



**Weatherford**<sup>®</sup>  
LABORATORIES

**CORE ANALYSIS REPORT**  
**Conventional Core**

**Vecta Oil & Gas, Ltd.**

**Red Cloud 44-5 Well**  
**Wildcat Field**  
**Cheyenne County, Colorado**

**FINAL REPORT**

Performed for:  
**Vecta Oil & Gas, Ltd.**  
575 Union Blvd., Suite 208  
Lakewood, Colorado 80228

Report issued:  
May 3, 2010

Performed by:  
**Weatherford Laboratories**  
16161 Table Mountain Parkway  
Golden, Colorado 80403

File: DN-46724



May 3, 2010

Herb Mosca  
**Vecta Oil & Gas, Ltd.**  
575 Union Blvd., Suite 208  
Lakewood, Colorado 80228

Subject: Conventional Core  
Final Routine Core Analysis Report  
Red Cloud 44-5 Well  
Cheyenne County, Colorado  
File: DN-46724

Mr. Mosca:

A core study using core material recovered from the subject well has been completed for Vecta Oil & Gas, Ltd. The procedures were modified during the course of the study through e-mail and telephone conversations between Weatherford Laboratories' and authorized Vecta Oil & Gas, Ltd personnel. Final results of the routine core analysis study are presented herein. Preliminary data were provided to Vecta Oil & Gas, Ltd and posted to the Weatherford Laboratories' secure data hosting website, as available throughout the course of the study. The routine core analysis data and graphical results are presented in tabular and graphic formats in Section 1 of this report.

### **Wellsite**

Weatherford Laboratories personnel were present at the wellsite for recovery of the conventional core as it reached surface. A total of sixty (60) feet of conventional core from one (1) coring run were recovered and delivered to Weatherford Laboratories in Golden, Colorado on March 22, 2010. A separate wellsite report that includes the details of the processing was posted to the Weatherford Laboratories' secure data hosting website March 29, 2010.

### **Core Handling and Sampling**

#### Core Inventory & Gamma

Upon arrival at the Weatherford Laboratories facility, all recovered core material was inventoried and logged for total gamma. A final inventory of received core is included in Appendix A of this report. Core gamma data were processed and plotted in depth versus total gamma (API units), at a vertical scale of 5 inches to 100 feet.

#### Core Sampling

Twenty-five (25) core plug samples were drilled from Core 1 for Fast Track routine core analysis (RCA). The RCA core plug samples were acquired in a horizontal orientation from the requested intervals. The RCA samples were cut 1.5-inches in diameter, using humidified nitrogen as a bit lubricant. Each horizontal RCA sample was then trimmed to 2.0-inches in length to come from the center of the core, weighed, and wrapped in Saran and aluminum foil. Each RCA sample was immediately taken to the extraction lab to begin the Fast Track RCA.

## **Routine Core Analysis**

### Extraction/Leaching

The core plug samples for Fast Track routine core analysis was weighed to 0.001 grams. Then each core plug sample was placed in a pre-dried, pre-weighed, and pre-labeled glass extraction thimble. The core plug and thimble samples were weighed together for accuracy just prior to loading into the extraction unit. The core plug sample was not removed from the glass thimble until after the drying process described below. All associated glassware used for the extraction and leaching process was cleaned, rinsed with solvents, and dried before use.

Selected samples were submitted to the Dean Stark extraction process, where gas phase toluene is used to extract hydrocarbons and in-situ water from individual core samples. Each condenser, core chamber and flask used for the Dean-Stark extraction process was rinsed with fresh reagent grade toluene before pre-boiling. The toluene in each Dean Stark extraction unit was pre-boiled for a minimum of one hour to ensure there was no free water in the system prior to loading the core plug samples. A control unit was established for each set of core plug samples where a pre-weighed amount of distilled water was added to the toluene and monitored for full recovery during the pre-boiling step. This is performed to ensure the batch of toluene was not contaminated with chemicals that would make the extracted water miscible with the Toluene solvent. Each graduated sidearm receiving tube was checked for water and dried prior to loading the core plug samples.

After the samples were loaded into its individual Dean Stark extraction unit, the condenser was capped with desiccant to prevent the introduction of condensed atmospheric water into the system. Water volume in each graduated sidearm receiving tube was monitored during the toluene extraction over a 24-hour period due to the requested Fast Track analysis. The condenser was rinsed with reagent grade toluene and a wire was used to detach any water droplets from the neck of the condenser. Each sample was removed from its Dean-Stark extraction unit and allowed to vent overnight. Final water volumes were measured volumetrically to ( $\pm 0.05$  cc), removed from the graduated sidearm tube by a syringe, and weighed gravimetrically to ( $\pm 0.001$  grams).

### Sample Drying

Each core plug and thimble sample was dried in a vacuum oven at 180 degrees Fahrenheit. Samples were removed from the oven and cooled to room temperature over desiccant in a sealed container. Due to the requested Fast Track analysis after a 24-hour period each core plug sample was removed from its glass thimble. The core plug sample was weighed and its associated glass thimble was weighed to ensure accuracy.

### Grain Volume and Grain Density Determination

A grain volume of each core plug sample was measured by helium injection using the Boyle's Law method. The equipment was calibrated with known volume steel billets to establish a pressure vs. volume linear relationship. Berea, titanium and steel standards were measured before each run to ensure the system was properly calibrated. The core plug samples were kept in a desiccator until ready for grain volume measurement and individually weighed just prior to its grain volume measurement. The Berea check plug was measured after every fifth sample, and the measurement of every fifth core plug sample was repeated to ensure continued calibration of the system.

Grain densities (gm/cc) were calculated from the dry sample weight (gm) and grain volume data (cc) using the formula:

$$GD = \frac{DW}{GV}$$

Where: GD = Grain Density, gm/cc  
DW = Dry weight, gm  
GV = Grain Volume, cc

### Plug Permeability to Air and Porosity Measurements

Boyle's law helium pore volumes and steady state nitrogen permeability values were measured at the designated net confining stress (NCS) of 800 psi. Each core plug sample was loaded into a Hydrostatic core holder system

**Vecta Oil & Gas, Ltd.**  
 Red Cloud 44-5 Well  
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and pressure was applied to achieve a simulated reservoir stress. Using the techniques established by Frank Jones, pore volume was measured and calculated using the following equation:

At NCS:

$$\phi = (PV) / (GV+PV) * 100$$

Where:  $\phi$  = Porosity, percent  
 PV = Pore Volume, cc  
 GV = Helium Grain Volume, cc

Permeability to air was measured by establishing a constant differential pressure and constant flow rate of nitrogen gas across each core plug sample. Permeability values are calculated based on Darcy's Law.

$$K_{air} = 14700 * \frac{(Length * Volume * Viscosity)}{(Pressure * Area * Time)}$$

Where:  $K_{air}$  = Permeability to Air, millidarcys  
 14700 = constant for unit conversions  
 Length = length of test sample, cm  
 Volume = volume of nitrogen measured, cm<sup>3</sup>  
 Viscosity = nitrogen's viscosity at test temperature, cp  
 Pressure = pressure drop across test sample, psi  
 Area = area of test sample, cm<sup>2</sup>  
 Time = time of measurement, seconds

Klinkenberg permeability values are provided for each sample and were calculated from the observed steady-state data using the following equation:

$$KK = G - \frac{(G + AA * G^{\frac{Ma+1}{PMa}} - Ka)}{1 + AA * G^{\frac{Ma}{PMa}}}$$

Where: KK = Klinkenberg Permeability  
 G = Ka  
 If Ka > 0.437, then AA = 0.777 and Ma = -0.39  
 If Ka < 0.437, then AA = 0.86 and Ma = -0.33  
 PMA = Mean Pressure

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Red Cloud 44-5 Well  
Cheyenne County, Colorado  
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### **Sample Disposition**

After the core sampling program was completed twenty-two (22) boxes of core material from Core 1 and one box of the endtrim material from twenty-five (25) core plug samples were delivered, via Weatherford Laboratories personnel to Triple "O" Slabbing on March 23, 2010 to Triple "O" Slabbing. The release forms and inventories are included in Appendix B.

Weatherford Laboratories appreciates the opportunity to have been of service to Vecta Oil & Gas, Ltd. If you have any questions, or if we may be of any further assistance, please contact any Weatherford Laboratories' representatives at (720) 898-8200.

Sincerely,

David B. Sutton  
General Manager  
Western US – Core Analysis

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**Vecta Oil & Gas, Ltd.**  
Red Cloud 44-5 Well  
Cheyenne County, Colorado  
File No.: DN-46724

## **SECTION 1**

### **ROUTINE CORE ANALYSIS RESULTS – FAST TRACK**

- Total Gamma
- Core Data
- Permeability/Saturation and Porosity Cross Plots

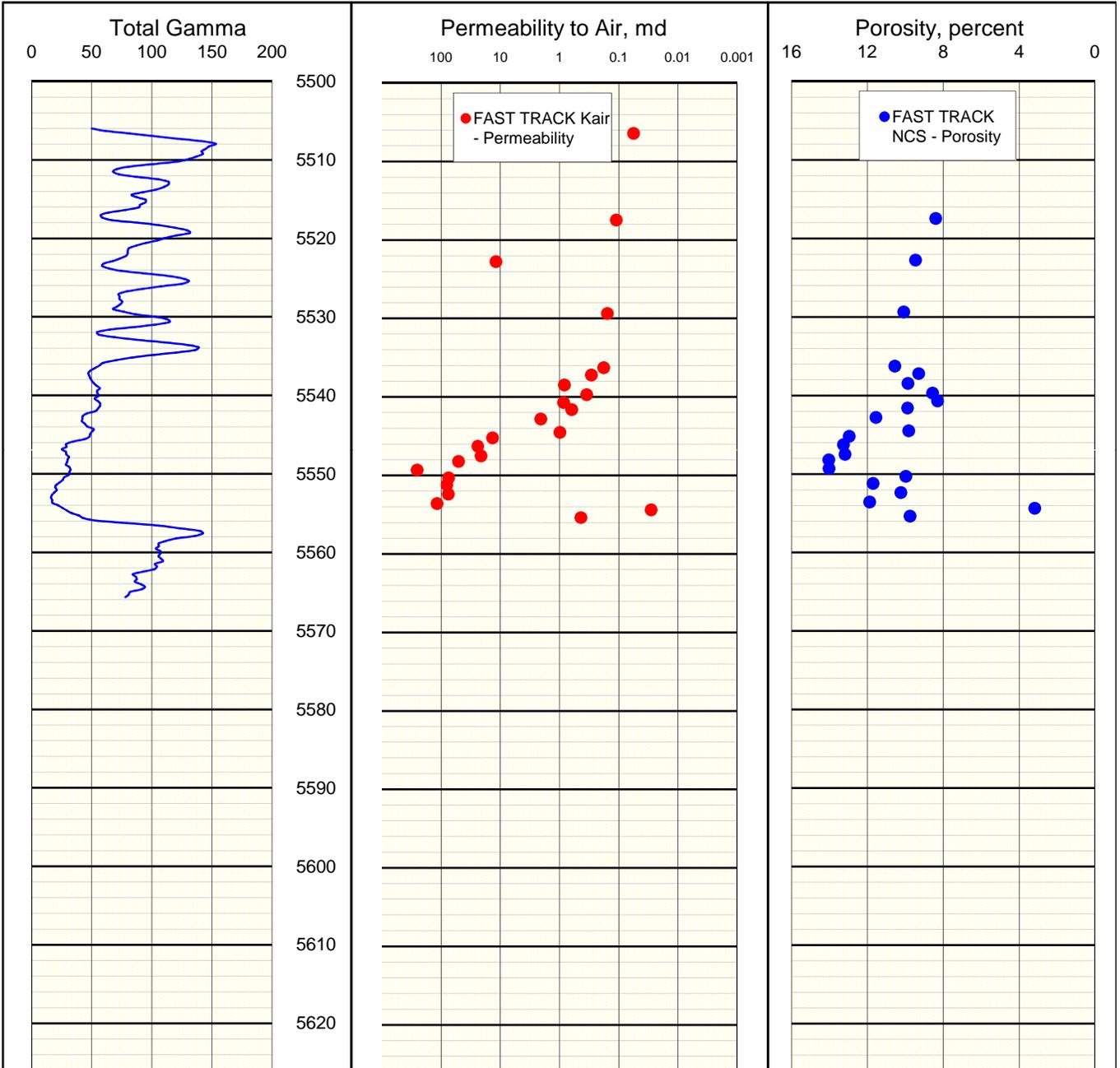
# CORE GAMMA, PERMEABILITY, AND POROSITY PROFILE PLOT

VERTICAL SCALE 5 inch:100 feet

Vecta Oil & Gas, Ltd.  
Red Cloud 44-5 Well  
Wildcat Field

Cheyenne County, Colorado  
File No.: DN-46724  
Date: 3/25/2010

Core: 1 (5506.0' - 5565.7')





## SUMMARY OF FAST TRACK CORE ANALYSES RESULTS

Vacuum Oven Dried at 180° F    Net Confining Stress: 800 psi

Vecta Oil & Gas, Ltd.  
Red Cloud 44-5 Well  
Wildcat Field

Cheyenne County, Colorado  
File No.: DN-46724  
Date: 3/25/2010

Core Number	Sample Number	Sample Depth, feet	Permeability, millidarcys		Porosity, percent		Grain Density, gm/cc	Fluid Saturations, percent		
			to Air	Klinkenberg	Ambient	NCS		Water	Oil	Total
1	1-1	5506.40	0.057	0.028	7.0	7.0	2.70	55.9	12.1	68.0
1	1-12(f)	5517.45	0.111	0.059	8.4	8.4	2.67	63.8	25.3	89.1
1	1-17(f)	5522.75	11.9	9.5	9.5	9.5	2.67	66.1	27.5	93.6
1	1-24	5529.35	0.157	0.080	10.1	10.1	2.67	67.9	15.4	83.2
1	1-29(F)	5534.20		+	7.5		2.67	47.8	37.1	84.8
1	1-31	5536.25	0.181	0.103	10.6	10.6	2.66	64.1	20.5	84.7
1	1-32(f)	5537.20	0.292	0.215	9.3	9.3	2.67	58.4	28.9	87.3
1	1-33(f)	5538.45	0.836	0.620	9.9	9.9	2.67	65.9	21.8	87.7
1	1-34(f)	5539.70	0.350	0.170	8.6	8.6	2.66	53.0	34.0	87.0
1	1-35(f)	5540.70	0.856	0.636	8.3	8.3	2.66	69.1	15.8	84.9
1	1-36	5541.60	0.627	0.463	9.9	9.9	2.66	56.5	17.6	74.1
1	1-37	5542.80	2.08	1.55	11.6	11.5	2.65	60.4	20.9	81.3
1	1-38(F)	5543.25		+	11.1		2.65	64.3	13.1	77.4
1	1-39	5544.50	0.987	0.729	9.8	9.8	2.65	57.6	12.1	69.7
1	1-40	5545.20	13.6	10.9	13.0	13.0	2.66	81.2	11.2	92.4
1	1-41	5546.25	24.1	19.9	13.3	13.3	2.65	81.8	12.9	94.7
1	1-42	5547.50	21.2	17.4	13.2	13.2	2.66	83.8	15.5	99.4
1	1-43	5548.20	51.1	43.9	14.1	14.0	2.65	62.6	15.8	78.4
1	1-44	5549.30	255.	234.	14.0	14.0	2.66	59.9	16.9	76.8
1	1-45	5550.30	74.6	64.9	10.0	10.0	2.70	72.3	11.0	83.3
1	1-46	5551.20	80.1	69.9	11.7	11.7	2.69	72.9	11.9	84.7
1	1-47	5552.35	75.6	65.8	10.3	10.2	2.69	63.2	16.4	79.6
1	1-48	5553.55	117.	104.	11.9	11.9	2.66	71.5	5.9	77.4
1	1-49	5554.35	0.029	0.016	3.2	3.2	2.68	36.4	18.2	54.5
1	1-50	5555.35	0.440	0.221	9.8	9.7	2.65	62.1	10.7	72.8
Average values:			31.8	28.1	10.2	10.3	2.67	63.9	17.9	81.9

- + Indicates the sample is unsuitable for this type of measurement
- (f) Indicates the sample has a visible fracture
- (F) Indicates the sample is fractured into multiple pieces

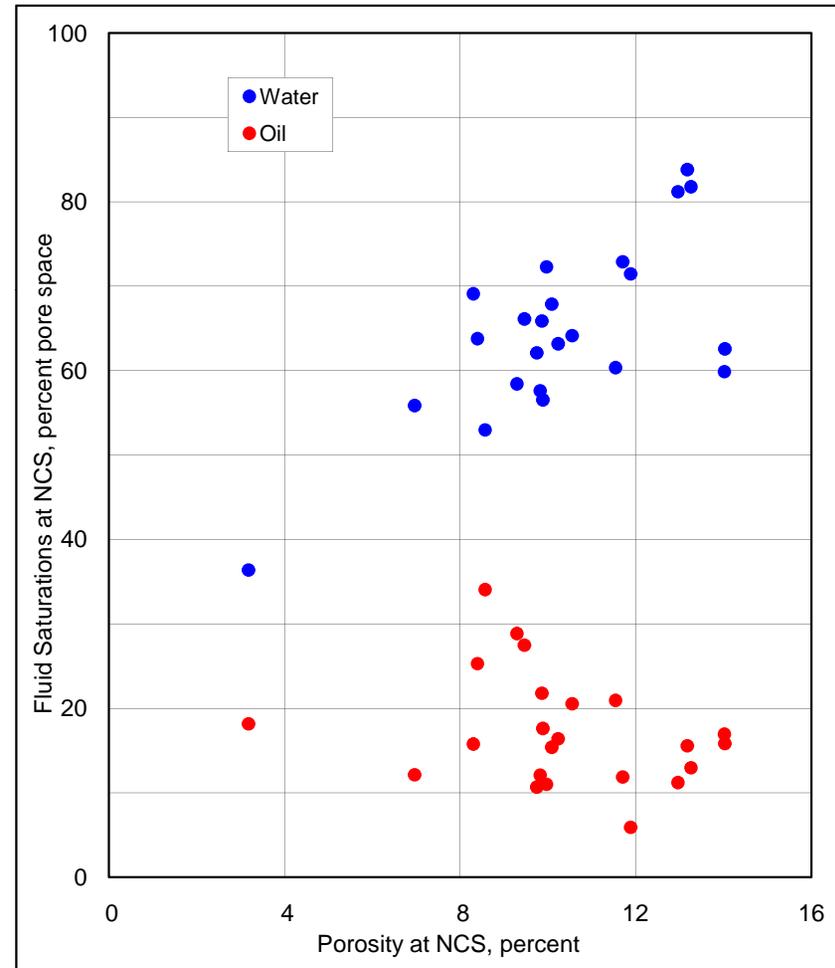
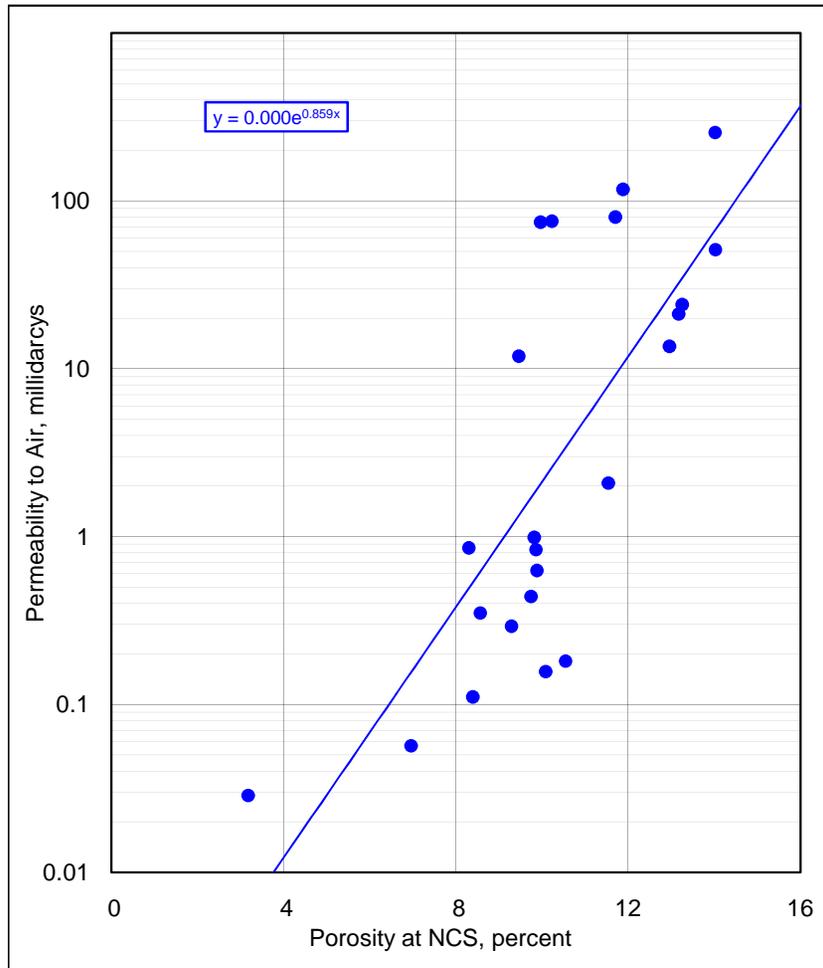


## PERMEABILITY AND FLUID SATURATIONS VERSUS POROSITY - FAST TRACK RESULTS

Vacuum Oven Dried at 180° F Net Confining Stress: 800 psi

Vecta Oil & Gas, Ltd.  
Red Cloud 44-5 Well  
Wildcat Field

Cheyenne County, Colorado  
File No.: DN-46724  
Date: 3/25/2010



**Vecta Oil & Gas, Ltd.**  
Red Cloud 44-5 Well  
Cheyenne County, Colorado  
File No.: DN-46724

## **APPENDIX A**

### **CORE INVENTORIES**

- Received Inventory
- Sample List / Drill Sheet



## WELLSITE - TUBE LIST

Vecta Oil & Gas, Ltd.  
 Red Cloud 44-5 Well  
 Wildcat Field

Cheyenne County, Colorado  
 File No.: DN-46724  
 Date: 3/23/2010

Core 1				
Tube (Box) Number	Top Depth, feet	Bottom Depth, feet	Recovered Core, feet	Comments
1	5506.00	5509.00	3.00	
2	5509.00	5512.00	3.00	Tube 2 sunk down into tube 0.7 ft.
3	5512.00	5515.00	3.00	
4	5515.00	5518.00	3.00	
5	5518.00	5521.00	3.00	
6	5521.00	5524.00	3.00	
7	5524.00	5527.00	3.00	
8	5527.00	5530.00	3.00	
9	5530.00	5532.00	2.00	
10	5532.00	5533.00	1.00	cupling
11	5533.00	5536.00	3.00	
12	5536.00	5539.00	3.00	
13	5539.00	5542.00	3.00	
14	5542.00	5545.00	3.00	
15	5545.00	5548.00	3.00	
16	5548.00	5551.00	3.00	
17	5551.00	5554.00	3.00	
18	5554.00	5557.00	3.00	
19	5557.00	5560.00	3.00	
20	5560.00	5563.00	3.00	
21	5563.00	5564.10	1.10	
22	5564.10	5565.70	1.60	

**Total Footage Recovered:      59.70**



## DRILL SHEET CORE 1

Vecta Oil & Gas, Ltd.  
Red Cloud 44-5 Well  
Wildcat Field

Cheyenne County, Colorado  
File No.: DN-46724  
Date: 3/22/2010

**RCA samples taken from the sands only**

**RCA - for FT Dean Stark extraction**

Core No.	Sample No.	Actual Sample Depth, feet	<b>RCA Plug Diameter: 1.5 - inch</b> <b>Plug Length: 2.0 - inches</b> <b>Drilling Fluid: Humidified Nitrogen (3% KCl)</b> <b>Comments: Orient End Trim</b> <b>By Notching W/Trim Saw "Up-Hole" Direction</b>		Driller Name	Date Drilled	Plug Weight, grams
1	1-1	5506.40	Short Plug		J. Bean	3/22/2010	112.29
1	1-12	5517.45			J. Bean	3/22/2010	145.57
1	1-17	5522.75			J. Bean	3/22/2010	151.88
1	1-24	5529.35			J. Bean	3/22/2010	148.86
1	1-29	5534.20			J. Bean	3/22/2010	142.23
1	1-31	5536.25			J. Bean	3/22/2010	142.19
1	1-32	5537.20			J. Bean	3/22/2010	137.91
1	1-33	5538.45			J. Bean	3/22/2010	149.27
1	1-34	5539.70	3 attempts		J. Bean	3/22/2010	153.36
1	1-35	5540.70			J. Bean	3/22/2010	152.74
1	1-36	5541.60			J. Bean	3/22/2010	141.28
1	1-37	5542.80	2 attempts		J. Bean	3/22/2010	136.50
1	1-38	5543.25			J. Bean	3/22/2010	140.05
1	1-39	5544.50			J. Bean	3/22/2010	139.13
1	1-40	5545.20			J. Bean	3/22/2010	134.14
1	1-41	5546.25			J. Bean	3/22/2010	136.48
1	1-42	5547.50			J. Bean	3/22/2010	136.40
1	1-43	5548.20			J. Bean	3/22/2010	136.95
1	1-44	5549.30			J. Bean	3/23/2010	142.55
1	1-45	5550.30			J. Bean	3/23/2010	143.17
1	1-46	5551.20			J. Bean	3/23/2010	138.73
1	1-47	5552.35			J. Bean	3/23/2010	143.82
1	1-48	5553.55			J. Bean	3/23/2010	149.25

Vecta Oil & Gas, Ltd.  
 Red Cloud 44-5 Well  
 Wildcat Field

Cheyenne County, Colorado  
 File No.: DN-46724  
 Date: 3/22/2010

**RCA samples taken from the sands only**

Core No.	Sample No.	Actual Sample Depth, feet	RCA - for FT Dean Stark extraction		Driller Name	Date Drilled	Plug Weight, grams
			RCA Plug Diameter: 1.5 - inch Plug Length: 2.0 - inches Drilling Fluid: Humidified Nitrogen (3% KCl) Comments: Orient End Trim By Notching W/Trim Saw "Up-Hole" Direction				
1	1-49	5554.35			J. Bean	3/23/2010	157.67
1	1-50	5555.35			J. Bean	3/23/2010	141.96

Summary of plug: (25) for Fast Track RCA

**Endtrims need to go to Triple "O" with the rest of the core**

**Vecta Oil & Gas, Ltd.**  
Red Cloud 44-5 Well  
Cheyenne County, Colorado  
File No.: DN-46724

## **APPENDIX B**

### **SAMPLE SHIPMENTS**

- Release Forms
- Inventories



(720) 898-8200  
Fax: (720) 898-8222

16161 Table Mountain Parkway, Golden, Colorado 80403

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## Release Form

Upon Receipt, please sign release form and fax back to (720) 898-8222

Date: 3/23/2010

WFTL Employee Authorizing Release: Suzy Nickerson

Means Of Delivery: WFTL personnel delivery (J.B. & J.M.)

WFTL File Number: DN-46724

Well Information: Vecta Oil & Gas, Ltd.  
Red Cloud 44-5 Well  
Wildcat Field  
Cheyenne County, Colorado

Material Released: (22) boxes containing (60) feet of whole core and (25) Endtrims

Individual Requesting Release: Herb Mosca (Vecta)

Individual Authorizing Release: Herb Mosca (Vecta)

Purpose Of Release: Per Client Request

Address Material Was Delivered To: Triple "O" Slabbing Phone: (303) 778-7173  
Attention: Butch Oliver  
2830 W. 9th Ave  
Denver, Colorado 80204

Delivery Accepted By: \_\_\_\_\_ Date: \_\_\_\_\_

Printed Name: \_\_\_\_\_



INVENTORY - WHOLE CORE

Vecta Oil & Gas, Ltd.  
Red Cloud 44-5 Well  
Wildcat Field

Cheyenne County, Colorado  
File No.: DN-46724  
Date: 3/23/2010

Tube (Box) Number	Top Depth, feet	Bottom Depth, feet	Recovered Core, feet
1	5506.00	5509.00	3.00
2	5509.00	5512.00	3.00
3	5512.00	5515.00	3.00
4	5515.00	5518.00	3.00
5	5518.00	5521.00	3.00
6	5521.00	5524.00	3.00
7	5524.00	5527.00	3.00
8	5527.00	5530.00	3.00
9	5530.00	5532.00	2.00
10	5532.00	5533.00	1.00
11	5533.00	5536.00	3.00
12	5536.00	5539.00	3.00
13	5539.00	5542.00	3.00
14	5542.00	5545.00	3.00
15	5545.00	5548.00	3.00
16	5548.00	5551.00	3.00
17	5551.00	5554.00	3.00
18	5554.00	5557.00	3.00
19	5557.00	5560.00	3.00
20	5560.00	5563.00	3.00
21	5563.00	5564.10	1.10
22	5564.10	5565.70	1.60

**Total Footage Recovered: 59.70**



INVENTORY - ENDTRIMS

Vecta Oil & Gas, Ltd.  
Red Cloud 44-5 Well  
Wildcat Field

Cheyenne County, Colorado  
File No.: DN-46724  
Date: 3/23/2010

WFTL Sample Number	Sample Depth, feet
1-1	5506.40
1-12	5517.45
1-17	5522.75
1-24	5529.35
1-29	5534.20
1-31	5536.25
1-32	5537.20
1-33	5538.45
1-34	5539.70
1-35	5540.70
1-36	5541.60
1-37	5542.80
1-38	5543.25
1-39	5544.50
1-40	5545.20
1-41	5546.25
1-42	5547.50
1-43	5548.20
1-44	5549.30
1-45	5550.30
1-46	5551.20
1-47	5552.35
1-48	5553.55
1-49	5554.35
1-50	5555.35