

## Medium Sour Blend (MSB) Pool Quality Specifications

Quality Specifications for Component Streams to the Medium Sour Blend (MSB) Pool							
Quality	Units	Min	Max	Pool Typical Ex- Superior*	Referee Test Method	Test Frequency	Enbridge Response to Crude Not Meeting Quality Specs
<b>Existing Specifications</b>							
Density (15C)	kg/m <sup>3</sup>	>799	<876	859	ASTM D4052	Frequency: AR <sup>2</sup>	Delayed shut-in <sup>6</sup>
Viscosity, at reference temp	cSt	2	<20		ASTM D7042	Frequency: QR <sup>4</sup>	Delayed shut-in <sup>6</sup>
Olefins, total <sup>1</sup>	mass%		<1		H NMR	Frequency: R <sup>7</sup>	Immediate shut-in <sup>5</sup>
Vapour Pressure (VPCR <sub>4.1</sub> @ 37.8 C)	kPa		85/95 <sup>8</sup>		ASTM D6377	Frequency: MR <sup>3</sup>	Immediate shut-in <sup>5</sup>
S&W	vol%		0.5		ASTM D4007	Frequency: AR <sup>2</sup>	Immediate shut-in <sup>5</sup>
Organic Chlorides <sup>1</sup>	wppm		<1		ASTM D4929	Frequency: QR <sup>4</sup>	Immediate shut-in <sup>5</sup>
<b>Component Typical</b>							
MCR	wt%		6	4.9	ASTM D4530	Frequency: MR <sup>3</sup>	Reclassification Process <sup>6</sup>
TAN <sup>9</sup>	mgKOH/g		0.5	0.2	ASTM D664	Frequency: MR <sup>3</sup>	Reclassification Process <sup>6</sup>
Nickel	mg/L		33	17	ASTM D5708-05	Frequency: MR <sup>3</sup>	Reclassification Process <sup>6</sup>
Vanadium	mg/L		75	36	ASTM D5708-05	Frequency: MR <sup>3</sup>	Reclassification Process <sup>6</sup>
Naphtha (IBP-350F)	mass% recovered			23	ASTM D7169		
Distillate (350-650F)	mass% recovered			27	ASTM D7169		
Gas Oil (650-980F)	mass% recovered			26	ASTM D7169		
Resid (+980F)	mass% recovered			24	ASTM D7169		

\*The estimated crude quality of a pool is based on a limited number of random composite samples of batches ex-Superior, timeframe June 2022 – May 2023.

### Notes

- For these properties, blending should not occur.
- AR: All Receipts of MSB component streams tested using weekly composite.
- MR: Monthly Random testing of MSB component streams.
- QR: Quarterly Random testing of MSB component streams. Upon violation perform probational testing at Enbridge discretion.
- Immediate shut-in upon identifying violation. Request third party Certificate of Analysis prior to subsequent receipt.
- Upon violation, notification to applicable party, increase monitoring. Consequence based on outcome of increased monitoring.
- R: Annual Random testing.
- Max 85kPa from May 1<sup>st</sup> through October 31<sup>st</sup>  
Max 95kPa from November 1<sup>st</sup> through April 30<sup>th</sup>
- Heavy High TAN Crude: TAN > 1.1 mgKOH/g  
Heavy Crude: TAN ≤ 1.1. mgKOH/g