

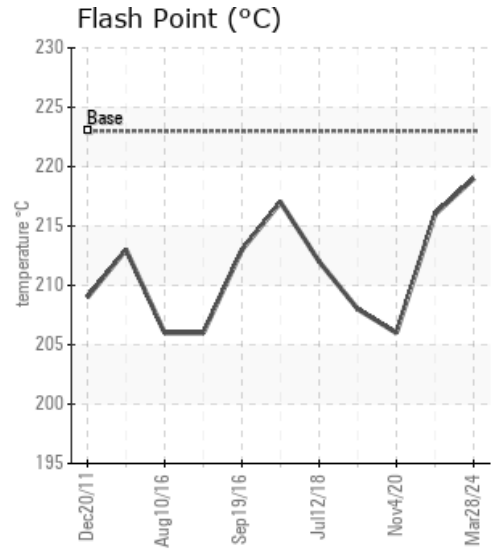
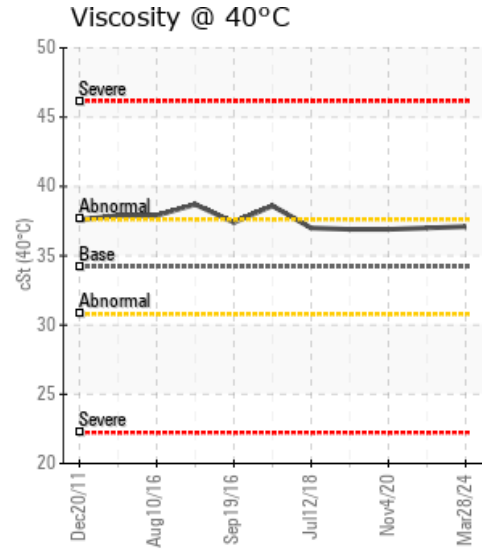
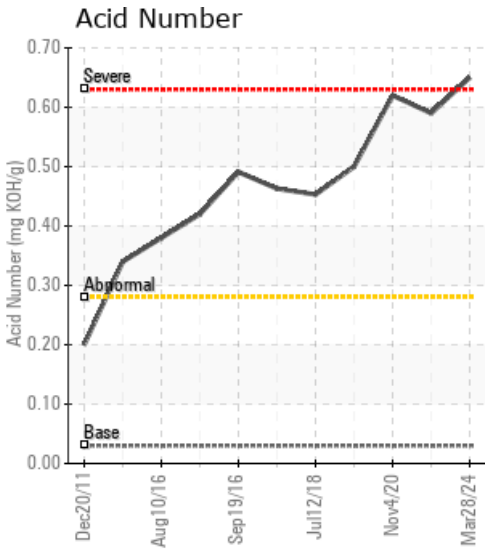
## [BLUE RIDGE LUMBER WEST FRASER / LSD ENERGY PLANT 5W1/4-36-59-10-W5]

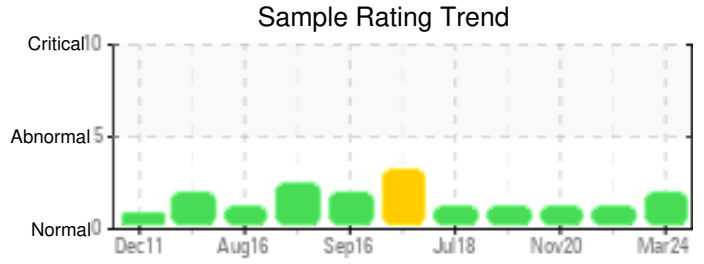
Customer: PTRHTF20093	System Information	Sample Information
BLUE RIDGE LUMBER INC PO BOX 87 PO BOX 87 BLUE RIDGE, AB T0E 0B0 CA Attn: Steven Lin Tel: (587)590-9770 E-Mail: steven.lin@westfraser.com	System Volume: 200000 ltr Bulk Operating Temp: 482F / 250C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: CLASSEN WIESLOCH	Lab No: 02627139 Analyst: Peter Harteveld Sample Date: 03/28/24 Received Date: 04/05/24 Completed: 04/12/24 Peter Harteveld peter.harteveld@HFSinclair.com

Recommendation: The fluid is in a good condition and suitable for use. The AN is elevated and the 90% GCD temperature is high. These are indications of fluid degradation via oxidation. The Fe content is low which means there is no corrosion ongoing as a result of acidity increase from oxidation. It is recommended to check proper operation of the blanket gas system and keep the fluid temperature in the expansion tank low. Please re-sample in 12 months.

Comments: Acid Number (AN) is abnormally high. (GCD) 90% Distillation Point is marginally high.

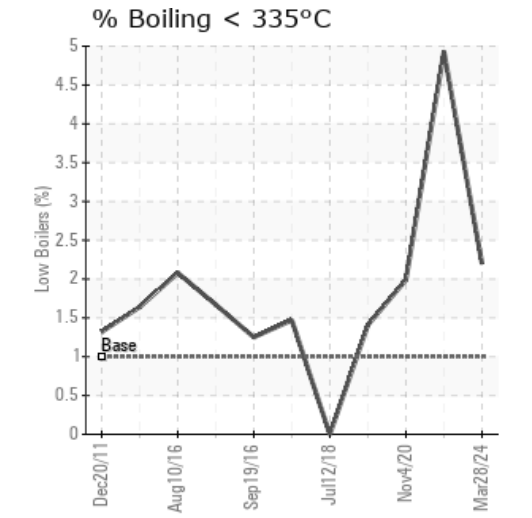
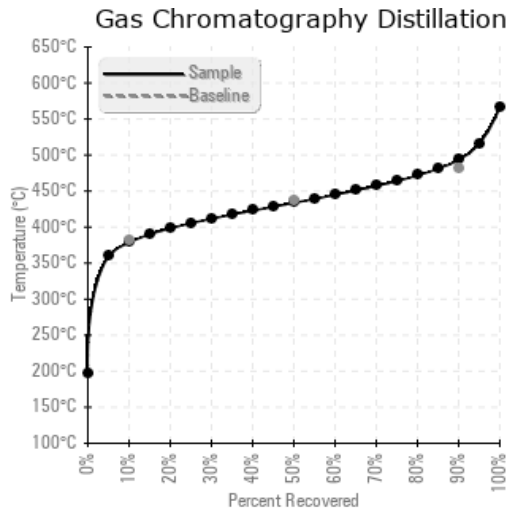
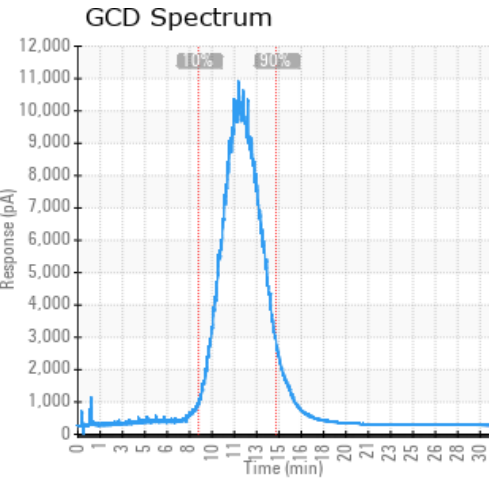
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
03/28/24	04/05/24	14.0y		426 / 219	33	37.1	0.65	0.169	713 / 379	813 / 434	920 / 493	2.20
06/01/23	06/15/23	16.0y		421 / 216	0.00	37.0	0.59	0.106	686 / 363	789 / 420	916 / 491	4.93
11/04/20	11/16/20	14.0y	SAMPLING STATION	403 / 206	80.4	36.9	0.62	0.137	716 / 380	813 / 434	920 / 493	1.99
06/11/19	06/18/19	0.0y		406 / 208	26.0	36.9	0.500	0.043	707 / 375	807 / 431	918 / 492	1.41
07/12/18	07/17/18	12.0y	OIL COLLECTION ROOT1	414 / 212	139.9	37.0	0.453	0.065	724 / 384	789 / 421	897 / 481	0.00
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00





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
03/28/24	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/01/23	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/04/20	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/11/19	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/12/18	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Baseline Data			0	0						0			0	0					0				0	

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



Historical Comments	
06/01/23	The fluid is in a reasonable condition and suitable for further use. The AN is elevated (0.59) but not to point where the fluid has become corrosive. The elevated AN in combination a decreased 10% GCD temperature and increased low boiler vapor content of 4.93% indicates normal (acceptable) thermal degradation of the fluid. It is recommended to vent off low boiler vapor. Please resample in 12 months. Since this is a large volume system consideration should be given to sweetening of the fill. This to limit acid number increase at an early stage instead of having to replace the whole volume when AN reaches the limit. (Acid Number increase progresses exponentially) Acid Number (AN) is abnormally high.
11/04/20	The acid number remains above normal. The acid number is a measure of the acidic compounds in the oil. Increases in the acid number are likely due to the formation of oxidation by products in the oil. This value will increase exponentially once the process begins. Tendencies are for sludge and deposits to increase and corrosion to occur if the fluid continues to be utilized beyond its limits. Although they are within normal limits, we would like to point out reducing trends in the flash point & increasing solids.
06/11/19	Based on the analysis results, it appears that the oil may have experienced acid number deterioration conditions. This may be due in part to the length of service on the oil (13 years indicated). The acid number is a measure of the acidic compounds in the oil. Increases in the acid number are likely due to the formation of oxidation by products in the oil. This value will increase exponentially once the process begins. Tendencies are for sludge and deposits to increase and corrosion to occur if the fluid continues to be utilized beyond its limits. None of the other oil degradation products are indicated. Acid Number (AN) is abnormally high.
07/12/18	Based on the analysis results, it appears that the oil may continue to experience oxidation. This may be due in part to the length of service on the oil (12 years indicated) The acid number continues to be above normal. The acid number, is a measure of the acidic compounds in the oil. Increases in the acid number are likely due to the formation of oxidation by products in the oil. This value will increase exponentially once the process begins. Tendencies are for sludge and deposits to increase and corrosion to occur if the fluid continues to be utilized beyond its limits. The oxidation level in the sample remains well above normal, however, it is remaining stable. Acid Number (AN) is abnormally high.

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