

# Appendices

## 1 SAMPLE LOCATION AND ANALYSES

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The following tables (1, 2, 3 and 4) report the complete suite of analysis carried out on each sample. Samples from B1 to B18 were collected near Ballybunnion (Co. Kerry).

The first two samples were collected in the Ladies' Beach (figure 2) and, on the other side of the castle, at the Men's Beach, one shale sample (B18) was collected from the Limestone unit below the Clare shale.



Figure 1. Ladies' Beach outcrop in Ballybunnion. The red stars show the approximate sample locations of B1 (on the left) and B2, just under the marine band on the right.

The second area sampled, further north, was what Kelk (1960) termed, "Bay 2" (figure 2). Fifteen samples (B3-B17) were collected at a ca. 30 m sample interval. This was reduced in the Ross Sandstone Formation which was siltier.



Figure 2. Bay two section just north of Ballybunnion

The third locality in the Clare Basin was at St. Brendan's Well (), where four samples (B19- B22) were collected. Three sample (B19-B20- B22) came from the base of the Clare shale (one just above the phosphate bed, one two metres above and he third one nine metres above). The fourth sample (B21) was taken from a quarry in the Ross Sandstone Formation just above the top of the Clare Shale Formation.



Figure 3. St. Brendan's Well outcrop with the location of B19, B20 and B22 samples (red stars)

SAMPLES	TOC	VITRINITE REFLECTANCE	XRD	ROCK-EVAL	ADSORPTION
		<i>Measured</i>	<i>Barren</i>		
B1	1	1		1	
B2	2	2			1
B3	1	1			
B4	1		1	1	
B5	2	2		1	1
B6	1	1		1	
B7	1	1			
B8	2	2		1	1
B9	2	2			1
B10	1	1		1	
B11	2	2			1
B12	1		1		
B13	1		1	1	
B14	1	1			
B15	1	1			
B16			1		
B17	1		1	1	
B18	2	2		1	1
B19	2	2		1	1
B20	1		1		
B21	1	1		1	
B22	2	2		1	1

Table 1-1. Analysis run on samples B1-B22

B23 was collected at Fisherstreet Bay (Co. Clare) and B24 was collected in a marine band in Loop Head peninsula (Co. Clare). Samples from the Dublin Basin have been obtained from the GSI 13-01 borehole drilled in Kentstown (now stored in the Geological Survey of Ireland (GSI) core storage facility in Sandyford). Twenty-seven core samples (B39-B65) were taken from this borehole with an average sampling spacing of 10 m. Of these 27 samples, 7 where be used for adsorption-desorption experiments (table 3). Additional four samples (B25-B28) from the Irish Cement quarry at Donore (Co. Meath), but just B25 and B28 were productive (table 2).

SAMPLES	TOC	VITRINITE REFLECTANCE		XRD	ROCK-EVAL	ADSORPTION
		Measured	Barren			
B23	2	2		1	1	1
B24	2	2		1	1	
B25	2	2			1	1
B26	1		1			
B27	1		1			
B28	2	2			1	1
B29	2	2		1	1	1
B30	1	1		1		
B31	1	1		1		
B32	2	2		1	1	
B33	1		1	1		
B34	2	2		1	1	2
B35	1		1	1		
B36	1		1	1		
B37	2	2		1	1	1
B38	2	2		1	1	
B39	1	1				
B40		1		1		
B41	1		1			
B42	1	1		1		
B43	1	1				
<b>B44</b>	<b>2</b>	<b>2</b>		<b>1</b>	<b>1</b>	<b>2</b>

Table 1-2. Analysis run on samples B23-B44

Ten samples (B29-B38) were collected from the GSI 09/04 borehole from Kildysart (Co. Clare) thanks to Prof. Peter Haughton (UCD) and Dr. Brian McConnell (Geological Survey of Ireland) granted us access (table 2).

SAMPLES	TOC	VITRINITE REFLECTANCE	XRD	ROCK-EVAL	ADSORPTION
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B45	1		1			
B46	1	1		1		
B47	1		1			
B48	1	1		1		
B49	1	1				
B50	1	1		1		
B51	1	1				
B52	2	2		1	1	1
B53	1	1		1		
B54	1	1				
B55	1		1	1		
B56	2	2		1	1	1
B57	1	1		1		
B58	1	1		1		
B59	1		1			
B60	2	2		1	1	2
B61	1	1				
B62	1	1		1		
B63	1	1		1		
B64	2	2		1	1	1
B65	1		1	1		
QB1	2	2			1	
QB3	2	2			1	

Table 1-3. Analysis run on samples B45-QB3

QB1 and QB3 (table 3), from the Quebradas formation, were sampled by Paulo Fernandes at Quebradas beach in Portugal. Forty-four samples (AC1-1 to AC1-44) were also collected from the AC1 borehole which drilled Middle Viséan Flysch Mértola Formation (table 4).

SAMPLES	DEPTH (M)	TOC	SAMPLES	DEPTH (M)	TOC
AC1-1	21	1	AC1-23	481.7	1
AC1-2	35.1	1	AC1-24	486.8	1
AC1-3	47.7	1	AC1-25	494	1
AC1-4	64.3	1	AC1-26	503	1
AC1-5	64.3	1	AC1-27	522.1	1
AC1-6	77.9	1	AC1-28	532.5	1

<b>AC1-7</b>	103.6	1	<b>AC1-29</b>	539.4	1
<b>AC1-8</b>	140.6	1	<b>AC1-30</b>	554.7	1
<b>AC1-9</b>	166.7	1	<b>AC1-31</b>	557.5	1
<b>AC1-10</b>	197.2	1	<b>AC1-32</b>	561	1
<b>AC1-11</b>	246.2	1	<b>AC1-33</b>	586.9	1
<b>AC1-12</b>	299.2	1	<b>AC1-34</b>	586.9	1
<b>AC1-13</b>	312.8	1	<b>AC1-35</b>	612.7	1
<b>AC1-14</b>	322.55	1	<b>AC1-36</b>	623.1	1
<b>AC1-15</b>	357.1	1	<b>AC1-37</b>	631.1	1
<b>AC1-16</b>	359.9	1	<b>AC1-38</b>	691.2	1
<b>AC1-17</b>	383.7	1	<b>AC1-39</b>	724.9	1
<b>AC1-18</b>	383.7	1	<b>AC1-40</b>	726.5	1
<b>AC1-19</b>	402.8	1	<b>AC1-41</b>	728.5	1
<b>AC1-20</b>	421.5	1	<b>AC1-42</b>	729.5	1
<b>AC1-21</b>	468.5	1	<b>AC1-43</b>	729.5	1
<b>AC1-22</b>	474.1	1	<b>AC1-44</b>	747.6	1

Table 1-4. Analyses run for the AC1 borehole samples

## 2 ANALYSIS

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### 2.1 TOC

In table 5 and 6 are, respectively, reported the TOC values for each sample of the Clare and Dublin basins. In tables 7 and 8 are reported the TOC values for the Quebradas Formation and the AC1 borehole samples.

SAMPLES	TIC (WT%)	KGS ASH YIELD (WT%)	LECO TOC (WT%)	TCD TOC (WT%)	SAMPLES	TIC (WT%)	KGS ASH YIELD (WT%)	LECO TOC (WT%)	TCD TOC (WT%)
B1	0.02	90.99	6.23	5.38	B18	6.54	73.68	1.65	8.11
B2	0.01	91.38	5.76	5.99	B19	0.08	89.73	2.73	3.29
B3				6.17	B20				3.54
B4				2.44	B21				1.57
B5	0.01	92.15	2.3	2.304	B22	0.69	89.59	2.29	2.87
B6				2.97	B23	3.25	79.94	7.05	9.6
B7				0.82	B24	0	84.59	11.1	11.89
B8	6.42	76.16	0.32	3.71	B29	0.02	93.01	2.7	3.4
B9				1.95	B30				5.52
B10				0.95	B31				3.7
B11	0.08	93.58	1.48		B32	1.41	89.29	2.9	3.96
B12				0.88	B33				5.66
B13				0.95	B34	1.18	83.91	8.39	5.91
B14				0.87	B35				9.6
B15				1.28	B36				1.05
B16					B37	1.17	85.52	7.11	7.99
B17				1.32	B38	0.01	91.91	1.94	2.64

Table 2-1.TOC values for the Clare Basin

Samples	TIC (wt%)	KGS Ash Yield (wt%)	KGS TOC (wt%)	TCD TOC (wt%)	Samples	TIC (wt%)	KGS Ash Yield (wt%)	KGS TOC (wt%)	TCD TOC (wt%)
B25	0.86	87.93	4.52	5.38	B50				2.04
B26				4	B52	0.97	90.3	3.32	4.67
B27				4.03	B53				14
B28	5.31	79.95	1.81	5.58	B54				2.6
B39				4.06	B55				10.1
B41				5	B56	0.26	93.1	2.41	2.71
B43				2.92	B57				9
B44	0.06	91.13	1.43	2	B58				4.25
B45				10	B59				3.13
B46				2.09	B60	1.06	88.3	4.53	4.95
B47				1.31	B62				3.57
B48				1.51	B63				3.28
B49				8	B64	4.35	81.1	2.62	4.93
					B65				5

Table 2-2.TOC values for the Dublin Basin

SAMPLES	TIC (WT%)	KGS ASH YIELD (WT%)	LECO TOC (WT%)	TCD TOC (WT%)
QB1	0	89.94	4.95	
QB 3	0	84.64	4.99	

Table 2-3. TOC values for the Quebradas Formation in Portugal

SAMPLES AC-1	TCD TOC (WT%)	SAMPLES	TCD TOC (WT%)
1	0.75	23	0.81
2	0.58	24	0.40
3	0.78	25	0.90
4	0.75	26	0.84
5	0.92	27	1.19
6	3.12	28	4.82
7	0.72	29	1.94
8	0.75	30	1.03
9	1.25	31	1.51
10	0.62	32	3.03
11	0.90	33	2.96
12	7.16	34	1.15
13	1.06	35	0.61
14	1.17	36	1.80
15	1.10	37	0.32
16	0.84	38	
17	0.64	39	0.36
18	0.69	40	
19	1.53	41	0.73
20	1.42	42	2.39
21	1.26	43	2.38
22	0.66	44	0.72

Table 2-4. TOC values for the samples from the AC1 borehole. The analysis was performed by Trinity College Dublin

## 2.2 VITRINITE REFLECTANCE

Samples	R <sub>oran</sub> (%)	SD	Measurements	Samples	R <sub>oran</sub> (%)	SD	Measurements
B1	5.43	0.38	100	B15	5.5	0.62	51
B2	4.25	0.91	48	B17	Barren		
B3	5.13	0.24	16	B18	5.28	0.34	61
B4	to do			B19	5.09	0.45	59
B5	5.05	0.46	60	B20	Barren		
B6	4.92	0.42	25	B21	5.08	0.53	67
B7	Barren			B22	5.01	0.52	82
B8	5.47	0.58	32	B23	5.02	0.16	64
B9	4.95	0.42	25	B24	5.33	0.43	64
B10	5.13	0.24	16	B25	4.81	0.46	53
B11	5.74	0.57	63	B26	4.55	0.42	77
B12	Barren			B27	4.52	0.2	57
B13	Barren			B28	4.54	0.13	47
B14	5.36	0.35	23	B29	4.43	0.28	64

Table 2-5. R<sub>oran</sub> values for the Clare Basin samples

SAMPLES	R <sub>ORAN</sub> (%)	SD	MEASUREMENTS	CALCULATED R <sub>ORAN</sub> (%)
B25	2.25	0.19	28	
B28	2.79	0.46	27	
B39	3.84	0.64	39	
B43	2.48	0.42	30	
B44	2.14	0.3	84	0
B46	1.89	0.42	38	
B48	2.16	0.45	53	
B50	2.64	0.31	27	
B52	2.13	0.4	75	1.19
B53	2.43	0.61	16	
B54	2.17	0.55	29	
B56	2.33	0.26	31	1.55
B57	2.81	0.63	6	
B58	2.54	0.3	84	
B60	2.33	0.51	94	2.09
B62	2.53	0.43	26	
B63	1.94	0.23	16	
B64	2.4	0.28	61	1.82

Rock- E Table 2-6. Vitrinite reflectance values measure and calculated from the Tmax for the Donore and GSI13/01 samples

## 2.3 ROCK-EVAL PYROLYSIS

### 2.3.1 Clare Basin

SAMPLES	S1 (mgHC/g)	S2 (mgHC/g)	S3 (mg CO <sub>2</sub> /g)	T <sub>MAX</sub> (°C)
B1	0.02	0.04	0.2	0
B2	0.05	0.04	0.39	0
B5	0.14	0.04	0.15	0
B8	0.04	0.01	0.48	0
B11	0.04	0.04	0.08	0
B18	0.05	0.01	0.36	0
B19	0.04	0.01	0.13	0
B22	0.05	0.07	0.24	0
B29	0.05	0.05	0.08	0
B32	0.05	0.04	0.59	0
B34	0.1	0.06	0.21	0
B37	0.08	0.05	0.21	0
B38	0.02	0.01	0.18	0

Table 2-7. S1, S2, S3 peaks and Tmax data from the Clare Basin samples

SAMPLES	HYDROGEN INDEX (S2X100/TOC)	OXYGEN INDEX (S3X100/TOC)	S2/S3 CONC. (mg HC/mg CO <sub>2</sub> )	S1/TOC NORM. OIL CONTENT	PRODUCTION INDEX (S1/(S1+S2))
B1	1.66	8.30	0.20	0.83	0.33
B2	0.88	8.61	0.10	1.10	0.56
B5	0.70	2.61	0.27	2.43	0.78
B8	0.68	32.43	0.02	2.70	0.80
B11	1.53	3.05	0.50	1.53	0.50
B18	0.16	5.78	0.03	0.80	0.83
B19	0.37	4.76	0.08	1.47	0.80
B22	3.06	10.48	0.29	2.18	0.42
B29	1.85	2.96	0.63	1.85	0.50
B32	1.38	20.34	0.07	1.72	0.56
B34	0.72	2.50	0.29	1.19	0.63
B37	0.70	2.95	0.24	1.13	0.62
B38	0.51	9.26	0.06	1.03	0.67

Table 2-8. Hydrogen Index, Oxygen Index, S2/S3, Normalised Oil content and Production Index for the Clare Basin samples

### 2.3.2 Dublin Basin

Samples	S1 (mgHC/g)	S2 (mgHC/g)	S3 (mg CO <sub>2</sub> /g)	T <sub>MAX</sub> (°C)
B25	0.1	0.01	0.21	0
B28	0.06	0.06	0.16	0
B44	0.05	0.09	0.05	0
B52	0.14	0.37	0.13	464
B56	0.09	0.25	0.08	484
B60	0.08	0.73	0.14	514
B64	0.06	0.45	0.23	499

Table 2-9. S1, S2, S3 peaks and Tmax data from the Dublin Basin samples

Samples	Hydrogen Index (S2x100/TOC)	Oxygen Index (S3x100/TOC)	S2/S3 Conc. (mg HC/mg CO <sub>2</sub> )	S1/TOC Norm. Oil Content	Production Index (S1/(S1+S2))
B25	0.2212389	4.64602	0.04762	2.2124	0.90909
B28	3.3149171	8.83978	0.375	3.3149	0.5
B44	6.2937063	3.4965	1.8	3.4965	0.35714
B52	11.144578	3.91566	2.84615	4.2169	0.27451
B56	10.373444	3.3195	3.125	3.7344	0.26471
B60	16.11479	3.09051	5.21429	1.766	0.09877
B64	17.175573	8.77863	1.95652	2.2901	0.11765

Table 2-10. Hydrogen Index, Oxygen Index, S2/S3, Normalised Oil content and Production Index for the Dublin Basin samples

### 2.3.3 Portugal

Samples	S1 (mgHC/g)	S2 (mgHC/g)	S3 (mg CO <sub>2</sub> /g)	T <sub>MAX</sub> (°C)
<b>QB1</b>	0.05	0.01	0.11	0
<b>QB3</b>	0.08	0.14	0.24	0

Table 2-11. S1, S2, S3 peaks and Tmax data from the Quebradas Fm. samples

Samples	Hydrogen Index (S2x100/TOC)	Oxygen Index (S3x100/TOC)	S2/S3 Conc. (mg HC/mg CO <sub>2</sub> )	S1/TOC Norm. Oil Content	Production Index (S1/(S1+S2))
<b>B25</b>	0.20	2.22	0.09	1.01	0.83
<b>B28</b>	2.81	4.81	0.58	1.60	0.36

Table 2-12. Hydrogen Index, Oxygen Index, S2/S3, Normalised Oil content and Production Index for the Quebradas Fm. samples

## 2.4 XRD ANALYSIS

See separate PDF attachment

## 2.5 ADSORPTION ANALYSIS

Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)
	In-Situ
44	8.7
99	21.0
165	32.0
236	40.3
307	48.2
377	55.2
466	62.6
528	68.4
595	73.4
622	75.8

  

Langmuir Parameters	
	In-Situ
Vol. (ft <sup>3</sup> /ton)	159.8
Pressure (PSIA)	702.3
Isotherm Temperature:	104.0 °F
Goodness of fit of Langmuir regression:	0.98
Moisture	1.19 %
Density	2.461 g/cc

2-13. Summary of CO<sub>2</sub> adsorption analysis for B1 sample

Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)	
	In-Situ	
26		8.5
52		14.7
102		22.8
167		30.8
239		38.0
307		43.5
382		48.4
449		52.9
531		56.6
593		59.3
654		59.7
<b>Langmuir Parameters</b>		
	In-Situ	
Vol. (ft <sup>3</sup> /ton)	83.6	
Pressure (PSIA)	264.0	
<b>SUMMARY OF ADSORPTION ANALYSES IMP. UNITS</b>		
<b>Isotherm Temperature:</b>	104.0 °F	
<b>Goodness of fit of Langmuir regression:</b>	0.99	
<b>Moisture=</b>	<b>1.21% Density</b>	<b>2.420 g/cc</b>

Table 2-14. Summary of CO<sub>2</sub> adsorption analysis for B2 sample

Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)	
	In-Situ	
29		5.5
53		10.1
106		15.3
170		20.4
238		24.5
308		28.2
378		30.9
448		34.5
519		37.4
590		39.2
645		40.5
<b>Langmuir Parameters</b>		
	In-Situ	
Vol. (ft <sup>3</sup> /ton)	57.3	
Pressure (PSIA)	289.1	
<b>SUMMARY OF ADSORPTION ANALYSES IMP. UNITS</b>		
<b>Isotherm Temperature:</b>	104.0 °F	
<b>Goodness of fit of Langmuir regression:</b>	0.99	
<b>Moisture=</b>	<b>0.56 % Density</b>	<b>2.664 g/cc</b>

Table 2-15. Summary of CO<sub>2</sub> adsorption analysis for B11 sample

Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)	
	In-Situ	
27		3.8
50		7.8
102		12.9
164		16.7
237		19.2
302		20.5
373		22.4
443		23.4
512		24.9
587		25.0
692		25.2
<b>Langmuir Parameters</b>		
	In-Situ	
Vol. (ft <sup>3</sup> /ton)	32.0	
Pressure (PSIA)	164.3	
<b>SUMMARY OF ADSORPTION ANALYSES IMP. UNITS</b>		
<b>Isotherm Temperature:</b>	104.0	°F
<b>Goodness of fit of Langmuir regression:</b>	0.99	
<b>Moisture= 0.84 % Density</b>	2.705	g/cc

Table 2-16. Summary of CO<sub>2</sub> adsorption analysis for B 18 sample

Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)	
	In-Situ	
32		7.5
57		11.9
107		17.0
169		21.8
237		25.9
306		29.6
376		32.6
444		33.8
514		35.3
589		37.3
648		38.7
<b>Langmuir Parameters</b>		
	In-Situ	
Vol. (ft <sup>3</sup> /ton)	49.4	
Pressure (PSIA)	197.7	
<b>SUMMARY OF ADSORPTION ANALYSES IMP. UNITS</b>		
<b>Isotherm Temperature:</b>	104.0	°F
<b>Goodness of fit of Langmuir regression:</b>	1.00	
<b>Moisture= 2.29 % Density</b>	2.647	g/cc

Table 2-17. Summary of CO<sub>2</sub> adsorption analysis for B 19 sample

Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)	
	In-Situ	
23		7.7
46		12.7
97		22.1
163		32.4
234		39.3
304		47.8
375		56.1
445		61.9
517		66.7
589		69.4
<b>Langmuir Parameters</b>		
	In-Situ	
Vol. (ft <sup>3</sup> /ton)	112.3	
Pressure (PSIA)	377.1	
<b>SUMMARY OF ADSORPTION ANALYSES IMP. UNITS</b>		
<b>Isotherm Temperature:</b>	104.0 °F	
<b>Goodness of fit of Langmuir regression:</b>	0.97	
<b>Moisture=</b> 1.32 %	<b>Density</b>	2.744 g/cc

Table 2-18. Summary of CO<sub>2</sub> adsorption analysis for B 22 sample

Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)	
	In-Situ	
23		11.0
47		25.5
98		42.8
172		58.4
248		68.0
316		76.2
400		80.8
467		84.2
546		85.0
597		85.8
714		85.9
<b>Langmuir Parameters</b>		
	In-Situ	
Vol. (ft <sup>3</sup> /ton)	109.3	
Pressure (PSIA)	159.1	
<b>SUMMARY OF ADSORPTION ANALYSES IMP. UNITS</b>		
<b>Isotherm Temperature:</b>	104.0 °F	
<b>Goodness of fit of Langmuir regression:</b>	0.99	
<b>Moisture=</b> 0.83 %	<b>Density</b>	2.66 g/cc

Table 2-19. Summary of CO<sub>2</sub> adsorption analysis for B 24 sample

Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)	
	In-Situ	
39		10.9
91		24.9
158		37.2
230		46.7
302		55.1
373		62.2
461		69.8
524		72.4
590		76.3
<b>Langmuir Parameters</b>		
	In-Situ	
Vol. (ft <sup>3</sup> /ton)	128.1	
Pressure (PSIA)	396.1	
<b>SUMMARY OF ADSORPTION ANALYSES IMP. UNITS</b>		
<b>Isotherm Temperature:</b>	104.0 °F	
<b>Goodness of fit of Langmuir regression:</b>	1.00	
<b>Moisture= 0.85</b>	<b>% Density</b>	<b>2.585 g/cc</b>

Table 2-20. Summary of CO<sub>2</sub> adsorption analysis for B 29 sample

Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)	
	In-Situ	
40		18.9
90		41.0
157		62.0
222		75.9
296		87.6
372		98.5
457		108.2
522		113.8
591		116.8
748		124.9
<b>Langmuir Parameters</b>		
	In-Situ	
Vol. (ft <sup>3</sup> /ton)	178.7	
Pressure (PSIA)	307.4	
<b>SUMMARY OF ADSORPTION ANALYSES IMP. UNITS</b>		
<b>Isotherm Temperature:</b>	104.0 °F	
<b>Goodness of fit of Langmuir regression:</b>	1.00	
<b>Moisture= 1.69</b>	<b>% Density</b>	<b>2.624 g/cc</b>

Table 2-21. Summary of CO<sub>2</sub> adsorption analysis for B 34 sample

Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)	
	In-Situ	
38		24.7
94		48.8
166		65.9
242		78.9
314		88.7
391		95.8
478		100.1
574		103.0
702		107.6
<b>Langmuir Parameters</b>		
	In-Situ	
Vol. (ft <sup>3</sup> /ton)	133.4	
Pressure (PSIA)	163.8	
<b>SUMMARY OF ADSORPTION ANALYSES IMP. UNITS</b>		
<b>Isotherm Temperature:</b>	104.0 °F	
<b>Goodness of fit of Langmuir regression:</b>	1.00	
<b>Moisture= 1.69</b>	<b>% Density</b>	<b>2.592 g/cc</b>

Table 2-22. Summary of CO<sub>2</sub> adsorption analysis for B 37 sample

Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)	
	In-Situ	
49		11.8
105		23.8
170		33.9
237		42.0
307		48.0
376		54.5
464		60.7
567		65.2
732		70.8
925		75.3
1131		79.4
1299		82.2
1439		84.3
1824		87.4
<b>Langmuir Parameters</b>		
	In-Situ	
Vol. (ft <sup>3</sup> /ton)	104.9	
Pressure (PSIA)	358.1	
<b>SUMMARY OF ADSORPTION ANALYSES IMP. UNITS</b>		
<b>Isotherm Temperature:</b>	104.0 °F	
<b>Goodness of fit of Langmuir regression:</b>	1.00	
<b>Moisture= 1.69</b>	<b>% Density</b>	<b>2.611 g/cc</b>

Table 2-23. Summary of CH<sub>4</sub> adsorption analysis for B 34 sample

Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)	
	In-Situ	
45		17.1
98		32.4
171		46.4
238		56.2
311		64.0
377		70.4
469		75.9
563		81.0
728		86.7
<b>Langmuir Parameters</b>		
	In-Situ	
Vol. (ft <sup>3</sup> /ton)	118.8	
Pressure (PSIA)	265.1	
<b>SUMMARY OF ADSORPTION ANALYSES IMP. UNITS</b>		
<b>Isotherm Temperature:</b>	104.0 °F	
<b>Goodness of fit of Langmuir regression:</b>	1.00	
<b>Moisture= 1.71</b>	<b>% Density</b>	<b>2.623 g/cc</b>

Table 2-24. Summary of CO<sub>2</sub> adsorption analysis for B 25 sample

Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)	
	In-Situ	
43		6.8
99		13.6
168		19.8
239		24.9
307		28.3
377		31.5
463		34.4
570		36.7
744		39.2
<b>Langmuir Parameters</b>		
	In-Situ	
Vol. (ft <sup>3</sup> /ton)	56.0	
Pressure (PSIA)	302.9	
<b>SUMMARY OF ADSORPTION ANALYSES IMP. UNITS</b>		
<b>Isotherm Temperature:</b>	104.0 °F	
<b>Goodness of fit of Langmuir regression:</b>	1.00	
<b>Moisture= 0.61</b>	<b>% Density</b>	<b>2.564 g/cc</b>

Table 2-25. Summary of CO<sub>2</sub> adsorption analysis for B 28 sample

Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)	
	In-Situ	
33		6.6
55		10.4
102		14.4
166		19.5
236		24.5
307		28.5
377		29.6
445		29.9
516		30.7
587		32.4
679		33.5
<b>Langmuir Parameters</b>		
	In-Situ	
Vol. (ft <sup>3</sup> /ton)	42.2	
Pressure (PSIA)	177.1	
<b>SUMMARY OF ADSORPTION ANALYSES IMP. UNITS</b>		
<b>Isotherm Temperature:</b>	104.0 °F	
<b>Goodness of fit of Langmuir regression:</b>	1.00	
<b>Moisture= 2.16 % Density</b>	2.622 g/cc	

Table 2-26. Summary of CO<sub>2</sub> adsorption analysis for B 44 sample

Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)	
	In-Situ	
24		6.5
47		12.1
96		25.5
162		37.1
233		48.0
305		60.3
377		68.9
448		75.7
518		79.8
590		84.5
716		93.6
<b>Langmuir Parameters</b>		
	In-Situ	
Vol. (ft <sup>3</sup> /ton)	171.2	
Pressure (PSIA)	584.2	
<b>SUMMARY OF ADSORPTION ANALYSES IMP. UNITS</b>		
<b>Isotherm Temperature:</b>	104.0 °F	
<b>Goodness of fit of Langmuir regression:</b>	0.99	
<b>Moisture= 0.96 % Density</b>	2.582 g/cc	

Table 2-27. Summary of CO<sub>2</sub> adsorption analysis for B 52 sample

Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)	
	In-Situ	
31	8.7	
50	15.3	
98	26.3	
162	36.0	
232	44.7	
303	53.2	
375	58.6	
446	65.6	
516	70.7	
587	72.7	
677	75.1	
<b>Langmuir Parameters</b>		
	In-Situ	
Vol. (ft <sup>3</sup> /ton)	115.9	
Pressure (PSIA)	352.9	
<b>SUMMARY OF ADSORPTION ANALYSES IMP. UNITS</b>		
<b>Isotherm Temperature:</b>	104.0 °F	
<b>Goodness of fit of Langmuir regression:</b>	0.99	
<b>Moisture= 1.66</b>	<b>% Density</b>	<b>2.597 g/cc</b>

Table 2-28. Summary of CO<sub>2</sub> adsorption analysis for B 56 sample

Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)	
	In-Situ	
42	16.5	
93	31.9	
158	49.1	
230	61.0	
302	70.0	
373	79.1	
462	86.2	
522	92.2	
589	96.7	
661	101.2	
<b>Langmuir Parameters</b>		
	In-Situ	
Vol. (ft <sup>3</sup> /ton)	154.1	
Pressure (PSIA)	352.2	
<b>SUMMARY OF ADSORPTION ANALYSES IMP. UNITS</b>		
<b>Isotherm Temperature:</b>	104.0 °F	
<b>Goodness of fit of Langmuir regression:</b>	1.00	
<b>Moisture= 0.61</b>	<b>% Density</b>	<b>2.589 g/cc</b>

Table 2-29. Summary of CO<sub>2</sub> adsorption analysis for B 60 sample

Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)	
	In-Situ	
42		14.0
94		27.3
164		39.1
235		48.7
306		57.2
376		67.1
468		78.9
576		88.0
675		97.0
769		102.0
<b>Langmuir Parameters</b>		
	In-Situ	
Vol. (ft <sup>3</sup> /ton)	168.5	
Pressure (PSIA)	528.8	
<b>SUMMARY OF ADSORPTION ANALYSES IMP. UNITS</b>		
<b>Isotherm Temperature:</b>	104.0 °F	
<b>Goodness of fit of Langmuir regression:</b>	0.97	
<b>Moisture= 0.83 % Density</b>	2.638 g/cc	

Table 2-30. Summary of CO<sub>2</sub> adsorption analysis for B 64 sample

Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)	
	In-Situ	
47		1.8
104		4.2
170		5.5
240		9.1
310		11.2
380		12.4
534		13.5
721		14.8
923		14.6
1131		15.0
1301		14.8
1403		14.9
<b>Langmuir Parameters</b>		
	In-Situ	
Vol. (ft <sup>3</sup> /ton)	19.1	
Pressure (PSIA)	310.3	
<b>SUMMARY OF ADSORPTION ANALYSES IMP. UNITS</b>		
<b>Isotherm Temperature:</b>	104.0 °F	
<b>Goodness of fit of Langmuir regression:</b>	0.97	
<b>Moisture= 2.16 % Density</b>	2.605 g/cc	

Table 2-31. Summary of CH<sub>4</sub> adsorption analysis for B 44 sample

Pressure (PSIA)	Adsorbed gas (ft <sup>3</sup> /ton)	
	In-Situ	
43		8.1
100		14.7
164		20.9
232		25.9
301		30.7
370		34.5
457		40.0
560		43.7
728		47.1
922		50.6
1126		53.4
1293		54.8
1412		56.0
1868		58.6
<b>Langmuir Parameters</b>		
	In-Situ	
Vol. (ft <sup>3</sup> /ton)	70.7	
Pressure (PSIA)	371.8	
<b>SUMMARY OF ADSORPTION ANALYSES IMP. UNITS</b>		
<b>Isotherm Temperature:</b>	104.0 °F	
<b>Goodness of fit of Langmuir regression:</b>	1.00	
<b>Moisture= 0.61</b>	<b>% Density</b>	<b>2.593 g/cc</b>

Table 2-32. Summary of CH<sub>4</sub> adsorption analysis for B 60 sample