

## Synbit Blend (SYB) Pool Quality Specifications

Quality Specifications for Component Streams to the Synbit Blend (SYB) Pool								
Quality	Units	Min	Max	Typical*	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>	≥904	≤940			ASTM D4052	Frequency: AR <sup>2</sup>	Delayed shut-in <sup>6</sup>
Viscosity	cSt	≥100	≤350			ASTM D445	Frequency: QR <sup>4</sup>	Delayed shut-in <sup>6</sup>
Olefins, total <sup>1</sup>	wt%		<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		95,103 <sup>8</sup>			ASTM D6377	Frequency: QR <sup>4</sup>	Immediate shut-in <sup>5</sup>
BS&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%			<9	8	ASTM D4530	Frequency: MR <sup>3</sup>	Notification Process <sup>6</sup>
Naphtha (IBP-350F)	mass% recovered			7-14	11	ASTM D7169	Frequency: MR <sup>3</sup>	Notification Process <sup>6</sup>
Resid (+980F)	mass% recovered			29-38	36	ASTM D7169	Frequency: MR <sup>3</sup>	Notification Process <sup>6</sup>
TAN	mgKOH/g			>1.1	1.6	ASTM D664 & ASTM D664 CCQTA modified	Frequency: MR <sup>3</sup>	Notification Process <sup>6</sup>
Nickel	mg/L			<65	47	ASTM D5708-05	Frequency: MR <sup>3</sup>	Notification Process <sup>6</sup>
Vanadium	mg/L			<172	122	ASTM D5708-05	Frequency: MR <sup>3</sup>	Notification Process <sup>6</sup>
<b>Other Requirements</b>								
– Only the following approved Light Synthetics to be utilized as diluent for SYB feeder components. These include OSA, SSP, PAS, CNS, PSC, HSB, SYN, PSY, HSC, and any combination thereof. – Within New Commodity Approval process, a raw bitumen assay is to be submitted.								

\*The expected or anticipated crude quality of individual components, understanding the fact that there may be, on occasion, variability outside of the range of the typical.

\*\*The estimated crude quality of a pool is based on a limited number of random composite samples of batches ex-Superior, timeframe July 2014 – March 2015.

### Notes

- For these properties, blending should not occur.
- AR: All Receipts of SYB component streams tested using weekly composite.
- MR: Monthly Random testing of SYB component streams.
- QR: Quarterly Random testing of SYB 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: Random testing. 2015 – Twice per year; 2016 onwards – Annually.
- Max 95kPa May 1<sup>st</sup> through Sept 15<sup>th</sup>  
Max 103kPa Sept 16<sup>th</sup> through Apr 30<sup>th</sup>