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30-025-40420

8-21-17s-32e

130/S & 1813/E

ROTARY SIDEWALL CORE ANALYSIS REPORT

FOR

PB ENERGY STORAGE SERVICES, INC.

MALJAMAR AGI # 1

LEA COUNTY, NEW MEXICO

FOR RECORD ONLY

ECG 11-7-2013

PB ENERGY STORAGE SERVICES, INC.
MALJAMAR AGI # 1
LEA COUNTY, NEW MEXICO
U.S.A.
File: MD-58350



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PB ENERGY ENERGY STORAGE SERVICES
MALJAMAR AGI #1
LEA COUNTY, NEW MEXICO

A.P.I. NUMBER :
FIELD :
LOCATION:

FILE NO. : MD-58350
DATE : June 21, 2012
ANALYSTS : WH, SB, JR

DEAN STARK EXTRACTION

SAMPLE NO.	DEPTH ft	GRAIN DENSITY	POR %	PERM mD	SATURATIONS		GAS UNITS	FLUORESCENCE %	LITHOLOGY
					Sw	So			
1	9185.0	2.82	5.9	p 0.062	38.1	Tr	26	Tr	Dol brn-gy sslyt sshy
2	9217.0	2.72	4.4	p 0.030	25.5	16.9	2	50	Ls tn-brn sslyt tr ppp-sml vug calc fd frac
3	9228.0	2.71	3.1	0.007	37.0	12.3	25	60	Ls tn-gy sslyt sc ppp-sml vug sc foss
4	9294.0	2.81	5.2	0.015	38.2	15.4	228	50	Dol gy-brn sslyt sshy abd shy intrbd
5	9305.0	2.72	3.1	0.027	60.3	0.0	1	0	Ls tn-gy sslyt sc ppp-sml vug sc foss sty
6	9325.0	2.80	2.3	0.014	84.3	0.0	5	0	Dol gy-brn sslyt sshy sc sty
7	9335.0	2.75	4.1	0.064	52.2	0.0	2	0	Ls tn-brn sslyt sc ppp-sml vug sc foss sc sml A/I sty
8	9345.0	2.71	10.0	p 0.999	58.1	10.1	67	50	Ls crm-tn sslyt ppp-sml vug foss
9	9400.0	2.80	2.1	0.006	78.4	0.0	3	0	Dol gy-brn sslyt sshy sc pyr
10	9582.0	2.72	1.2	p 0.039	53.3	0.0	0	0	Ls brn-gy sslyt tr foss frac
11	9615.0	2.78	2.9	p 0.403	51.2	0.0	3	0	Ls brn-gy sslyt tr foss sc A/I frac
12	9624.0	2.72	1.0	p 0.030	67.5	0.0	0	0	Ls brn-gy sslyt sc A/I
13	9709.0	2.65	0.7	0.003	91.3	0.0	0	0	Cht gy-brn dns lmy
14	9762.0	2.71	0.9	0.005	49.0	0.0	80	0	Ls gy-dk gy slty shy foss
15	9772.0	2.71	11.8	p 1.236	19.1	22.2	51	80	Ls crm-tn gran sslyt abd ppp-sml vug foss
16	9773.0	2.76	12.1	p 3.178	13.8	21.3	71	80	Ls crm-tn gran sslyt abd ppp-sml vug foss
17	9790.0	2.79	10.1	tbfa	48.5	14.1	23	60	Ls tn-gy sslyt sc ppp-sml vug sc foss sc pyr
18	9803.0	2.83	5.5	tbfa	27.3	10.6	142	40	Dol tn-brn sslyt sc ppp-sml vug sli anhyd
p = probe permeability measurement									
19	9844.0	2.71	0.4	p <.001	75.4	0.0	10	0	Ls brn-gy sslyt sshy sc calc xl frac



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SAMPLE NO.	DEPTH ft	GRAIN DENSITY	POR %	PERM mD	SATURATIONS Sw	So	GAS UNITS	FLUORESCENCE %	LITHOLOGY
20	9867.0	2.74	5.3	0.030	42.8	0.0	2	0	Ls crm-tn ssly sc ppp-sml vug sc foss
21	9897.0	2.75	4.5	0.059	32.8	0.0	0	0	Ls crm-tn ssly sc ppp-sml vug sc foss
22	9930.0	2.72	4.7	0.135	62.5	0.0	0	0	Ls crm-tn ssly sc ppp-sml vug sc foss
23	9970.0	2.83	5.0	tbfa	76.9	0.0	4	0	Dol gy-brn ssly
24	9979.0	2.84	2.1	p <.001	30.7	0.0	2	0	Dol gy-brn ssly
25	9996.0	2.74	2.0	p <.001	19.5	0.0	0	0	Ls crm-tn ssly sty
26	10060.0	2.72	4.1	p 1.256	38.3	Tr	0	Tr	Ls crm-tn ssly tr ppp-sml vug frac sty
27	10081.0	2.72	1.9	0.021	41.4	0.0	0	0	Ls tn-gy ssly tr ppp-sml vug sty
28	10102.0	2.75	7.4	p 0.266	57.9	0.0	0	0	Ls crm-tn ssly ppp-sml vug foss

p = probe permeability measurement



LITHOLOGICAL ABBREVIATIONS

Anhydrite (-ic)	anhy, anhyd	Filled	fd	Poor	pr
Anhydrite inclusion	AI	Fine (-ly)	f, fnly	Pyrite	pyr
Bentonite (-ic)	bent	Fluorescence	flu	Quartz (-itic)	qtz
Black (-ish)	blk, blksh	Fossil (-iferous)	foss	Red	rd
Bleeding Oil	B/O	Fracture	frac	Round	rnd
Brecciated	brec	Fragments	frag	Residual Oil	So
Bright	brt	Friable	fri	Residual Water	Sw
Brittle	brit	Fusulinid	fus	Sample	Spl
Broken	brkn	Gilsonite	gil	Sandstone	Ss
Brown	brn	Gold	gld	Sandy	sdv
Buff	bf	Good	gd	Scattered	sc
Calcite (-ic)	calc, calctc	Grain (-s)	gr	Shaley	shy
Calcareous	calc	Granular	gran	Shale	sh
Carbonaceous	carb	Gray	gy	Shale parting	s/p
Cement	cmt	Gypsum	gyp	Silt (-y)	slt, slty
Chalk (-y)	chk, chky	Hair line(frac)	hl	Slight (-ly)	sli, s
Chert	cht	Halite	hal	Small	sml
Clay	cl	Inclusion	incl	Spotted (-y)	sp
Coal	c	Laminations (ated)	lam	Stringer	strgr
Coarse	crs	Large	lrg	Stylolite (-itic)	sty, styl
Conglomerate	cgl	Light	lt	Subround	sbrnd
Consolidated	consol	Limestone	ls	Subangular	sbang
Contaminated	contam	Limey	lmy	Sucrosic	suc
Crinoid (-al)	crin, crinal	Lithology	lith	Sulphur	su
Cross-bedded	x-bd	Medium	m	Tan	tn
Crystal (-line)	Xl, xln	Mineral Fluorescence	mf	Too broken (for Analysis)	tbfa
Dark	dk	Moderate	mod	Thin	thn
Dense	dns	Mudcake	m/c	Trace	Tr
Diameter	dia	No Show	N/S	Tripolitic	trip
Dolomite (ic)	dol, dolm	Oolite (-itic)	ool	Very	v
Dull	dl	Pale	pl	Vertical	vert, vt
Faint	fnt	Permeability	Perm, K	Vug (-gy)	vug
Fair	fr	Pin-Point Porosity	ppp		



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PB ENERGY ENERGY STORAGE SERVICES

MALJAMAR AGI #1

6/29/2012

QUALITY CONTROL RERUN DATA

Sample No.	GRAIN DENSITY		POROSITY		<i>k</i> standard Test Sample	PERMEABILITY	
	original	reruns	original	reruns		original	reruns
5	2.722	2.723	3.13	3.17	2.621	0.027	0.026
8	2.715	2.714	9.96	9.95			
13	2.646	2.645	0.69	0.66		0.003	0.004
16	2.761	2.761	12.11	12.14			
22	2.724	2.724	4.67	4.66	2.619	0.135	0.136
27	2.717	2.716	1.93	1.91		0.021	0.023



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June 22, 2012

PB ENERGY STORAGE SERVICES, INC.

16285 Park Ten Place, Suite 400
Houston, TX. 77084

Attn: RUSSELL BENTLEY

RE: MALJAMAR AGI # 1

Rotary Sidewall Core Analysis

Mr. BENTLEY:

The core analysis data from the above referenced well is enclosed in the following pages.

All quality control data is enclosed in a separate section of the report. The data, results, and digital images will be maintained in our files for your future reference. If you have any questions regarding our results or procedures, please do not hesitate to contact us. We appreciate the opportunity to analyze the core from the above referenced well and look forward to working with you again in the future.

DISTRIBUTION

PB ENERGY STORAGE SERVICES, INC.

Attn: RUSSELL BENTLEY/CHAD WILLIAMS
16285 Park Ten Place, Suite 400
Houston, TX. 77084

1 Copy of the report with photographs and 1 USB Drive

GEOLEX, INCORPORATED

Attn: ALBERTO GUTIERREZ/JIM HUNTER
500 Marquette Ave., NW, Suite 1350
Albuquerque, NM. 87102

8 Copies of the report and 1 USB Drive

Sincerely,

Wayne Helms, General Manager
Weatherford Laboratories

PB ENERGY STORAGE SERVICES, INC.

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CORE ANALYSIS PROCEDURES
FOR
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LEA COUNTY, NEW MEXICO

The Rotary Sidewalls were picked up by Weatherford Laboratories.

Gases from the Sidewalls were measured by Hot Wire Chromatography and reported in Gas Units.

A brief Lithological Description of the Sidewalls was recorded.

A description of the Fluorescence of the Sidewalls was recorded.

Ultraviolet Light Photographs were taken of the Sidewalls for a permanent record.

Natural Light Photographs were taken of the Sidewalls for a permanent record.

Composite Photographs of the Sidewall End Trims were taken under Natural and Ultraviolet Light.

The Sidewalls were extracted utilizing the Dean Stark method.

The fluids were measured by the Dean Stark method.

Porosities were measured in a Boyle's Law Porosimeter utilizing Helium.

Permeabilities were measured in a Hassler Sleeve Permeameter utilizing Nitrogen at 300 psi confining pressure.

Test samples of a known permeability were measured before and after the Sidewall permeabilities were measured.

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28	10102.0	2.75	7.4	p 0.266	57.9	0.0	0	0	Ls crm-tn ssly ppp-sml vug foss

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Bleeding Oil	B/O	Fracture	frac	Round	rnd
Brecciated	brec	Fragments	frag	Residual Oil	So
Bright	brt	Friable	fri	Residual Water	Sw
Brittle	brit	Fusulinid	fus	Sample	Spl
Broken	brkn	Gilsonite	gil	Sandstone	Ss
Brown	brn	Gold	gld	Sandy	sdv
Buff	bf	Good	gd	Scattered	sc
Calcite (-ic)	calc, calctc	Grain (-s)	gr	Shaley	shy
Calcareous	calc	Granular	gran	Shale	sh
Carbonaceous	carb	Gray	gy	Shale parting	s/p
Cement	cmt	Gypsum	gyp	Silt (-y)	silt, slty
Chalk (-y)	chk, chky	Hair line(frac)	hl	Slight (-ly)	sli, s
Chert	cht	Halite	hal	Small	sml
Clay	cl	Inclusion	incl	Spotted (-y)	sp
Coal	c	Laminations (ated)	lam	Stringer	strgr
Coarse	crs	Large	lrg	Stylolite (-itic)	sty, styl
Conglomerate	cgl	Light	lt	Subround	sbrnd
Consolidated	consol	Limestone	ls	Subangular	sbang
Contaminated	contam	Limey	lmy	Sucrosic	suc
Crinoid (-al)	crin, crinal	Lithology	lith	Sulphur	su
Cross-bedded	x-bd	Medium	m	Tan	tn
Crystal (-line)	Xl, xln	Mineral Fluorescence	mf	Too broken (for Analysis)	tbfa
Dark	dk	Moderate	mod	Thin	thn
Dense	dns	Mudcake	m/c	Trace	Tr
Diameter	dia	No Show	N/S	Tripolitic	trip
Dolomite (ic)	dol, dolm	Oolite (-itic)	ool	Very	v
Dull	dl	Pale	pl	Vertical	vert, vt
Faint	fnt	Permeability	Perm, K	Vug (-gy)	vug
Fair	fr	Pin-Point Porosity	ppp		



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