

ORIGINAL

KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION
WELL COMPLETION FORM
WELL HISTORY - DESCRIPTION OF WELL & LEASE

Form ACO-1
September 1999
Form Must Be Typed

Operator: License # 33300
Name: Evergreen Operating Corporation
Address: 1401 17th Street, Suite 1200
City/State/Zip: Denver CO 80202
Purchaser:
Operator Contact Person: Tom Erwin
Phone: (303) 298-8100 ext 1330
Contractor: Name: Layne Christensen Company
License: 32999
Wellsite Geologist: Richard Robba, PG

API No: ~~15-121-27769-00~~ 15-121-27768-0000
County: Miami
S2 SW NE Sec. 7S Twp. 18 S. R. 24 [X] East [ ] West
2310 feet from S/W (circle one) Line of Section
1900 feet from E/W (circle one) Line of Section

Footages Calculated from Nearest Outside Section Corner:
(circle one) NE SE NW SW
Lease Name: Peckman Angus Well #: 32-7 WD

Field Name: Forest City Coal Gas Area
Producing Formation: Cherokee Group
Elevation: Ground: 901 Kelly Bushing: 906
Total Depth: 1752' Plug Back Total Depth: 1752'
Amount of Surface Pipe Set and Cemented at 44 Feet
Multiple Stage Cementing Collar Used? [ ] Yes [X] No
If yes, show depth set \_\_\_\_\_ Feet
If Alternate II completion, cement circulated from 1253
feet depth to Surface w/ 350 sx cmt.

Designate Type of Completion:
[X] New Well [ ] Re-Entry [ ] Workover
[ ] Oil [X] SWD [ ] SLOW [ ] Temp. Abd.
[ ] Gas [ ] ENHR [ ] SIGW
[ ] Dry [ ] Other (Core, WSW, Expl., Cathodic, etc)
If Workover/Re-entry: Old Well Info as per KANSAS CORPORATION COMMISSION
Operator:
Well Name:
Original Comp. Date: Original Re-perf. Date:
[ ] Deepening [ ] Re-perf. [ ] Conv. to Enhr./SWD
[ ] Plug Back [ ] Plug Back Total Depth
[ ] Commingled [ ] Docket No.
[ ] Dual Completion [ ] Docket No.
[X] Other (SWD or Enhr.?) [ ] Docket No. D28279
10/30/2003 11/03/2003 1/09/2004
Spud Date or Date Reached TD Completion Date or
Recompletion Date Recompletion Date

Drilling Fluid Management Plan RECEIVED MAR 8 2004
(Data must be collected from the Reserve Pit)
Chloride content \_\_\_\_\_ ppm Fluid volume 500 bbls
Dewatering method used Vacuum pit and backfill
Location of fluid disposal if hauled offsite:
Operator Name: Evergreen Operating Corporation
Lease Name: Peckman Angus License No.: 33300
Quarter NE Sec. 7S Twp. 18 S. R. 24 [X] East [ ] West
County: Miami Docket No.: D28279

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.

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: Thomas M. Erwin
Title: Sr Operations Engineer Date: 3/6/04
Subscribed and sworn to before me this 4th day of March, 2004.
Notary Public: Kanna Brew
Date Commission Expires: 11/24/07

KCC Office Use ONLY
No Letter of Confidentiality Attached
If Denied, Yes [ ] Date:
Yes Wireline Log Received
Yes Geologist Report Received
[ ] UIC Distribution

# ORIGINAL

Side Two

Operator Name: Evergreen Operating Corporation Lease Name: Peckman Angus Well #: 32-7 WD  
 Sec. 7S Twp. 18 S. R. 24  East  West County: Miami

**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 copy of all Electric Wireline Logs surveyed. Attach final geological well site report.

Drill Stem Tests Taken <i>(Attach Additional Sheets)</i>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Log	Formation (Top), Depth and Datum	<input type="checkbox"/> Sample
Samples Sent to Geological Survey	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Name	Top	Datum
Cores Taken	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Stark Shale	59	842
Electric Log Run <i>(Submit Copy)</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	B/Kansas City	102	799
List All E. Logs Run:		Altamount	304	597
		Summit	410	491
		Excello	432	469
		Vshale	531	370
		Tebo	593	308
		Mississippi	756	145
SIL, CNL, CBL				
Kinderhook	1140	-239		
Arbuckle	1267	-366		

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
Surface	12 1/4	8 5/8	24	44	Portland	12	Neat
Production	7 7/8	5 1/2	15.5	1730	CL-A	350	30% F. ash, 2% cacl2
External Casing Pkr				1253			

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
	None	RECEIVED KANSAS CORPORATION COMMISSION  MAR - 8 2004  CONSERVATION DIVISION WICHITA, KS	

TUBING RECORD	Size	Set At	Packer At	Liner Run
	2 7/8	1239	1239	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Date of First, Resumerd Production, SWD or Enhr.	Producing Method			
1/30/2004 SWD injection	<input type="checkbox"/> Flowing <input type="checkbox"/> Pumping <input type="checkbox"/> Gas Lift <input type="checkbox"/> Other (Explain)			
Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio Gravity
	0	0	0	

Disposition of Gas:  Vented  Sold  Used on Lease  Open Hole  Perf.  Dually Comp.  Commingled  Other (Specify) \_\_\_\_\_

*(If vented, Submit ACO-18.)*

For KCC Use: 9-29-03  
Effective Date: \_\_\_\_\_  
District # 3  
SGA?  Yes  No

KANSAS CORPORATION COMMISSION  
OIL & GAS CONSERVATION DIVISION

Form C-1  
December 2002  
Form must be Typed  
Form must be Signed  
All blanks must be Filled

NOTICE OF INTENT TO DRILL

Must be approved by KCC five (5) days prior to commencing well

AP 80' E of

Expected Spud Date November 17th 2003  
month day year

Spot S2 - SW - NE Sec. 7 Twp. 18S S. R. 24E  East  West

OPERATOR: License# 33300  
Name: Evergreen Operating Corporation  
Address: 1401 17th Street, Suite 1200  
City/State/Zip: Denver, CO. 80202  
Contact Person: Dan Magee, Director of Engineering  
Phone: 303-298-8100

2310 feet from  N /  S Line of Section  
1900 feet from  E /  W Line of Section

Is SECTION  Regular  Irregular?

(Note: Locate well on the Section Plat on reverse side)

County: Miami County, Kansas  
Lease Name: Peckman Angus Well #: 32-7 WD  
Field Name: Forest City Coal Gas Area

CONTRACTOR: License# 32999  
Name: Layne Christensen Company

Is this a Prorated / Spaced Field?  Yes  No

Target Information(s): Arbuckle Sandstone  
Nearest Lease or unit boundary: 330'

Well Drilled For:  Oil  Gas  OWWO  Seismic; # of Holes  Other  
Well Class:  Enh Rec  Storage  Disposal  Other  
Type Equipment:  Mud Rotary  Air Rotary  Cable

Ground Surface Elevation: 901' feet MSL

Water well within one-quarter mile:  Yes  No

Public water supply well within one mile:  Yes  No

Depth to bottom of fresh water: 100' ~~40'~~

Depth to bottom of usable water: 203' ~~48'~~

Surface Pipe by Alternate:  1  2

Length of Surface Pipe Planned to be set: 60'

Length of Conductor Pipe required: N/A

Projected Total Depth: 2000'

Formation at Total Depth: Arbuckle Sandstone

If OWWO: old well information as follows:

Operator: \_\_\_\_\_  
Well Name: \_\_\_\_\_  
Original Completion Date: \_\_\_\_\_ Original Total Depth: \_\_\_\_\_

Water Source for Drilling Operations:

Well  Farm Pond  Other \_\_\_\_\_

DWR Permit #: Pending

Directional, Deviated or Horizontal well?  Yes  No

If Yes, true vertical depth: \_\_\_\_\_

Bottom Hole Location: \_\_\_\_\_

KCC DKT #: \_\_\_\_\_

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(Note: Apply for Permit with DWR )

Will Cores be taken?  Yes  No

If Yes, proposed zone: Coals and Shales

AFFIDAVIT

The undersigned hereby affirms that the drilling, completion and eventual plugging of this well will comply with K.S.A. 55 et. seq.

It is agreed that the following minimum requirements will be met:

1. Notify the appropriate district office *prior* to spudding of well;
2. A copy of the approved notice of intent to drill *shall be* posted on each drilling rig;
3. The minimum amount of surface pipe as specified below *shall be set* by circulating cement to the top; in all cases surface pipe *shall be set* through all unconsolidated materials plus a minimum of 20 feet into the underlying formation.
4. If the well is dry hole, an agreement between the operator and the district office on plug length and placement is necessary *prior to plugging*;
5. The appropriate district office will be notified before well is either plugged or production casing is cemented in;
6. If an ALTERNATE II COMPLETION, production pipe shall be cemented from below any usable water to surface within **120 days** of spud date. Or pursuant to Appendix "B" - Eastern Kansas surface casing order #133,891-C, which applies to the KCC District 3 area, alternate II cementing must be completed within 30 days of the spud date or the well shall be plugged. **In all cases, NOTIFY district office** prior to any cementing.

I hereby certify that the statements made herein are true and to the best of my knowledge and belief.

Date: 9-23-03 Signature of Operator or Agent: Dan Magee Title: Director of Engineering

For KCC Use ONLY  
API # 15 - 121-27768-00-00  
Conductor pipe required NONE feet  
Minimum surface pipe required 20 feet per Alt. + 2  
Approved by: RJP 9-24-03  
This authorization expires: 3-24-04  
(This authorization void if drilling not started within 6 months of effective date.)  
Spud date: \_\_\_\_\_ Agent: \_\_\_\_\_

Remember to:

- File Drill Pit Application (form CDP-1) with Intent to Drill;
- File Completion Form ACO-1 within 120 days of spud date;
- File acreage attribution plat according to field proration orders;
- Notify appropriate district office 48 hours prior to workover or re-entry;
- Submit plugging report (CP-4) after plugging is completed;
- Obtain written approval before disposing or injecting salt water.

Well Not Drilled - Permit Expired

Signature of Operator or Agent: \_\_\_\_\_

Date: \_\_\_\_\_

Mail to: KCC - Conservation Division, 130 S. Market - Room 2078, Wichita, Kansas 67202

7  
18  
248

EVERGREEN RESOURCES, INC.

**ORIGINAL**

OPERATOR <b>EVERGREEN OPERATING CORP</b>
WELL NAME <b>PECKMAN ANGUS #32 - 7 WD</b>
LEGAL LOCATION <b>SWNE SECTION 7, T18S - R24E</b>
COUNTY, STATE <b>MIAMI, KANSAS</b>

DATE <b>10/31/2003</b>	TOTAL DEPTH <b>283' GL</b>
REPORT NO. <b>1</b>	DEPTH (LAST 24 HRS) <b>283'</b>
RIG CONTRACTOR <b>CHRISTENSEN</b>	DAYS SINCE SPUD <b>1</b>
CONSULTANT <b>FRIEDRICHS</b>	AFE # <b>03KS-004</b>

DAILY DRILLING REPORT

PRESENT OPERATION			
PRESENT OPERATION <b>R U CORE EQUIPMENT</b>	DAILY COST <b>\$ 8,208</b>	CUM COST <b>\$ 8,208</b>	AFE COSTS <b>\$ 122,782</b>

DAILY DRILLING SUMMARY			
FROM (hrs)	TO (hrs)	HOURS (hrs)	DESCRIPTION OF DAILY OPERATIONS (06:00 - 06:00 hrs)
17:30	18:15	0.75	MORU, GETTING PERMISSION TO DRILL FROM KCC @ 08:00 10/28/03. SPOKE W/ BECKY.
18:15	20:00	1.75	SPUD WELL @ 17:30 HRS, 10/30/03, AIR DRILLING W/ 11" BIT TO 45' GL.
20:00	21:00	1.00	RUN 1 JT 8 5/8", 24 #FT, J-55, 8RD, ST&C CSG SET @ 43.5'. CEMENT DOWN BACKSIDE W/ 12 SX PORTLAND CEMENT TO SURFACE.
21:00	05:00	8.00	WOC, NU @04:00, RU 8" AIR HAMMER BIT
05:00	06:00	1.00	DRILLING FROM 45' TO 283' GL W/ 8" AIR HAMMER. ( ROP - 238 FPH)
TOTAL HOURS		12.50	

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SUMMARY OF RIG HOURS		
DESC.	DAILY (hrs)	CUM. (hrs)
Drill	2.75	2.75
Trip	-	-
Circulate	-	-
Rig Repair	-	-
Rig Service	-	-
Dev Survey	0.00	-
NU / ND	-	-
Cement	-	-
Run Casing	1.00	1.00
WOC	8.00	8.00
OH Logging	-	-
Mix Mud	-	-
MI & RU	0.75	0.75
Rat Hole	-	-
Mouse Hole	-	-
Fishing	-	-
DST	-	-
CH Logging	-	-
Perforating	-	-
Swab	-	-
Frac	-	-
Acidize	-	-
Coring	-	-
Other	-	-
TOTALS	12.50	12.50

DESCRIPTION OF DAILY & CUMULATIVE COSTS					
COST CODE	DESCRIPTION OF DAILY COSTS	DAILY (\$)	CUMULATIVE (\$)	AFE (\$)	
2030.010	Land, Legal, Title, Survey, Arch, Damages, Permits, Signs	\$ 1,050	\$ 1,050	\$ 2,000	
2030.031	Dirtwork, Road, Localikon, Pits, Liner	\$ 400	\$ 400	\$ 1,200	
2030.019	Contract Drilling	\$ 3,608	\$ 3,608	\$ 32,855	
2032.001	Water		\$ -	\$ 1,400	
2032.013	Drill Bits, Stabilizers, Reamers		\$ -	\$ 4,950	
2031.046	Cementing and Services		\$ -	\$ 8,000	
2030.053	Coring and Analysis		\$ -	\$ 20,800	
2030.052	Logging		\$ -	\$ 3,000	
2030.054	Mud Logging	\$ 750	\$ 750	\$ 4,800	
2030.037	Rental Equipment		\$ -	\$ 1,000	
2030.028	Transportation	\$ 200	\$ 200	\$ 2,250	
2030.064	Completion Unit		\$ -	\$ 3,000	
2030.055	Perforating		\$ -	\$ 1,500	
2031.058	Well Stimulation		\$ -	\$ 5,000	
2030.035	Contract Labor	\$ 600	\$ 600	\$ 1,000	
2030.022	Engineering / Supervision	\$ 600	\$ 600	\$ 4,200	
2030.099	Intangible Miscellaneous and Contingencies	\$ 500	\$ 500	\$ 4,838	
2040.001 / 2040.004	Surface and Production Casing	\$ 300	\$ 300	\$ 6,600	
2040.007	Tubing		\$ -	\$ 3,380	
2040.023	Float Equipment, Shoes, Centralizers		\$ -	\$ 1,250	
2040.028	Wellhead Equipment		\$ -	\$ 1,950	
2040.022	PACKERS, ANCHORS AND HANGERS, ETC.		\$ -	\$ 3,000	
2040.031 / 2040.037	Drivehead, Engine / Motor and Hydraulic Pump / Electric Unit		\$ -	\$ -	
2040.052 / 2040.055	Valves and Fittings, Small / Large		\$ -	\$ 1,500	
2040.067	Other Surface Equipment		\$ -	\$ 2,500	
2040.099	Tangible Miscellaneous and Contingencies	\$ 200	\$ 200	\$ 1,009	
TOTAL COSTS		\$ 8,208	\$ 8,208	\$ 122,782	

Customer E.O.C.				Date 10/30/03		F.R. #		Service Supervisor Ray Decker						
Lease & Well Name – PECKMAN ANGUS 32 – 7				Location 18S23ESEC20				County – Parish – Block MIAMI COUNTY						
District		Drilling Contractor Rig # LAYNE				Type of Job 5 ½ Longstring								
Size & Types of Plugs			List – CSG - Hardware			Physical Slurry Properties								
Top	5 ½ Top Rubber		8 CENTRALIZERS			Slurry WGT PPG	Slurry YLD Ft <sup>3</sup>	Water GPS	Pump Time Hr:Min	Std Slurry	Std Mix Water			
Btm														
Materials Furnished														
185 SKS Vermejo						13.3	1.45	9.76						
2 lbs red dye														
<b>ORIGINAL</b>														
Available mix fluid			Bbl.		Available Displ. Fluid			Bbl.		Total				
Hole			TBG-CSG-D.P.			TBG-CSG-D.P.			Collar Depths					
Size	% Excess	Depth	Size	WGT	Type	Depth	Size	WGT	Type	Depth	Shoe	Float		
81/4"		901'	5 ½	15.5.#		866'								
Last Casing			Pkr - Cmt Ret – Br PI - Liner			Perf Depth		Top Conn		Well Fluid				
Csg.	WGT	Type	Depth	Brand & Type		Depth	Top	Btm	Size	Thread	Type	WGT		
8 5/8	24#		694'						5 1/2	8rd	H2O	8.33		
Cal Displ Vol – Bbl 20 BBL.				Cal Psi		Cal Max Psi	OP Max 1500 PSI		Max Tbg PSI		Max Csg PSI		Displ Fluid	Water
TBG	CSG	CSG	Total	Bump Plug	To Rev	SQ PSI	Rated	OP	Rate d	OP	Type	WGT	Source	
						1500 PSI					H2o	8.33	Tank	
Explanation: WELL DID CIRCULATE. DID BUMP PLUG.														
Pressure/Rate Detail							Explanation							
Time HR:Min	Pressure – PSI		Rate BPM	Bbl Fluid Pumped	Fluid Type	Safety Meeting: Crew x      Co. Rep x								
	Pipe	Annulus				Testing Lines      Psi 2000								
1430	80		3	15	H2O	PUMP DYE WATER AHEAD								
1435	100		3	48	CMT	PUMP CMT. @ 13.3 PPG								
1500	375		3.5	20	H2O	PUMP DISPLACEMENT								
1505	1500				H2O	BUMPED PLUG								
							RECEIVED KANSAS CORPORATION COMMISSION							
							MAR 8 2004							
							10 BBLS – 200 PSI							
							15 BBLS – 300 PSI							
							20 BBLS – 375 PSI							
							CONSERVATION DIVISION WICHITA, KS							
Bumped Plug	PSI to Bump Plug	Test Float Equip	Bbl CMT Returns/ Reversed	Total Bbl Pumped	PSI Left On CSG	Spot Top Cement	Serv. Supv.							
Y	1500	Y	9 BBL	83 BBL	0	Y	Ray Decker							

**Professional Energy Services**

9402 Kessler Lane  
Shawnee Mission, KS 66212  
Ph.913.341.7434

**GEOLOGICAL REPORT**

**ORIGINAL**

Operator: **EVERGREEN OPERATING CORPORATION**  
Project: Lancaster D Well Name: Peckman Angus 32-7 WD  
Location: Ap. S/2 SW NE - 2310' FNL and 1900' FEL  
Sec. 7-T18S-R24E County: Miami State: Kansas  
All measurements GL: 901 API: 15-121-27768-00-00  
Company: Sr. Operations Engineer: Mr. Tom Erwin  
Company: Geologist: Mr. Paul Clarke  
Professional Energy Services: Geologist: Rich Robba  
Drilling Superintendent: Drew Friedrichs  
Patterson Logging: Roger Taylor  
Drilling Contractor: Layne Christensen Company  
TerraTek: Desorption: Technician Chip DeVaney  
Geosearch Logging: Mudlogger: Pat Andrews  
Commenced: 10/30/03 Completed: 11/04/03

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This geological report is prepared for **EVERGREEN OPERATING CORPORATION**. Wellsite geological supervision was conducted from surface to TD. This well was air drilled to core point and continuous cored from the Marmaton to the Mississippi. The Peckman Angus 32-7 WD was deepened to the Arbuckle porosity. ROP, gas curves and sample descriptions from air and mud rotary chips are recorded on the mud log and geophysical survey formation tops and visual core recovery descriptions are listed below.

Peckman Angus 32-7 WD

Formation E-Log Tops

Stark Shale:	59'	Mississippi:	756'
B/Kansas City:	102'	Kinderhook	1140'
Core Point:	280'	Arbuckle Dol	1234'
Altamount:	304'	Clean Arbuckle	1267'
Summit:	410'	RTD:	1752'
Excello:	432'	LTD:	1320'
VShale:	531'		
Tebo Shale:	593'		

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Coal and Coal Shale Intersections Core or E-Log

Net Coals(ft) < 1.75 g.cc

Net Coals(ft) < 2.00 g.cc

Net Carbonaceous Shale (ft)

Name	Depth	Name	Depth	Name	Depth
DS1 Mulberry	319.8-320.8	DS3 Lexington	360.8-361.6	(Core) Fleming	545.3-546.2
DS2 Mulberry	321.2-322.2	Bevier (lost rec.)	513.9-514.8	(Core) Mineral	567-568.
DS4 Mulky	434.7-435.7	DS5 Croweberg	536.8-537.7	DS8 Drywood	688-689.8
DS6 Tebo	594.8-595.8	(Core) Bluejacket	642.3-642.6	(Core is coal)	
DS7 Tebo	595.8-596.9	DS9 Rowe	706-706.8		
DS10 Neutral	740.2-741.2	(Core) RoweB	713-713.5		
DS11 Neutral	741.2-742.6				

Cumulative Net Thickness Core and E-Log

Net Coals(ft) < 1.75 g.cc

Net Coals(ft) < 2.00 g.cc

Net Carbonaceous Shale (ft)

7.9'

4.2'

3.8'

Visual Core Sample Descriptions

- 289-288 SHALE, pale blu/wh, locally fissile and mod - well indurated, nodular (siderite), w/ calc. mtrx.
- 288-289 MUDSTONE, rd, w/ rd/gy mottling at basal 0.2 ft. non-calcareous.
- 289-298 SHALE, pale blu/grn/gy, w/ calcified macro-fossils (bivalves).
- 301-304 SHALE, med. to dkgy, clay rich.
- 298-301 MUDSTONE, dull rd, w/ occ. macrofossils in argil mtrx.
- 304-308 LIMESTONE, tan to off wh, hard, well cemented microxln tex, frac and calc veining common, macrofossils present in abundance.
- 308-311 SHALE, med gy and non calcareous.
- 311-313 SHALE, blk, v fissile w/ fine-scale lamination and foss bands.
- 313-319 CLAYSTONE: mottled gy/blu/grn, nodular, clay rich and locally calcareous.
- 319-320 LIMESTONE, wh, off wh, w/ sh devel at base, slishogas.
- 320-322 COAL, blk, bright color, vitre and locally fragmented, v local cleat devel, w/ pervasive concoidal fracture, relatively hard and low density, bleeding gas, especially in lowermost 1ft.
- 322-327 CLAYSTONE, gy, mottled and calcareous with nodules of siderite, plant frags common.
- 327-336 LIMESTONE, crm to off wh, nodular and well cemented, appears tight.
- 336-340 SANDSTONE, blu to med gy, fn-grn w/ fvispor, bleeding gas and patchy residual oil sho.
- 340-345 SHALE, dk to med gy, w/ thin vfn gn ss laminae.
- 345-352 SHALE, v dk gy to blk w/ patch pyr.
- 352-357 LIMESTONE, tan to gy, fn-microxln tex w/ shelly bands, well cemented, w/ lt, patch outgassing.
- 357-358 SHALE, blk uniform, med. organic content.
- 358-358 CARB SH: blk, blk, dull luster and intermediate density, vslishogas.

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Visual Core Sample Descriptions

- 358-361 SHALE, v dk gy to blk, laminated and fissile, w/ v fn-gn ss, plant fragments and rootlet beds.
- 361-362 COAL, bright, low density and blk, crude de vel of face and butt cleats, w/ irregular fracture networks pervasive, occ ash banding.
- 362-373 CLAYSTONE, pale gy, blk waxy tex, clay rich, w/ fn disseminated organic (plant) fragments, locally calcareous (from nodules).
- 373-394 LIMESTONE, wh to off wh, occ gy, vfn-microgran/microxln ls tex, nodular and well cemented, appear tite. Irregular, deformed bedding w/ thin (<0.2) sh interbeds, base appears grad w/ underlying litho.
- 394-406 SHALE, dull brn/gy (earthy), massive and waxy, fissile and calcareous, low organic content.
- 406-407 LIMESTONE, pale gy/wh, microxln, thin stringer.
- 407-411 SHALE, dkgy, grading to blk organic rich mottled, massive, and blk, firm.
- 411-412 SHALE (coal-shale), blk organic rich, intermediate density, vfn-grn, blk locally frac, p-fgassho.
- 412-422 SHALE, v pale gy to lt tan, waxy and clay rich, low organic content, sli calcareous, macro-foss include bivalves and brachiopods.
- 422-423 LIMESTONE, off wh to crm, microxln, massive, shelly.
- 423-431 SHALE, med gy, platy tex, soft and mica, mildly calcareous, macrofossils incl bivalves and coral.
- 431-432 SHALE, dkgy, to blk, organic rich, blk w/ lenticular nodules of tan/brn siderite.
- 432-434 COAL, bright, blk w/ vitr. luster, firm to hard, thin siltstone/ash laminae, concoidal frac w/ mineralization, to discernable cleating.
- 434-441 SHALE, dull gy, locally mottling, w/ thin micaceous siltstone interbeds, and local calcite cement.
- 441-456 SANDSTONE, pale tan to med gy, fn-gn, mica rich, well sorted, relatively soft, weakly cemented showing moderately gdvispor, brn to tan, vfn-fngn qtz-arenite, well sorted w/ mod. sli cement, slivispor.
- 456-501 SANDSTONE brn to tan, fn to fn/med gn, basal 1 ft is med grn (ss fn upward from base), relatively well-sorted qtz-arenite, w/ mod gdvispor gas bleeding throughout, although patchy, crude, x-strata may provide por breaks, gd blk oil sho in basal 1.5 ft of snd.
- 501-505 SILTSTONE, gy earthy, micaceous, soft, residual oil sho.
- 505-513 SHALE, med to dk gy/blu, waxy and clay rich w/ v thin organic rich laminations, bleeding gas, non-calcareous and friable/blk (poor sample condition).
- 513-514 COAL, bright, locally dull, low density, highly frac w one p de vel (non pervasive) cleat system and an irregular occluded frac system, vslishogas.
- 514-516 CLAYSTONE, mottled dk to pale blu/gy, waxy w/ slick-en-slides, blk, nodular and locally well indurated, thin sh lamination and weakly calcareous throughout.
- 516-527 SHALE, v pale gy to blu, mottled and nodular, soft and fissile, vfn-gn ss laminae.
- 527-528 LIMESTONE, wh, microxln, shelly and v well cemented.
- 528-530 SHALE, gy calcareous, soft and friable.
- 530-531 SHALE, deep purple to dk gy, relatively low density and organic rich.
- 531-536 SHALE, med gy, mottled, low organic content.
- 536-537 COAL, blk, bright, clean vitr luster, one set of cleats, and mosaic of irregular frac.
- 537-544 SHALE, gy/blu, well-indurated and waxy, w/ slick-en-slides and siltstone laminations.
- 544-544 COAL, blk, bright, low density, irregular fracs w/ no vis cleat, excel. shogas.
- 544-565 SHALE, gy/blu, waxy, w/ slick-en-slides and siltstone laminations.
- 565-566 COAL (CSh), (lost core?) blk, sli vitr luster and thin laminations, organic rich, slishogas.
- 566-595 SHALE, mottled gy/grn to v dk blu, non-calcareous w/ dec organic content at lower depths.
- 595-597 COAL, shly, med density, bright w/ dull areas, pshogas, some ash.
- 597-602 UNDERCLAY, dkgy, w/ brn-gy clay layers, cs tex.



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CONSERVATION DIVISION  
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Visual Core Sample Descriptions

602-623 SHALE, ltgy, w/ dkgy 2"-6" bands, hard w/ v ltgy and dkgy sh v thin bedding w/ slumping, blk sh v low organics content, all blk sh last 2'.  
623-637 SILTSTONE, gritty, ltgy, vfngn, v well sorted sn ds, chunky or layers of carb leaves and stems.  
637-642 SHALE, dkgy, blk w/ 1/2 " to 1" brn sh bands, flat bedding leaves and stems carb sh, seasonal thin beds w/ inc carb at base.  
642-642.3 COAL, blk, v gassey, vp cleats, low density.  
643-652 UNDERCLAY, well devel, gy-gr w/ bkn pcs brn sh, pasty thin layers, isolated layers w/ v low carb content.  
652-679 SHALE, vdkgy, blk w/ 1"-2" brn sh bands, v low organics, v thin lt to dkgy layers within bands, v rare trc gas outgassing.  
679-686 SANDSTONE, vfngn, well rnd/sorted, lt-dk tan, olive layering, x-bedding, w/ pcs blk carb incl.  
686-687 COAL, bright, excel shogas, f cleating, low density.  
687-694 UNDERCLAY, gy w/ numerous bkn pcs blk carb sh bec/ sdy near base gr-gy.  
694-696 SHALE, gy-gr w/ thin blk carb mats.  
696-704 SHALE, blk, w/ thin layers ltgy thin beds, pyr, brach w/ clay replacement.  
704-705 COAL, blk, low density, gdshogas, fcleating, 1 CSh band 2".  
705-712 SANDSTONE, vfn-fngn, ltgy, fsorted, leaves, sub rnd w/ many carb mats, and bkn pcs, some slumping and x bedding.  
712-713 COAL, gassey, dull, shly, vpyr, w/ gy sh bkn pcs incl.  
713-720 UNDERCLAY, olive-gy, gritty and cs tex.  
720-738 SHALE, blk w/ low-med organics, thin ltgy sh bands w/ occ 2"-4" ltgy clay, vertical and horizontal fill, pyr, fissile, inc ltgy bands and burrows towards base.  
738-740.4 COAL, blk some brn, v low density, gdshogas, bright, gd cleats, pyr, calcite.  
740.4-748 UNDERCLAY, gy-gr, soft, well devel.  
748-754 SHALE, dkgy w/ blk carb mats, bkn blk sh pcs, thin ltgy sh laminations.  
754-756 LIMESTONE, vfn-fnxln, lt tan, v ool, nvp.

Respectfully submitted,

Richard A. Robba, PG  
Director of Operations  
Professional Energy Services

Paul Clarke, PHD  
CBM Geologist  
Evergreen Operating Corp.