Petroleum Services

Sidewall Core Analysis

ERG Operating Company, LLC

Los Alamos 322-DS Well

Cat Canyon Field
Santa Barbara County, California

FINAL REPORT

July 2, 2012

CL File: 57111-212339ER

Performed by:
Core Laboratories, Inc.
3437 Landco Drive
Bakersfield, California 93308
(661) 325-5657

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Petroleum Services Division
3437 Landco Dr.
Bakersfield, California 93308
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July 2, 2012

Greg Hummel
ERG Operating Company, LLC
6085 Cat Canyon Road
Santa Maria, CA 93454

Subject: Sidewall Core Analysis
File No.: 57111-212339ER

Dear Mr. Hummel:

Enclosed are final data for 30 percussion sidewall samples submitted to our laboratory from well Los Alamos 322-DS, Cat Canyon Field, Santa Barbara County, CA.

Porosity, permeability and saturation (PKS) determinations, along with white and ultraviolet light photographs, were performed on each sample where there was suitable recovery. Basic procedures used for this project are documented on the following pages for reference.

Thank you for this opportunity to be of service to ERG Operating Company, LLC. Please do not hesitate to contact us at (661-325-5657) if you have any questions regarding these results or if we can be of any additional service.

Sincerely,
Core Laboratories

Gil Casabar
Senior Group Leader

Distribution: 1 original report, 1 CD copy: Addressee

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Basic Test Procedures [1]

Core Analysis (Summation)

- Remove visible drilling mud contamination from sidewall sample.
- Expose a fresh sample surface and photograph (if requested) under white and ultraviolet (UV) lighting.
- Record lithological description.
- Determine Air Permeability (Empirical) for sample.
- Cut end-clip from sample for Summation of Fluids analysis.
- Measure Bulk Volume by mercury displacement.
- Place sample material into test equipment.
- Heat samples at 350 ^{o}F for approximately 30 minutes and record initial water values.
- Increase retort temperature to 1200 ^{o}F
- Centrifuge tubes to insure water-oil separation.
- Measure final fluid levels and calculate saturation percentages.

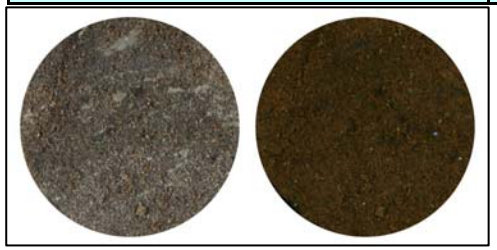
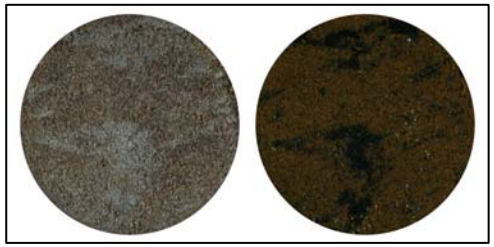
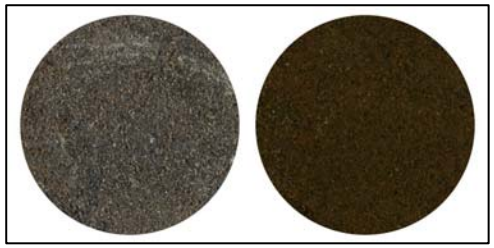
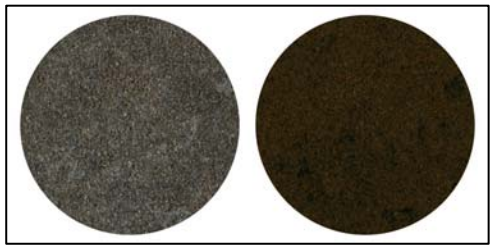
(1) See Core Analysis Procedures page for specific methods used.

Company: ERG Operating Company, LLC
Well: Los Alamos 322-DS
Field: Cat Canyon

Location: Sec. 31-9N-32W
Elevation:
Drlg Fluid:

File No.: 57111-212339ER
API No.: 04-083-22762
Date: 7/2/2012

Sidewall Core Analysis Results

Core Images	Sample Number	Depth	Rec	Perm. Kair	Porosity	Fluid Saturation				Sample Wt.	Method
White Light | UV Light		ft	in	md	%	Oil %	Water %	O/W Ratio	Total %	g	
	1	2682.0	0.6	700.0	26.3	27.9	50.3	0.56	78.2	14.7	3
	Sd brn vf-fgr sslty-slty f cly lams m-d stn vdgld flor										
	2	2686.0	1.2	300.0	33.2	16.2	56.2	0.29	72.3	14.2	3
	Sd brn-gy vfgr slty scly msp stn vdgld flor										
	3	2690.0	0.5	1000.0	34.5	24.0	35.2	0.68	59.2	11.9	3
	Sd brn vf-fgr sslty-slty m stn vdgld flor										
	4	2694.0	1.0	1200.0	35.1	19.7	56.2	0.35	75.9	14.0	3
	Sd brn vf-fgr sslty scly m stn vdgld flor										

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Field: Cat Canyon

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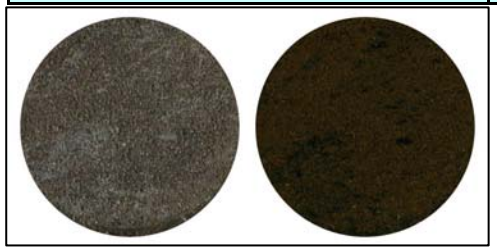
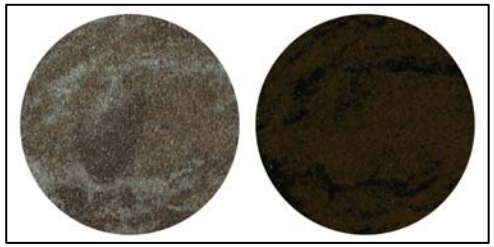
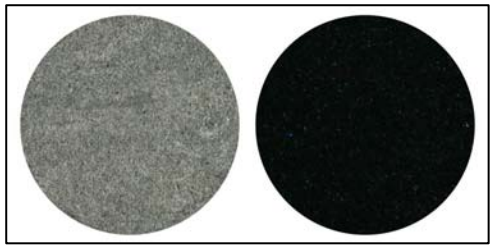
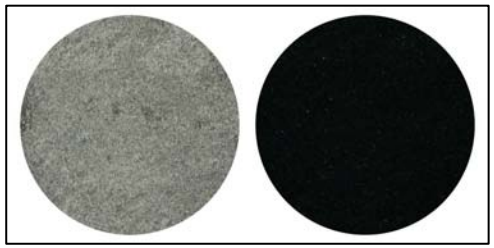
Sidewall Core Analysis Results

Core Images White Light | UV Light	Sample Number	Depth ft	Rec in	Perm. Kair md	Porosity %	Fluid Saturation Oil %	Water %	O/W Ratio	Total %	Sample Wt. g	Method
	5	2698.0	1.2	800.0	35.7	18.5	54.7	0.34	73.2	14.5	3
	Sd brn-gy vfgr sslty scly msp stn vdgld flor										
	6	2702.0	1.5	200.0	33.0	12.3	68.6	0.18	80.9	14.9	3
	Sd brn vf-fgr slty scly msp stn vdgld flor										
	7	2706.0	1.1	<100.0	30.9	4.1	85.8	0.05	89.9	13.5	3
	Sd gy-tn vfgr vslty scly lsp stn vdgld flor										
	8	2710.0	1.1	<50.0	29.3	0.0	91.6	0.00	91.6	14.8	3
	Sd gy vfgr vslty cly no stn no flor										

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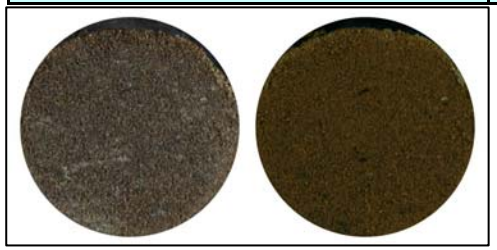
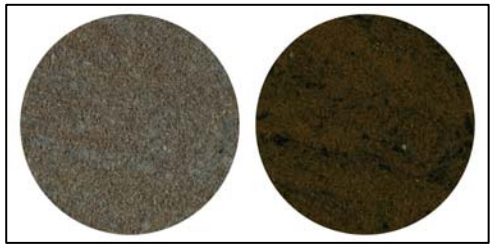
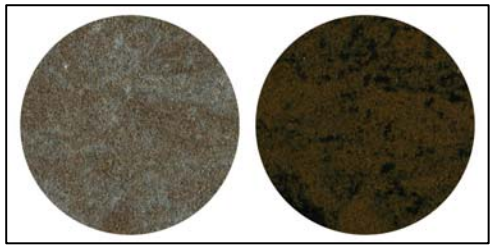
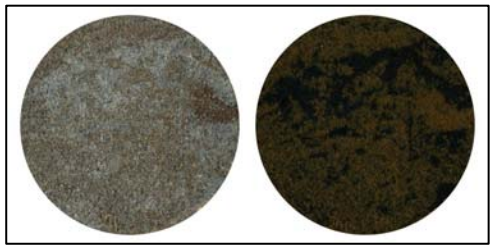
Sidewall Core Analysis Results

Core Images	Sample Number	Depth	Rec	Perm. Kair	Porosity	Fluid Saturation				Sample Wt.	Method
White Light | UV Light		ft	in	md	%	Oil %	Water %	O/W Ratio	Total %	g	
	9	2748.0	0.6	1600.0	35.3	21.0	44.2	0.47	65.2	10.5	3
	Sd brn vf-fgr sslty smica m stn vdgld-dgld flor										
	10	2752.0	1.2	400.0	33.1	15.4	66.4	0.23	81.8	14.9	3
	Sd brn vf-fgr slty scly m stn vdgld-dgld flor										
	11	2756.0	1.5	200.0	34.0	11.2	67.1	0.17	78.3	14.9	3
	Sd brn-gy vf-fgr slty cly msp stn vdgld-dgld flor										
	12	2760.0	1.5	100.0	34.3	7.4	70.6	0.10	78.0	14.9	3
	Sd brn-gy vf-fgr slty cly msp stn vdgld-dgld flor										

Company: ERG Operating Company, LLC
Well: Los Alamos 322-DS
Field: Cat Canyon

Location: Sec. 31-9N-32W
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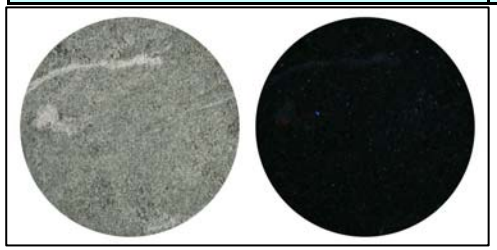
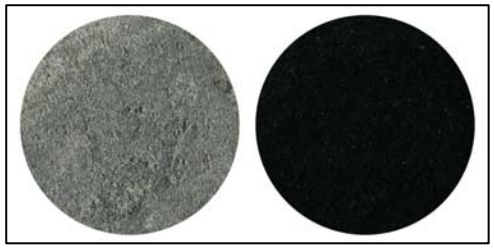
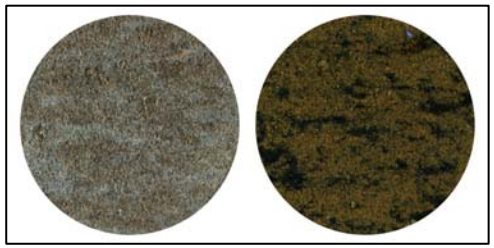
Core Images White Light | UV Light	Sample Number	Depth ft	Rec in	Perm. Kair md	Porosity %	Fluid Saturation Oil %	Water %	O/W Ratio	Total %	Sample Wt. g	Method
	13	2764.0	1.5	<50.0	34.7	0.0	77.6	0.00	77.6	13.3	3
	Sd gy vfgr vslty cly no stn no flor										
	14	2782.0	1.2	<20.0	36.1	0.0	75.9	0.00	75.9	12.2	3
	Sd gy vfgr vslty vcly no stn no flor										
	15	2799.0	1.1	100.0	29.0	0.0	92.3	0.00	92.3	14.4	3
	Sd gy vf-fgr vslty scly no stn no flor										
	16	2916.0	1.0	300.0	29.7	10.1	74.5	0.14	84.6	14.8	3
	Sd brn-gy vf-fgr slty cly fos msp stn dgld flor										

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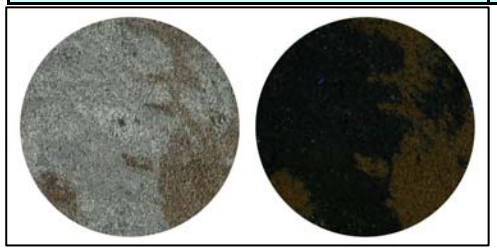
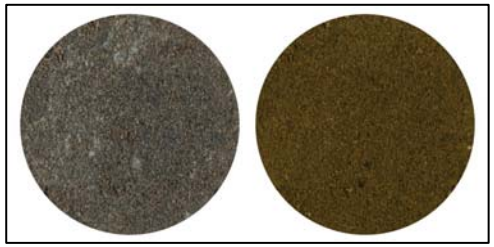
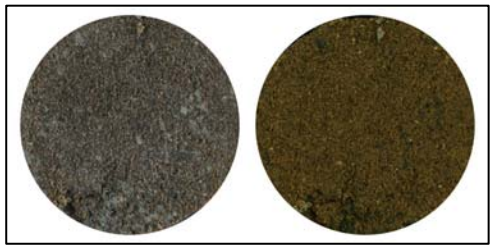
White Light | UV Light		ft	in	md	%	Oil %	Water %	O/W Ratio	Total %	g	
	17	2922.0	0.9	<100.0	32.6	7.9	75.3	0.10	83.2	14.2	3
	Sd gy-brn vf-fgr vslty cly msp stn dgld flor										
	18	2990.0	0.6	1200.0	33.4	20.8	58.2	0.36	79.0	12.9	3
	Sd brn vf-fgr sslty scly m stn dgld flor										
	19	2994.0	0.6	1600.0	34.6	22.2	45.6	0.49	67.8	13.0	3
	Sd brn vf-fgr sslty m stn dgld-vdgld flor										
	20	2998.0	0.8	1400.0	37.8	18.4	38.8	0.48	57.3	7.6	3
	Sd brn vf-fgr sslty m stn dgld flor										

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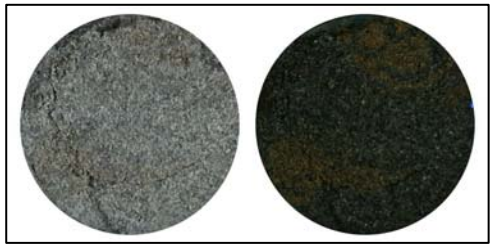
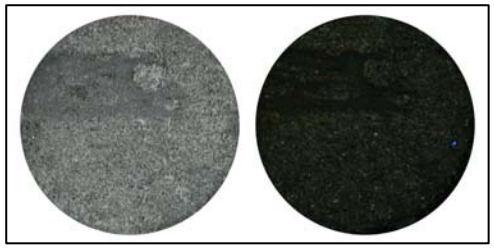
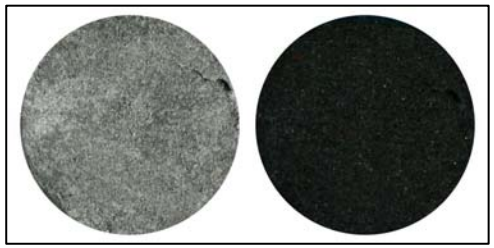
White Light | UV Light		ft	in	md	%	Oil %	Water %	O/W Ratio	Total %	g	
	21	3002.0	1.0	200.0	28.6	14.3	67.7	0.21	82.0	14.8	3
	Sd brn-gy vf-fgr slty scly msp stn dgld flor										
	22	3006.0	0.5	300.0	32.1	2.4	88.2	0.03	90.6	10.3	3
	Sd gy-lbrn vfgr slty scly lsp stn vdgld flor										
	23	3010.0	1.0	<50.0	33.4	0.0	86.5	0.00	86.5	12.7	3
	Sd gy vfgr vslty cly no stn no flor										
	24	3014.0	0.6	<20.0	27.5	0.0	83.1	0.00	83.1	14.0	3
	Sd gy vfgr vslty cly scalc no stn no flor										

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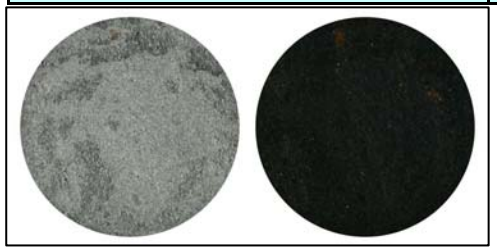
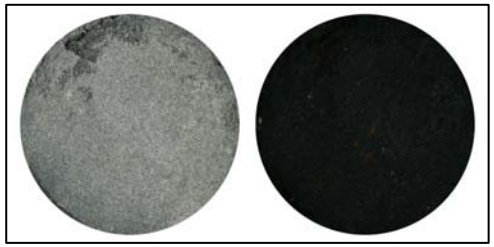
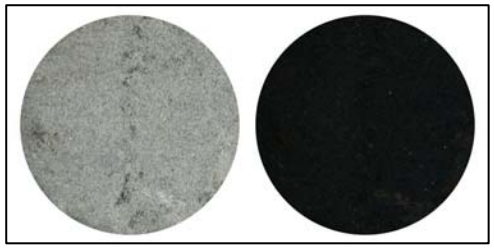
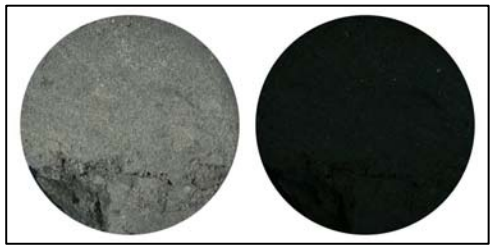
White Light | UV Light		ft	in	md	%	Oil %	Water %	O/W Ratio	Total %	g	
	25	3018.0	1.0	<20.0	32.8	0.0	69.4	0.00	69.4	11.0	3
	Sd gy vfgr vslty vcly no stn no flor										
	26	3022.0	0.6	<20.0	33.4	0.0	76.6	0.00	76.6	12.6	3
	Sd gy vfgr vslty vcly no stn no flor										
	27	3026.0	0.5	<10.0	30.8	0.0	76.5	0.00	76.5	11.4	3
	Slt gy vsdy vcly no stn no flor										
	28	3158.0	0.5	<5.0	36.0	0.0	76.9	0.00	76.9	10.7	3
	Slt gy ssdy vcly no stn no flor										

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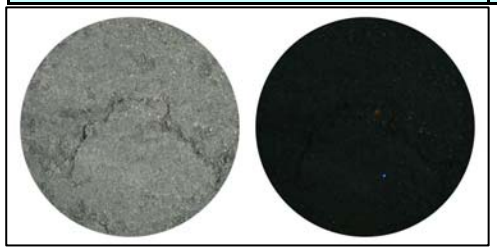	29	3166.0	1.2	<10.0	29.0	0.0	68.5	0.00	68.5	14.0	3
	Sd gy vfgr vslty cly no stn no flor										
	30	3206.0	0.8	<10.0	33.2	0.0	62.8	0.00	62.8	14.2	3
	Sd gy vfgr vslty cly no stn no flor										

Company: ERG Operating Company, LLC
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Field: Cat Canyon

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Core Type: Sidewall Core

Core Analysis Procedures and Conditions

	Procedure (1)	Procedure (2)	Procedure (3)	Procedure (4)
Sampling Method	Percussion	Percussion	Percussion	Rotary
Drill Coolant	N/A	N/A	N/A	N/A
Jacket Material	Nickel	None	N/A	None
Saturation Method	Dean Stark (Toluene)	Dean Stark (Toluene)	Retort	Dean Stark (Toluene)
Porosity Method				
Grain Volume	Boyle's Law (Helium)	Boyle's Law (Helium)	Bulk Vol-Pore Vol	Boyle's Law (Helium)
Pore Volume	Boyle's Law (Helium)	Bulk Vol-Grain Vol	Summation Of Fluids	Bulk Vol-Grain Vol
Bulk Volume	Pore Vol + Grain Vol	Mercury Displacement	Mercury Displacement	Mercury Displacement
Permeability Method	Air	Empirical	Empirical	Air

Common Conditions

Sleeved Sample Seating Pressure: N/A

Confining Pressure Pore Vol & Permeability: N/A

Samples Dried At 235 Degrees Fahrenheit

Additional Extraction by Soxhlet with Methylene Chloride/Methanol