

## ENNIS HOT OIL SYSTEM

**Customer: PTRHTF10112**  
 CERTAINTEED - SAINT GOBAIN  
 2901 N KAUFMAN ST  
 ENNIS, TX 75119 USA  
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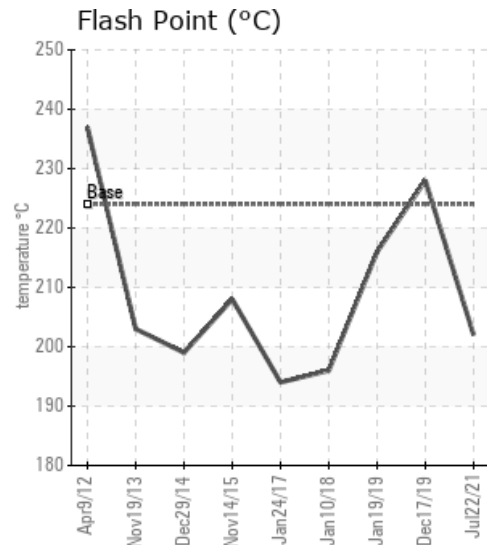
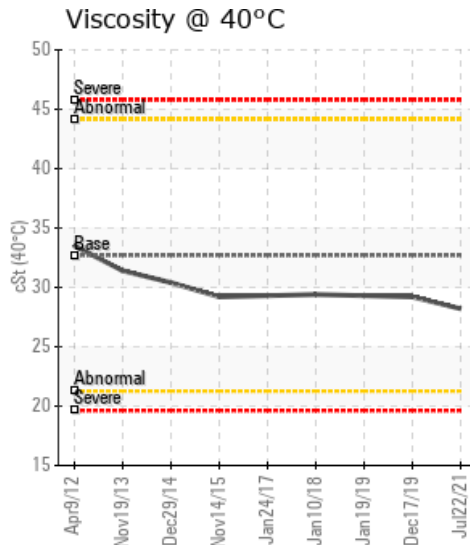
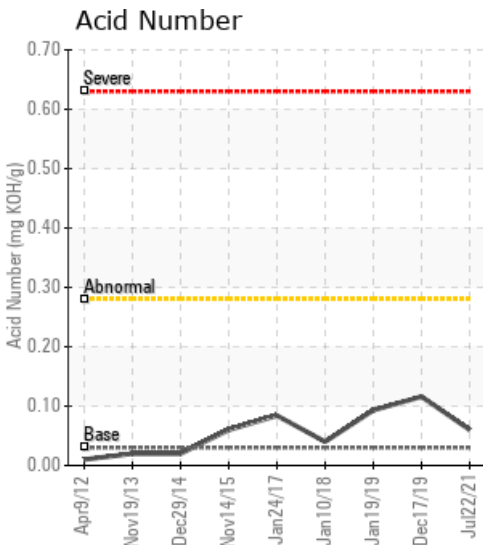
**System Information**  
 System Volume: 2000 gal  
 Bulk Operating Temp: 525F / 274C  
 Heating Source:  
 Blanket:  
 Fluid: PETRO CANADA CALFLO AF  
 Make: ENNIS

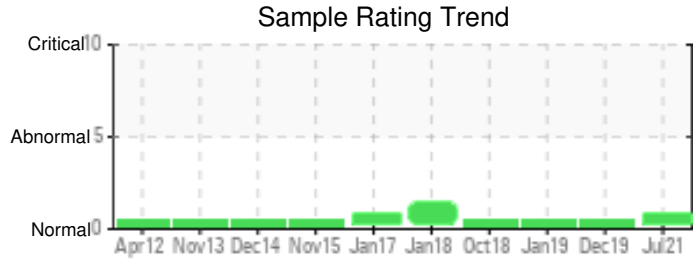
**Sample Information**  
 Lab No: 02438611  
 Analyst: Garrett Bapp  
 Sample Date: 07/22/21  
 Received Date: 08/13/21  
 Completed: 09/10/21  
 Garrett Bapp  
 Garrett.Bapp@HFSinclair.com

Recommendation: Fluid is showing signs of thermal cracking. Is is evident in the reduction in GCD 10%, rise in GCD 90%, reduction in COC Flash Point and decrease in viscosity. Recommendation to vent light ends from the system and resample at normal interval.

Comments: (GCD) 90% Distillation Point is abnormally high.

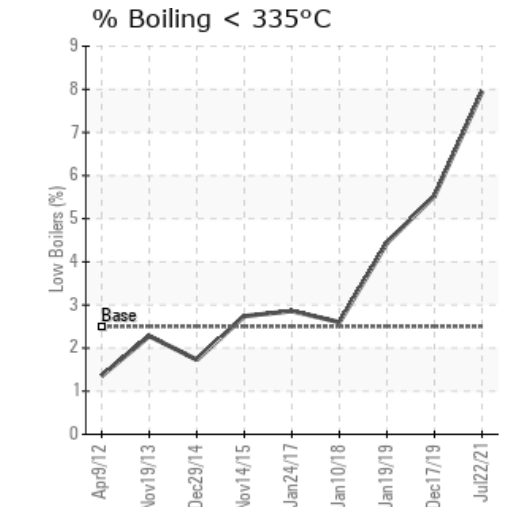
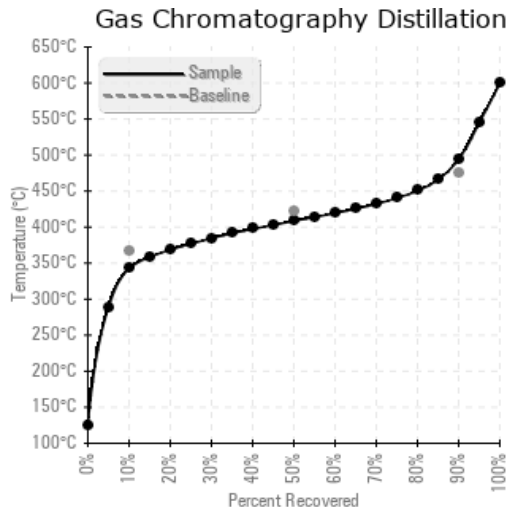
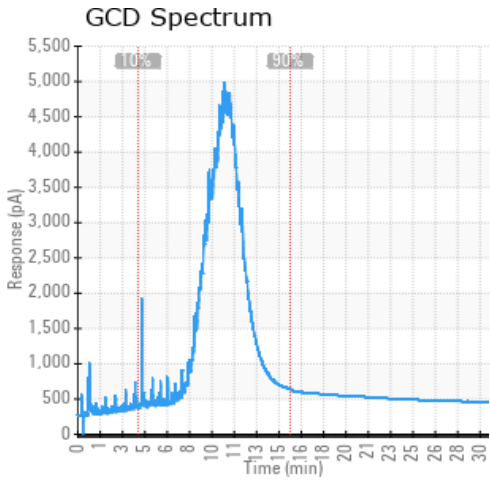
| Sample Date   | Received Date | Fluid Age | Sample Location | Flash Point (COC) | Water (KF) | Viscosity (40°C) | Acid Number | Solids | GCD 10%   | GCD 50%   | GCD 90%   | GCD % < 335°C |
|---------------|---------------|-----------|-----------------|-------------------|------------|------------------|-------------|--------|-----------|-----------|-----------|---------------|
|               | mm/dd/yy      |           |                 | °F/°C             | ppm        | cSt              | mg/KOH/g    | %wt    | °F/°C     | °F/°C     | °F/°C     | %             |
| 07/22/21      | 08/13/21      | 11.0y     | MAIN LOOP PUMP  | 396 / 202         | 20.4       | 28.2             | 0.06        | 0.035  | 649 / 343 | 767 / 408 | 921 / 494 | 7.95          |
| 12/17/19      | 12/30/19      | 9.0y      | MAIN PUMP       | 442 / 228         | 12.5       | 29.2             | 0.116       | 0.117  | 661 / 349 | 769 / 409 | 870 / 465 | 5.53          |
| 01/19/19      | 02/04/19      | 8.0y      | MAIN PUMPS      | 421 / 216         | 22.1       | 29.3             | 0.093       | 0.015  | 668 / 354 | 775 / 413 | 879 / 470 | 4.44          |
| 10/25/18      | 11/13/18      | 0.0y      |                 |                   |            |                  |             |        |           |           |           |               |
| 01/10/18      | 03/22/18      | 84.0y     |                 | 385 / 196         | 2.8        | 29.4             | 0.04        | 0.093  | 682 / 361 | 784 / 418 | 894 / 479 | 2.60          |
| Baseline Data |               |           |                 | 435 / 224         |            | 32.7             | 0.03        |        | 693 / 367 | 790 / 421 | 887 / 475 | 2.5           |





| 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 |
|----------------------|------|----------|--------|----------|--------|------|-----|---------|--------|----------|---------|--------|-----------|----------|------------|----------|-----------|---------|-------|-----------|---------|--------|------------|------|
| 07/22/21             | 0    | 0        | 0      | 0        | 0      | 0    | 0   | 0       | 0      | 0        | 0       | 0      | 0         | 0        | 0          | 0        | 0         | 0       | 0     | 0         | 0       | 0      | 29         | 0    |
| 12/17/19             | 0    | 0        | 0      | 0        | 0      | 0    | 0   | 0       | 0      | 0        | 0       | 0      | 0         | 0        | 0          | 0        | 0         | 0       | 0     | 0         | 0       | 0      | 31         | 0    |
| 01/19/19             | 0    | 0        | 0      | 0        | 0      | 0    | 0   | 0       | 0      | 0        | 0       | 0      | 0         | 0        | 0          | 0        | 0         | 0       | 0     | 0         | 0       | 0      | 38         | 0    |
| 10/25/18             | 352  | 1        | 3      | 9        | 5      | 0    | 3   | 0       | 0      | 0        | 24      | 6      | 0         | 1        | 1          | 0        | 5         |         | 0     | 1         | 112     | 0      | 45         | 8    |
| 01/10/18             | 0    | 0        | 0      | 0        | 0      | 0    | 0   | 0       | 0      | 0        | 0       | 0      | 0         | 0        | 0          | 0        | 0         | 0       | 0     | 0         | 0       | 0      | 17         | 0    |
| <b>Baseline Data</b> |      |          | 0      | 0        |        |      |     |         |        | 0        |         |        | 0         | 0        |            |          |           |         | 0     |           |         |        | 270        |      |

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



| Historical Comments |   |
|---------------------|---|
| 12/17/19            | Nothing changed since the last sample. The oil condition looks acceptable and no action appears to be needed at this time. Viscosity is normal, flash point is high, other properties are normal. Re-sample at next scheduled interval. |
| 01/19/19            | The oil condition looks acceptable and no action appears to be needed at this time. Viscosity is normal, flash point is high, other properties are normal. Re-sample at next scheduled interval.  |
| 10/25/18            | This is a baseline read-out on the submitted sample. Additive levels indicate a type of oil.  |
| 01/10/18            | The fluid condition appears normal at this time. No action needed other than re-sample at next scheduled interval.  |

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