

Attachment E – Oil Properties

Ranges of physical properties for example oil types.

Property	Units	Oil Types							
		Gasoline	Diesel	Light Crude	Bakken Crude	Dilbit ¹	Heavy Crude	IFO	Bunker C
Density	Kg/m ³ at 15°C	720	840	780 to 880	794 to 840	824 to 941	880 to 1000	940 to 990	960 to 1040
API Gravity		65	35	30 to 50	36.7 to 46.3, Avg. 41 ^{*NDPC}	18 to 39	10 to 30	10 to 20	5 to 15
Viscosity	mPas at 15°C	0.5	2	5 to 50	3.37 cSt ^{MUS}	270.5* to 265,263 **	50 to 50,000	1,000 to 15,000	10,000 to 50,000
Flash point	15°C	-35	45	-30 to 30	<-20°F (<-29°C) ^{MSDS}	<-35 ^{**m} to 58 ^{*m}	-30 to 60	80 to 100	>100
Solubility in Water	ppm	200	40	10 to 50	Negligible ^{MSDS}	-	5 to 30	10 to 30	1 to 5
Pour Point	°C	NR	-35 to -1	-40 to 30	-40	-30 ^{**m} to 15 ^{**m}	-40 to 30	-10 to 10	5 to 20
Interfacial Tension	mN/m at 15°C	27	27	10 to 30	ND	27 ^{*m} to 150 ^{*m}	15 to 30	25 to 30	25 to 35

Modified from Fingas (2013)¹; Values provided include weathered dilbit from tests; NA= not relevant; * Calculated for AWB; ** Calculated value for CL; ^{*m} Measured value of AWB; ^{**m} Measured value of CL

^{*NDPC} North Dakota Petroleum Council, ND= Not determined (MSDS (CoP) or NDPC); ^{MSDS} = ConocoPhillips MSDS

^{MHA} Mandan Hidatsa Arikara Nation Clean Fuel Refinery's comparisons of Synthetic crude and Bakken submitted to EPA in April, 2010

[https://yosemite.epa.gov/oa/eab_web_docket.nsf/Filings%20By%20Appeal%20Number/C288B68AA94008B48525796B004CC9CC/\\$File/Response%20to%20Petitions%20for%20Review%20Exhibit%207%20...19.07.pdf](https://yosemite.epa.gov/oa/eab_web_docket.nsf/Filings%20By%20Appeal%20Number/C288B68AA94008B48525796B004CC9CC/$File/Response%20to%20Petitions%20for%20Review%20Exhibit%207%20...19.07.pdf) last visited on 4/18/16

^{MUS} Bakken Crude SDS by Musket

<http://desmogblog.com/sites/beta.desmogblog.com/files/Northern%20Plains%20Bakken%20Safety%20Data%20Sheet.pdf> last visited on 4/18/16

¹ A Comparison of the Properties of Diluted Bitumen Crudes with other Oils
POLARIS Applied Sciences, Inc. (2013).

https://crrc.unh.edu/sites/crrc.unh.edu/files/comparison_bitumen_other_oils_polaris_2014.pdf