

## Pennington Crude Oil Assay

WHOLE CRUDE	
Gravity, °API	33.7
Specific Gravity	0.86
Sulfur, wt %	0.11
Nitrogen, ppm	598
Pour Point °F	35
Pour Point °C	1.7
Acid Number, mg KOH/g	0.22
Back-Blended Acid, mg KOH/g	0.23
Viscosity @ 40 °C (104 °F), cSt	3.12
Viscosity @ 50 °C (122 °F), cSt	2.64
Asphaltenes, C7, %	0.00
Nickel, ppm	1.96
Vanadium, ppm	0.69
Characterization Factor, K	11.6

TBP YIELDS, VOL %	
Butanes and Lighter	0.71
Light Gasoline (55-175 °F)	3.66
Light Naphtha (175-300 °F)	15.35
Heavy Naphtha (300-400 °F)	12.31
Kerosene (400-500 °F)	15.86
Atm. Gas Oil (500-650 °F)	24.14
Lt Vacuum Gas Oil (650-800 °F)	15.11
Hvy Vacuum Gas Oil (800-1050 °F)	10.41
Vacuum Residuum (1050 °F+)	2.46

LIGHT GASOLINE (55-175 °F)	
Gravity, °API	79.6
Specific Gravity	0.67
Mercaptan Sulfur, ppm	0.06
Octane Number, Research, Clear	75.7

LIGHT NAPHTHA (175-300 °F)	
Gravity, °API	54.8
Specific Gravity	0.76
Mercaptan Sulfur, ppm	0.19
Naphthenes, vol %	47.61
Aromatics, vol %	16.86
Octane Number, Research, Clear	68.9

HEAVY NAPHTHA (300-400 °F)	
Gravity, °API	44.6
Specific Gravity	0.80
Sulfur, wt %	0.01
Mercaptan Sulfur, ppm	0.27
Naphthenes, vol %	59.45
Aromatics, vol %	18.24
Smoke Point, mm (ASTM)	22.4

KEROSENE (400-500 °F)	
Gravity, °API	33.4
Specific Gravity	0.86
Sulfur, wt %	0.04
Mercaptan Sulfur, ppm	0.39
Naphthenes, vol %	58.7
Aromatics, vol %	21.11
Freezing Point, °F	-62.3
Freezing Point, °C	-52.4
Smoke Point, mm (ASTM)	18
Acid Number, mg KOH/g	0.02
Viscosity @ 50 °C (122 °F), cSt	1.63

ATM. GAS OIL (500-650 °F)	
Gravity, °API	29.9
Specific Gravity	0.88
Sulfur, wt %	0.11
Nitrogen, ppm	85.2
Acid Number, mg KOH/g	0.101
Pour Point °F	8
Pour Point °C	-13.3
Viscosity @ 50 °C (122 °F), cSt	3.57
Cetane Index	46.1
Characterization Factor, K	11.53

## Pennington Crude Oil Assay

ATM. RESIDUUM (650 °F+)	
Yield, vol%	27.98
Gravity, °API	19.4
Specific Gravity	0.94
Sulfur, wt %	0.25
Nitrogen, ppm	1870
MCR, wt%	1.82
Asphaltenes, C7, %	0.01
Nickel, ppm	6.37
Vanadium, ppm	2.26
Pour Point °F	93.2
Pour Point °C	34
Viscosity @ 50 °C (122 °F), cSt	71.6
Viscosity @ 100 °C (212 °F), cSt	10.9
Characterization Factor, K	11.57

LT VAC. GAS OIL (650-800 °F)	
Gravity, °API	22.3
Specific Gravity	0.92
Sulfur, wt %	0.21
Nitrogen, ppm	535
Naphthenes, vol %	45.54
Paraffins, vol%	11.56
Pour Point °F	67.1
Pour Point °C	19.5
Acid Number, mg KOH/g	0.43
Aniline Point, °F	154.4
Aniline Point, °C	68
Hydrogen, wt%	12.42
Viscosity @ 50 °C (122 °F), cSt	18.4
Viscosity @ 100 °C (212 °F), cSt	4.49
Characterization Factor, K	11.49

HVY VAC. GAS OIL (800-1050 °F)	
Gravity, °API	18.1
Specific Gravity	0.95
Sulfur, wt %	0.26
Nitrogen, ppm	2450
Pour Point °F	108.4
Pour Point °C	42.4
Acid Number, mg KOH/g	0.97
Aniline Point, °F	175.5
Aniline Point, °C	79.7
Hydrogen, wt%	12.47
Viscosity @ 50 °C (122 °F), cSt	234
Viscosity @ 100 °C (212 °F), cSt	21.1
Characterization Factor, K	11.7

VACUUM RESIDUUM (1050 °F+)	
Yield, vol%	2.46
Gravity, °API	8.4
Specific Gravity	1.01
Sulfur, wt %	0.42
Nitrogen, ppm	7110
Hydrogen, wt%	11.99
MCR, wt%	16.3
Asphaltenes, C7, %	0.14
Nickel, ppm	64.7
Vanadium, ppm	23
Pour Point °F	120.5
Pour Point °C	49.1
Viscosity @ 50 °C (122 °F), cSt	560000
Viscosity @ 100 °C (212 °F), cSt	2200
Viscosity @ 135 °C (275 °F), cSt	241
Cutter, vol% in Fuel Oil	35.1
Fuel Oil Yield, vol%	3.78
Characterization Factor, K	11.8