

Crude Oil Assay – WTI (from OGI 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

C₁-C₂, 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

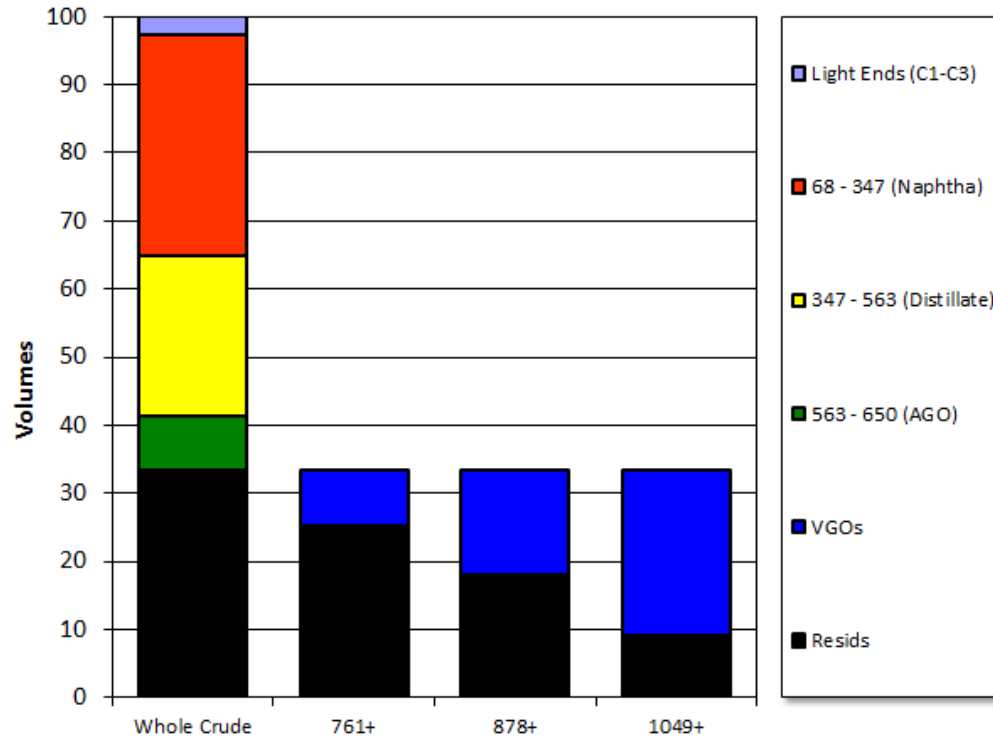
Property	Whole Crude	Light Ends, C1-C3	68 - 347	347 - 563	563 - 650	650 - 1049	650 - 1500	761 - 1500	878 - 1500	1049 - 1500
Initial Boiling Point, °F			68	347	563	650	650	761	878	1049
End Boiling Point, °F			347	563	650	1049	1500	1500	1500	1500
Incremental Amount, vol%			32.39	23.5	8.1	24.3	33.3	25.3	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)

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		0.0214	0.110	0.288	0.445	0.72			
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+)



Crude Oil Assay – WTI (from OGI article)

Fraction	IBP °F	EP °F	Cumulative vol%	Yields		Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
				Increment vol%	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.

Crude Oil Assay – WTI (from OGI article)

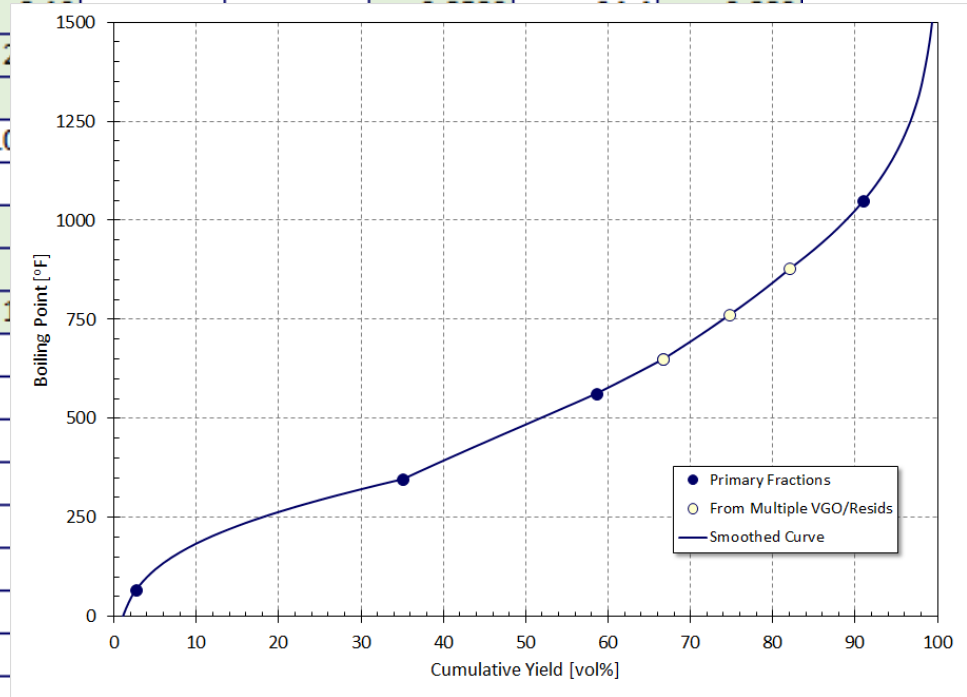
Fraction	IBP °F	EP °F	Cumulative vol%	Yields		Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
				Increment vol%	wt%				
Whole Crude	IBP	FBP		100	100		0.8212	40.8	0.34
Primary Fractions									
Gas + LPG	IBP	68		2.71	4.35				
Naphtha	68	347		22.39					0.0314
Kerosene	347	563		23.50			0.8201	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.

Crude Oil Assay – WTI (from OGI article)

Fraction	IBP °F	EP °F	Cumulative vol%	Yields		Mid vol%	Specific Gravity	API
				Increment vol%	wt%			
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
AGO	563	650	58.60					0.110
VGO	650	1049	66.70					
Vac Resid	1049	FBP	91.00					
Total				100				
Other Fractions								
Atm Resid	650	FBP	66.70					
Vac Resid #2	761	FBP	74.70					
Vac Resid #3	878	FBP	82.05					
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.



Crude Oil Assay – WTI (from OGI article)

Fraction	IBP °F	EP °F	Yields			Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
			Cumulative vol%	Increment vol%	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.

Crude Oil Assay – WTI (from OGI article)

Fraction	IBP °F	EP °F	Cumulative vol%	Yields		Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
				Increment vol%	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	23.47	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.

Crude Oil Assay – WTI (from OGI article)

Fraction	IBP °F	EP °F	Cumulative vol%	Yields		Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
				Increment vol%	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	29.47	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.

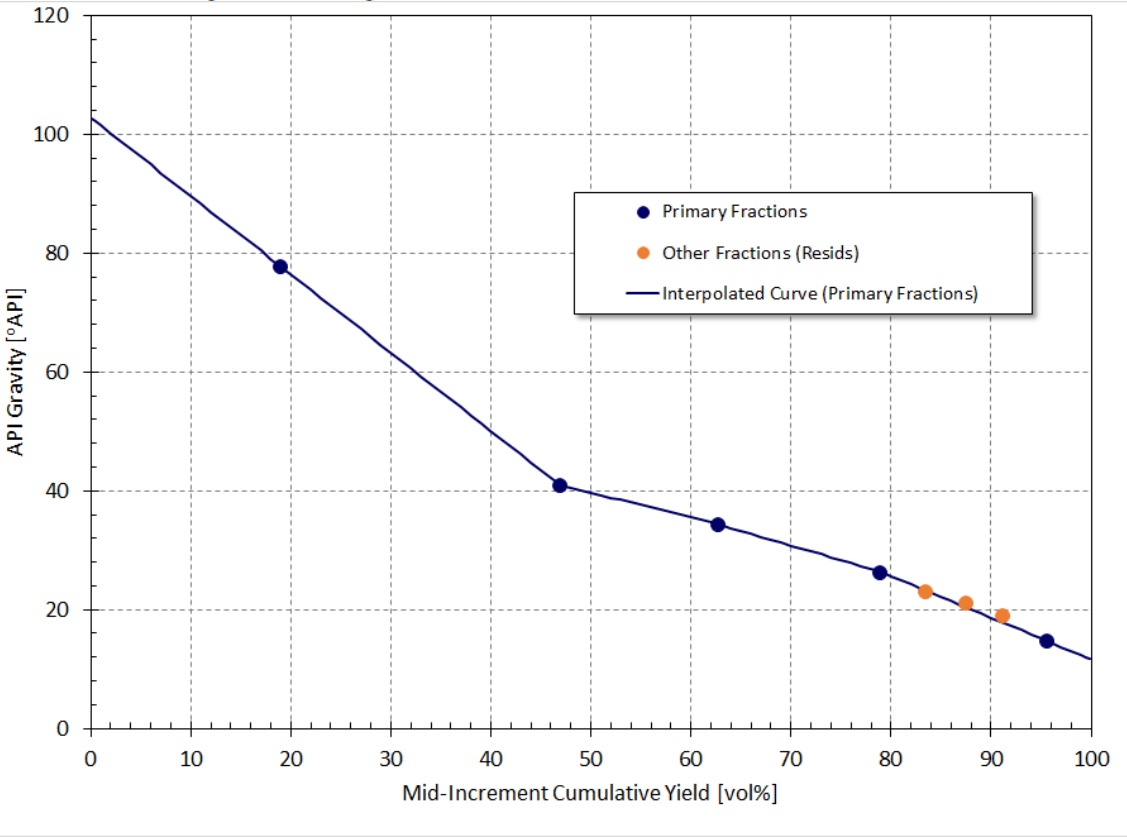
Crude Oil Assay – WTI (from OGI article)

Fraction	IBP °F	EP °F	Cumulative vol%	Yields		Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
				Increment vol%	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 OGIJ article)

Fraction	IBP °F	EP °F	Cumulative vol%	Yields Increment vol%	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 OGI article)

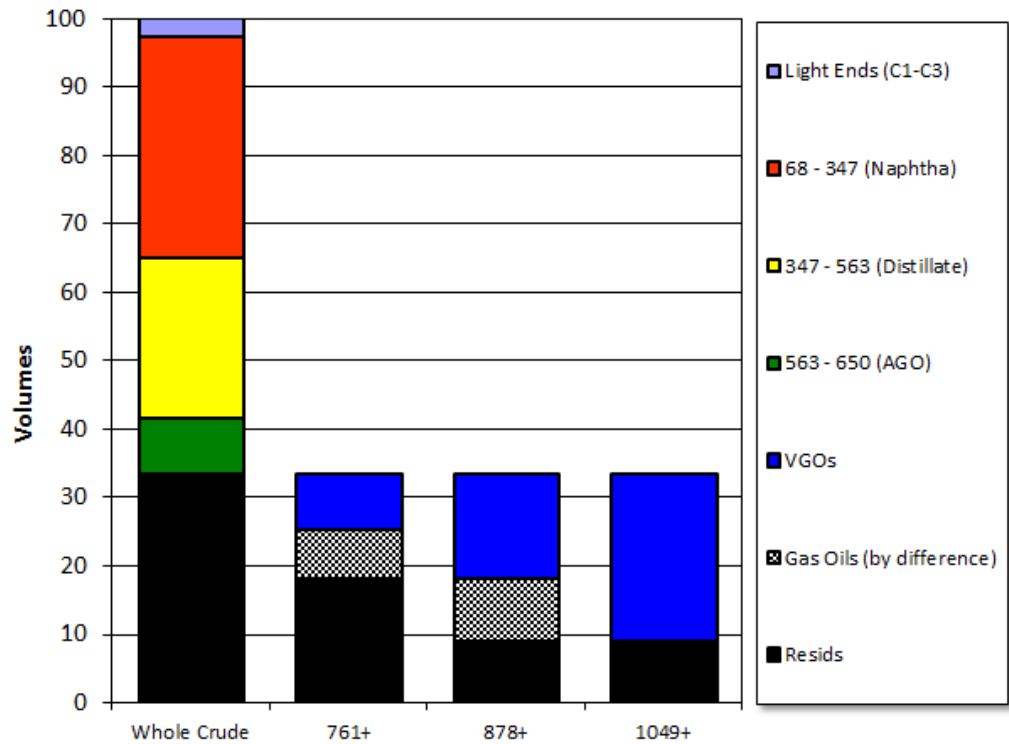
Fraction	IBP °F	EP °F	Cumulative vol%	Yields		Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
				Increment vol%	wt%				
Whole Crude	IBP	FBP		100	100		0.8212	40.8	0.34
Primary Fractions									
Gas + LPG	IBP	68		2.71	4.35				
Naphtha	68	347	2.71	32.39	26.66	18.905	0.6758	77.9	0.0314
Kerosene	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 OGI article)

Fraction	IBP °F	EP °F	Cumulative vol%	Yields		Micro vol%	Specific Gravity	API
				Increment vol%	wt%			
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	1		
Kerosene	347	563	35.10	23.50	23.47	4		
AGO	563	650	58.1					
VGO	650	1049	66.1					
Vac Resid	1049	FBP	91.1					
Total								
Other Fractions								
Atm Resid	650	FBP	66.1					
Vac Resid #2	761	FBP	74.1					
Vac Resid #3	878	FBP	82.1					
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.



Crude Oil Assay – WTI (from OGI article)

Fraction	IBP °F	EP °F	Yields			Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
			Cumulative vol%	Increment vol%	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.

Crude Oil Assay – WTI (from OGI article)

Fraction	IBP °F	EP °F	Cumulative vol%	Yields		Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
				Increment vol%	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".

Crude Oil Assay – WTI (from OGI article)

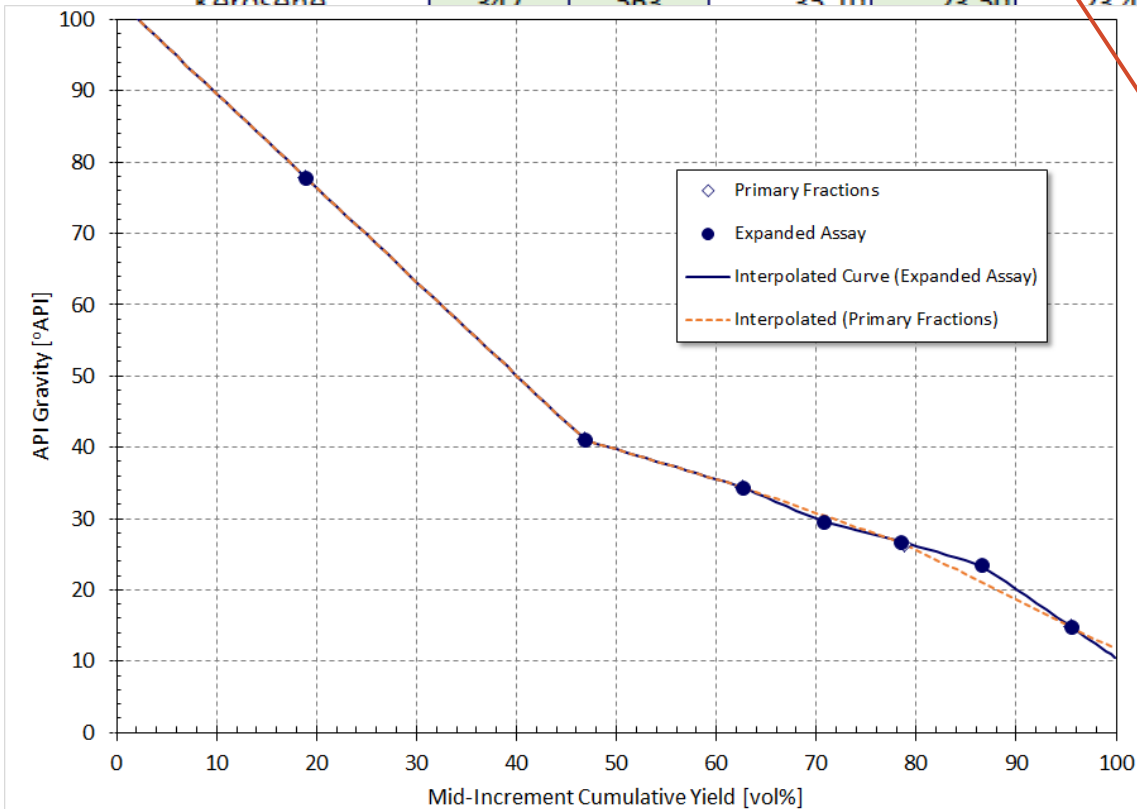
Fraction	IBP °F	EP °F	Yields			Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
			Cumulative vol%	Increment vol%	wt%				
Whole Crude	IBP	FBP		100	100		0.8212	40.8	0.34
Primary Fractions									
Gas + LPG	IBP	68		2.71	4.35				
Naphtha	68	347	2.71	32.39	26.66	18.905	0.6758	77.9	0.0314
Kerosene	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
LVGO	650	761	66.70	24.30	26.51	78.850	0.8960	26.4	0.445
MVGO	761	878	91.00	9.00	10.60	95.500	0.9672	14.8	1.408
HVGO	878	1049		100.00	100.00				0.326
Vac Resid	1049	FBP							
			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.

Crude Oil Assay – WTI (from OGI article)

Back-calculate gravity values for new Vacuum Gas Oils.

Cumulative vol%	Yields		Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
	Increment vol%	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 2.17	56.2	22.17	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	
			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 OGI article)

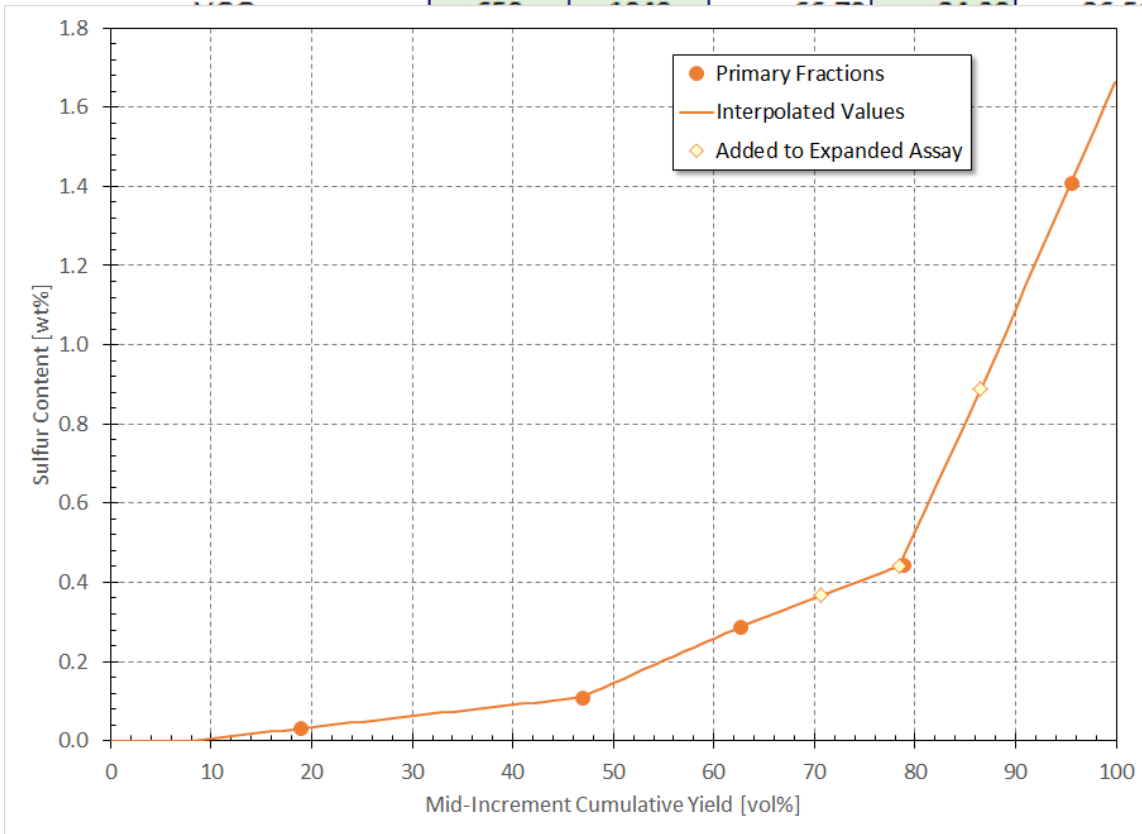
Fraction	IBP °F	EP °F	Cumulative vol%	Yields		Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
				Increment vol%	wt%				
Whole Crude	IBP	FBP		100	100		0.8212	40.8	0.34
Primary Fractions									
Gas + LPG	IBP	68		2.71	4.35				
Naphtha	68	347	2.71	32.39	26.66	18.905	0.6758	77.9	0.0314
Kerosene	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.

Crude Oil Assay – WTI (from OGI article)

Determine sulfur values from the values established by the Primary Fractions

IBP	EP	Yields			Mid-Inc	Specific Gravity	API Gravity	Sulfur
		Cumulative vol%	Increment vol%	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	25.8	0.440
					86.525	0.9132	23.4	0.889
					95.500	0.9672	14.8	1.408



Crude Oil Assay – WTI (from OGI article)

Fraction	IBP °F	EP °F	Cumulative vol%	Yields		Mid-Inc vol%	Specific Gravity	API Gravity °API	Sulfur wt%
				Increment vol%	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				