Compositional Analyses
for

University of Kansas

Miscellaneous Stock Tank Oil Samples
Bemis-Shutts Field, Ellis County, KS

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RFL 2001-081
9-Nov-2001

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PENCOR
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November 9, 2001

University of Kansas
Tertiary Oil Recovery Project
4008 Learned Hall
Lawrence, KS 66045

ATTN: Mr. Richard Pancake

Subject: **Bemis-Shutts Field**
Ellis County, KS
File: **RFL 2001-081**

Dear Mr. Pancake:

Samples of stock tank oil from selected wells in the subject field were forwarded to our laboratory facilty in Houston, Texas USA for compositional analyses. Each of the samples was analyzed by temperature-programmed, capillary chromatography to a triacontanes plus residual fraction. In addition, the total sample molecular weight was measured by freezing point depression using a cryoscope and the total sample density was measured using a frequency-based automated densitometer. No nitrogen content was found in any of the samples submitted for analysis and the complete results of the analyses are presented on the following pages.

It has been a pleasure to perform these tests for University of Kansas, Lawrence, KS. Should any questions arise or if we may be of further service in any way, please do not hesitate to contact me.

Sincerely,

Lee Williams
Laboratory Manager
PENCOR *Special Fluid Studies*
Houston, Texas

LW:encl
1 cc: Addressee

Composition of STO Hadley B1

(From Chromatographic Technique)

Component	Mol %	Wt %	Density (gm/cc)	MW	Vol %
Hydrogen Sulfide	.00	.00			
Carbon Dioxide	.00	.00			
Nitrogen	.00	.00			
Methane	.00	.00			
Ethane	.00	.00			
Propane	.00	.00			
iso-Butane	.00	.00			
n-Butane	2.38	.61	.5840	58.1	0.89
iso-Pentane	1.51	.48	.6244	72.2	0.66
n-Pentane	2.52	.80	.6311	72.2	1.08
Hexanes	5.24	1.94	.6850	84.0	2.42
Heptanes	8.94	3.78	.7220	96.0	4.48
Octanes	10.70	5.05	.7450	107.0	5.78
Nonanes	7.77	4.14	.7640	121.0	4.63
Decanes	7.06	4.17	.7780	134.0	4.58
Undecanes	5.62	3.64	.7890	147.0	3.94
Dodecanes	4.41	3.13	.8000	161.0	3.34
Tridecanes	4.71	3.63	.8110	175.0	3.83
Tetradecanes	3.92	3.28	.8220	190.0	3.41
Pentadecanes	3.59	3.26	.8320	206.0	3.35
Hexadecanes	3.06	2.99	.8390	222.0	3.04
Heptadecanes	2.69	2.81	.8470	237.0	2.84
Octadecanes	2.60	2.88	.8520	251.0	2.89
Nonadecanes	2.36	2.73	.8570	263.0	2.72
Eicosanes	1.96	2.38	.8620	275.0	2.36
Heneicosanes	1.75	2.24	.8670	291.0	2.20
Docosanes	1.39	1.87	.8720	305.0	1.83
Tricosanes	1.28	1.80	.8770	318.0	1.75
Tetracosanes	1.12	1.64	.8810	331.0	1.59
Pentacosanes	1.13	1.71	.8850	345.0	1.65
Hexacosanes	.90	1.42	.8890	359.0	1.37
Heptacosanes	.93	1.54	.8930	374.0	1.47
Octacosanes	.80	1.36	.8960	388.0	1.30
Nonacosanes	.80	1.41	.8990	402.0	1.34
Triacontanes plus	8.86	33.31	.9714	853.7	29.29
Totals	100.00	100.00			100.00

Sample Characteristics

This is Core Lab sample number 611

Total Liquid Molecular Weight	227.0
Total Liquid Density (gm/cc)	0.8541
Total Liquid API Gravity	34.0

Properties of Heavy Fractions

Plus Fractions	Mol %	Wt %	Density (gm/cc)	°API	MW
Hexanes plus	93.59	98.11	0.861	32.8	238.0
Heptanes plus	88.35	96.17	0.865	31.9	247.1
Decanes plus	60.94	83.20	0.887	27.8	309.9
Undecanes plus	53.88	79.03	0.894	26.6	333.0
Eicosanes plus	20.92	50.68	0.938	19.2	550.0
Pentacosanes plus	13.42	40.75	0.956	16.4	689.8
Triacontanes plus	8.86	33.31	0.971	14.0	853.7

Composition of STO Hadley B8

(From Chromatographic Technique)

Component	Mol %	Wt %	Density (gm/cc)	MW	Vol %
Hydrogen Sulfide	.00	.00			
Carbon Dioxide	.00	.00			
Nitrogen	.00	.00			
Methane	.00	.00			
Ethane	.00	.00			
Propane	.00	.00			
iso-Butane	.00	.00			
n-Butane	1.29	.33	.5840	58.1	0.49
iso-Pentane	.92	.29	.6244	72.2	0.39
n-Pentane	2.12	.67	.6311	72.2	0.91
Hexanes	4.51	1.66	.6850	84.0	2.07
Heptanes	8.38	3.53	.7220	96.0	4.19
Octanes	10.55	4.94	.7450	107.0	5.70
Nonanes	8.10	4.30	.7640	121.0	4.82
Decanes	7.40	4.35	.7780	134.0	4.79
Undecanes	5.82	3.75	.7890	147.0	4.07
Dodecanes	4.73	3.34	.8000	161.0	3.58
Tridecanes	4.90	3.76	.8110	175.0	3.97
Tetradecanes	4.06	3.38	.8220	190.0	3.52
Pentadecanes	3.69	3.33	.8320	206.0	3.43
Hexadecanes	3.12	3.04	.8390	222.0	3.10
Heptadecanes	2.82	2.93	.8470	237.0	2.96
Octadecanes	2.68	2.95	.8520	251.0	2.96
Nonadecanes	2.42	2.79	.8570	263.0	2.79
Eicosanes	1.98	2.39	.8620	275.0	2.37
Heneicosanes	1.79	2.29	.8670	291.0	2.26
Docosanes	1.36	1.82	.8720	305.0	1.79
Tricosanes	1.35	1.88	.8770	318.0	1.83
Tetracosanes	1.26	1.83	.8810	331.0	1.78
Pentacosanes	1.22	1.84	.8850	345.0	1.78
Hexacosanes	1.02	1.61	.8890	359.0	1.55
Heptacosanes	.99	1.62	.8930	374.0	1.55
Octacosanes	.92	1.56	.8960	388.0	1.49
Nonacosanes	.84	1.48	.8990	402.0	1.41
Triacontanes plus	9.76	32.34	.9750	754.8	28.42
Totals	100.00	100.00			100.00

Sample Characteristics

This is Core Lab sample number 608

Total Liquid Molecular Weight	228.0
Total Liquid Density (gm/cc)	0.8565
Total Liquid API Gravity	33.5

Properties of Heavy Fractions

Plus Fractions	Mol %	Wt %	Density (gm/cc)	°API	MW
Hexanes plus	95.67	98.71	0.861	32.7	235.2
Heptanes plus	91.16	97.05	0.865	31.9	242.7
Decanes plus	64.13	84.28	0.887	27.9	299.6
Undecanes plus	56.73	79.93	0.893	26.7	321.2
Eicosanes plus	22.49	50.66	0.938	19.1	513.4
Pentacosanes plus	14.75	40.45	0.957	16.2	625.0
Triacontanes plus	9.76	32.34	0.975	13.5	754.8

Composition of STO Hadley K-1

(From Chromatographic Technique)

Component	Mol %	Wt %	Density (gm/cc)	MW	Vol %
Hydrogen Sulfide	.00	.00			
Carbon Dioxide	.00	.00			
Nitrogen	.00	.00			
Methane	.00	.00			
Ethane	.00	.00			
Propane	.00	.00			
iso-Butane	.00	.00			
n-Butane	2.85	.73	.5840	58.1	1.06
iso-Pentane	1.42	.45	.6244	72.2	0.61
n-Pentane	2.86	.91	.6311	72.2	1.23
Hexanes	5.16	1.91	.6850	84.0	2.38
Heptanes	8.70	3.68	.7220	96.0	4.34
Octanes	10.32	4.87	.7450	107.0	5.55
Nonanes	7.52	4.01	.7640	121.0	4.47
Decanes	6.74	3.98	.7780	134.0	4.36
Undecanes	5.42	3.51	.7890	147.0	3.79
Dodecanes	4.43	3.14	.8000	161.0	3.35
Tridecanes	4.64	3.58	.8110	175.0	3.76
Tetradecanes	3.92	3.28	.8220	190.0	3.40
Pentadecanes	3.66	3.32	.8320	206.0	3.40
Hexadecanes	2.93	2.87	.8390	222.0	2.91
Heptadecanes	2.81	2.93	.8470	237.0	2.95
Octadecanes	2.53	2.80	.8520	251.0	2.80
Nonadecanes	2.37	2.75	.8570	263.0	2.73
Eicosanes	1.76	2.13	.8620	275.0	2.10
Heneicosanes	1.69	2.17	.8670	291.0	2.13
Docosanes	1.28	1.72	.8720	305.0	1.68
Tricosanes	1.27	1.78	.8770	318.0	1.73
Tetracosanes	1.05	1.53	.8810	331.0	1.48
Pentacosanes	1.00	1.52	.8850	345.0	1.47
Hexacosanes	.87	1.38	.8890	359.0	1.32
Heptacosanes	.87	1.43	.8930	374.0	1.36
Octacosanes	.80	1.36	.8960	388.0	1.29
Nonacosanes	.72	1.28	.8990	402.0	1.21
Triacontanes plus	10.41	34.98	.9573	763.1	31.12
Totals	100.00	100.00			100.00

Sample Characteristics

This is Core Lab sample number 607

Total Liquid Molecular Weight	227.0
Total Liquid Density (gm/cc)	0.8519
Total Liquid API Gravity	34.4

Properties of Heavy Fractions

Plus Fractions	Mol %	Wt %	Density (gm/cc)	°API	MW
Hexanes plus	92.87	97.91	0.859	33.1	239.3
Heptanes plus	87.71	96.00	0.863	32.2	248.5
Decanes plus	61.17	83.44	0.885	28.3	309.7
Undecanes plus	54.43	79.46	0.891	27.2	331.4
Eicosanes plus	21.72	51.28	0.931	20.3	536.1
Pentacosanes plus	14.67	41.95	0.946	18.0	649.4
Triacontanes plus	10.41	34.98	0.957	16.2	763.1

Composition of STO Hadley M1

(From Chromatographic Technique)

Component	Mol %	Wt %	Density (gm/cc)	MW	Vol %
Hydrogen Sulfide	.00	.00			
Carbon Dioxide	.00	.00			
Nitrogen	.00	.00			
Methane	.00	.00			
Ethane	.00	.00			
Propane	.00	.00			
iso-Butane	.00	.00			
n-Butane	2.43	.60	.5840	58.1	0.88
iso-Pentane	1.21	.37	.6244	72.2	0.51
n-Pentane	2.54	.78	.6311	72.2	1.06
Hexanes	4.87	1.74	.6850	84.0	2.18
Heptanes	8.37	3.42	.7220	96.0	4.06
Octanes	10.29	4.69	.7450	107.0	5.40
Nonanes	7.61	3.92	.7640	121.0	4.40
Decanes	7.00	3.99	.7780	134.0	4.40
Undecanes	5.48	3.43	.7890	147.0	3.73
Dodecanes	4.42	3.03	.8000	161.0	3.25
Tridecanes	4.71	3.51	.8110	175.0	3.71
Tetradecanes	3.98	3.22	.8220	190.0	3.36
Pentadecanes	3.71	3.25	.8320	206.0	3.35
Hexadecanes	3.19	3.01	.8390	222.0	3.08
Heptadecanes	2.84	2.86	.8470	237.0	2.90
Octadecanes	2.82	3.01	.8520	251.0	3.03
Nonadecanes	2.56	2.87	.8570	263.0	2.87
Eicosanes	2.00	2.34	.8620	275.0	2.32
Heneicosanes	1.90	2.35	.8670	291.0	2.32
Docosanes	1.35	1.75	.8720	305.0	1.72
Tricosanes	1.49	2.01	.8770	318.0	1.96
Tetracosanes	1.31	1.84	.8810	331.0	1.79
Pentacosanes	1.16	1.71	.8850	345.0	1.65
Hexacosanes	1.01	1.55	.8890	359.0	1.49
Heptacosanes	.87	1.39	.8930	374.0	1.34
Octacosanes	.70	1.15	.8960	388.0	1.10
Nonacosanes	.80	1.37	.8990	402.0	1.30
Triacontanes plus	9.38	34.84	.9696	872.9	30.81
Totals	100.00	100.00			100.00

Sample Characteristics

This is Core Lab sample number 612

Total Liquid Molecular Weight	235.0
Total Liquid Density (gm/cc)	0.8576
Total Liquid API Gravity	33.3

Properties of Heavy Fractions

Plus Fractions	Mol %	Wt %	Density (gm/cc)	°API	MW
Hexanes plus	93.82	98.25	0.864	32.2	246.1
Heptanes plus	88.95	96.51	0.868	31.4	255.0
Decanes plus	62.68	84.48	0.889	27.5	316.7
Undecanes plus	55.68	80.49	0.895	26.4	339.7
Eicosanes plus	21.97	52.30	0.938	19.3	559.5
Pentacosanes plus	13.92	42.01	0.955	16.5	709.0
Triacontanes plus	9.38	34.84	0.970	14.3	872.9

Composition of STO Glathart #1

(From Chromatographic Technique)

Component	Mol %	Wt %	Density (gm/cc)	MW	Vol %
Hydrogen Sulfide	.00	.00			
Carbon Dioxide	.00	.00			
Nitrogen	.00	.00			
Methane	.00	.00			
Ethane	.00	.00			
Propane	.00	.00			
iso-Butane	.00	.00			
n-Butane	2.89	.72	.5840	58.1	1.06
iso-Pentane	1.55	.48	.6244	72.2	0.66
n-Pentane	2.68	.83	.6311	72.2	1.13
Hexanes	5.02	1.81	.6850	84.0	2.27
Heptanes	8.81	3.63	.7220	96.0	4.32
Octanes	10.63	4.89	.7450	107.0	5.63
Nonanes	7.70	4.00	.7640	121.0	4.50
Decanes	7.09	4.08	.7780	134.0	4.50
Undecanes	5.66	3.57	.7890	147.0	3.88
Dodecanes	4.52	3.12	.8000	161.0	3.35
Tridecanes	4.50	3.38	.8110	175.0	3.58
Tetradecanes	3.83	3.12	.8220	190.0	3.26
Pentadecanes	3.57	3.16	.8320	206.0	3.26
Hexadecanes	3.09	2.94	.8390	222.0	3.00
Heptadecanes	2.80	2.85	.8470	237.0	2.88
Octadecanes	2.51	2.70	.8520	251.0	2.72
Nonadecanes	2.47	2.79	.8570	263.0	2.80
Eicosanes	1.88	2.22	.8620	275.0	2.21
Heneicosanes	1.79	2.23	.8670	291.0	2.21
Docosanes	1.40	1.83	.8720	305.0	1.80
Tricosanes	1.20	1.64	.8770	318.0	1.61
Tetracosanes	1.06	1.50	.8810	331.0	1.46
Pentacosanes	1.14	1.69	.8850	345.0	1.64
Hexacosanes	.88	1.35	.8890	359.0	1.30
Heptacosanes	.98	1.57	.8930	374.0	1.51
Octacosanes	.93	1.55	.8960	388.0	1.48
Nonacosanes	.62	1.07	.8990	402.0	1.02
Triacontanes plus	8.80	35.28	.9780	933.8	30.96
Totals	100.00	100.00			100.00

Sample Characteristics

This is Core Lab sample number 610

Total Liquid Molecular Weight	233.0
Total Liquid Density (gm/cc)	0.8583
Total Liquid API Gravity	33.2

Properties of Heavy Fractions

Plus Fractions	Mol %	Wt %	Density (gm/cc)	°API	MW
Hexanes plus	92.88	97.97	0.866	31.8	245.8
Heptanes plus	87.86	96.16	0.870	31.0	255.0
Decanes plus	60.72	83.64	0.892	26.9	321.0
Undecanes plus	53.63	79.56	0.899	25.7	345.7
Eicosanes plus	20.68	51.93	0.944	18.2	585.1
Pentacosanes plus	13.35	42.51	0.962	15.4	741.8
Triacontanes plus	8.80	35.28	0.978	13.0	933.8

Composition of STO Glathart #6

(From Chromatographic Technique)

Component	Mol %	Wt %	Density (gm/cc)	MW	Vol %
Hydrogen Sulfide	.00	.00			
Carbon Dioxide	.00	.00			
Nitrogen	.00	.00			
Methane	.00	.00			
Ethane	.00	.00			
Propane	.00	.00			
iso-Butane	.00	.00			
n-Butane	4.16	1.08	.5840	58.1	1.57
iso-Pentane	1.77	.57	.6244	72.2	0.77
n-Pentane	3.45	1.11	.6311	72.2	1.50
Hexanes	5.63	2.11	.6850	84.0	2.62
Heptanes	9.19	3.94	.7220	96.0	4.65
Octanes	10.66	5.08	.7450	107.0	5.81
Nonanes	7.72	4.17	.7640	121.0	4.65
Decanes	7.00	4.19	.7780	134.0	4.59
Undecanes	5.50	3.61	.7890	147.0	3.90
Dodecanes	4.44	3.19	.8000	161.0	3.39
Tridecanes	4.45	3.48	.8110	175.0	3.65
Tetradecanes	3.71	3.15	.8220	190.0	3.26
Pentadecanes	3.41	3.14	.8320	206.0	3.21
Hexadecanes	2.90	2.87	.8390	222.0	2.91
Heptadecanes	2.50	2.65	.8470	237.0	2.66
Octadecanes	2.49	2.79	.8520	251.0	2.78
Nonadecanes	2.25	2.64	.8570	263.0	2.62
Eicosanes	1.56	1.92	.8620	275.0	1.90
Heneicosanes	1.65	2.15	.8670	291.0	2.11
Docosanes	1.19	1.62	.8720	305.0	1.58
Tricosanes	.97	1.37	.8770	318.0	1.33
Tetracosanes	1.02	1.50	.8810	331.0	1.45
Pentacosanes	1.00	1.54	.8850	345.0	1.48
Hexacosanes	.87	1.39	.8890	359.0	1.33
Heptacosanes	.89	1.48	.8930	374.0	1.41
Octacosanes	.74	1.28	.8960	388.0	1.22
Nonacosanes	.72	1.30	.8990	402.0	1.23
Triacontanes plus	8.16	34.68	.9695	951.7	30.43
Totals	100.00	100.00			100.00

Sample Characteristics

This is Core Lab sample number 601

Total Liquid Molecular Weight	224.0
Total Liquid Density (gm/cc)	0.8508
Total Liquid API Gravity	34.7

Properties of Heavy Fractions

Plus Fractions	Mol %	Wt %	Density (gm/cc)	°API	MW
Hexanes plus	90.62	97.24	0.860	32.8	240.4
Heptanes plus	84.99	95.13	0.865	31.8	250.7
Decanes plus	57.42	81.94	0.889	27.5	319.6
Undecanes plus	50.42	77.75	0.896	26.3	345.4
Eicosanes plus	18.77	50.23	0.940	18.9	599.4
Pentacosanes plus	12.38	41.67	0.956	16.4	753.9
Triacontanes plus	8.16	34.68	0.969	14.3	951.7

Composition of STO Glathart #8

(From Chromatographic Technique)

Component	Mol %	Wt %	Density (gm/cc)	MW	Vol %
Hydrogen Sulfide	.00	.00			
Carbon Dioxide	.00	.00			
Nitrogen	.00	.00			
Methane	.00	.00			
Ethane	.00	.00			
Propane	.00	.00			
iso-Butane	.00	.00			
n-Butane	2.59	.66	.5840	58.1	0.96
iso-Pentane	1.42	.45	.6244	72.2	0.61
n-Pentane	3.07	.97	.6311	72.2	1.31
Hexanes	5.24	1.93	.6850	84.0	2.40
Heptanes	8.81	3.71	.7220	96.0	4.38
Octanes	10.70	5.03	.7450	107.0	5.75
Nonanes	7.82	4.15	.7640	121.0	4.63
Decanes	7.06	4.15	.7780	134.0	4.54
Undecanes	5.55	3.58	.7890	147.0	3.87
Dodecanes	4.53	3.20	.8000	161.0	3.41
Tridecanes	4.72	3.62	.8110	175.0	3.80
Tetradecanes	3.88	3.23	.8220	190.0	3.35
Pentadecanes	3.50	3.16	.8320	206.0	3.24
Hexadecanes	3.05	2.97	.8390	222.0	3.02
Heptadecanes	2.69	2.80	.8470	237.0	2.82
Octadecanes	2.47	2.72	.8520	251.0	2.72
Nonadecanes	2.44	2.82	.8570	263.0	2.81
Eicosanes	1.89	2.28	.8620	275.0	2.26
Heneicosanes	1.75	2.23	.8670	291.0	2.19
Docosanes	1.52	2.03	.8720	305.0	1.99
Tricosanes	1.25	1.75	.8770	318.0	1.71
Tetracosanes	1.18	1.71	.8810	331.0	1.65
Pentacosanes	1.14	1.73	.8850	345.0	1.66
Hexacosanes	1.05	1.65	.8890	359.0	1.59
Heptacosanes	.98	1.61	.8930	374.0	1.53
Octacosanes	.83	1.41	.8960	388.0	1.34
Nonacosanes	.81	1.43	.8990	402.0	1.36
Triacontanes plus	8.06	33.02	.9674	934.4	29.09
Totals	100.00	100.00			100.00

Sample Characteristics

This is Core Lab sample number 603

Total Liquid Molecular Weight	228.0
Total Liquid Density (gm/cc)	0.8526
Total Liquid API Gravity	34.3

Properties of Heavy Fractions

Plus Fractions	Mol %	Wt %	Density (gm/cc)	°API	MW
Hexanes plus	92.92	97.92	0.860	33.0	240.3
Heptanes plus	87.68	95.99	0.864	32.1	249.6
Decanes plus	60.35	83.10	0.886	28.0	314.0
Undecanes plus	53.29	78.95	0.893	26.9	337.8
Eicosanes plus	20.46	50.85	0.935	19.7	566.8
Pentacosanes plus	12.87	40.85	0.952	17.0	723.9
Triacontanes plus	8.06	33.02	0.967	14.6	934.4

Composition of STO Hall B10

(From Chromatographic Technique)

Component	Mol %	Wt %	Density (gm/cc)	MW	Vol %
Hydrogen Sulfide	.00	.00			
Carbon Dioxide	.00	.00			
Nitrogen	.00	.00			
Methane	.00	.00			
Ethane	.00	.00			
Propane	.00	.00			
iso-Butane	.00	.00			
n-Butane	3.27	.86	.5840	58.1	1.25
iso-Pentane	1.65	.54	.6244	72.2	0.73
n-Pentane	3.12	1.02	.6311	72.2	1.38
Hexanes	5.74	2.18	.6850	84.0	2.70
Heptanes	9.23	4.01	.7220	96.0	4.72
Octanes	10.75	5.21	.7450	107.0	5.93
Nonanes	7.78	4.26	.7640	121.0	4.74
Decanes	7.49	4.54	.7780	134.0	4.96
Undecanes	6.19	4.12	.7890	147.0	4.44
Dodecanes	4.45	3.24	.8000	161.0	3.44
Tridecanes	4.58	3.63	.8110	175.0	3.81
Tetradecanes	3.72	3.20	.8220	190.0	3.31
Pentadecanes	3.32	3.09	.8320	206.0	3.15
Hexadecanes	2.85	2.86	.8390	222.0	2.90
Heptadecanes	2.49	2.67	.8470	237.0	2.68
Octadecanes	2.47	2.81	.8520	251.0	2.80
Nonadecanes	2.21	2.63	.8570	263.0	2.61
Eicosanes	1.66	2.06	.8620	275.0	2.03
Heneicosanes	1.57	2.07	.8670	291.0	2.03
Docosanes	1.20	1.66	.8720	305.0	1.61
Tricosanes	1.22	1.75	.8770	318.0	1.70
Tetracosanes	1.14	1.71	.8810	331.0	1.65
Pentacosanes	1.07	1.67	.8850	345.0	1.61
Hexacosanes	.81	1.31	.8890	359.0	1.25
Heptacosanes	.85	1.44	.8930	374.0	1.37
Octacosanes	.81	1.43	.8960	388.0	1.36
Nonacosanes	.76	1.38	.8990	402.0	1.31
Triacontanes plus	7.60	32.65	.9716	949.6	28.55
Totals	100.00	100.00			100.00

Sample Characteristics

This is Core Lab sample number 609

Total Liquid Molecular Weight	221.0
Total Liquid Density (gm/cc)	0.8497
Total Liquid API Gravity	34.9

Properties of Heavy Fractions

Plus Fractions	Mol %	Wt %	Density (gm/cc)	°API	MW
Hexanes plus	91.96	97.58	0.858	33.3	234.5
Heptanes plus	86.22	95.40	0.863	32.3	244.5
Decanes plus	58.46	81.92	0.886	28.0	309.7
Undecanes plus	50.97	77.38	0.893	26.7	335.5
Eicosanes plus	18.69	49.13	0.939	19.1	581.0
Pentacosanes plus	11.90	39.88	0.956	16.3	740.8
Triacontanes plus	7.60	32.65	0.972	14.0	949.6

Composition of STO Hall B17

(From Chromatographic Technique)

Component	Mol %	Wt %	Density (gm/cc)	MW	Vol %
Hydrogen Sulfide	.00	.00			
Carbon Dioxide	.00	.00			
Nitrogen	.00	.00			
Methane	.00	.00			
Ethane	.00	.00			
Propane	.00	.00			
iso-Butane	.00	.00			
n-Butane	3.18	.83	.5840	58.1	1.21
iso-Pentane	1.55	.50	.6244	72.2	0.68
n-Pentane	3.12	1.01	.6311	72.2	1.36
Hexanes	5.63	2.12	.6850	84.0	2.63
Heptanes	9.15	3.94	.7220	96.0	4.64
Octanes	10.71	5.16	.7450	107.0	5.85
Nonanes	7.70	4.18	.7640	121.0	4.65
Decanes	7.06	4.24	.7780	134.0	4.63
Undecanes	5.57	3.67	.7890	147.0	3.95
Dodecanes	4.29	3.10	.8000	161.0	3.30
Tridecanes	4.57	3.59	.8110	175.0	3.76
Tetradecanes	3.80	3.24	.8220	190.0	3.35
Pentadecanes	3.49	3.22	.8320	206.0	3.29
Hexadecanes	2.89	2.88	.8390	222.0	2.91
Heptadecanes	2.53	2.69	.8470	237.0	2.70
Octadecanes	2.54	2.86	.8520	251.0	2.85
Nonadecanes	2.28	2.69	.8570	263.0	2.67
Eicosanes	1.79	2.21	.8620	275.0	2.18
Heneicosanes	1.68	2.19	.8670	291.0	2.15
Docosanes	1.26	1.73	.8720	305.0	1.68
Tricosanes	1.17	1.67	.8770	318.0	1.61
Tetracosanes	1.16	1.72	.8810	331.0	1.66
Pentacosanes	1.00	1.54	.8850	345.0	1.48
Hexacosanes	.86	1.39	.8890	359.0	1.33
Heptacosanes	.89	1.49	.8930	374.0	1.42
Octacosanes	.69	1.20	.8960	388.0	1.14
Nonacosanes	.71	1.28	.8990	402.0	1.21
Triacontanes plus	8.73	33.66	.9618	860.6	29.73
Totals	100.00	100.00			100.00

Sample Characteristics

This is Core Lab sample number 604

Total Liquid Molecular Weight	223.0
Total Liquid Density (gm/cc)	0.8496
Total Liquid API Gravity	34.9

Properties of Heavy Fractions

Plus Fractions	Mol %	Wt %	Density (gm/cc)	°API	MW
Hexanes plus	92.15	97.66	0.857	33.4	236.3
Heptanes plus	86.52	95.54	0.862	32.5	246.2
Decanes plus	58.96	82.26	0.885	28.3	311.2
Undecanes plus	51.90	78.02	0.891	27.1	335.3
Eicosanes plus	19.94	50.08	0.933	20.0	560.4
Pentacosanes plus	12.88	40.56	0.949	17.4	702.9
Triacontanes plus	8.73	33.66	0.962	15.5	860.6

Composition of STO Hall B-21

(From Chromatographic Technique)

Component	Mol %	Wt %	Density (gm/cc)	MW	Vol %
Hydrogen Sulfide	.00	.00			
Carbon Dioxide	.00	.00			
Nitrogen	.00	.00			
Methane	.00	.00			
Ethane	.00	.00			
Propane	.00	.00			
iso-Butane	.00	.00			
n-Butane	4.03	1.08	.5840	58.1	1.57
iso-Pentane	1.65	.55	.6244	72.2	0.75
n-Pentane	3.52	1.17	.6311	72.2	1.57
Hexanes	5.97	2.31	.6850	84.0	2.85
Heptanes	9.52	4.21	.7220	96.0	4.94
Octanes	10.98	5.40	.7450	107.0	6.15
Nonanes	7.89	4.40	.7640	121.0	4.88
Decanes	6.93	4.28	.7780	134.0	4.66
Undecanes	5.57	3.77	.7890	147.0	4.05
Dodecanes	4.35	3.23	.8000	161.0	3.42
Tridecanes	4.43	3.57	.8110	175.0	3.73
Tetradecanes	3.65	3.20	.8220	190.0	3.29
Pentadecanes	3.33	3.16	.8320	206.0	3.22
Hexadecanes	2.82	2.89	.8390	222.0	2.91
Heptadecanes	2.56	2.80	.8470	237.0	2.80
Octadecanes	2.40	2.78	.8520	251.0	2.76
Nonadecanes	2.16	2.62	.8570	263.0	2.59
Eicosanes	1.85	2.35	.8620	275.0	2.31
Heneicosanes	1.42	1.90	.8670	291.0	1.85
Docosanes	1.35	1.90	.8720	305.0	1.85
Tricosanes	1.09	1.59	.8770	318.0	1.53
Tetracosanes	1.05	1.60	.8810	331.0	1.54
Pentacosanes	1.09	1.73	.8850	345.0	1.65
Hexacosanes	.60	1.00	.8890	359.0	0.95
Heptacosanes	.87	1.50	.8930	374.0	1.42
Octacosanes	.53	.95	.8960	388.0	0.90
Nonacosanes	.57	1.05	.8990	402.0	0.99
Triacontanes plus	7.82	33.01	.9687	915.9	28.86
Totals	100.00	100.00			100.00

Sample Characteristics

This is Core Lab sample number 606

Total Liquid Molecular Weight	217.0
Total Liquid Density (gm/cc)	0.8469
Total Liquid API Gravity	35.4

Properties of Heavy Fractions

Plus Fractions	Mol %	Wt %	Density (gm/cc)	°API	MW
Hexanes plus	90.80	97.20	0.857	33.5	232.3
Heptanes plus	84.83	94.89	0.862	32.5	242.7
Decanes plus	56.44	80.88	0.886	28.0	310.9
Undecanes plus	49.51	76.60	0.893	26.8	335.7
Eicosanes plus	18.24	48.58	0.938	19.2	578.0
Pentacosanes plus	11.48	39.24	0.956	16.4	741.7
Triacontanes plus	7.82	33.01	0.969	14.4	915.9