| Mnmn | See Foot-notes | Crude Name | Product Code | Country | Assay Date | Density | RVP | Sulfur | a) Pour Point | Carbon Residue | Viscosity (SSU) | | | b) H2S | Metals (ppm) | | | | TAN E | SALT | Organic Chlorides (ppm) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | Vanadium | | Nickel | | | | | |
| | | | | | | (API@60) | (psia) | (%) | (degF) | (%) | @60 F | @80 F | @100 F | (ppm) | Whole | Pitch | Whole | Pitch | (mg KOH/g) | (lb/MB) | Whole | Naphtha |
| **Sweet - Low Metals Group** | | | | | | | | | | | | | | | | | | | | | | |
| ABO | | ABO | 82909 | Nigeria | 7/5/202005 | 39.5 | 6.2 | 0.136 | <-27.4 | 1.1 | 38.9 | 36.5 | 34.3 | <1 | 0.4 | 6.2 | 3.7 | 54 | 0.76 | 8 | <1 | 1.2 |
| ACS | | ALBA CONDENSATE AND SAHARAN BLEND (66/33) | 83020 | Equatorial Guinea | 9/1/2010 | 55.2 | 8.9 | 0.04 | -64 | ---- | 35 | 36 | 34.2 | --- | < 0.5 | ---- | < 0.5 | ---- | < 0.1 | --- | --- | --- |
| AKLL | | AKPO AND LLS BLEND | 50584 | USA | 9/15/2010 | 40.5 | 5.45 | 0.38 | -5 | 1.75 | 40 | 38 | 35 | < 1 | 2.35 | --- | 3.27 | --- | 0.45 | --- | --- | --- |
| AKPO | | AKPO BLEND | 83371 | Nigeria | 12/22/2008 | 46.2 | 6.67 | 0.06 | 3 | - | 47 | - | - | - | 1.6 | - | 0.1 | - | 0.05 | - | - | - |
| ALCO | | ALBA CONDENSATE | 82951 | Equatorial Guinea | 5/5/2010 | 51.7 | 8 | 0.02 | -60 | 0.02 | 30 | 29 | 28 | <1 | <0.1 | 0.2 | <0.1 | 2 | 0.07 | 1 | - | - |
| AME | ✓ | AMENAM BLEND | 82985 | Nigeria | 11/19/2008 | 40.2 | 5.64 | 0.102 | 53.6 | 0.79 | 75.5 | 35.9 | 33.9 | <1 | 1.3 | 22 | 2.7 | 43 | 0.28 | 5 | <1 | - |
| AQB | | ALBA CONDENSATE/ QUA IBO 50/50 BLEND. | 83014 | New Guinea Nigeria | 1/11/2006 | 42.5 | 6.2 | 0.07 | 0 | 0.56 | 36 | 34 | 32 | <1 | 0.2 | 41.8 | 2 | 6.3 | 0.2 | 3 | - | - |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASGD | | AASGARD | 82790 | Norway | 4/21/2010 | 47.6 | 9.3 | 0.172 | < -27.4 | 0.43 | 32.4 | < 32 | < 32 | <1 | 1.7 | 44 | 0.4 | 9.7 | <0.05 | 127 | < 1 | < 1 |
| ATB | | ALBA/TXC MIDDLE DISTILLATE (75/25) | 50582 | USA | 11/3/2003 | 47.96 | 8.09 | 0.22 | -43 | ---- | 31 | 30 | 30 | ---- | 0.04 | 8.62 | 0.06 | 13.1 | 0.08 | ---- | ---- | ---- |
| AZE | | AZERI LIGHT | 83015 | Azerbaijan | 4/1/2006 | 34.8 | 5.89 | 0.15 | -8 | 1.399 | 66 | 55 | 48 | <5 | 0.24 | 1.59 | 3.27 | 21.73 | 0.26 | 7 | - | - |
| BCSW | ✓ | BAYOU CHOCTAW - SWEET | 82268 | USA | 9/8/2005 | 36 | 4.26 | 0.398 | 32 | 1.1 | 54.7 | 45.49 | 41.2 | <1 | 5.49 | 31 | 3.8 | 21 | 0.16 | 25 | <1 | <1 |
| BONGA | | BONGA | 82396 | Nigeria | 8/1/2008 | 30.3 | 2.81 | 0.252 | <-27.4 | 0.94 | 64.4 | 50.7 | 44 | <1 | 0.3 | 3.2 | 3 | 25 | 0.4 | 5 | <1 | <1 |
| BRN | ✓ | BRENT | 82288 | U. K. | 5/8/2004 | 38.6 | 5.61 | 0.38 | 5 | 1.6 | 47.4 | 41.8 | 37.6 | <1 | 5.5 | 39 | 1.1 | 7.6 | <0.05 | 3 | <1 | 1.1 |
| BSR | | BRASS RIVER | 82325 | Nigeria | 11/1/2005 | 35.2 | 3.61 | 0.141 | -0.4 | 0.8 | 43.8 | 39.7 | 36.6 | <1 | 0.4 | 6.6 | 2.4 | 36 | 0.29 | 13 | <1 | <1 |
| CAB | ✓ | CABINDA | 82345 | Angola | 3/3/2003 | 32.4 | 2.66 | 0.132 | 59 | 3.5 | - | - | 73.5 | <1 | 1.7 | 6 | 17 | 63 | 0.17 | 3 | <1 | <1 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COS | | COSSACK | 50021 | Austrailia | 10/16/2006 | 47.3 | 6.4 | 0.03 | -18 | 0.4 | 65 | 54 | 47 | - | 0.02 | 3 | 0.13 | 27 | 0.04 | - | - | - |
| CUS | ✓ | CUSIANA | 82419 | Columbia | 5/23/2007 | 43.3 | 7.51 | 0.144 | 32 | 0.6 | 37.34 | 34.58 | 32.64 | <1 | 3.1 | 58 | 1.2 | 18 | <0.05 | 4 | <1 | 1.1 |
| DRAUG | | DRAUGEN | 82575 | Norway | 11/16/2005 | 37.6 | 6.24 | 0.191 | <-27.4 | 1.7 | 44 | 39.4 | 36.6 | <1 | 1.4 | 8.9 | 1.1 | 7.1 | 0.32 | 2 | <1 | 1.6 |
| EAN | ✓ | EA CRUDE | 82991 | Nigeria | 6/16/2004 | 35.1 | 3.92 | 0.084 | 26.6 | 0.03 | 43 | 39.5 | 36.6 | <1 | <0.1 | 0.5 | 0.9 | 22 | 0.14 | 1 | <1 | <1 |
| EF57 | ✓ | Eagle Ford API 57 | 82865 | USA | 2/28/2011 | 57.6 | 9.3 | 0.05 | 15 | 0.1 | 31 | 30 | 29 | < 1 | 0.03 | 0.56 | 0.21 | 3.02 | 0.03 | 0.9 | < 1 | < 1 |
| EFHI | ✓ | Eagle Ford Crude (RVP 8.6 psia or higher) | 998 | USA | 12/30/2011 | 58.8 | 9.7 | 0.041 | 15.2 | 0.07 | 32.4 | 31.1 | 30.2 | < 1 | < 0.5 | 0.5 | 0.2 | 4.1 | 0.02 | 0 | < 1 | < 1 |
| EFLO | | Eagle Ford Crude (RVP less than 8.6 psia) | 997 | USA | 12/30/2011 | 47.7 | 6.5 | 0.101 | 5.9 | 0.24 | 40.6 | 37.1 | 34.8 | < 1 | 0.1 | 0.6 | 0.1 | 2.2 | 0.03 | 1 | < 1 | < 1 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EKO | | EKOFISK | 82307 | Norway | 11/11/2005 | 37.5 | 4.23 | 0.223 | 26.6 | 2 | 52.95 | 49.89 | 44.3 | <1 | 1.7 | 9.2 | 2.3 | 13 | 0.1 | 11 | <1 | <1 |
| ERHA | | ERHA | 82390 | Nigeria | 5/13/2006 | 32.7 | 2.52 | 0.2 | 0 | 1.24 | 62.82 | 60.73 | 42.61 | <1 | 0.3 | 2.7 | 3.7 | 30 | 0.36 | 8 | <1 | <1 |
| ESC | ✓ | ESCRAVOS | 82338 | Nigeria | 1/21/2011 | 33.4 | 3.23 | 0.172 | 10.4 | 1.27 | 52.9 | 46.6 | 41.2 | < 1 | 0.6 | 6.6 | 4.7 | 51 | 0.6 | 13 | < 1 | < 1 |
| ESP | | ESPOIR | 82983 | Ivory Coast | 1/1/2002 | 33 | 6.3 | 0.3 | 33.3 | 1.45 | 66 | 54 | 47 | - | 1.1 | - | 4 | - | 0.17 | 24.7 | - | - |
| ESS | ✓ | ES SIDER | 82329 | Libya | 6/5/2006 | 36.5 | 5.4 | 0.402 | -5 | 2.98 | 70.56 | 51.81 | 45.53 | 25.6 | 1.6 | 8.6 | 5.5 | 30 | <0.05 | 13 | <1 | <1 |
| FOB | | FORCADOS/OSO COND BLEND | 83003 | Nigeria | 2/28/2005 | 39.31 | 10 | 0.1 | 18 | - | 38 | 36 | 34 | <1 | 0.33 | 6.92 | 2.01 | 42.71 | 0.2 | <1 | - | - |
| FON | ✓ | FOINAVEN | 82424 | U. K. | 6/12/2000 | 26.6 | 0.63 | 0.4 | 42.8 | 2 | 478.5 | 188.6 | 110.6 | <1 | 4.6 | 18.8 | 2.7 | 10.3 | 0.16 | 8 | <1 | 2 |
| FOR | ✓ | FORCADOS | 82331 | Nigeria | 6/16/2011 | 30.1 | 3.97 | 0.172 | <-27.4 | 0.88 | 63.9 | 51.6 | 45.9 | < 1 | 0.4 | 5 | 2.7 | 37 | 0.45 | 21 | < 1 | < 1 |
| GAL | ✓ | GALEOTA | 82314 | Trinidad | 4/5/2010 | 42.9 | 4.14 | 0.129 | <-27.4 | 0.12 | 32.9 | <32 | <32 | <1 | <0.1 | 3.9 | 0.1 | 4.1 | 0.25 | 3 | <1 | - |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| General Crude | | General Crude | GC | US | 7/25/2014 | 44.5 | 6.66 | 0.114 | < -27.4 | 0.46 | 38.3 | 35.4 | 33.7 | < 1 | 1.2 | 15 | 0.2 | 3.3 | < 0.1 | 14.8 | < 1 | - |
| GIR | | GIRASSOL | 82583 | Angola | 11/13/2008 | 29.8 | 2.12 | 0.331 | 10.4 | 2.82 | 134.7 | 91.9 | 66.5 | <1 | 3.7 | 22 | 8.5 | 51 | 0.37 | 24 | <1 | - |
| HBA | ✓ | HIBERNIA | 82139 | Canada | 8/16/2003 | 34.4 | 3.18 | 0.406 | 42.8 | 2.3 | - | 52.03 | 49.94 | <1 | 1 | 4.5 | 1 | 4.3 | <0.05 | 12 | <1 | <1 |
| HLS | | HEAVY LA SWEET | 82720 | USA | 2/22/2013 | 33.4 | 3.02 | 0.416 | < -27.4 | 2.86 | 68.97 | 80 | 48.2 | < 1 | 3.6 | 26 | 5.6 | 38 | 0.25 | 74.5 | < 1 | < 1 |
| HULL | | HUNGO/ LLS BLEND | 82967 | USA | 12/11/2004 | 33.4 | 3.21 | 0.462 | -16.6 | 2.7 | 65.46 | 52.92 | 46.1 | <1 | 6.4 | 34 | 7.7 | 44 | 0.54 | 70 | <1 | <1 |
| KIT | ✓ | KITINA | 82580 | Congo | 9/21/2002 | 36.4 | 4.2 | 0.11 | 59 | 2.3 | - | 56.8 | 48.5 | <1 | 1 | 4.7 | 9.1 | 38 | 0.1 | 4 | <1 | <1 |
| KWI | ✓ | QUA IBOE | 82339 | Nigeria | 10/25/2006 | 36.3 | 4.47 | 0.124 | 55 | 1.1 | 75.04 | 43.38 | 38.95 | <1 | 0.44 | 7.8 | 3.3 | 59 | 0.36 | 6 | <1 | <1 |
| LLS | | LIGHT LOUISIANA SWEET | 82722 | USA | 3/3/2014 | 38.7 | 5.88 | 0.388 | < -27.4 | 1.59 | 47.3 | 42.4 | 38.6 | <1 | 4.2 | 38 | 2.2 | 21 | 0.4 | 70 | < 1 | <1.1 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LLSA | | LLS/SA HARAN (30/70) | 83008 | USA | 8/23/2005 | 42.58 | 8.2 | 0.17 | -34 | 1.09 | 39 | 37 | 35 | <1 | 1.31 | 14.01 | 1.38 | 14.74 | 0.16 | - | - | - |
| LMS | | Light MISSISSIPPI SWEET | 82723 | USA | 11/1/2011 | 41.2 | 3.5 | 0.395 | < -27.4 | 1.33 | 45.8 | 40.3 | 37.4 | < 1 | 0.8 | 11 | 0.7 | 12 | 0.25 | 36 | < 1 | < 1 |
| LNAP | | LLS/NAPTHA BLEND (88/12) | 84001 | USA | 2/5/2009 | 41.2 | 5.85 | 0.3 | -27 | 1.7 | 40 | 38 | 35 | <1 | 2.2 | - | 2.5 | - | 0.38 | - | - | - |
| LSAH | | LLS/SA HARAN (50/50) | 83008 | USA | 9/7/2007 | 40.3 | 5.61 | 0.189 | <-27.4 | 1.23 | 43.35 | 39.72 | 36.85 | <1 | 1.6 | 13.1 | 1.3 | 11.4 | 0.28 | 12 | < 1 | < 1 |
| LVGO | | LLS/VGO (83/17) BLEND | 50457 | USA | 1/20/2012 | 38.2 | 4.03 | 0.159 | -11.2 | 0.98 | 56.2 | 44.3 | 39.8 | < 1 | 1.4 | 16.2 | 1.1 | 13.6 | 0.21 | 27 | < 1 | < 1 |
| MBS | | MIXED BLEND SWEET | 83994 | Canada | 6/10/2009 | 39.2 | 6.4 | 0.46 | -20 | 1.97 | 48 | 42 | 37 | - | 9.3 | 56.7 | 6.7 | 31 | - | 3.3 | - | - |
| MLS | | Memphis Light Sweet | 82726 | USA | 1/24/2014 | 43.7 | 3.9 | 0.244 | < -27.4 | 0.5 | 42.4 | 37.9 | 34.9 | < 1 | 4.6 | 50 | 1 | 12 | 0.1 | 37.4 | < 1 | < 1 |
| NDS | | North Dakota Sweet | 82545 | USA | 1/14/2014 | 42.1 | 5.94 | 0.0955 | < -27.4 | 0.54 | 37.7 | 35.3 | 33.7 | < 1 | 0.4 | 6.6 | 0.6 | 7.8 | < 0.1 | 63.4 | < 1 | < 1 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NKS | ✓ | N"KOSSA | 82135 | Congo | 9/22/2005 | 42 | 5.53 | 0.0549 | 53.6 | 2.2 | 48.6 | 40.3 | 37.1 | <1 | 0.2 | 1.1 | 1.7 | 14 | 0.04 | 2 | <1 | <1 |
| OKON | ✓ | OKONO | 82584 | Nigeria | 2/9/2002 | 41.9 | 7.7 | 0.06 | 64.4 | 0.4 | 39 | 35 | 33 | - | <2 | 4 | 2 | 57 | 0.34 | 13 | - | - |
| OSB | | OSEBERG | 82271 | Norway | 4/26/2003 | 38.7 | 5.19 | 0.22 | 15.8 | 1.8 | 45.1 | 39.4 | 38.5 | <1 | 1.1 | 8.6 | 1.1 | 8.9 | 0.11 | 7 | <1 | <1 |
| OSO | ✓ | OSO CONDENSATE | 82403 | Nigeria | 09/26/2008 | 45.8 | 8.85 | 0.0496 | 26.6 | 0.3 | - | 32.6 | 31.6 | <1 | 0.4 | 17 | 0.6 | 11 | 0.1 | 6 | <1 | <1 |
| PAL | | PALANCA | 82266 | Angola | 2/19/2005 | 36.8 | 4.54 | 0.183 | 37.4 | 1.6 | 57.4 | 48 | 42.3 | <1 | 1.4 | 7.8 | 1.2 | 9.5 | <0.05 | 4 | <1 | <1 |
| PHD | | PORT HUDSON | 82864 | USA | 3/3/2005 | 41.6 | 3.05 | 0.15 | -11.2 | 0.75 | 38.8 | 36.3 | 34.3 | <1 | 1.3 | 21 | 1.6 | 26 | 0.22 | 31 | <1 | <1 |
| PURC | ✓ | PUROVSKIY | 83782 | Russia | 8/19/2010 | 61.1 | 7.74 | 0.0137 | <-27.4 | < 0.1 | 28.3 | 28.1 | 27.8 | < 1 | < 0.1 | - | < 0.1 | - | <0.05 | <1 | < 1 | < 1 |
| RABL | ✓ | RABI LIGHT | 82999 | Gabon | 7/15/2004 | 37.67 | 3.8 | 0.15 | 71.6 | - | 88 | 65 | 54 | < 1 | 1.2 | 3 | 10 | 69 | 0.08 | - | - | - |
| SAH | ✓ | SAHARAN BLEND | 82298 | Middle East | 9/12/2009 | 43.6 | 6.82 | 0.0725 | <-27.4 | 1.15 | 40.1 | 38 | 35.4 | < 1 | 0.5 | 4.3 | 0.4 | 3.7 | 0.13 | 123 | < 1 | - |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SCH | ✓ | SCHIEHALLION | 82441 | Scotland | 4/23/2005 | 25.6 | 1.1 | 0.456 | 37.4 | 3 | 372.2 | 186.6 | 110.9 | 2 | 7.2 | 30.2 | 4.4 | 18.2 | 0.31 | 22 | <1 | <1 |
| SLS | | SOUTH LOUISIANA SWEET | 82586 | USA | 02/19/2013 | 36.6 | 3 | 0.206 | 10.4 | 1.23 | 52.1 | 45.5 | - | < 1 | 1.3 | 14 | 2 | 26 | 0.35 | 93.6 | < 1 | - |
| TROL | ✓ | TROLL EXPORT | 82421 | Norway | 7/20/2004 | 28.4 | 1.86 | 0.24 | 10.4 | 1.59 | 121.6 | 75.2 | 62.2 | <1 | 0.8 | 3.9 | 0.8 | 3.5 | 1 | <1 | <1 | <1 |
| WHSW | | WEST HACKBERRY SWEET | 82267 | USA | 7/26/2011 | 39.9 | 5.83 | 0.293 | <-27.4 | 1.76 | 43.6 | 40.1 | 36.8 | <1 | 5.6 | 41 | 4.5 | 34 | 0.15 | 9 | <1 | 1.5 |
| XIK | ✓ | XIKOMBA | 82982 | Angola | 9/27/2004 | 34.6 | 5.02 | 0.406 | 32 | 3.6 | 84.9 | 51.4 | 42.1 | <1 | 5.3 | 13 | 28 | 65 | 0.15 | 18 | <1 | <1 |
| YOHO | ✓ | YOHO CRUDE | 82810 | Nigeria | 1/4/2007 | 39.6 | 4.96 | 0.0743 | 55 | 0.551 | 71.01 | 35.25 | 33.34 | <1 | 0.36 | 13 | 0.72 | 18.1 | 0.27 | 9 | <1 | <1 |
| ZFR | | ZAFIRO | 82252 | Equatorial Guinea | 12/23/2004 | 30.7 | 2.33 | 0.272 | 10.4 | 2.8 | 73.6 | 57.7 | 48.4 | <1 | 2.5 | 16 | 13 | 82 | 0.73 | 6 | <1 | <1 |
| ZUASW | | ZUATA SWEET | 82576 | Angola | 8/18/2005 | 30.8 | 2.31 | 0.135 | <-27.4 | <0.1 | 63.11 | 50.2 | 44.31 | <1 | 0.8 | - | 0.2 | - | <0.05 | 2 | <1 | 3.4 |
| ZUE | | ZUEITINA | 83016 | Libya | 3/16/2006 | 37.89 | 4.41 | 0.47 | 32 | 2.4 | 60 | 49 | 43 | - | 1.57 | 9.88 | 7.28 | 45.79 | 0.379 | 5 | - | - |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sweet - High Metals Group** | | | | | | | | | | | | | | | | | | | | |
| MONDO | | MONDO | 83990 | Angola | 7/23/2009 | 30 | 4.4 | 0.498 | -11.2 | 5.56 | 130.4 | 113.4 | 67.3 | < 1 | 7.3 | 33 | 21 | 92 | 0.69 | 52 | < 1 | - |
| NBA | ✓ | NEMBA | 82255 | Angola | 9/20/2008 | 39.4 | 5.51 | 0.219 | T | 2.4 | 45.6 | 40.9 | 38.1 | <1 | 4.7 | 43 | 11 | 95 | 0.11 | 9 | <1 | <1 |
| PLU | ✓ | PLUTONIO | 83785 | Angola | 7/1/2008 | 33.3 | 3.16 | 0.371 | 48.2 | 3.4 | 117.8 | 64.7 | 52.7 | <1 | 5.6 | 29 | 19 | 99 | 0.27 | 56 | <1 | <1 |
| STB | | SANTA BARBARA | 82251 | USA | 8/8/2011 | 40.4 | 5.67 | 0.452 | < -27.4 | 0.93 | 37 | 35.2 | 33.3 | < 1 | 5.6 | 99 | 1.3 | 22 | <0.05 | 9.2 | <1 | <1 |
| **Intermediate Group** | | | | | | | | | | | | | | | | | | | | |
| BNL | ✓ | BONNY LIGHT | 82337 | Nigeria | 6/22/2011 | 33.9 | 4 | 0.529 | -11.2 | 1.39 | 49 | 43.1 | 39.1 | < 1 | 6.9 | 70 | 4.6 | 51 | 0.25 | 140 | <1 | <1 |
| CPC | ✓ | CPC BLEND | CAP00 | Kazakstan | 07/17/2006 | 43.6 | 6.18 | 0.54 | <-27.4 | 0.84 | 37.49 | 34.98 | 33.21 | <1 | 1.8 | 30 | 0.85 | 19 | <0.05 | 2 | <1 | <1 |
| FOT | | FORTIES | 82308 | U.K. | 2/13/2010 | 39.7 | 7.56 | 0.686 | 10.4 | 1.63 | 49.7 | 39.2 | 37.6 | < 1 | 7.6 | 61 | 2.6 | 20 | 0.1 | 54 | <1 | <1 |
| HUN | ✓ | HUNGO | 82965 | Angola | 3/20/2007 | 29.5 | 3.05 | 0.583 | <-27.4 | 4.9 | 141.6 | 98.55 | 69.75 | <1 | 12 | 47 | 17 | 63 | 0.53 | 35 | <1 | <1 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KISS | ✓ | KISSANJE | 83007 | Angola | 6/22/2011 | 31.3 | 5.45 | 0.543 | -16.6 | 3.69 | 95.6 | 68.1 | 55.3 | < 1 | 9 | 42 | 11 | 54 | 0.48 | 78 | < 1 | < 1 |
| MTHB | | MARS/THUNDERHORSE BLEND (25/75) | 84003 | USA | 1/1/2009 | 33.3 | 6 | 0.94 | -29 | 4.5 | 70 | 56 | 48 | - | 16.4 | 72 | 11.3 | 52 | 0.17 | 18 | - | - |
| OMA | | OLMECA | 82385 | Mexico | 9/17/2005 | 38.7 | 4.79 | 0.891 | <-27.4 | 0.9 | 42.5 | 38.9 | 36.2 | 4 | 8.9 | 58 | 1.5 | 8.5 | 0.05 | 7 | <1 | 1.9 |
| RCL | | RONCADOR LIGHT | 50567 | Brazil | 5/23/2010 | 28.5 | 2.09 | 0.542 | -5.8 | 3.72 | 199.2 | 125.8 | 73.6 | < 1 | 11 | 50 | 5.9 | 30 | 0.15 | 14 | < 1 | 2.2 |
| TH | | THUNDER HORSE | 83019 | USA | 10/19/2009 | 33.2 | 3.36 | 0.83 | <-27.4 | 4.05 | 70.1 | 57.4 | 47.6 | <1 | 11 | 50 | 10 | 45 | 0.12 | 0.12 | <1 | - |
| VAS | ✓ | VASCONIA | 82237 | Colombia | 4/20/2010 | 28 | 2.34 | 0.703 | 42.8 | 5.26 | 165.3 | 97.3 | 70.4 | < 1 | 65 | 324 | 28 | 134 | 0.3 | 7 | < 1 | < 1 |
| YKB | | YK BLEND | 83995 | Russia | 7/20/2009 | 33.7 | 0.92 | 0.756 | 10.4 | 0.85 | 55.9 | 49.2 | 41 | < 1 | 3.1 | 53 | 1.7 | 27 | < 0.05 | 5 | < 1 | - |
| **Sour Group** | | | | | | | | | | | | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ABL | | ARABIAN LIGHT | 82376 | Saudi Arabia | 1/19/2014 | 33 | 3.86 | 1.98 | < -27.4 | 4.66 | 66.5 | 54.1 | 46.9 | < 1 | 12 | 63 | 3.8 | 19 | < 0.1 | 4.1 | < 1 | < 1 |
| ALMB | | ARAB LIGHT/MARS BLEND (75/25) | 299 | USA | 1/1/2006 | 32.3 | 4.9 | 1.96 | -79 | 5 | 72 | 58 | 50 | - | 21.2 | 91 | 7.5 | 31 | 0.2 | 18 | - | - |
| AXL | | ARABIAN EXTRA LIGHT | 82375 | Saudi Arabia | 6/8/2011 | 39.7 | 5.39 | 1.07 | < -27.4 | 1.82 | 42.6 | 38.9 | 36.1 | < 1 | 3.2 | 25 | 1.4 | 12 | <0.05 | 1.9 | < 1 | < 1 |
| BASLI | | BASRAH LT/MESA 30 BLEND (35/65) | 82671 | USA | 2/8/2001 | 30.5 | 3.5 | 1.63 | <-27.4 | 5 | 92.8 | 75.5 | 54.2 | <1 | 39 | 181 | 9.6 | 43 | 0.09 | 4 | < 1 | < 1 |
| BCSR | | BAYOU CHOCTAW - SOUR | 82174 | USA | 5/1/1998 | 32.2 | 3.6 | 1.43 | 11 | 4 | 76.8 | 57 | 47.3 | 100 | 40.3 | 240 | 11.1 | 66 | 0.13 | <50 | <0.1 | - |
| BS | | BONITO SOUR | 82743 | USA | 3/3/2014 | 33.7 | 3.77 | 1.32 | < -27.4 | 3.61 | 71.5 | 58.9 | 49.5 | <1 | 16 | 94 | 6 | 37 | 0.55 | 101.9 | < 1 | <1.2 |
| EIC | | EUGENE ISLAND | 82725 | USA | 1/27/2014 | 31.7 | 6.78 | 1.16 | < -27.4 | 4.53 | 87.4 | 68.2 | 54.8 | < 1 | 28 | 127 | 14 | 62 | 0.4 | 47.2 | < 1 | < 1 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EMS | | MISSISSIPPI SOUR | 82520 | USA | 8/1/2012 | 35.8 | 3 | 1.83 | <-27.4 | 4.13 | 52.6 | 46 | 41.2 | < 1 | 5.2 | 24 | 3.8 | 18 | 0.15 | 48.6 | < 1 | < 1 |
| FUR | | FURRIAL | 82374 | Venezuela | 3/19/2002 | 30 | 2.76 | 1.06 | <-27.4 | 4.3 | 93.5 | 69.02 | 53.6 | <1 | 38 | 179 | 8.2 | 35 | 0.087 | 3 | <1 | <1 |
| HAM | | HAMACA | 83002 | Venezuela | 3/30/2004 | 25.5 | 2 | 1.6 | -40 | 7.4 | 430 | 260 | 160 | <1 | 200 | 706 | 46 | 164 | 0.64 | <1 | - | - |
| HUMB | | HUNGO/MARS BLEND | 83018 | USA | 7/1/2006 | 28.4 | 3.3 | 1.24 | -16 | 1.24 | 133.6 | 97.2 | 73 | - | 28 | 120 | 18 | 77 | 0.66 | - | - | - |
| ITM | | ISTHMUS | 82387 | Mexico | 10/19/2005 | 32.7 | 3.41 | 1.57 | <-27.4 | 4.9 | 68.3 | 55.7 | 50.2 | 23 | 74 | 300 | 14 | 57 | 0.1 | 6 | <1 | <1 |
| KMB2 | | KUWAIT/MARS BLEND (33/67) | 82187 | USA | 9/30/2004 | 30.5 | 5.2 | 2 | -40 | 5.3 | 106 | 76 | 59 | 1 | 37 | 74 | 14 | 28 | 0.4 | 175 | - | - |
| MMB | | MARS/MESA BLEND (40/60) | 82428 | USA | 9/8/2000 | 30.1 | 3.1 | 1.65 | -22 | 5.1 | 100 | 70.9 | 57.6 | <1 | 48 | 156 | 14 | 49 | 0.27 | 85 | <1 | <1 |
| MSA | | MESA 30 | 82369 | Venezuela | 5/1/2005 | 30.1 | 3.3 | 1.09 | <-27.4 | 4.6 | 93.8 | 82.3 | 61.9 | <1 | 42 | 217 | 9.1 | 46 | 0.18 | 12 | <1 | <1 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MUB | | MARS/URALS BLEND (50/50) | 82998 | USA | 7/9/2004 | 31.05 | 5.4 | 1.57 | -16 | 4.35 | 89 | 70 | 55 | - | 37.6 | 172.7 | 12.1 | 58.3 | 0.379 | 103.5 | - | - |
| MUB2 | | MARS/URALS BLEND (33/67) | 82183 | USA | 9/27/2004 | 31.2 | 4.9 | 1.53 | -7.5 | 4.2 | 89 | 67 | 57 | - | 134.7 | 198.5 | 43.8 | 69.7 | 0.22 | 40 | - | - |
| ORI | | ORIENTE | 82388 | Equador | 1/5/2001 | 24.1 | 2.83 | 1.51 | 5 | 9.3 | 652.6 | 356.4 | 201 | <1 | 167 | 240 | 66 | 240 | 0.13 | 61 | <1 | <1 |
| PSD | | POSEIDON | 82749 | USA | 4/21/2013 | 29.1 | 4.03 | 1.78 | < -27.4 | 6.22 | 153.5 | 104.3 | 69.4 | < 1 | 47 | 219 | 17 | 71 | 0.5 | 233.6 | <1 | <1 |
| SLI | ✓ | SOUTH LOUISIANA INTERMEDIATE | 82779 | USA | 3/20/2006 | 29.8 | 4.1 | 0.66 | -70.6 | 3.3 | 105.1 | 77.2 | 58.7 | <1 | 6.4 | - | 6.4 | - | 1.34 | 8 | - | - |
| THB | | Seg 17/Thunder Horse (30/70) Blend | 84004 | USA | 12/31/2011 | 33.1 | 6.4 | 1.22 | -24 | 5.1 | 69 | 56 | 49 | < 1 | 15.6 | 70 | 10 | 43 | 0.08 | 3.5 | < 1 | < 1 |

| High Sulfur Sour Group | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ABH | | ARABIAN HEAVY | 82378 | Saudi Arabia | 10/22/2006 | 27.7 | 3.29 | 2.99 | <-27.4 | 8 | 221.4 | 145.9 | 97.27 | <1 | 45 | 171 | 13 | 54 | 0.2 | 1 | <1 | <1 |
| ABL17 | | ARABIAN LIGHT / SEG 17 BLEND | 82987 | USA | 4/21/2004 | 32.1 | 3.39 | 2.19 | <-27.4 | 5.2 | 78.75 | 59.77 | 50.1 | <1 | 27 | 110 | 7.8 | 31 | 0.12 | 3 | <1 | <1 |
| ABM | | ARABIAN MEDIUM | 82377 | Saudi Arabia | 6/2/2011 | 30.9 | 3.09 | 2.54 | -11.2 | 5.45 | 94.7 | 70.3 | 57.2 | < 1 | 28 | 112 | 8.6 | 36 | 0.15 | 2.6 | < 1 | < 1 |
| AHL | | ARAB HEAVY/ ARAB LIGHT (20/80) | 83006 | USA | 6/1/2005 | 32.56 | 4.3 | 2.06 | -10 | 5 | 77 | 60 | 51 | 0 | 26.3 | 107.4 | 7.9 | 32.2 | 0.12 | 23 | - | - |
| AMH | | ALBIAN MUSKEY RIVER HEAVY | 83997 | Canada | 6/9/2011 | 21.6 | 4.2 | 3.81 | -49 | ---- | 1539.2 | 612.33 | 288.8 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| AMMB | | ARAB MEDIUM /MARS BLEND (75/25) | 301 | USA | 1/1/2009 | 30.2 | 6 | 2.36 | -50 | 6.1 | - | - | 67 | - | 40.68 | 172.63 | 12.7 | 54.03 | - | - | - | - |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BAS | | BASRAH LIGHT | 82383 | Iraq | 6/2/2011 | 30.1 | 5.5 | 2.9 | <-27.4 | 5.99 | 101.4 | 73.1 | 58.9 | < 1 | 40 | 159 | 10 | 40 | 0.2 | 88.2 | < 1 | < 1 |
| BASM | | BASRAH LIGHT/MARS BLN (75/25) | 82554 | USA | 9/30/2004 | 32.1 | 5.34 | 2.16 | -38.2 | 4.7 | 118 | 74 | 56.7 | <1 | 11.9 | - | 37.1 | - | 0.178 | 33.3 | - | - |
| DAL | | DALIA | 83783 | Angola | 2/9/2011 | 23.1 | 2.77 | 0.513 | < -27.4 | 4.53 | 677 | 357 | 206 | < 1 | 7.4 | 28 | 18 | 74 | 1.6 | 111 | < 1 | 3.4 |
| EMX | | EAST MS MIX | 82521 | USA | 9/3/2003 | 30.9 | 2.99 | 2.1 | 15.8 | 7.3 | 106.7 | 78.53 | 57.3 | 23 | 23 | 87 | 8 | 31 | 0.26 | 250 | <1 | <1 |
| KIR | | KIRKUK | 82384 | IRAQ | 3/11/2003 | 33.9 | 4.57 | 2.26 | -0.4 | 4.9 | 62.9 | 52.3 | 45.6 | <1 | 31 | 128 | 13 | 53 | 0.12 | 75 | <1 | <1 |
| KMB | | KUWAIT /MARS BLEND (50/50) | 82186 | USA | 9/30/2004 | 30.5 | 5.7 | 2.2 | -40 | 5.6 | 110 | 76 | 59 | 1 | 36.7 | 142 | 13.2 | 51 | 0.33 | 135 | - | - |
| KUW | | KUWAIT | 82380 | Kuwait | 6/4/2011 | 30.1 | 4.48 | 2.8 | -22 | 6.65 | 115.7 | 83.4 | 64.4 | < 1 | 34 | 132 | 9.8 | 36 | 0.1 | <1 | <1 | <1 |
| MARS | | MARS BLEND | 82745 | USA | 6/8/2011 | 28.6 | 3.3 | 2.02 | < -27.4 | 6 | 163.5 | 107 | 79.7 | < 1 | 58 | 206 | 21 | 80 | 0.55 | 32 | < 1 | < 1 |
| MMBL | | MARS/MAYA BLEND (20/80) | 83996 | USA | 5/20/2009 | 22.6 | 4.2 | 3.1 | -41 | 5.1 | 880 | 480 | 260 | - | 41 | 166 | 15 | 65 | - | 69.4 | - | - |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OGU | ✓ | OGUEN DJO | 82995 | Gabon | 6/15/2004 | 27.3 | 4.5 | 1.5 | 54 | 5.2 | 280 | 160 | 108 | <5 | 43 | 135 | 69 | 233 | 1.7 | - | - | - |
| SGCB | | SOUTH ERN GREEN CANYO N BLD | 83005 | USA | 4/21/2005 | 31.5 | 4.42 | 2.19 | <-27.4 | 6 | 90.8 | 69.2 | 56.1 | <1 | 74 | 291 | 19 | 74 | 0.56 | 64 | <1 | 2.66 |

| HYDROCARBON | HYDROCARBON |
|---|---|
| AMENAM BLEND | Viscosity at 60F not reported - too close to pour point for accurate measurement<br>BAYOU CHOCTAW |
| BAYOU CHOCTAW - SWEET | !! Due to Hydrogen Sulfide results- Take safety precautions !! |
| BONNY LIGHT | Must be pour point suppressed if moved through LOOP cavern |
| CABINDA | Must be monitored for pour point depression. ! Viscosity at 60 and 80F not accurately measured - too close to pour point. |
| CPC BLEND | Due to RVP, must be shipped on a case by case basis and approved prior to each nomination. |
| CUSIANA | Must be monitored for pour point depression. . Note: Cusiana continues to have HIGH Metals. Cusiana will be moved as a Sweet/ High Metals batch unless metals return to previous low levels. Due to RVP, to move in summer months, must be shipped on a case by case basis and approved prior to each nomination. |
| EA CRUDE | Must be monitored for pour point depression. |
| Eagle Ford API 57 | crude exceeds our RVP guidelines for the Summer months and each batch must be approved by Crude Oil Quality or the Manager of Oil Movements from May through September. |
| Eagle Ford Crude (RVP 8.6 psia or higher) | crude exceeds our RVP guidelines and each batch must be approved by Crude Oil Quality or the Manager of Oil Movements |
| ESCRAVOS | Must be monitored for pour point depression. |
| ES SIDER | !! Due to Hydrogen Sulfide results- Take safety precautions !! |
| FOINAVEN | Must be monitored for pour point depression. |
| FORCADOS | Must be pour point suppressed if moved through LOOP cavern |
| GALEOTA | Must be monitored for pour point depression. |
| HIBERNIA | Must be monitored for pour point depression. |
| HUNGO | Must be pour point suppressed if moved through LOOP cavern |

| | |
|---|---|
| KISSANJE | Must be pour point suppressed if moved through LOOP cavern |
| KITINA | Must be monitored for pour point depression. |
| QUA IBOE | Must be monitored for pour point depression. |
| NEMBA | Must be monitored for pour point depression. |
| N"KOSSA | Must be monitored for pour point depression. |
| OGUENDJO | Must be monitored for pour point depression. |
| OKONO | Must be monitored for pour point depression. |
| OSO CONDENSATE | Must be monitored for pour point depression. Due to RVP, must be shipped on a case by case basis and approved prior to each nomination. |
| PLUTONIO | Must be monitored for pour point depression. |
| PUROVSKIY | Due to RVP, must be shipped on a case by case basis and approved prior to each nomination. |
| RABI LIGHT | Must be monitored for pour point depression. |
| SAHARAN BLEND | Due to RVP, must be shipped on a case by case basis and approved prior to each nomination. |
| SCHIEHALLION | Must be monitored for pour point depression. |
| SOUTH LOUISIANA INTERMEDIATE | Put into Sour group due to Acid Number >1 |
| TROLL EXPORT | Acid number on Troll Export continues to be higher than usual. Will continue to move with Sweet Low Metals group and will monitor. |
| VASCONIA | Must be monitored for pour point depression. |
| XIKOMBA | Must be monitored for pour point depression. |
| YOHO CRUDE | Must be monitored for pour point depression. |

a) POUR POINT may have been depressed in the sample taken for this assay.
b) Due to loss of H2S in sampling and shipping, H2S is likely higher than stated in this assay. TAKE precautions with all crude oils - sour or sweet.

**NOTES**

| CRITERIA FOR GROUPING CRUDES ON CAPLINE | | | |
|---|---|---|---|
| **Group** | **Criteria** | | |
| | **Sulfur** | **Ni + V(pitch)** | **TAN** |
| | %w | ppm | mg KOH/g |
| **Sweet - Low Metals** | < 0.5 | <= 100 | <= 1.0 |

| POUR POINT REQUIREMENTS | |
|---|---|
| Summer | Start on or after April 1, Clear of System by September 30 <= 55F |
| Winter | Start October 1 - March 31 <= 35F |
| **RVP LIMITATIONS** | |

| | | | | | |
|---|---|---|---|---|---|
| **Sweet - High Metals** | < 0.5 | <= 250 | <= 1.0 | | |
| **Intermediate** | 0.5 - 1.0 | <= 550 | <= 1.0 | Year-Round | RVP of <= 8.6 psi accepted year-round |
| **Sour** | >1.0 - 2.0 | <= 1200 | <= 1.5 | Winter | Start on or after October 1, Clear of System by April 30 <= 9.6 |
| **High Sulfur Sour** | > 2.0 | <= 1200 | <= 2.0 | NOTE: RVP > 9.6 Subject to Management Approval | |