ 1	+ 11	3394	-1258	- 12	- 2	3422	-1266	- 4	+ 6
TORONTO	3431	-1292	3421	-1282	3438	-1291	- 1	+ 9	3460	-1311	+ 19	+ 29	3418	-1282	- 10	+ 0	3444	-1288	- 4	+ 6
LKC	3446	-1307	3435	-1296	3453	-1306	- 1	+ 10	3458	-1309	+ 2	+ 13	3434	-1298	- 9	+ 2	3459	-1303	- 4	+ 7
BKC	3671	-1532	3654	-1515	3678	-1531	- 1	+ 16	3682	-1533	+ 1	+ 18	3658	-1522	- 10	+ 7	3687	-1531	- 1	+ 16
SIMPSON DOLOMITE	3747	-1608																		
ARBuckle	3757	-1618	3751	-1612	3761	-1614	- 4	+ 2	3761	-1612	- 6	+ 0	3744	-1608	- 10	- 4	3772	-1616	- 2	+ 4
TOTAL DEPTH	3852	-1713	3850	-1711	3860	-1713	+ 0	+ 2	3775	-1626	- 87	- 85	3895	-1759	+ 46	+ 48	3825	-1669	- 44	- 42

DST #1 LKC A-D 3428' - 3504'



Company: IA Operating, Inc.
Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
County: ELLIS
State: Kansas
Drilling Contractor: Discovery Drilling Company, Inc. - Rig 1
Elevation: 2131 Sur
Field Name: Cromb South
Pool: Pool Ext.
Job Number: 285

Operation:

Uploading recovery & pressures

DATE

November
28
2018

DST #1 Formation: Lan A-D Test Interval: 3428 - 3504' Total Depth: 3504'

Time On: 00:17 11/28 Time Off: 07:00 11/28
Time On Bottom: 02:50 11/28 Time Off Bottom: 04:50 11/28

Electronic Volume Estimate:
3'

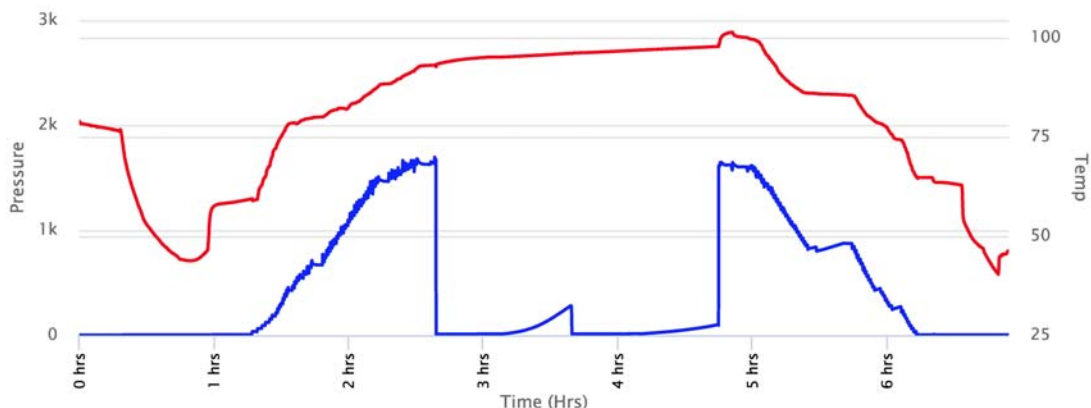
1st Open
Minutes: 30
Current Reading:
.2" at 30 min
Max Reading: .2"

1st Close
Minutes: 30
Current Reading:
0" at 30 min
Max Reading: 0"

2nd Open
Minutes: 30
Current Reading:
0" at 30 min
Max Reading: 0"

2nd Close
Minutes: 30
Current Reading:
0" at 30 min
Max Reading: 0"

Inside Recorder



DST #1 LKC A-D 3428' - 3504'



Company: IA Operating, Inc.
Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
County: ELLIS
State: Kansas
Drilling Contractor: Discovery Drilling Company, Inc. - Rig 1
Elevation: 2131 Sur
Field Name: Cromb South
Pool: Pool Ext.
Job Number: 285

Operation:
Uploading recovery & pressures

DATE
November
28
2018

DST #1 **Formation: Lan A-D** **Test Interval: 3428 - 3504'** **Total Depth: 3504'**

Time On: 00:17 11/28 Time Off: 07:00 11/28
Time On Bottom: 02:50 11/28 Time Off Bottom: 04:50 11/28

Recovered

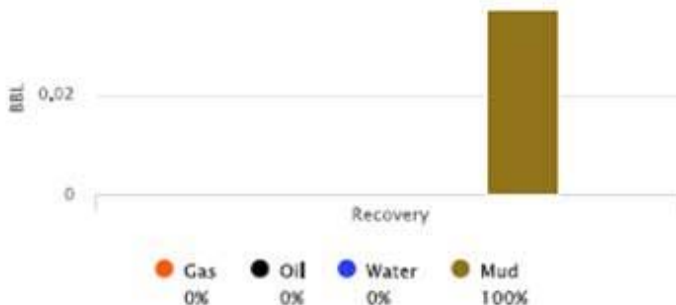
Foot	BBLs	Description of Fluid	Gas %	Oil %	Water %	Mud %
5	0.0371	M	0	0	0	100

Total Recovered: 5 ft
Total Barrels Recovered: 0,0371

Reversed Out
NO

Recovery at a glance

Initial Hydrostatic Pressure	1628	PSI
Initial Flow	11 to 12	PSI
Initial Closed in Pressure	280	PSI
Final Flow Pressure	13 to 14	PSI
Final Closed in Pressure	100	PSI
Final Hydrostatic Pressure	1622	PSI
Temperature	98	°F
Pressure Change Initial Close / Final Close	64.4	%



DST #2 LKC I - K 3576' - 3650'

11/29/2018



Company: IA Operating, Inc.
Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
County: ELLIS
State: Kansas
Drilling Contractor: Discovery Drilling Company, Inc. - Rig 1
Elevation: 2131 GL
Field Name: Cromb South
Pool: Pool Ext.
Job Number: 285

Operation:
Test Complete

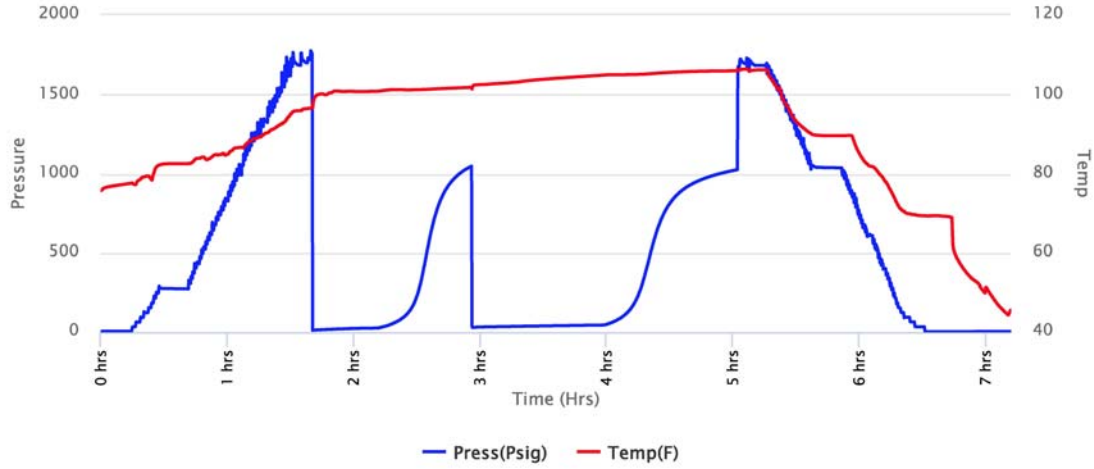
DATE
November
28
2018

DST #2 **Formation: Lan I-K** **Test Interval: 3576 - 3650'** **Total Depth: 3650'**

Time On: 21:57 11/28 Time Off: 05:25 11/29
Time On Bottom: 00:02 11/29 Time Off Bottom: 03:17 11/29

Electronic Volume Estimate:
171'

1st Open	1st Close	2nd Open	2nd Close
Minutes: 30	Minutes: 45	Minutes: 60	Minutes: 60
Current Reading: 3.2" at 30 min	Current Reading: 0" at 45 min	Current Reading: 6.7" at 60 min	Current Reading: 0" at 60 min
Max Reading: 3.2"	Max Reading: 0"	Max Reading: 6.7"	Max Reading: 0"



DST #2 LKC I - K 3576' - 3650'



Company: IA Operating, Inc.
Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W
 County: ELLIS
 State: Kansas
 Drilling Contractor: Discovery Drilling Company, Inc. - Rig 1
 Elevation: 2131 GL
 Field Name: Cromb South
 Pool: Pool Ext.
 Job Number: 285

Operation:
 Test Complete

DATE
 November
28
 2018

DST #2 **Formation: Lan I-K** **Test Interval: 3576 - 3650'** **Total Depth: 3650'**
 Time On: 21:57 11/28 Time Off: 05:25 11/29
 Time On Bottom: 00:02 11/29 Time Off Bottom: 03:17 11/29

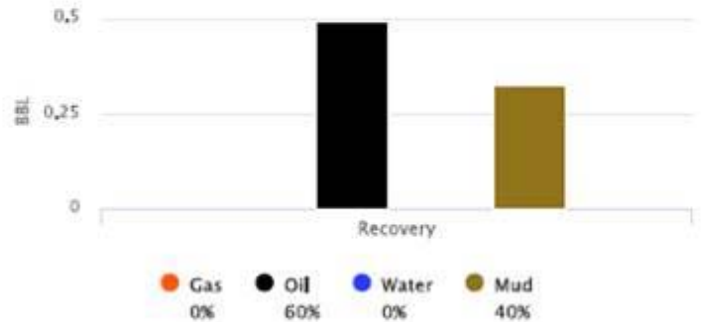
<u>Recovered</u>		<u>Description of Fluid</u>	<u>Gas %</u>	<u>Oil %</u>	<u>Water %</u>	<u>Mud %</u>
<u>Foot</u>	<u>BBLs</u>	HMCO	0	60	0	40
110	0.8162					

Total Recovered: 110 ft
 Total Barrels Recovered: 0.8162

Reversed Out
 NO

Recovery at a glance

Initial Hydrostatic Pressure	1723	PSI
Initial Flow	13 to 26	PSI
Initial Closed in Pressure	1047	PSI
Final Flow Pressure	29 to 45	PSI
Final Closed in Pressure	1025	PSI
Final Hydrostatic Pressure	1701	PSI
Temperature	106	°F
Pressure Change Initial Close / Final Close	2.1	%



ROCK TYPES

Cht	Lmst fw7>	Carbon Sh	Shcol
Chtcong1	shale, grn	Shb1ck	Ss
Dolprim	shale, gry	shale, red	Lscong1

ACCESSORIES

MINERAL

• Sandy

FOSSIL

◊ Oolite
 ⚙ Oomoldic

STRINGER

~~~~~ Chert  
 █████ Dolomite  
 █████ Sandstone

**OTHER SYMBOLS**

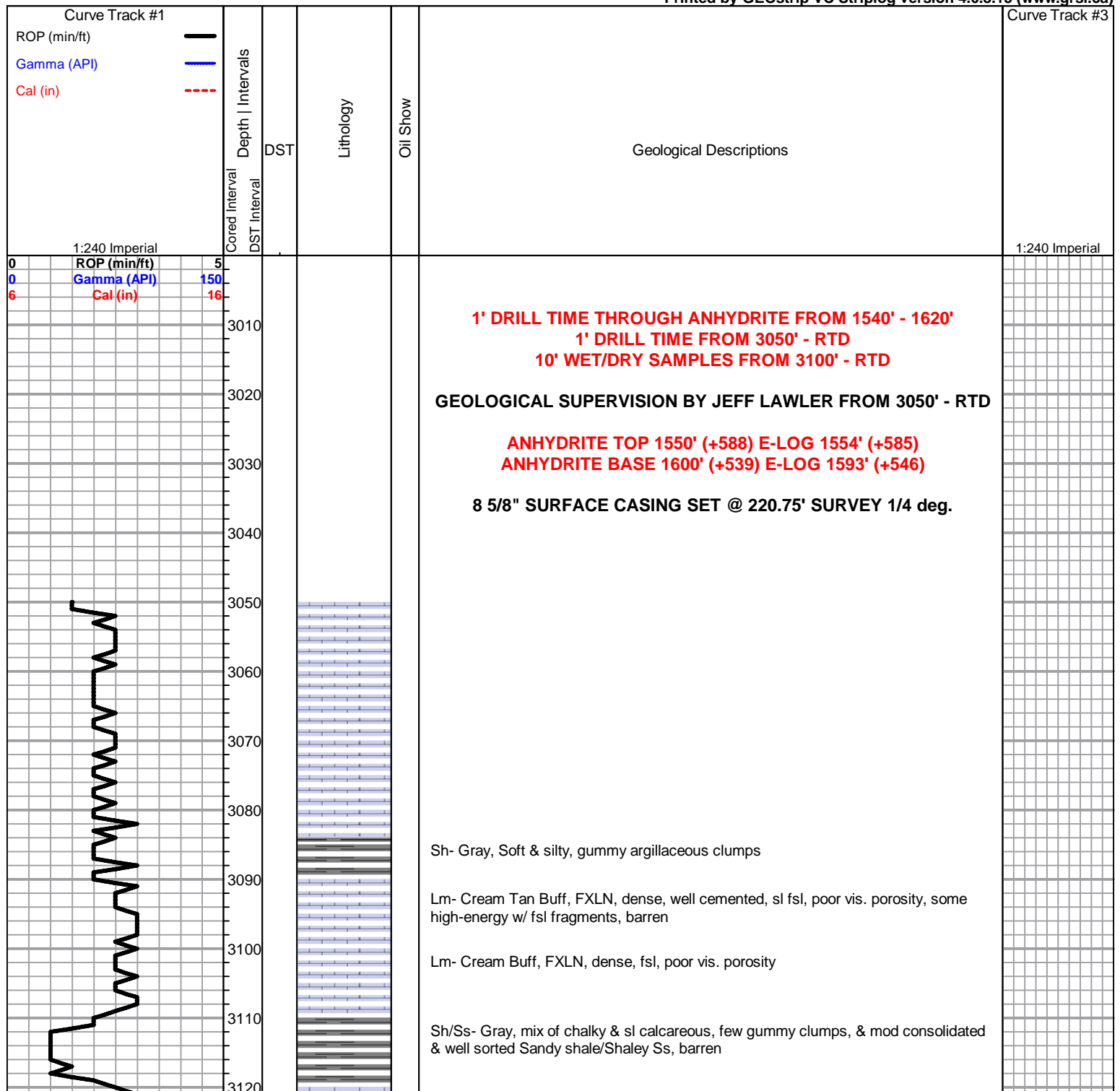
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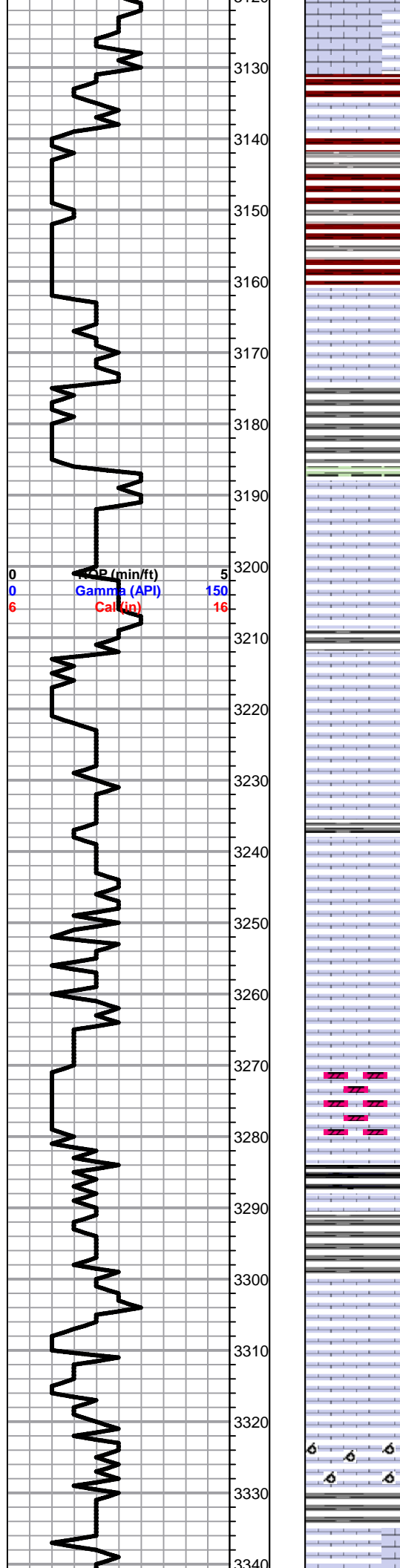
- Daily Report
- Digital Photo
- Document
- Folder
- Link
- Vertical Log File
- Horizontal Log File
- Core Log File
- Drill Cuttings Rpt

**DST**

- DST Int
- DST alt

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Sh- A/A w/ maroon, gritty & earthy, heavily micaceous gray shale

Sh- A/A

Lm- Cream Buff, Fn Grn, chalky & fsl

Sh- Gray Maroon Green, dense & waxy, gritty & earthy

**TOPEKA 3187' (-1048) E-LOG 3189' (-1050)** Lm- Cream Tan Brown, tight fsl mix, all w/ poor vis. porosity, few loose fusulinids, some sl chalky in part

Lm- Cream, VFXN, dense, well cemented, tight w/ no vis. porosity

Lm- Tan Cream Brown, VF-FXLN, dense, sl fsl, poor vis. porosity, barren

Sh- Gray, platy, some sandy shale/shaley Ss, mica

Lm- Tan Cream Buff, FXLN, fsl, well dev. w/ dense XLN & fn ppt interXLN porosity, barren, mixed w/ poor vis. porosity, all barren

Sh- Gray Maroon, sl calcareous & chalky, fsl, gritty & earthy

Lm- Gray Brown, FXLN, bioclastic w/ fsl fragments, dense XLN porosity, barren

Lm- Tan Cream, VF-FXLN, fsl, mostly with dense XLN porosity, mod. developed, some tight w/ poor/min. vis. porosity, sl cherty Ls, all barren

Lm- Tan Cream, VFXLN, tight w/ min. vis. porosity, sl fsl

Lm- Tan, FXLN, trashy high-energy mix w/ fsl fragments, few sl chalky in part, dense to sctrd XLN porosity

Lm- Cream Off White, FXLN, sl trashy, sl fsl, dense XLN & reXLN porosity, sl granular, mod. dev. barren

Lm- Tan Brown, VF-FXLN, sctrd mottling, well cemented, mod. dev. few pcs sl dolomitic, few pcs of sl cherty Ls/Chert w/ min. vis. porosity, barren

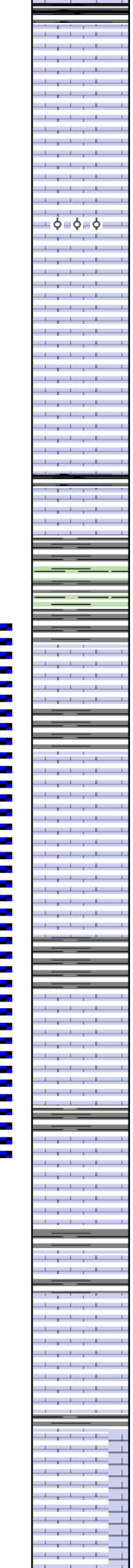
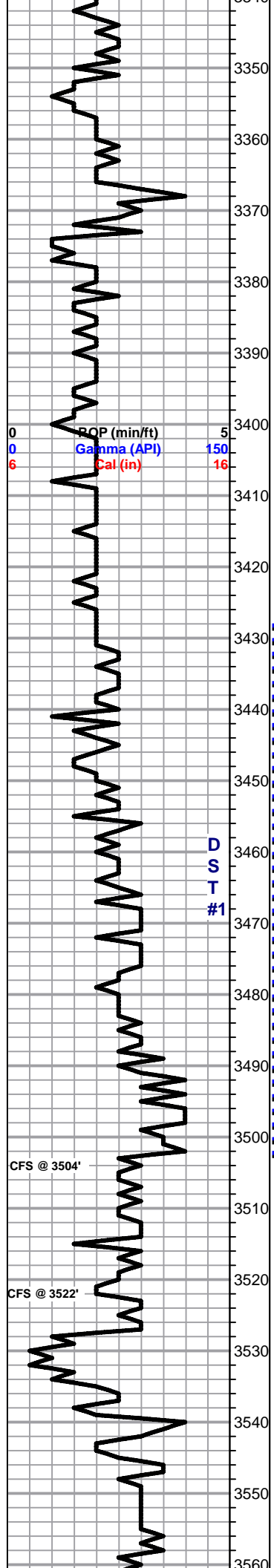
Sh- Black Maroon Green, fissile & carbonaceous, gritty & earthy, gummy clumps

Lm- Cream Off White, FXLN, mod. well dev. w/ dense XLN & fn ppt porosity, clean & barren

Lm- Cream Tan, FXLN, A/A, sctrd to heavy mottling, mixed w/ dense & tight w/ poor vis. porosity, clean & barren

Lm- Cream Off White, FXLN, fsl & oolitic, mod. well dev. w/ dense XLN & fn ppt inter oolite porosity, clean & barren, few pcs of fsl chert





Sh- Black Gray Maroon, fissile & carbonaceous, gritty & earthy, silty

Lm- Gray, VFXLN, dense, tight w/ no vis. porosity

Lm- Cream Buff, FXLN, dense, poorly dev. & mostly tight, clean & barren

Lm- Cream Buff, VF-FXLN, fsl & oolitic, poorly dev. & mostly tight w/ sctrd XLN to poor vis. porosity, clean & barren

Lm- Cream Off White, FXLN, gritty, mod. well dev. w/ dense XLN, reXLN & fn ppt porosity, fsl w/ fusulinids, clean & barren

Lm- Cream, FXLN Fn Grn, dense heavily mottled mix, all w/ poor porosity, clean & barren

**HEEBNER 3399' (-1260) E-LOG 3409' (-1270)** Sh- Black Gray Green, fissile & carbonaceous, dense & waxy, gritty & earthy

Sh- A/A

**TORONTO 3421' (-1282) E-LOG 3431' (-1292)** Lm- Cream Off White, FXLN, fsl, poorly dev. w/ sctrd XLN porosity, clean & barren

**LKC 3435' (-1296) E-LOG 3446' (-1307)** Lm- Cream Off White, FXLN, fsl & oolitic, sctrd XLN, reXLN, & fn inter oolite ppt porosity, SCTRD DRK STN, NSFO, NO ODR, few pcs of oolitic dolomitic & fresh bedded chert

Lm- White Off White, FXLN, dense, sl chalky in part, sctrd XLN porosity, vry clean & barren

Lm/Chert- Milky White Tan Cream, Crypto-VFXLN, fresh bedded chert/cherty Ls w/o vis. porosity

Lm- Tan Brown, VF-FXLN, dense, well cemented, poorly dev., sl dolomitic w/ consistent micro XLN porosity, clean & barren, few pcs oolitic w/ ppt inter oolite porosity, DRK STN, NSFO, NO ODR

Lm- Off White, FXLN, fsl & oolitic, mostly consistent XLN & fn ppt inter oolite porosity, SCTRD LT STN, NSFO, TR ODR???

Lm- Off White Cream, VF-FXLN, dense, well cemented, mostly tight w/ rare XLN porosity, vry clean & barren

Lm- Cream Off White, FXLN, sl fsl, poorly dev. w/ sctrd XLN porosity, clean & barren

Lm- Cream Off White, FXLN, well cemented, poorly dev. oolitic w/ sctrd XLN porosity, clean & barren, chalky in part, SCTRD WK BRWN STN, NSFO, NO ODR

Lm- Cream Off White, F-Med XLN, oolitic mix of well dev. w/ mostly consisted fn ppt inter oolite porosity, sctrd reXLN, DRK STN, SHW FR OIL, TR ODR, & well cemented, oolitic w/ sctrd XLN porosity, clean & barren

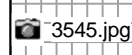
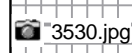
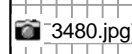
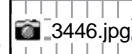
Lm- A/A w/ some tight cherty Ls w/ min. vis. porosity

SHORT TRIP SURVEY 1/2 deg. STRAP +0.43

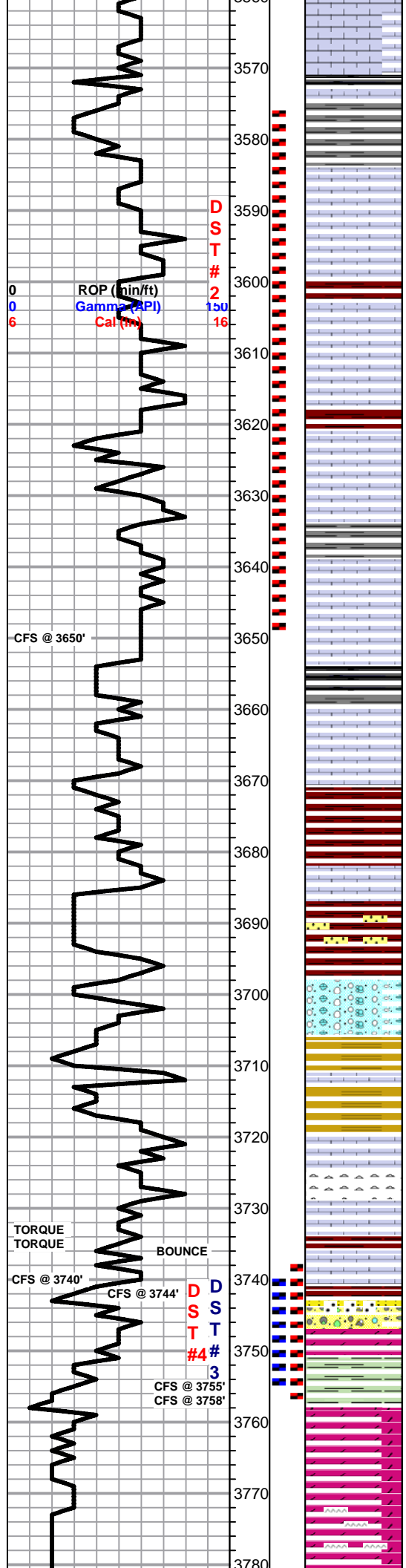
DST #1 LKC A-D 3428' - 3504' 30-30-30-30

5' MUD

IFP: 11-12#  
 FFP: 13-14#  
 SIP: 280-100#



DST #1



Sh- Black Gray Green, fissile & carbonaceous, dense & waxy

Lm- Cream Tan, VF-FXLN, sl fsl, poorly dev. sctrd to dense XLN porosity, mixed w/ fresh bedded chert/cherty Ls w/o vis. porosity, all barren

Lm- Cream, VFXLN, dense, well cemented & tight w/ min. vis. porosity, vry clean & barren

Lm- Off White, VF-FXLN, dense, well cemented, sctrd dev. w/ sctrd dense fn ppt porosity, 1 pc w/ ppt porosity, SCTRDRK STN, 1 PC W/ SAT DRK STN, SL TR FO, WK TR ODR

Lm- Cream Off White, FXLN, fsl & oolitic, few pcs fairly well dev. w/ sctrd ppt inter oolite porosity, SCTRDRK STN, TR FR O, TR ODR

Lm- Cream Off White, FXLN, fsl & oolitic, mod. dev. w/ sctrd XLN & ppt inter oolite porosity, few pcs sl oomoldic, SCTRDRK TO SUB-SAT DRK STN, TR FO, WK TR ODR

Sh- Gray Green Maroon, dense & waxy, gritty & earthy

Lm- Off White, VF-FXLN, dense, fsl & oolitic, well cemented & mostly tight w/ sctrd XLN & few w/ sctrd reXLN porosity, vry clean & barren

Lm- Gray Buff, FXLN, fsl & oolitic, poorly dev. w/ poor vis. porosity

Lm- Tan Cream, mix of tan oolitic, high-energy, sl trashy w/ poor vis. porosity & mottled w/ pink tint, sl arenaceous, sl chalky in part in some, poor vis. porosity

**BKC 3654' (-1515) E-LOG 3671' (-1532)** Sh- Maroon Gray Black, gritty & earthy, gummy argillaceous clumps

Sh/Ss- Maroon, mix of gritty & earthy shale & fn grn consolidated & well sorted Ss, barren

Lm- Cream Off White, FXLN, fsl & sl oolitic, poorly dev. & mostly tight w/ sctrd XLN porosity, barren

Sh/Ss- Maroon, gritty & earth, consolidated Fn Grn, well sorted & cemented, barren

Conglomerate Lm- White, lightly mottled w/ pink tint, mix of well cemented & tight w/ rare XLN porosity, loosely cemented & chalky in part, & few w/ sub-rounded qtz. inclusions, Ca cementation, all barren, few pcs of VFXLN, dense, well cemented yellow Ls

Lm- A/A w/ influx of qtz inclusions, some less dev. w/ no vis. porosity, cherty Ls  
Conglomerate Chert- Salmon Tan White, mix of detrital chert, some w/ qtz inclusions A/A, some dolomitic chert w/ dense XLN porosity, Sh- Maroon Gray Brown, dense & waxy, gritty & earthy, gummy clumps  
Conglomerate Dolomite/Chert- Salmon Brown, FXLN, well cemented, tight, trashy, detrital, poor vis. porosity

Lm- Off White, FXLN, sl fsl, tight w/ sctrd XLN porosity, some sl chalky in part, barren  
**3744'** - Lm/Chert- conglomerate chert A/A, Gray VFXLN, dense, well cemented cherty Lm, no vis. porosity, few pcs w/ sub-rounded qtz. inclusions

**SIMPSON 3747' (-1608)** Dol- White Frosted, FXLN, friable sandy, w/ Ca cementation, mod. well consolidated & sorted, sub-rounded, some w/ good cementation, pyrite inclusions, mint green shale, SCTRDRK DO STN, NSFO, 1 PC W/ TR ODR, LT YLW FLOR.

**ARBUCKLE 3751' (-1612) E-LOG 3757' (-1618)** Dol- Cream White, F-Crs XLN, mix of poorly to well dev., mostly sucrosic, better dev. rhombic, XLN & good interXLN connectivity, MOST W/ SCTRDRK ST, FR SFO, FR-GD ODR, few w/ cubic pyrite inclusions

**3758'** - Dol/Chert- Translucent/Frosted, MedXLN, sucrosic, semi-friable, rhombic matrix, consistent XLN porosity throughout, SUB-SAT/SAT DRK STN, FR SFO, GD ODR, Chert- Tan Translucent White, mix of oolitic/some oomoldic, some w/ fracturing, most barren, FEW W/ SCTRDRK STN, TR FO, ODR A/A,

DST #2 LKC I - K  
3576' - 3650'  
30-45-60-60.

110' HMC0  
(60%O, 40%M)

IFP: 13-26#  
FFP: 29-45#  
SIP: 1047-1025#  
BHT: 106 deg.

-3600.jpg

3610.jpg

3630.jpg

DST #3  
ARBUCKLE  
3740' - 3755'

30-45-60-60

55' GIP  
65' TOTAL FLUID  
60' CLEAN OIL  
(Gr: 24)  
5' OCM  
(25%O, 75%M)

IFP: 13-20#  
FFP: 23-36#  
SIP: 1201-1197#  
BHT: 105 deg.

DST 3.jpg

DST 3.1.jpg

3755.jpg

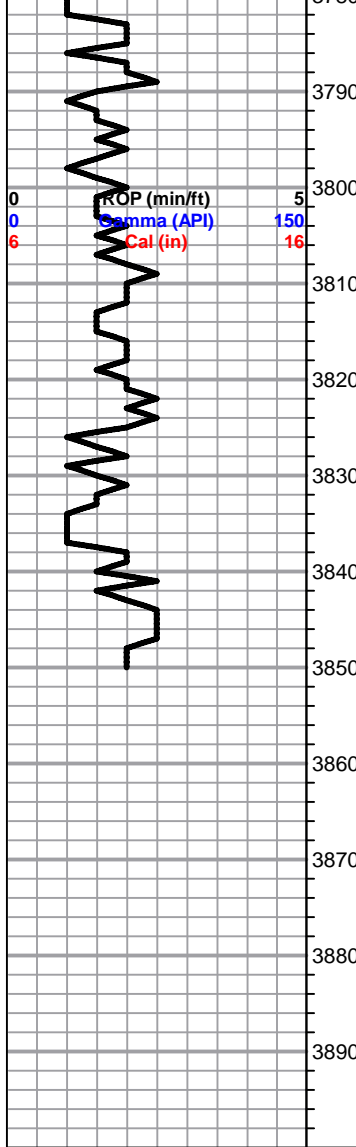
3758.jpg

DST 4.jpg

DST 4.1.jpg

DST #4  
ARBUCKLE  
3738' - 3758'  
30-45-30-45

120' GIP  
1270' TOTAL  
FLUID



D

- 3765-** Dol- Tan, mix of FXLN oomoldic w/ sctrd poor inter vugular porosity, MOSTLY BARREN, SOME PCS W/ SCTRD DRK OR SUB-SAT STN, FR SFO, MedXLN, well dev. & sucrosic, SAT DRK STN, FR SFO, ALL W/ GD ODR
- 3772-** Dol/Chert White Off White Tan Cream, VF-FXLN mix of mostly tight & loosely cemented, clean & barren, & well dev. w/ consistent dense XLN porosity, SAT DRK STN, GD SFO, GD ODR, pristine white porcelain like fresh bedded chert
- 3785-** Dol- Cream Tan, VF-FXLN, dense, well cemented, mostly tight w/ consistent microXLN porosity, barren
- 3795-** Dol- Cream Off White, FXLN, semi-sucrosic, loosely to well cemented, consistent inter XLN porosity, mostly barren, FEW PCS W/ BLK TARRY DO STN, NSFO, NO ODR
- 3805-** Dol- Lt Pink, VF-FXLN, dense, well cemented, mostly tight, some cherty dol., clean & barren
- 3812-** Dol- A/A & Cream, VF-FXLN, dense well cemented & tight, clean & barren

Dol- Cream Translucent, CrsXLN, well dev. sucrosic rhombic, most w/ inter XLN ppt porosity throughout, some w/ white cherty cementation, clean & barren

Dol- Cream Tan Buff, F-MedXLN, mostly well cemented, dense microXLN porosity, clean & barren, few pcs sl cherty dolomite

**RTD 3850' (-1711) LTD @ 01:11 12/1/2018**

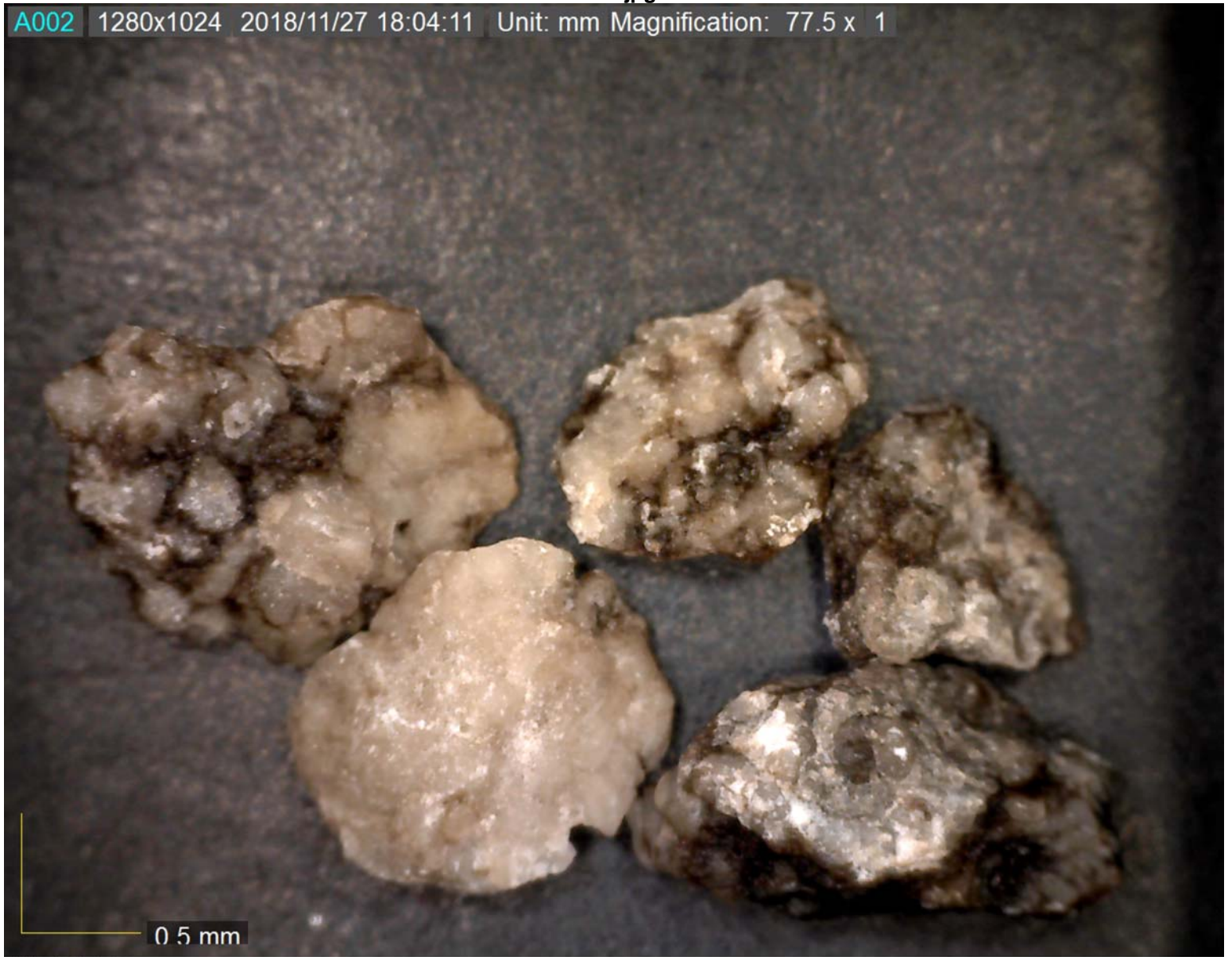
680' OIL Gr: 20  
 120' MWCGO  
 (10%G, 78%O,  
 10%W, 2%M)  
 350' OCMCW  
 (5%O, 85%W  
 10%M)  
 CHLOR: 48K  
 IFP: 47-318#  
 FFP: 312-460#  
 SIP: 1082-1055#  
 BHT: 120 deg.  
 3765.jpg  
 3772.jpg





0.5 mm

3440' x 35



0.5 mm

3475' X 30





0.5 mm

3500' X 20



0.5 mm

3530' X 20





0.5 mm

3545' X 20



0.5 mm

3600' X 20





0.5 mm

3610' X 20





# DST 3.jpg



Company: IA Operating, Inc.  
Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W  
County: ELLIS  
State: Kansas  
Drilling Contractor: Discovery Drilling  
Company, Inc. - Rig 1  
Elevation: 2131 GL  
Field Name: Cromb South  
Pool: Pool Ext.  
Job Number: 285

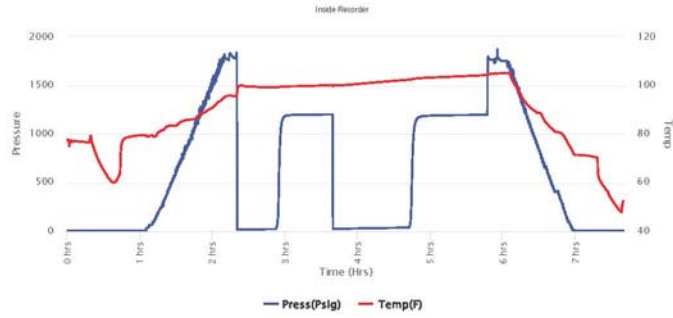
Operation:  
Test Complete

DATE  
November  
29  
2018

DST #3 Formation: Arbuckle Test Interval: 3740 - 3755' Total Depth: 3755'

Time On: 20:27 11/29 Time Off: 03:54 11/30  
Time On Bottom: 22:43 11/29 Time Off Bottom: 01:58 11/30

| Electronic Volume Estimate: | 1st Open Minutes: 30            | 1st Close Minutes: 45         | 2nd Open Minutes: 60            | 2nd Close Minutes: 60         |
|-----------------------------|---------------------------------|-------------------------------|---------------------------------|-------------------------------|
| 129'                        | Current Reading: 3.0" at 30 min | Current Reading: 0" at 45 min | Current Reading: 4.1" at 60 min | Current Reading: 0" at 60 min |
|                             | Max Reading: 3.0"               | Max Reading: 0"               | Max Reading: 4.1"               | Max Reading: 0"               |



# DST 3.1.jpg



Company: IA Operating, Inc.  
Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W  
County: ELLIS  
State: Kansas  
Drilling Contractor: Discovery Drilling Company, Inc. - Rig 1  
Elevation: 2131 GL  
Field Name: Cromb South  
Pool: Pool Ext.  
Job Number: 285

**Operation:**  
Test Complete

**DATE**  
November  
**29**  
2018

**DST #3**    **Formation: Arbuckle**    **Test Interval: 3740 - 3755'**    **Total Depth: 3755'**  
Time On: 20:27 11/29    Time Off: 03:54 11/30  
Time On Bottom: 22:43 11/29    Time Off Bottom: 01:58 11/30

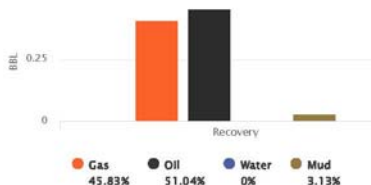
| Recovered |        | Description of Fluid | Gas % | Oil % | Water % | Mud % |
|-----------|--------|----------------------|-------|-------|---------|-------|
| Foot      | BBLS   |                      |       |       |         |       |
| 56        | 0.4081 | G                    | 100   | 0     | 0       | 0     |
| 60        | 0.4452 | O                    | 0     | 100   | 0       | 0     |
| 5         | 0.0371 | OCM                  | 0     | 25    | 0       | 75    |

Total Recovered: 120 ft  
Total Barrels Recovered: 0.8904

**Reversed Out**  
NO

|                                             |          |     |
|---------------------------------------------|----------|-----|
| Initial Hydrostatic Pressure                | 1780     | PSI |
| Initial Flow                                | 13 to 20 | PSI |
| Initial Closed In Pressure                  | 1201     | PSI |
| Final Flow Pressure                         | 23 to 36 | PSI |
| Final Closed In Pressure                    | 1197     | PSI |
| Final Hydrostatic Pressure                  | 1762     | PSI |
| Temperature                                 | 105      | °F  |
| Pressure Change Initial Close / Final Close | 0.4      | %   |

Recovery at a glance









0.5 mm

3758' X 20

# DST 4.jpg



Company: IA Operating, Inc.  
Lease: Keller #28-1

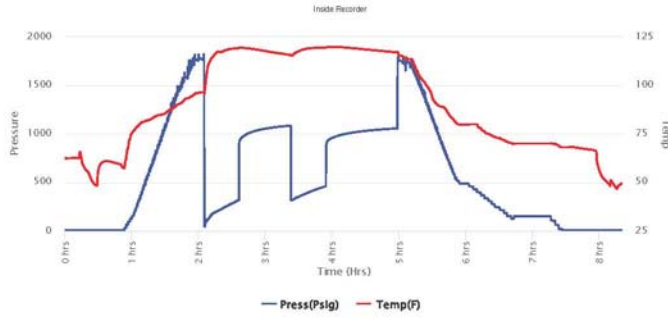
SEC: 28 TWN: 11S RNG: 20W  
County: ELLIS  
State: Kansas  
Drilling Contractor: Discovery Drilling Company, Inc. - Rig 1  
Elevation: 2131 GL  
Field Name: Cromb South  
Pool: Pool Ext.  
Job Number: 285

**Operation:**  
Uploading recovery & pressures

**DATE**  
November  
**30**  
2018

**DST #4**    **Formation: Arbuckle**    **Test Interval: 3738 - 3758'**    **Total Depth: 3758'**  
Time On: 10:43 11/30    Time Off: 18:50 11/30  
Time On Bottom: 12:43 11/30    Time Off Bottom: 15:28 11/30

| Electronic Volume Estimate: | 1st Open                         | 1st Close                     | 2nd Open                         | 2nd Close                       |
|-----------------------------|----------------------------------|-------------------------------|----------------------------------|---------------------------------|
| 1296'                       | Minutes: 30                      | Minutes: 45                   | Minutes: 30                      | Minutes: 60                     |
|                             | Current Reading: 70.1" at 30 min | Current Reading: 1" at 45 min | Current Reading: 57.1" at 30 min | Current Reading: 3.5" at 60 min |
|                             | Max Reading: 70.1"               | Max Reading: 1.0"             | Max Reading: 57.1"               | Max Reading: 3.5"               |



# DST 4.1.jpg



Company: IA Operating, Inc.  
Lease: Keller #28-1

SEC: 28 TWN: 11S RNG: 20W  
County: ELLIS  
State: Kansas  
Drilling Contractor: Discovery Drilling Company, Inc. - Rig 1  
Elevation: 2131 GL  
Field Name: Cromb South  
Pool: Pool Ext.  
Job Number: 285

**Operation:**  
Uploading recovery & pressures

**DATE**  
November  
**30**  
2018

**DST #4**    **Formation: Arbuckle**    **Test Interval: 3738 - 3758'**    **Total Depth: 3758'**  
Time On: 10:43 11/30    Time Off: 18:50 11/30  
Time On Bottom: 12:43 11/30    Time Off Bottom: 15:28 11/30

**Recovered**

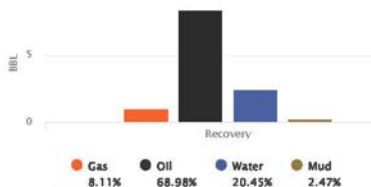
| Foot | BELS   | Description of Fluid | Gas % | Oil % | Water % | Mud % |
|------|--------|----------------------|-------|-------|---------|-------|
| 120  | 0.8904 | G                    | 100   | 0     | 0       | 0     |
| 680  | 7.4972 | O                    | 0     | 100   | 0       | 0     |
| 120  | 0.8904 | SLMCSLWCSLGO         | 10    | 78    | 10      | 2     |
| 350  | 2.8013 | SLOCSLMCW            | 0     | 5     | 85      | 10    |

Total Recovered: 1270 ft  
Total Barrels Recovered: 12.0793

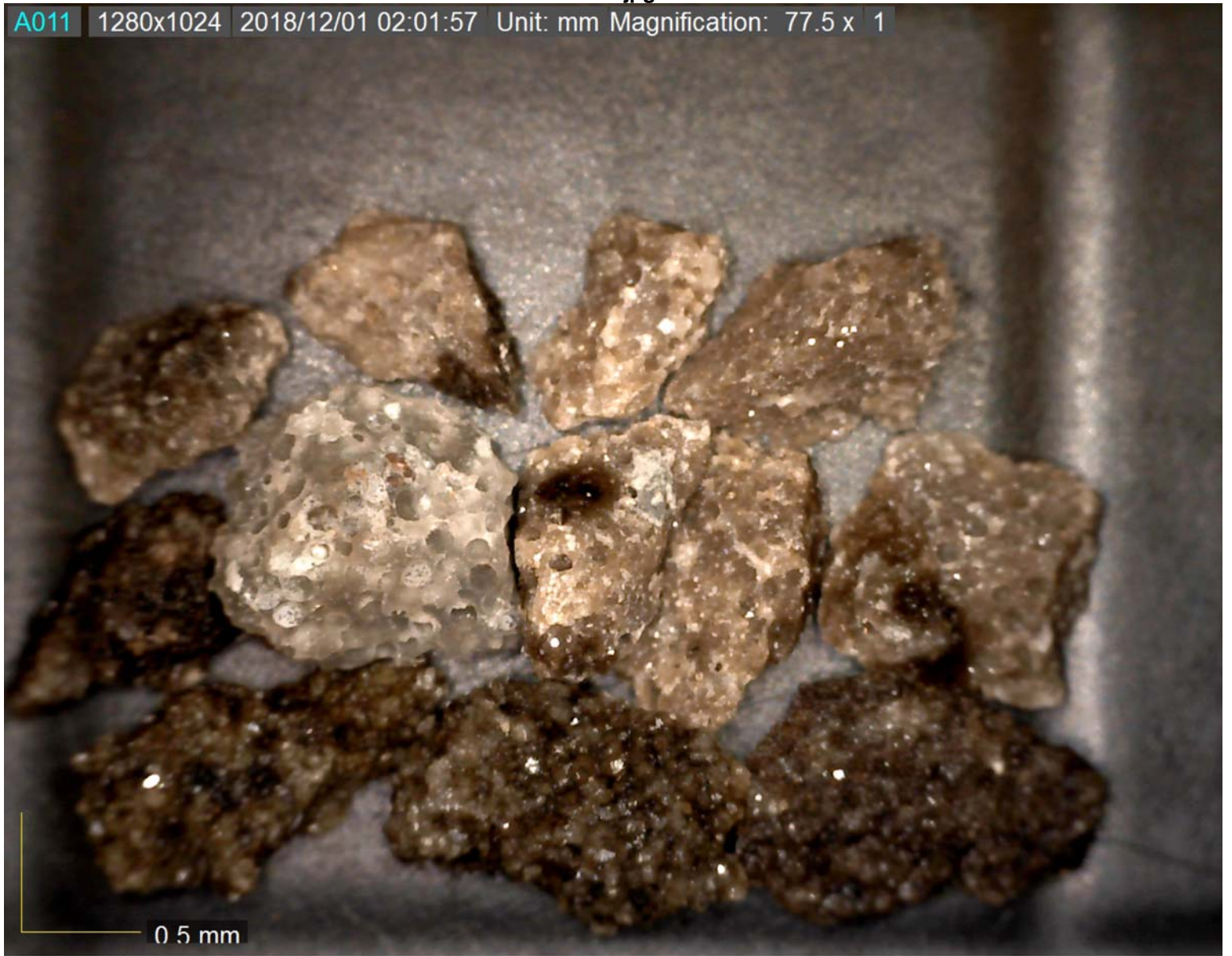
**Reversed Out**  
NO

|                                             |            |     |
|---------------------------------------------|------------|-----|
| Initial Hydrostatic Pressure                | 1764       | PSI |
| Initial Flow                                | 47 to 318  | PSI |
| Initial Closed in Pressure                  | 1082       | PSI |
| Final Flow Pressure                         | 312 to 460 | PSI |
| Final Closed in Pressure                    | 1055       | PSI |
| Final Hydrostatic Pressure                  | 1759       | PSI |
| Temperature                                 | 120        | °F  |
| Pressure Change Initial Close / Final Close | 2.5        | %   |

**Recovery at a glance**







0.5 mm

3765' x 20

