



From: Edmond Shtepani Intertek <edmond.shtepani@intertek.com>
Sent: Thursday, June 10, 2010 6:45 PM
To: Wang, Yun <Yun.Wang@bp.com>; Stephanie Heard Intertek <stephanie.heard@intertek.com>
Subject: RE: Concerns or Questions
Attach: WTC-10-001812 BP CCE Tables 061010.xls

Yun,
The CCE data at 100 F are attached. The SSF and MSF will be sent to tomorrow

Regards,

Edmond

From: Wang, Yun [mailto:Yun.Wang@bp.com]
Sent: Thursday, June 10, 2010 11:12 AM
To: Stephanie Heard Intertek
Cc: Edmond Shtepani Intertek
Subject: RE: Concerns or Questions
Importance: High

Stephanie, when can we receive the reports for CCE @ 100F and the SSF and MSF data? We are under pressure to receive the data as soon as possible.

Thanks and regards,

Yun Wang, Ph.D.

Complex Fluids CoP Leader
Reservoir Management Specialist Technical Support
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BP America, Inc.
11.176A, WestLake One
501 WestLake Park Blvd.
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Complex Fluids Community of Practice:
<http://ssw.bpweb.bp.com/Networks/ReservoirFluids/tabid/885/Default.aspx>

From: Stephanie Heard Intertek [mailto:stephanie.heard@intertek.com]
Sent: Thursday, June 10, 2010 11:07 AM
To: Wang, Yun
Cc: Edmond Shtepani Intertek
Subject: Concerns or Questions

Yun,
In Edmond's absence please feel free to call or email me with questions or concerns.

Thank you and have a great day!

DW 0007235

TREX 010420.0001

TREX-010420.0001

Stephanie Heard
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DW 0007236

TREX 010420.0002

TREX-010420.0002

ATTACHMENT INFO

Name: WTC-10-001812 BP CCE Tables
061010.xls

Comments: THIS FILE WAS PRODUCED IN NATIVE
FORMAT

ATTACHMENT INFO

DW 0007237

TREX 010420.0003

TREX-010420.0003

TABLE 2
AVERAGE FLUID COMPRESSIBILITIES @ 243.0 F (390.4 K) WITH MIXER

Pressure Range		Average Fluid Compressibility (psi ⁻¹)
From (psia)	To (psia)	
13500	12500	1.2284E-05
12500	11500	1.2789E-05
11500	10500	1.3753E-05
10500	9500	1.5323E-05
9500	8500	1.7331E-05
8500	7500	2.0654E-05
7500	6438 Psat	2.6101E-05

Pressure Range		Average Fluid Compressibility (MPa ⁻¹)
From (MPa)	To (MPa)	
93.08	86.18	1.7816E-03
86.18	79.29	1.8550E-03
79.29	72.39	1.9947E-03
72.39	65.50	2.2225E-03
65.50	58.61	2.5137E-03
58.61	51.71	2.9957E-03
51.71	44.39 Psat	3.7857E-03

Psat - Saturation Pressure

TABLE 3
CONSTANT COMPOSITION EXPANSION @ 243.0 F (390.4 K) WITH MIXER

Pressure		Relative Volume	Y-Function	Liquid Volume	Fluid Density
(psia)	(MPa)	[1]	[2]	(% of V _{tot})	(g/cc)
13500	93.08	0.886046			0.6017
12500	86.18	0.897065			0.5943
11500	79.29	0.908687			0.5867
10500	72.39	0.921358			0.5787
9500	65.50	0.935696			0.5698
8500	58.61	0.952199			0.5599
7500	51.71	0.972281			0.5484
6438 *	44.39	1.000000		100.00	0.5332
6378	43.98	1.002437	3.8373	86.50	
6299	43.43	1.005779	3.8117	74.51	
6230	42.96	1.008803	3.7894	70.01	
6155	42.44	1.012208	3.7652	68.68	
6141	42.34	1.012860	3.7606	68.67	
5844	40.29	1.027735	3.6647	66.27	
5547	38.25	1.045009	3.5688	64.25	
5250	36.20	1.065157	3.4729	62.52	
4953 **	34.15	1.088782	3.3770	60.48	
4656 **	32.10	1.116648	3.2811	58.81	
4359 **	30.05	1.149738	3.1852	57.08	
4062 **	28.01	1.189343	3.0893	55.03	
3765 **	25.96	1.237177	2.9934	52.87	
3468 **	23.91	1.295569	2.8975	50.09	
3171 **	21.86	1.367750	2.8016	47.17	
2874 **	19.82	1.458330	2.7057	43.55	
2577 **	17.77	1.574099	2.6098	40.12	
2280 **	15.72	1.725457	2.5138	36.03	
1983 **	13.67	1.929138	2.4179	31.75	
[1] Volume at indicated pressure per volume at saturation pressure					
[2] Y Function = ((P _{sat} -P)/P)/(Relative Volume - 1)					
* Saturation Pressure					
** Asphaltenes Precipitation					

TABLE 4
AVERAGE FLUID COMPRESSIBILITIES @ 243.0 F (390.4 K) WITHOUT MIXER

Pressure Range		Average Fluid Compressibility (psi ⁻¹)
From (psia)	To (psia)	
13500	12500	1.3071E-05
12500	11500	1.3339E-05
11500	10500	1.4003E-05
10500	9500	1.5571E-05
9500	8500	1.8090E-05
8500	7500	2.2475E-05
7500	6362 Psat	2.6983E-05

Pressure Range		Average Fluid Compressibility (MPa ⁻¹)
From (MPa)	To (MPa)	
93.08	86.18	1.8958E-03
86.18	79.29	1.9346E-03
79.29	72.39	2.0309E-03
72.39	65.50	2.2584E-03
65.50	58.61	2.6238E-03
58.61	51.71	3.2597E-03
51.71	43.86 Psat	3.9135E-03

Psat - Saturation Pressure

TABLE 5
CONSTANT COMPOSITION EXPANSION @ 243.0 F (390.4 K) WITHOUT MIXER

Pressure		Relative Volume	Y-Function	Liquid Volume	Fluid Density
(psia)	(MPa)	[1]	[2]	(% of Vtot)	(g/cc)
13500	93.08	0.879364			
12500	86.18	0.891010			
11500	79.29	0.903056			
10500	72.39	0.915881			
9500	65.50	0.930368			
8500	58.61	0.947509			
7500	51.71	0.969293			
6362 *	43.86	1.000000		100.00	
6206	42.79	1.006580	3.8200	80.41	
6050	41.71	1.013719	3.7591	73.12	
5894	40.64	1.021470	3.6982	67.93	
5738	39.56	1.029898	3.6373	65.62	
5582	38.49	1.039071	3.5764	64.18	
5426	37.41	1.049069	3.5155	62.30	
5270	36.34	1.059981	3.4546	60.63	
5114	35.26	1.071908	3.3937	59.49	
4958	34.18	1.084966	3.3328	58.31	
4802	33.11	1.099288	3.2719	57.07	
4646	32.03	1.115026	3.2110	55.94	
4490	30.96	1.132352	3.1501	54.71	
4334	29.88	1.151471	3.0892	54.10	
4178	28.81	1.172616	3.0283	52.69	
4022	27.73	1.196062	2.9674	51.80	
[1] Volume at indicated pressure per volume at saturation pressure					
[2] Y Function = ((Psat-P)/P)/(Relative Volume - 1)					
* Saturation Pressure					

TABLE 6
AVERAGE FLUID COMPRESSIBILITIES @ 100.0 F (310.9 K) WITH MIXER

Pressure Range		Average Fluid Compressibility (psi ⁻¹)
From (psia)	To (psia)	
13500	12500	1.1633E-05
12500	11500	1.1713E-05
11500	10500	1.1926E-05
10500	9500	1.2280E-05
9500	8500	1.3034E-05
8500	7500	1.5077E-05
7500	6107 Psat	1.9269E-05

Pressure Range		Average Fluid Compressibility (MPa ⁻¹)
From (MPa)	To (MPa)	
93.08	86.18	1.6872E-03
86.18	79.29	1.6988E-03
79.29	72.39	1.7297E-03
72.39	65.50	1.7810E-03
65.50	58.61	1.8905E-03
58.61	51.71	2.1867E-03
51.71	42.11 Psat	2.7947E-03

Psat - Saturation Pressure

TABLE 7
CONSTANT COMPOSITION EXPANSION @ 100.0 F (310.9 K) WITH MIXER

Pressure		Relative Volume	Y-Function	Liquid Volume	Fluid Density
(psia)	(MPa)	[1]	[2]	(% of V _{tot})	(g/cc)
13500	93.08	0.901806			
12500	86.18	0.912420			
11500	79.29	0.923233			
10500	72.39	0.934376			
9500	65.50	0.945993			
8500	58.61	0.958486			
7500	51.71	0.973158			
6107 *	42.11	1.000000		100.00	
5835	40.23	1.006891	6.7647	71.16	
5563	38.36	1.014929	6.5504	67.26	
5291	36.48	1.024340	6.3361	65.33	
5019	34.60	1.035410	6.1218	63.60	
4747	32.73	1.048497	5.9075	61.85	
4475	30.85	1.064057	5.6932	60.54	
4203	28.98	1.082682	5.4790	58.87	
3931	27.10	1.105144	5.2647	57.13	
3659	25.23	1.132473	5.0504	55.37	
3387	23.35	1.166059	4.8361	53.15	
3115	21.48	1.207824	4.6218	51.07	
2843	19.60	1.260485	4.4075	48.43	
2571	17.73	1.327994	4.1932	46.08	
2299	15.85	1.416290	3.9789	42.76	
2027	13.98	1.534673	3.7646	39.28	
[1] Volume at indicated pressure per volume at saturation pressure					
[2] Y Function = ((P _{sat} -P)/P)/(Relative Volume - 1)					
* Saturation Pressure					