

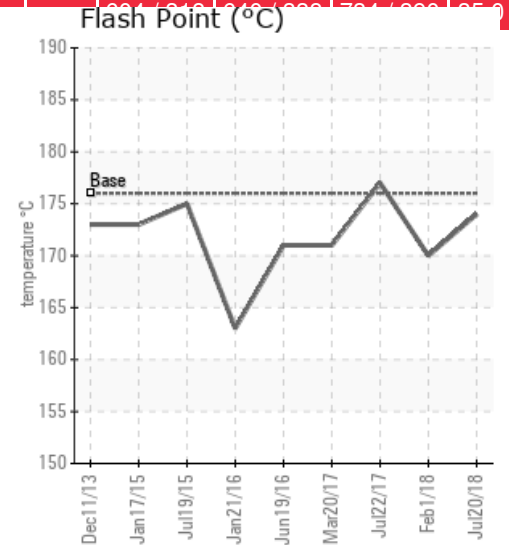
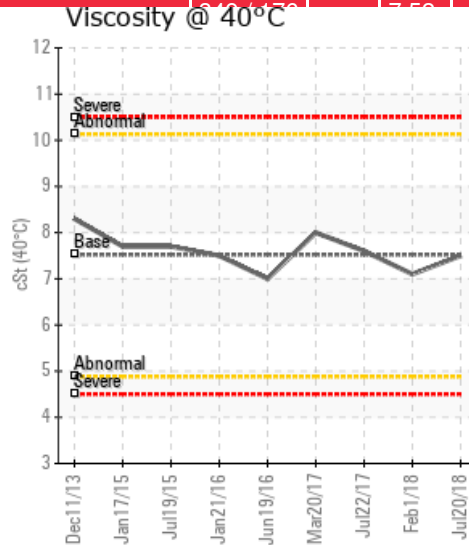
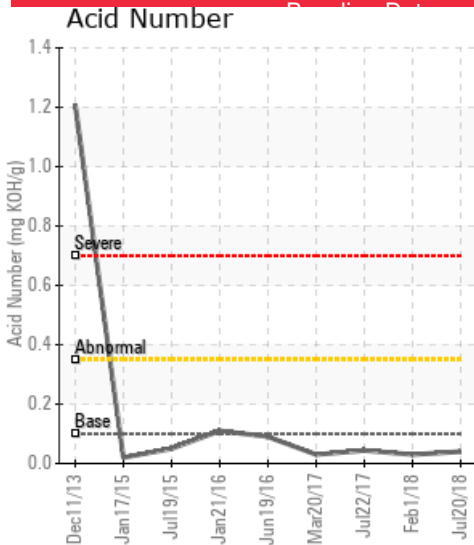
[ATHABASCA OIL CORP / 16-21-078-10W4M] L1 (PAD A) LIESMER

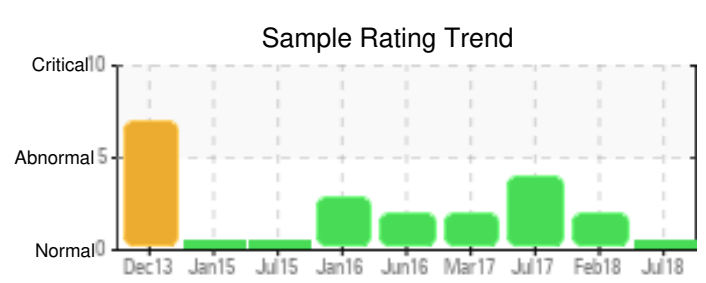
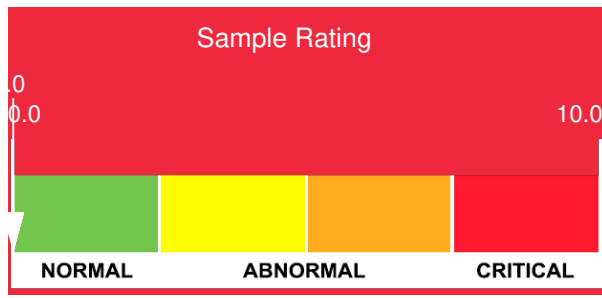
Customer: PTRHTF20133	System Information	Sample Information
ATHABASCA OIL CORP. LEISMER DEMONSTRATION PLANT LSD2-79-10-W4M NEAR CONKLIN, AB Canada Attn: George Ball Tel: x: E-Mail: gball@atha.com	System Volume: 8000 ltr Bulk Operating Temp: 212F / 100C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO LT Make: TORNADO TECHNOLOGIES	Lab No: 02233039 Analyst: Peter Harteveld Sample Date: 07/20/18 Received Date: 08/10/18 Completed: 08/15/18 To discuss this report contact Peter Harteveld at (780)967-4234

Recommendation: The fluid is in good condition and suitable for further use. The low boiler vapor content has decreased from 48.72% to 40.62%. Still slightly high but improved. Venting of these low boiler vapors on a regular basis is recommended. Please re-sample in 6 months.

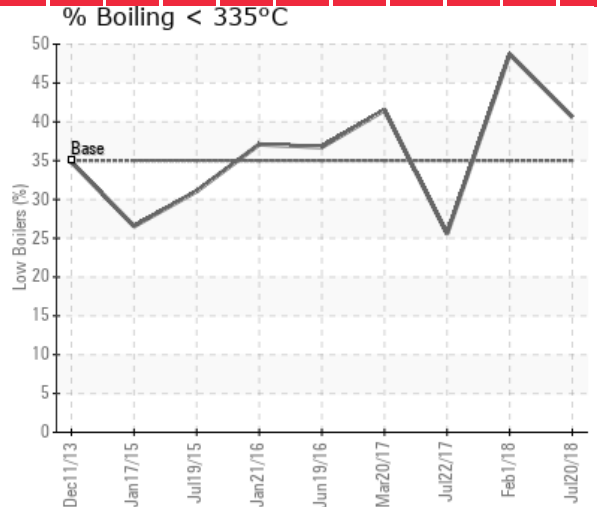
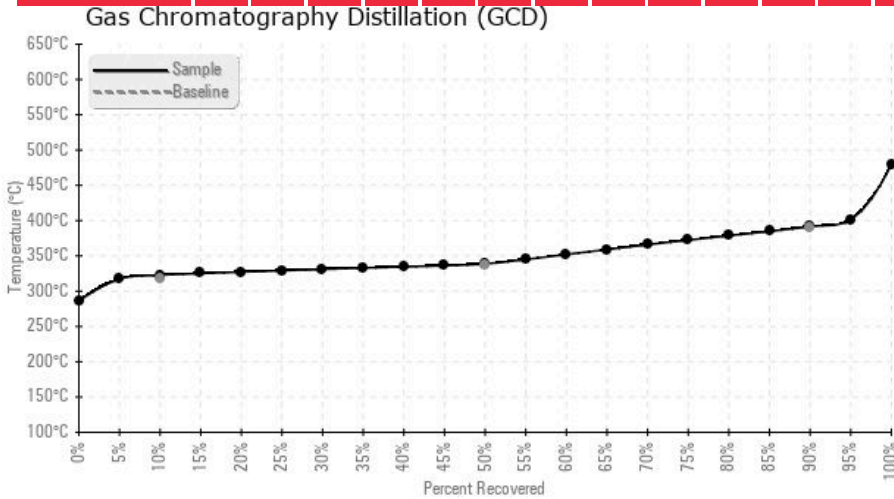
Comments:

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	%
07/20/18	08/10/18	3y	+/- 100M FROM HEATER	345 / 174	5.9	7.5	0.04	0.014	613 / 323	642 / 339	737 / 392	40.62
02/01/18	02/21/18	3y		338 / 170	4.8	7.1	0.03	0.004	608 / 320	635 / 335	727 / 386	48.72
07/22/17	08/08/17	0y		351 / 177	0.00	7.6	0.044	0.011	614 / 323	728 / 387	803 / 428	25.59
03/20/17	04/05/17	24y		340 / 171	0.00	8.0	0.03	0.043	609 / 321	642 / 339	744 / 396	41.52
06/19/16	07/05/16	18y	FLOW LINE	340 / 171	0.00	7.0	0.09	0.011	611 / 322	646 / 341	750 / 399	36.74
01/21/16	02/11/16	0y		325 / 163	13.7	7.5	0.11	0.169	609 / 321	674 / 356	802 / 428	37.09
07/19/15	07/31/15	10y		347 / 175	0.00	7.7	0.050	0.032	615 / 324	654 / 346	749 / 398	31.07





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
07/20/18	10	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	204	0
02/01/18	11	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	203	0
07/22/17	10	0	0	0	0	0	1	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	218	0
03/20/17	11	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	0	1	0	0	0	227	0
06/19/16	9	0	0	1	0	0	0	0	0	0	5	1	0	0	0	0	0	0	0	0	0	0	220	0
01/21/16	47	0	0	0	0	0	0	0	0	0	5	0	1	0	0	0	1	0	0	0	0	0	232	0
07/19/15	9	0	0	0	0	0	0	0	0	0	5	0	1	0	0	0	0	0	0	0	1	0	241	0
Elemental analysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	270	0



Historical Comments

02/01/18	The fluid is in good condition and suitable for further use. Low boiler vapor content is high (GCD% <335C = 48.72%). 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. (GCD) % < 335°C is abnormally high.
07/22/17	The fluid shows signs of degradation by oxidation. The 50% and 90% GCD temperatures are elevated. This can also be the result of adding a heavier fluid or ingress of process fluid. Ensure the blanket gas system is functional. The fluid is suitable for further use. Please re-sample in 6 months. (GCD) 50% Distillation Point is severely high. (GCD) 90% Distillation Point is severely high.
03/20/17	Percentage boil-off <335 degrees C has increased. This can be the result of thermal degradation or ingress of blanket gas when fuel gas is used as blanket gas. It is recommended to vent-off low boiler vapors to atmosphere. The content of low boiler vapors is at this moment not a problem but it is recommended to vent off regularly to prevent problems. The fluid is in good condition and suitable for further use. Please resample after 6 months. (GCD) % < 335°C is marginally high.
06/19/16	The fluid is in good condition and suitable for further use. Please re-sample in 12 months.
01/21/16	Oxidation has degraded the fluid slightly. Evidence of oxidation is an upwards shift in the distillation curve of the fluid. Also TAN and Pentane Insoluble (solids) content have increased. Please verify proper operation of the blanket gas system. The fluid is suitable for further use. Re-sample in 6 months. Please fill in oil service life next time. (GCD) 90% Distillation Point is severely high. (GCD) 50% Distillation Point is marginally high.
07/19/15	The fluid is in good condition and suitable for further use. Please re-sample in 6 months.

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