

## [ATHABASCA OIL CORP / 08-28-078-10W4M] L4 (PAD D) LIESMER

**Customer: PTRHTF20133**  
 ATHABASCA OIL CORP.  
 LEISMER DEMONSTRATION PLANT  
 LSD2-79-10-W4M  
 NEAR CONKLIN, AB Canada  
 Attn: Trevor Ip  
 Tel: (403)724-3349  
 E-Mail: treip@statoil.com

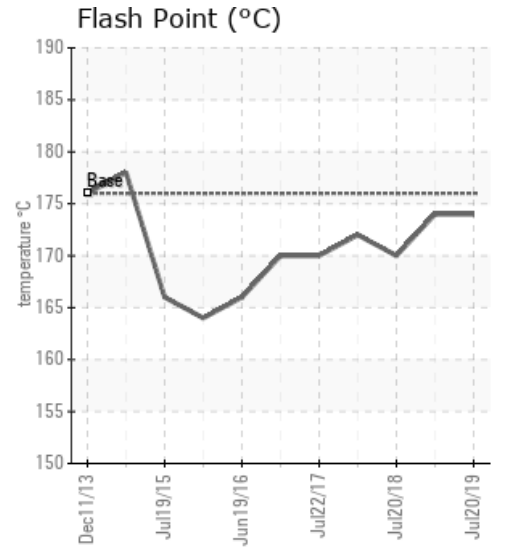
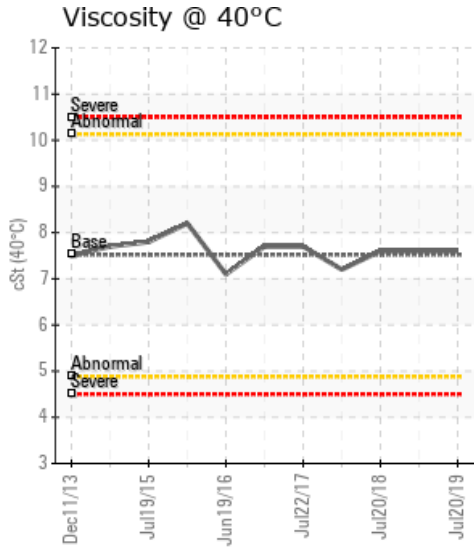
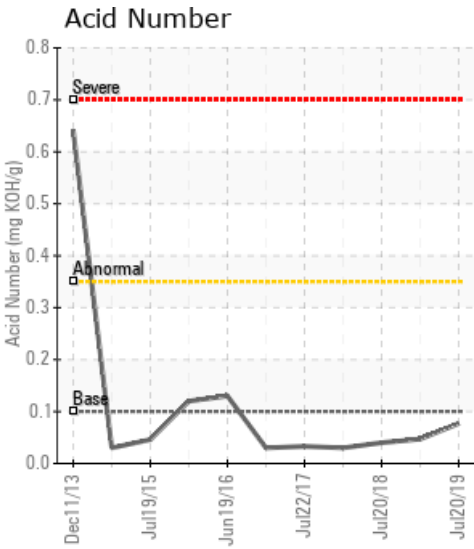
**System Information**  
 System Volume: 8000 ltr  
 Bulk Operating Temp: 212F / 100C  
 Heating Source:  
 Blanket:  
 Fluid: PETRO CANADA CALFLO LT  
 Make: TORNADO TECHNOLOGIES

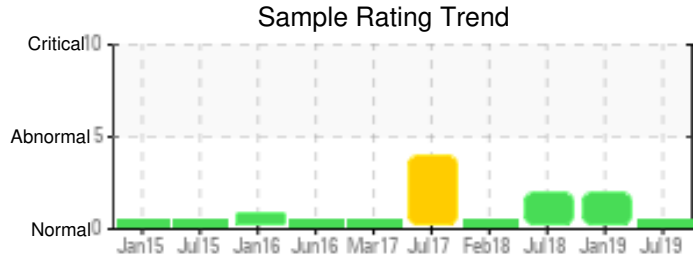
**Sample Information**  
 Lab No: 02301903  
 Analyst: Benjamin Latorre  
 Sample Date: 07/20/19  
 Received Date: 08/09/19  
 Completed: 08/19/19

Recommendation: Test results are normal. No immediate action required. Resample at the next interval.

Comments:

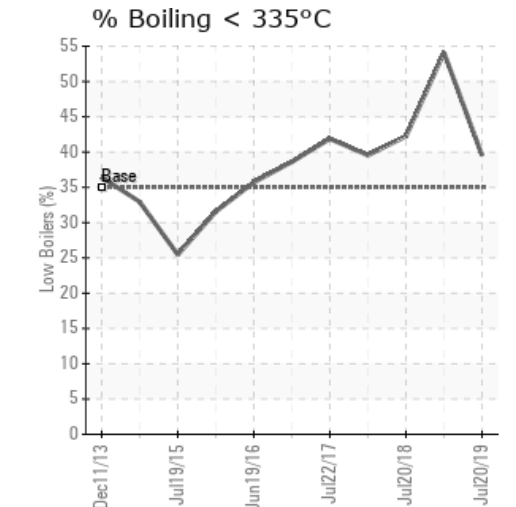
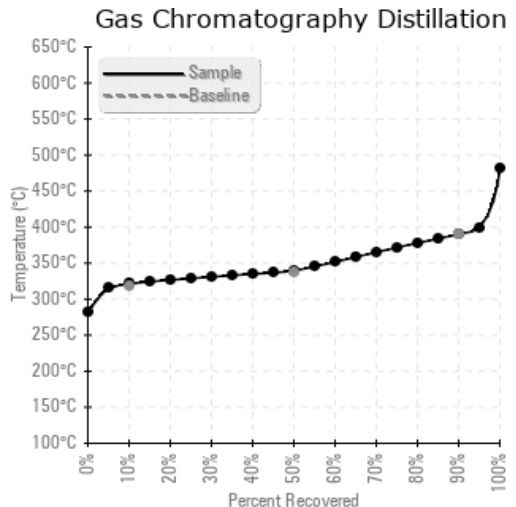
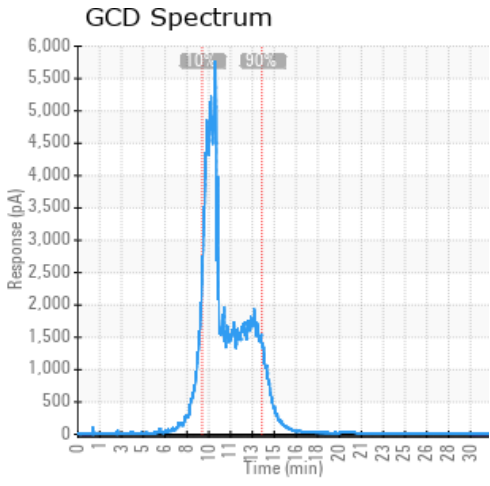
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
07/20/19	08/09/19	0y		345 / 174	183.2	7.6	0.077	0.051	610 / 321	643 / 340	735 / 391	39.56
01/20/19	02/08/19	0y		345 / 174	8.5	7.6	0.047	0.013	592 / 311	625 / 330	717 / 381	54.09
07/20/18	08/10/18	3y	+/- 100M FROM HEATER	338 / 170	0.8	7.6	0.04	0.016	611 / 322	642 / 339	733 / 389	42.24
02/01/18	02/21/18	3y		342 / 172	4.8	7.2	0.03	0.005	611 / 322	643 / 340	735 / 391	39.54
07/22/17	08/08/17	0y		338 / 170	1.3	7.7	0.033	0.010	608 / 320	654 / 346	789 / 421	41.87
03/20/17	04/05/17	24y		338 / 170	0.00	7.7	0.03	0.042	611 / 322	645 / 340	737 / 392	38.61
<b>Baseline Data</b>				349 / 176		7.52	0.1		604 / 318	640 / 338	734 / 390	35.0





Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc		
07/20/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	91	0		
01/20/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	87	0	
07/20/18	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	89	0	
02/01/18	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	86	0
07/22/17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83	0
03/20/17	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93	0
Baseline Data			0	0						0			0	0					0					270		

Elemental analysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]



Historical Comments	
01/20/19	Results normal. Resample at next interval. Low wear level. Low contaminants level. (GCD) % < 335°C is marginally high.
07/20/18	The fluid is in good condition and suitable for further use. The low boiler vapor content has increased slightly from 39.54% to 42.24%. It is recommended to vent these low boiler vapors to atmosphere on a regular basis. Please re-sample in 6 months. (GCD) % < 335°C is marginally high.
02/01/18	The fluid is in good condition and suitable for further use. Low boiler vapor content is slightly high (GCD% < 335C = 39.54%). For fresh Calflo LT this is 35%. This is a result of normal thermal degradation of the fluid and can be rectified by venting low boiler vapor to atmosphere. Please re-sample in 6 months.
07/22/17	The fluid is in a good condition and suitable for further use. The analysis does show indications of degradation. The % boil-off < 335C is elevated and the 90% GCD temperature is high. It is recommended to vent off low boiler vapors to atmosphere on a regular basis. (once per month) Please re-sample in 12 months and list fluid service life when sending in the sample. (GCD) 90% Distillation Point is severely high. (GCD) % < 335°C is marginally high.
03/20/17	The fluid is in good condition and suitable for further use. Please resample in 12 months.

Petro-Canada makes no representation or warranty of any kind, either express or implied, as to the accuracy or completeness of the analysis and assumes no responsibility and shall have no liability whatsoever with respect to such analysis, or a party's use of it. Petro-Canada is a division of HollyFrontier Corporation.