Crude Oil Assay – WTI (from OGJ article)

Benchmark West Texas Intermediate crude assayed

Anne K. Rhodes *Refining/Petrochemical Editor*

Here is an assay of West Texas Intermediate, one of the world's market crudes. The price of this crude, known as WTI, is followed by market analysts, investors, traders, and industry managers around the world.

WTI price is used as a benchmark for pricing all other U.S. crude oils. The 41° API, 0.34 wt % sulfur crude is gathered in West Texas and moved to Cushing, Okla., for distribution.

The WTI posted price is the price paid for the crude at the wellhead in West Texas and is the true benchmark on which other U.S. crudes are priced. The spot price is the negotiated price for short-term trades of the crude. And the New York Mercantile Exchange, or Nymex, price is a futures price for barrels delivered at Cushing.

West Texas Intermediate

Cushing, Okla.

Whole crude
Gravity, °API: 40.8
Specific gravity @ 60/60 F.: 0.8212
Sulfur, wt %: 0.34
Vis., cSt @ 60° F.: 5.24
Neut. no., mg/g: 0.10
Nitrogen, wt %: 0.08
Pour pt., °F.: –20

Light ends
C_1-C_3, wt %: 4.35

Range, °F.: 68-347
Yield, vol %: 32.39
RON, clear: 56.4*
Sulfur, wt %: 0.0314

Range, °F.: 347-563
Yield, vol %: 23.50
Specific gravity @ 60/60: 0.8201
Sulfur, wt %: 0.110
Aniline pt., °F.: 150.5
Vis., cSt @ 100° F.: 1.87
Freeze pt., °F: –25
Pour pt., °F.: –33
Smoke pt., mm: 22.1

Range, °F.: 563-650
Yield, vol %: 8.10
Specific gravity @ 60/60: 0.8529
Sulfur, wt %: 0.289
Aniline pt., °F.: 176.9
Vis., cSt @ 100° F.: 6.21
Freeze pt., °F.: 38*
Pour pt., °F.: 30

Range, °F.: 650-1,049
Yield, vol %: 24.30
Specific gravity @ 60/60: 0.8960
Sulfur, wt %: 0.445
Nitrogen, wt %: 0.105
V/Ni, ppm: 0.04*/0.09*

Range, °F.: 650-1,500
Yield, vol %: 33.30
Specific gravity @ 60/60: 0.9153
Sulfur, wt %: 0.72
Vis., cSt @ 140° F.: 56.8
Pour pt., °F: 78
V/Ni, ppm: 4.3/4.3
Fe, ppm: 20.2

Range, °F.: 761-1,500
Yield, vol %: 25.30
Specific gravity @ 60/60: 0.9268
Penetration @ 25° C., mm: >2,000†
Vis., cSt @ 212° F.: 26.70

Range, °F.: 878-1,500
Yield, vol %: 17.95
Specific gravity @ 60/60: 0.9403
Penetration @ 25° C., mm: >2,000†
Vis., cSt @ 212° F.: 58.7

Range, °F.: 1,049-1,500
Yield, vol %: 9.00
Specific gravity @ 60/60: 0.9672
Penetration @ 25° C., mm: 1,035.5†
Vis., cSt @ 212° F.: 360.3

*Extrapolated
†Estimated

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WTI Assay Data in Tabular Form

Property	Whole Crude	Light Ends, C1-C3	68 - 347	347 - 563	563 - 650	650 - 1049	650 - 1500	761 - 1500	878 - 1500	1049 - 1500
Initial Boiling Point, °F			68	347	563	650	650	761	878	1049
End Boiling Point, °F			347	563	650	1049	1500	1500	1500	1500
Incremental Amount, vol%			32.39	23.5	8.1	24.3	33.3	25.3	17.95	9
Incremental Amount, wt%		4.35								
API Gravity	40.8									
Specific Gravity	0.8212			0.8201	0.8529	0.896	0.9153	0.9268	0.9403	0.9672
Sulfur, wt%	0.34		0.0314	0.110	0.289	0.445	0.72			
Nitrogen, wt%	0.08					0.105				
Vanadium, ppmw						0.04	4.3			
Nickel, ppmw						0.09	4.3			
Iron ppmw							20.2			
RON, clear			56.4							
Neut. No., mg/g	0.1									
Aniline, °F				150.5	176.9					
Smoke Pt., mm				22.1						
Pour Point, °F	-20			-33	30					
Freeze Point, °F				-25	38					
Vis., cSt										
60°F	5.24									
100°F				1.87	6.21					
140°F							56.8			
212°F								26.7	58.7	360.3

Most interested in the amounts & quality (specific gravity & sulfur content)

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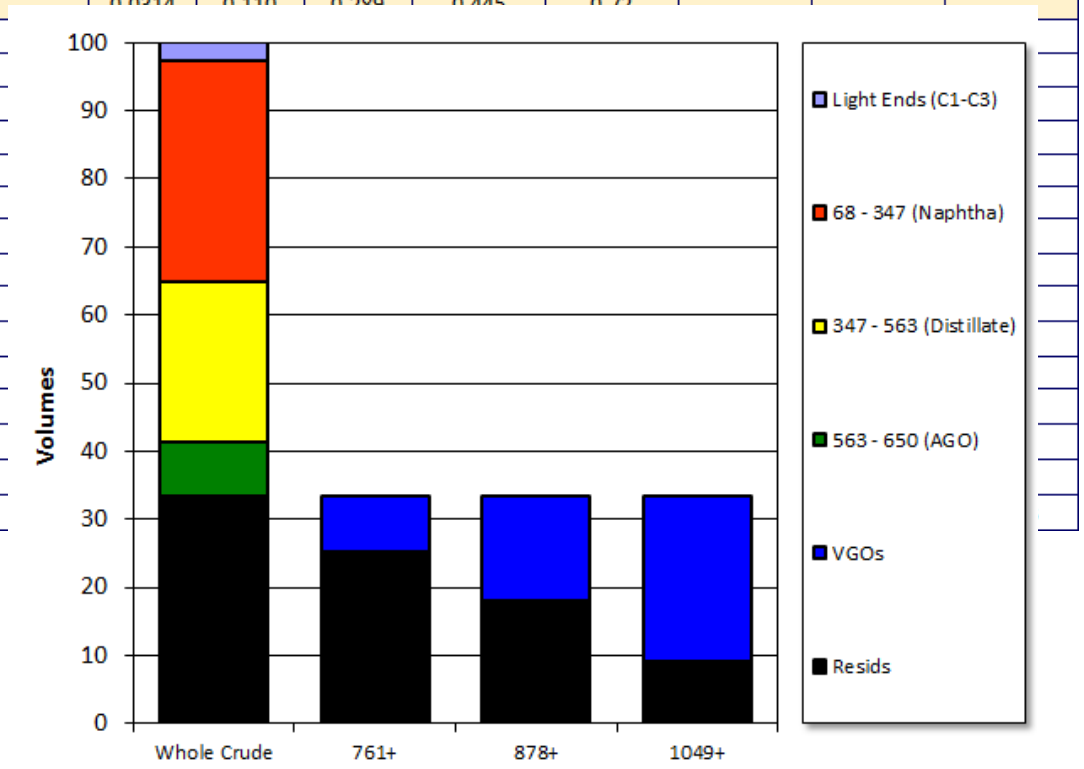
WTI Assay Data in Tabular Form

Property	Whole Crude	Light Ends, C1-C3	68 - 347	347 - 563	563 - 650	650 - 1049	650 - 1500	761 - 1500	878 - 1500	1049 - 1500
Initial Boiling Point, °F			68	347	563	650	650	761	878	1049
End Boiling Point, °F			347	563	650	1049	1500	1500	1500	1500
Incremental Amount, vol%			32.39	23.5	8.1	24.3	33.3	25.3	17.95	9
Incremental Amount, wt%		4.35								
API Gravity	40.8									
Specific Gravity	0.8212			0.8201	0.8529	0.896	0.9153	0.9268	0.9403	0.9672
Sulfur, wt%	0.34									
Nitrogen, wt%	0.08									
Vanadium, ppmw										
Nickel, ppmw										
Iron ppmw										
RON, clear										
Neut. No., mg/g	0.1									
Aniline, °F										
Smoke Pt., mm										
Pour Point, °F	-20									
Freeze Point, °F										
Vis., cSt										
60°F	5.24									
100°F										
140°F										
212°F										



Amounts. Note the multiple splits of the atmospheric resid (650°F+)

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Crude Oil Assay – WTI (from OGJ article)

Fraction	IBP °F	EP °F	Cumulative vol%	Yields Increment vol%	Yields Increment wt%	Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
Whole Crude	IBP	FBP		100	100		0.8212	40.8	0.34
Primary Fractions									
Gas + LPG	IBP	68			4.35				
Naphtha	68	347		32.39					0.0314
Kerosene	347	563		23.50			0.8201	41.0	0.110
AGO	563	650		8.10			0.8529	34.4	0.289
VGO	650	1049		24.30			0.8960	26.4	0.445
Vac Resid	1049	FBP		9.00			0.9672	14.8	
Total				97.29	4.35				0.000
Other Fractions									
Atm Resid	650	FBP		33.3			0.9153	23.1	0.720
Vac Resid #2	761	FBP		25.3			0.9268	21.2	
Vac Resid #3	878	FBP		17.95			0.9403	19.0	
Expanded Assay									
Gas + LPG									
Naphtha									
Total				0.00	0.00				

Extract values from Crude Oil Assay. Calculate API gravity values from specific gravity values.

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Crude Oil Assay – WTI (from OGJ article)

Fraction	IBP °F	EP °F	Cumulative vol%	Yields Increment vol%	Yields Increment wt%	Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
Whole Crude	IBP	FBP		100	100		0.8212	40.8	0.34
Primary Fractions									
Gas + LPG	IBP	68		2.71	4.35				
Naphtha	68	347		32.39					0.0314
Kerosene	347	563		23.50			0.8201	41.0	0.110
				8.10			0.8529	34.4	0.289
				24.30			0.8960	26.4	0.445
				9.00			0.9672	14.8	
				100.00	4.35				0.000
				33.3			0.9153	23.1	0.720
				25.3			0.9268	21.2	
Vac Resid #3	878	FBP		17.95			0.9403	19.0	
Expanded Assay									
Gas + LPG									
Naphtha									
Kerosene									
AGO									
LVGO									
MVGO									
HVGO									
Vac Resid									
Total				0.00	0.00				

Back-calculate the Gas+LPG Vol% Increment Yield value assuming ideal liquid volume mixing.

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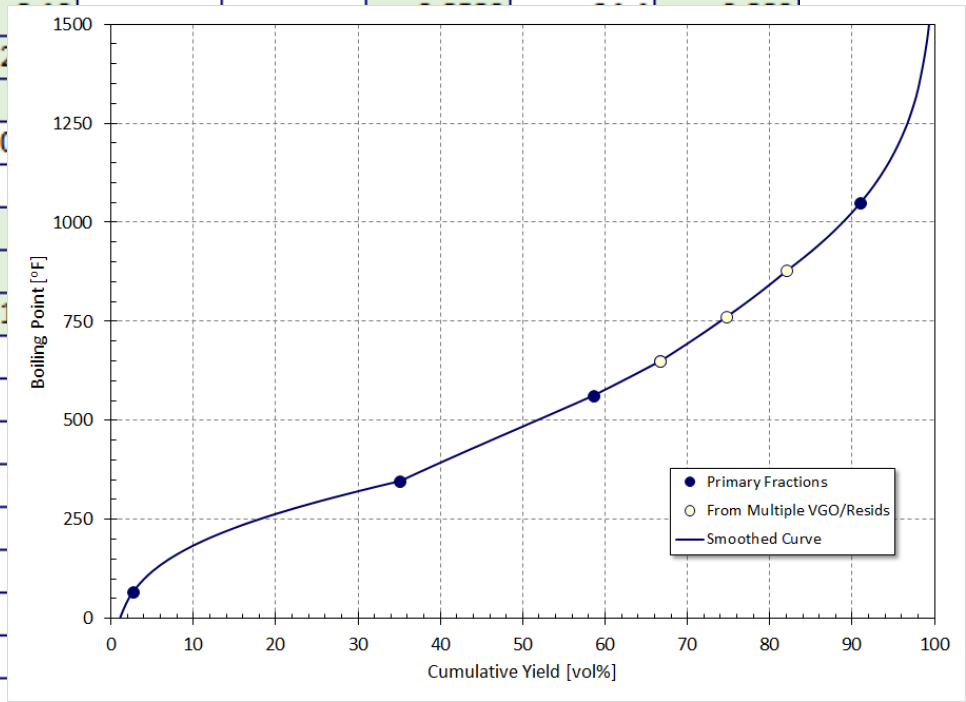
Crude Oil Assay – WTI (from OGJ article)

Fraction	IBP °F	EP °F	Yields Cumulative vol%	Yields Increment vol%	Yields Increment wt%	Mid vol	Specific	API	
Whole Crude	IBP	FBP		100	100				
Primary Fractions									
Gas + LPG	IBP	68		2.71	4.35				
Naphtha	68	347	2.71	32.39					
Kerosene	347	563	35.10	23.50			0.8201	41.0	0.110
AGO	563	650	58.60						
VGO	650	1049	66.70						
Vac Resid	1049	FBP	91.00						
Total				10					
Other Fractions									
Atm Resid	650	FBP	66.70						
Vac Resid #2	761	FBP	74.70						
Vac Resid #3	878	FBP	82.05	1					
Expanded Assay									
Gas + LPG									
Naphtha									
Kerosene									
AGO									
LVGO									
MVGO									
HVGO									
Vac Resid									
Total				0.00	0.00				

Combine all Vol% Increment Yield values to get the Cumulative Yield values at the IBP.



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Crude Oil Assay – WTI (from OGJ article)

Fraction	IBP °F	EP °F	Cumulative vol%	Yields Increment vol%	Yields Increment wt%	Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
Whole Crude	IBP	FBP		100	100		0.8212	40.8	0.34
Primary Fractions									
Gas + LPG	IBP	68		2.71	4.35				
Naphtha	68	347	2.71	32.39		18.905			0.0314
Kerosene	347	563	35.10	23.50		46.850	0.8201	41.0	0.110
			58.60	8.10		62.650	0.8529	34.4	0.289
			66.70	24.30		78.850	0.8960	26.4	0.445
			91.00	9.00		95.500	0.9672	14.8	
				100.00	4.35				0.000
			66.70	33.3		83.350	0.9153	23.1	0.720
			74.70	25.3		87.350	0.9268	21.2	
Vac Resid #3	878	FBP	82.05	17.95		91.025	0.9403	19.0	
Expanded Assay									
Gas + LPG									
Naphtha									
Kerosene									
AGO									
LVGO									
MVGO									
HVGO									
Vac Resid									
Total				0.00	0.00				

Calculate the Cumulative Yield values at the middle of the increment.

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Crude Oil Assay – WTI (from OGJ article)

Fraction	IBP °F	EP °F	Cumulative vol%	Yields Increment vol%	Yields Increment wt%	Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
Whole Crude	IBP	FBP		100	100		0.8212	40.8	0.34
Primary Fractions									
Gas + LPG	IBP	68		2.71	4.35				
Naphtha	68	347	2.71	32.39		18.905			0.0314
Kerosene	347	563	35.10	23.50	23.47	46.850	0.8201	41.0	0.110
			58.60	8.10	8.41	62.650	0.8529	34.4	0.289
			66.70	24.30	26.51	78.850	0.8960	26.4	0.445
			91.00	9.00	10.60	95.500	0.9672	14.8	
				100.00	73.34				0.229
			66.70	33.3	37.12	83.350	0.9153	23.1	0.720
			74.70	25.3	28.55	87.350	0.9268	21.2	
Vac Resid #3	878	FBP	82.05	17.95	20.55	91.025	0.9403	19.0	
Expanded Assay									
Gas + LPG									
Naphtha									
Kerosene									
AGO									
LVGO									
MVGO									
HVGO									
Vac Resid									
Total				0.00	0.00				

Calculate the Wt% Increment Yield values from the vol% values, the specific gravity, & the whole crude specific gravity.

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Crude Oil Assay – WTI (from OGJ article)

Fraction	IBP °F	EP °F	Yields Cumulative vol%	Yields Increment vol%	Yields Increment wt%	Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
Whole Crude	IBP	FBP		100	100		0.8212	40.8	0.34
Primary Fractions									
Gas + LPG	IBP	68		2.71	4.35				
Naphtha	68	347	2.71	32.39	26.66	18.905			0.0314
Kerosene	347	563	35.10	23.50	23.47	46.850	0.8201	41.0	0.110
			58.60	8.10	8.41	62.650	0.8529	34.4	0.289
			66.70	24.30	26.51	78.850	0.8960	26.4	0.445
			91.00	9.00	10.60	95.500	0.9672	14.8	
				100.00	100.00				0.176
			66.70	33.3	37.12	83.350	0.9153	23.1	0.720
			74.70	25.3	28.55	87.350	0.9268	21.2	
Vac Resid #3	878	FBP	82.05	17.95	20.55	91.025	0.9403	19.0	
Expanded Assay									
Gas + LPG									
Naphtha									
Kerosene									
AGO									
LVGO									
MVGO									
HVGO									
Vac Resid									
Total				0.00	0.00				

Back-calculate the Naphtha Wt% Increment Yield value to ensure mass balance on the whole crude.

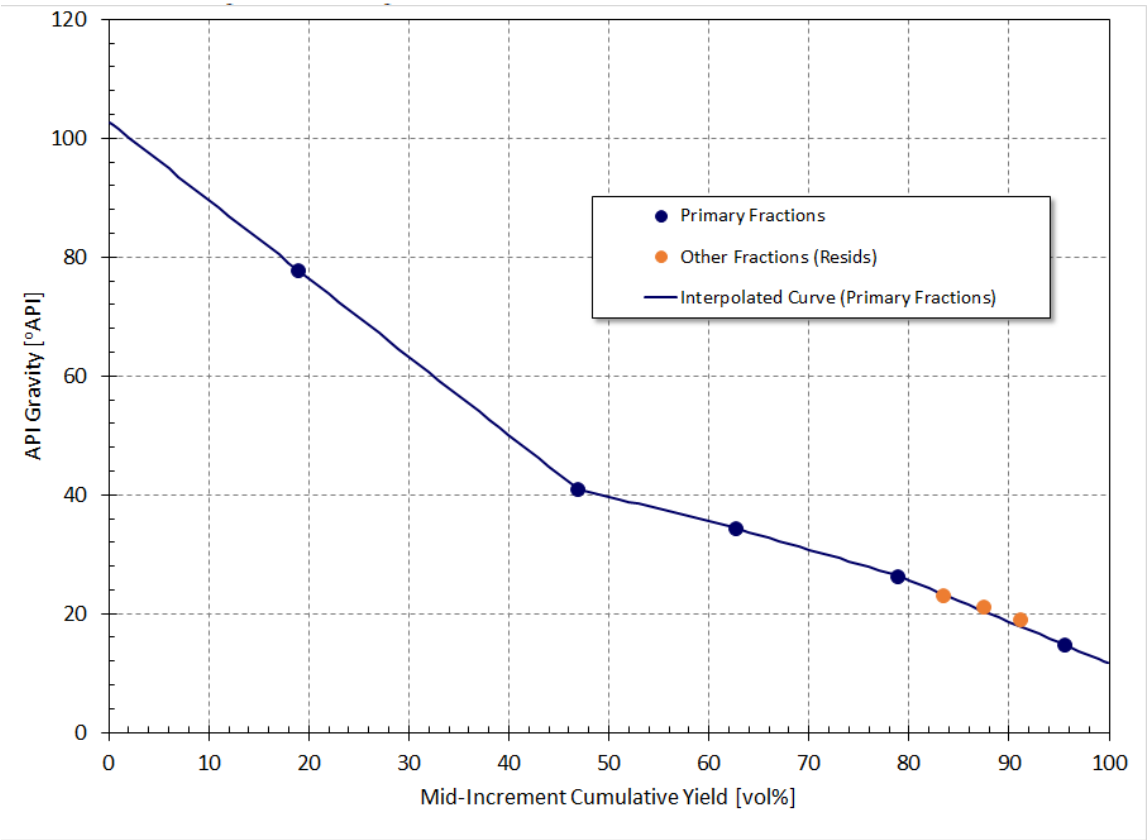
Crude Oil Assay – WTI (from OGJ article)

Fraction	IBP °F	EP °F	Cumulative vol%	Yields Increment vol%	Yields Increment wt%	Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
Whole Crude	IBP	FBP		100	100		0.8212	40.8	0.34
Primary Fractions									
Gas + LPG	IBP	68		2.71	4.35				
Naphtha	68	347	2.71	32.39	26.66	18.905	0.6758	77.9	0.0314
Kerosene	347	563	35.10	23.50	23.47	46.850	0.8201	41.0	0.110
AGO	563	650	58.60	8.10	8.41	62.650	0.8529	34.4	0.289
VGO	650	1049	66.70	24.30	26.51	78.850	0.8960	26.4	0.445
Vac Resid	1049	FBP	91.00	9.00	10.60	95.500	0.9672	14.8	
				100.00	100.00				0.176
			66.70	33.3	37.12	83.350	0.9153	23.1	0.720
			74.70	25.3	28.55	87.350	0.9268	21.2	
			82.05	17.95	20.55	91.025	0.9403	19.0	
Naphtha									
Kerosene									
AGO									
LVGO									
MVGO									
HVGO									
Vac Resid									
Total				0.00	0.00				

Back-calculate the Naphtha specific gravity from the Increment Yield values (vol% & wt%).

Crude Oil Assay – WTI (from OGJ article)

Fraction	IBP °F	EP °F	Cumulative vol%	Yields Increment vol%	Yields Increment wt%	Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
Whole Crude	IBP	FBP		100	100		0.8212	40.8	0.34
						18.905	0.6758	77.9	0.0314
						46.850	0.8201	41.0	0.110
						62.650	0.8529	34.4	0.289
						78.850	0.8960	26.4	0.445
						95.500	0.9672	14.8	
									0.176
						83.350	0.9153	23.1	0.720
						87.350	0.9268	21.2	
						91.025	0.9403	19.0	
Vac Resid									
Total				0.00	0.00				



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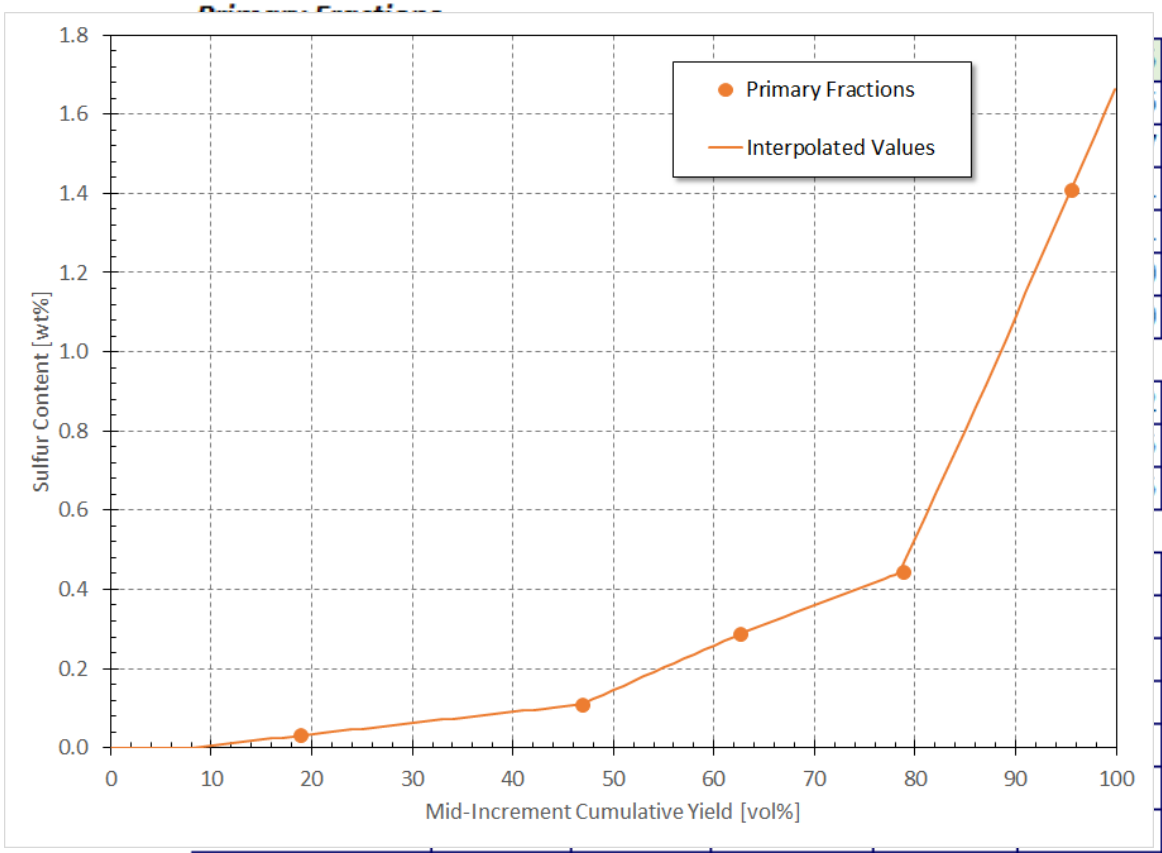
Crude Oil Assay – WTI (from OGJ article)

Fraction	IBP °F	EP °F	Cumulative vol%	Yields Increment vol%	Yields Increment wt%	Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
Whole Crude	IBP	FBP		100	100		0.8212	40.8	0.34
Primary Fractions									
Gas + LPG	IBP	68		2.71	4.35				
Naphtha	68	347	2.71	32.39	26.66	18.905	0.6758	77.9	0.0314
Kerosene	347	563	35.10	23.50	23.47	46.850	0.8201	41.0	0.110
AGO	563	650	58.60	8.10	8.41	62.650	0.8529	34.4	0.289
VGO	650	1049	66.70	24.30	26.51	78.850	0.8960	26.4	0.445
Vac Resid	1049	FBP	91.00	9.00	10.60	95.500	0.9672	14.8	1.408
Total				100.00	100.00				0.326
Other Fractions									
Atm Resid	650	FBP	66.70	33.3	37.12	83.350	0.9153	23.1	0.720
Vac Resid #2	761	FBP	74.70	25.3	28.55	87.350	0.9268	21.2	
Vac Resid #3	878	FBP	82.05	17.95	20.55	91.025	0.9403	19.0	
Expanded Assay									
Gas + LPG									
Vac Resid									
Total				0.00	0.00				

Back-calculate the Vac Resid sulfur value from the VGO & Atm Resid values (using wt% increment values).

Crude Oil Assay – WTI (from OGJ article)

Fraction	IBP °F	EP °F	Cumulative vol%	Yields Increment vol%	Yields Increment wt%	Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
Whole Crude	IBP	FBP		100	100		0.8212	40.8	0.34
						18.905	0.6758	77.9	0.0314
						46.850	0.8201	41.0	0.110
						62.650	0.8529	34.4	0.289
						78.850	0.8960	26.4	0.445
						95.500	0.9672	14.8	1.408
									0.326
						83.350	0.9153	23.1	0.720
						87.350	0.9268	21.2	
						91.025	0.9403	19.0	
Vac Resid									
Total				0.00	0.00				



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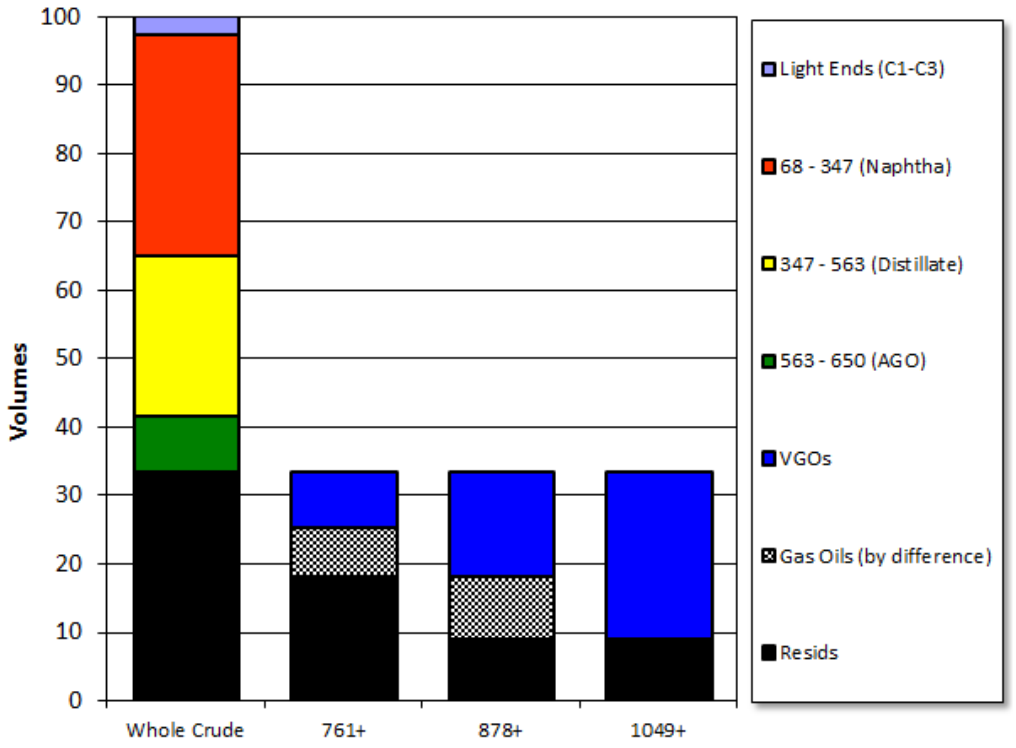
Crude Oil Assay – WTI (from OGJ article)

Fraction	IBP °F	EP °F	Yields Cumulative vol%	Yields Increment vol%	Yields wt%	Specific	API
Whole Crude	IBP	FBP		100	100		
Primary Fractions							
Gas + LPG	IBP	68		2.71	4.35		
Naphtha	68	347	2.71	32.39	26.66		
Kerosene	347	563	35.10	23.50	23.47		
AGO	563	650	58.				
VGO	650	1049	66.				
Vac Resid	1049	FBP	91.				
Total							
Other Fractions							
Atm Resid	650	FBP	66.				
Vac Resid #2	761	FBP	74.				
Vac Resid #3	878	FBP	82.				
Expanded Assay							
Gas + LPG	IBP	68					
Naphtha	68	347					
Kerosene	347	563					
AGO	563	650					
LVGO	650	761					
MVGO	761	878					
HVGO	878	1049					
Vac Resid	1049	FBP					
Total							

Define the IBP & EP values of the vacuum gas oils from the Other Fractions.



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Crude Oil Assay – WTI (from OGJ article)

Fraction	IBP °F	EP °F	Yields Cumulative vol%	Yields Increment vol%	Yields Increment wt%	Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
Whole Crude	IBP	FBP		100	100		0.8212	40.8	0.34
Primary Fractions									
Gas + LPG	IBP	68		2.71	4.35				
			2.71	32.39	26.66	18.905	0.6758	77.9	0.0314
			35.10	23.50	23.47	46.850	0.8201	41.0	0.110
			58.60	8.10	8.41	62.650	0.8529	34.4	0.289
			66.70	24.30	26.51	78.850	0.8960	26.4	0.445
			91.00	9.00	10.60	95.500	0.9672	14.8	1.408
				100.00	100.00				0.326
Atm Resid	650	FBP	66.70	33.3	37.12	83.350	0.9153	23.1	0.720
Vac Resid #2	761	FBP	74.70	25.3	28.55	87.350	0.9268	21.2	
Vac Resid #3	878	FBP	82.05	17.95	20.55	91.025	0.9403	19.0	
Expanded Assay									
Gas + LPG	IBP	68		2.71	4.35				
Naphtha	68	347	2.71	32.39	26.66	18.905	0.6758	77.9	0.0314
Kerosene	347	563	35.10	23.50	23.47	46.850	0.8201	41.0	0.11
AGO	563	650	58.60	8.10	8.41	62.650	0.8529	34.4	0.289
LVGO	650	761							
MVGO	761	878							
HVGO	878	1049							
Vac Resid	1049	FBP	91.00	9.00	10.60	95.500	0.9672	14.8	1.408
Total				75.70	73.49				

Copy all appropriate values from the Primary Fractions.

Updated: July 5, 2017

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Crude Oil Assay – WTI (from OGJ article)

Fraction	IBP °F	EP °F	Yields Cumulative vol%	Yields Increment vol%	Yields Increment wt%	Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
Whole Crude	IBP	FBP		100	100		0.8212	40.8	0.34
Primary Fractions									
Gas + LPG	IBP	68		2.71	4.35				
Naphtha	68	347	2.71	32.39	26.66	18.905	0.6758	77.9	0.0314
Kerosene	347	563	35.10	23.50	23.47	46.850	0.8201	41.0	0.110
AGO	563	650	58.60	8.10	8.41	62.650	0.8529	34.4	0.289
VGO	650	1049	66.70	24.30	26.51	78.850	0.8960	26.4	0.445
Vac Resid	1049	FBP	91.00	9.00	10.60	95.500	0.9672	14.8	1.408
Total				100.00	100.00				0.326
Other Fractions									
Atm Resid	650	FBP	66.70	33.3	37.12	8			
Vac Resid #2	761	FBP	74.70	25.3	28.55	8			
Vac Resid #3	878	FBP	82.05	17.95	20.55	9			
Expanded Assay									
Gas + LPG	IBP	68		2.71	4.35				
Naphtha	68	347	2.71	32.39	26.66	1			
Kerosene	347	563	35.10	23.50	23.47	46.850	0.8201	41.0	0.11
AGO	563	650	58.60	8.10	8.41	62.650	0.8529	34.4	0.289
LVGO	650	761	66.70	8.00					
MVGO	761	878	74.70	7.35					
HVGO	878	1049	82.05	8.95					
Vac Resid	1049	FBP	91.00	9.00	10.60	95.500	0.9672	14.8	1.408
Total				100.00	73.49				

Back-calculate gas oil vol% increments & determine associated cumulative yield values. Should match values in “Other Fractions”.

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Crude Oil Assay – WTI (from OGJ article)

Fraction	IBP °F	EP °F	Cumulative vol%	Yields Increment vol%	Yields Increment wt%	Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
Whole Crude	IBP	FBP		100	100		0.8212	40.8	0.34
Primary Fractions									
Gas + LPG	IBP	68		2.71	4.35				
Naphtha	68	347	2.71	32.39	26.66	18.905	0.6758	77.9	0.0314
Kerosene	347	563	35.10	23.50	23.47	46.850	0.8201	41.0	0.110
AGO	563	650	58.60	8.10	8.41	62.650	0.8529	34.4	0.289
			66.70	24.30	26.51	78.850	0.8960	26.4	0.445
			91.00	9.00	10.60	95.500	0.9672	14.8	1.408
				100.00	100.00				0.326
			66.70	33.3	37.12	83.350	0.9153	23.1	0.720
			74.70	25.3	28.55	87.350	0.9268	21.2	
			82.05	17.95	20.55	91.025	0.9403	19.0	
Expanded Assay									
Gas + LPG	IBP	68		2.71	4.35				
Naphtha	68	347	2.71	32.39	26.66	18.905	0.6758	77.9	0.0314
Kerosene	347	563	35.10	23.50	23.47	46.850	0.8201	41.0	0.11
AGO	563	650	58.60	8.10	8.41	62.650	0.8529	34.4	0.289
LVGO	650	761	66.70	8.00		70.700			
MVGO	761	878	74.70	7.35		78.375			
HVGO	878	1049	82.05	8.95		86.525			
Vac Resid	1049	FBP	91.00	9.00	10.60	95.500	0.9672	14.8	1.408
Total				100.00	73.49				

Calculate mid-increment values for the gas oils from the cumulative yield values.

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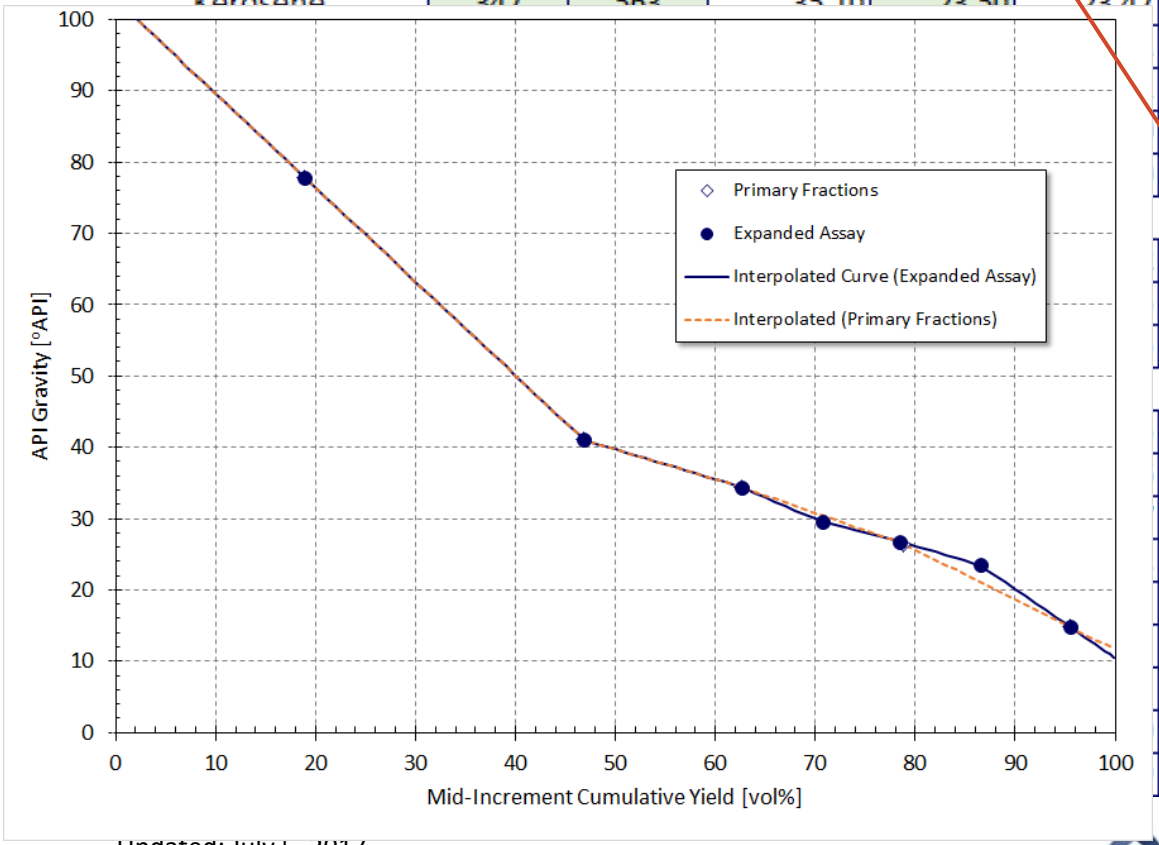
Crude Oil Assay – WTI (from OGJ article)

Back-calculate gravity values for new Vacuum Gas Oils.

	Cumulative vol%	Yields Increment vol%	Yields Increment wt%	Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
		100	100		0.8212	40.8	0.34
		2.71	4.35				
	2.71	32.39	26.66	18.905	0.6758	77.9	0.0314
Kerosene	347	563	35.10	46.850	0.8201	41.0	0.110
			23.47	62.650	0.8529	34.4	0.289
				78.850	0.8960	26.4	0.445
				95.500	0.9672	14.8	1.408
							0.326
				83.350	0.9153	23.1	0.720
				87.350	0.9268	21.2	
				91.025	0.9403	19.0	
				18.905	0.6758	77.9	0.0314
				46.850	0.8201	41.0	0.11
				62.650	0.8529	34.4	0.289
				70.700	0.8789	29.5	
				78.375	0.8938	26.8	
				86.525	0.9132	23.4	
				95.500	0.9672	14.8	1.408



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Crude Oil Assay – WTI (from OGJ article)

Fraction	IBP °F	EP °F	Cumulative vol%	Yields Increment vol%	Yields Increment wt%	Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
Whole Crude	IBP	FBP		100	100		0.8212	40.8	0.34
Primary Fractions									
Gas + LPG	IBP	68		2.71	4.35				
Naphtha	68	347	2.71	32.39	26.66	18.905	0.6758	77.9	0.0314
Kerosene	347	563	35.10	23.50	23.47	46.850	0.8201	41.0	0.110
AGO	563	650	58.60	8.10	8.41	62.650	0.8529	34.4	0.289
VGO	650	1049	66.70	24.30	26.51	78.850	0.8960	26.4	0.445
Vac Resid	1049	FBP	91.00	9.00	10.60	95.500	0.9672	14.8	1.408
Total				100.00	100.00				0.326
Other Fractions									
			66.70	33.3	37.12	83.350	0.9153	23.1	0.720
			74.70	25.3	28.55	87.350	0.9268	21.2	
			82.05	17.95	20.55	91.025	0.9403	19.0	
				2.71	4.35				
			2.71	32.39	26.66	18.905	0.6758	77.9	0.0314
			35.10	23.50	23.47	46.850	0.8201	41.0	0.11
AGO	563	650	58.60	8.10	8.41	62.650	0.8529	34.4	0.289
LVGO	650	761	66.70	8.00	8.56	70.700	0.8789	29.5	
MVGO	761	878	74.70	7.35	8.00	78.375	0.8938	26.8	
HVGO	878	1049	82.05	8.95	9.95	86.525	0.9132	23.4	
Vac Resid	1049	FBP	91.00	9.00	10.60	95.500	0.9672	14.8	1.408
Total				100.00	100.00				

Determine the gas oil wt% increments based on the specific gravity values.

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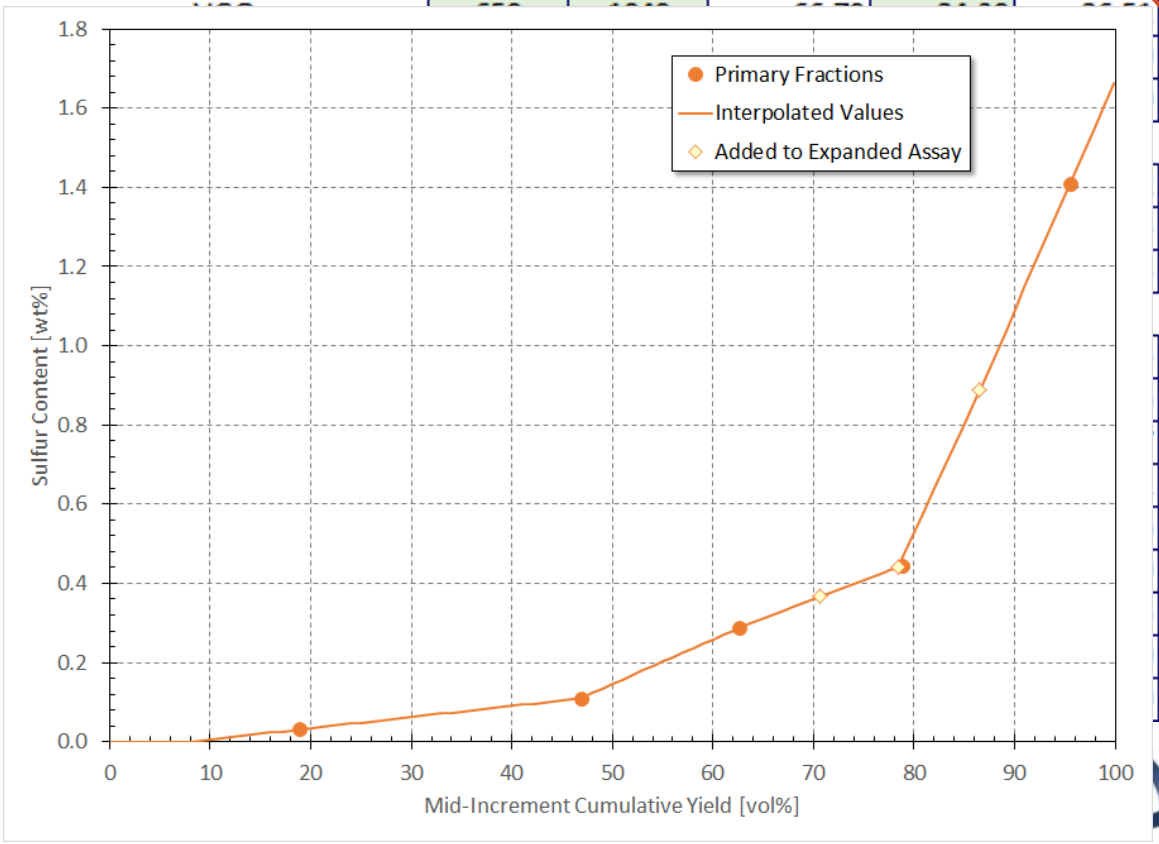
Crude Oil Assay – WTI (from OGJ article)

Determine sulfur values from the values established by the Primary Fractions

	IBP	EP	Cumulative	Yields Increment		Mid-Inc	Specific Gravity	API Gravity	Sulfur
			vol%	vol%	wt%	vol%		°API	wt%
				100	100		0.8212	40.8	0.34
				2.71	4.35				
			2.71	32.39	26.66	18.905	0.6758	77.9	0.0314
			35.10	23.50	23.47	46.850	0.8201	41.0	0.110
			58.60	8.10	8.41	62.650	0.8529	34.4	0.289
						78.850	0.8960	26.4	0.445
						95.500	0.9672	14.8	1.408
									0.326
						83.350	0.9153	23.1	0.720
						87.350	0.9268	21.2	
						91.025	0.9403	19.0	
						18.905	0.6758	77.9	0.0314
						46.850	0.8201	41.0	0.11
						62.650	0.8529	34.4	0.289
						70.700	0.8789	29.5	0.367
						78.375	0.8938	26.8	0.440
						86.525	0.9132	23.4	0.889
						95.500	0.9672	14.8	1.408



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Crude Oil Assay – WTI (from OGJ article)

Fraction	IBP °F	EP °F	Cumulative vol%	Yields Increment vol%	Yields Increment wt%	Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
Whole Crude	IBP	FBP		100	100		0.8212	40.8	0.34
Primary Fractions									
Gas + LPG	IBP	68		2.71	4.35				
Naphtha	68	347	2.71	32.39	26.66	18.905	0.6758	77.9	0.0314
Kerosene	347	563	35.10	23.50	23.47	46.850	0.8201	41.0	0.110
AGO	563	650	58.60	8.10	8.41	62.650	0.8529	34.4	0.289
VGO	650	1049	66.70	24.30	26.51	78.850	0.8960	26.4	0.445
Vac Resid	1049	FBP	91.00	9.00	10.60	95.500	0.9672	14.8	1.408
Total				100.00	100.00				0.326
Other Fractions									
Atm Resid	650	FBP	66.70	33.3	37.12	83.350	0.9153	23.1	0.720
Vac Resid #2	761	FBP	74.70	25.3	28.55	87.350	0.9268	21.2	
Vac Resid #3	878	FBP	82.05	17.95	20.55	91.025	0.9403	19.0	
Expanded Assay									
Gas + LPG	IBP	68		2.71	4.35				
Naphtha	68	347	2.71	32.39	26.66	18.905	0.6758	77.9	0.0314
Kerosene	347	563	35.10	23.50	23.47	46.850	0.8201	41.0	0.11
AGO	563	650	58.60	8.10	8.41	62.650	0.8529	34.4	0.289
LVGO	650	761	66.70	8.00	8.56	70.700	0.8789	29.5	0.367
MVGO	761	878	74.70	7.35	8.00	78.375	0.8938	26.8	0.440
HVGO	878	1049	82.05	8.95	9.95	86.525	0.9132	23.4	0.889
Vac Resid	1049	FBP	91.00	9.00	10.60	95.500	0.9672	14.8	1.408
Total				100.00	100.00				

Updated: July 5, 2017

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