

[KEYERA PARTNERSHIP / 3-12-46-14W5M] TOTE A

Customer: PTRHTF30084
 Keyera Partnership Brazeau River Ga...
 Box 7318
 Drayton Valley, AB T7A 1S5 Canada
 Attn: Don Renner
 Tel: (780)894-3601
 E-Mail: don_renner@keyera.com

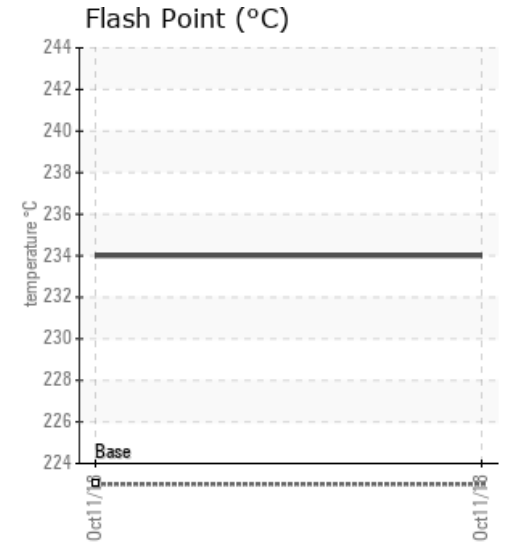
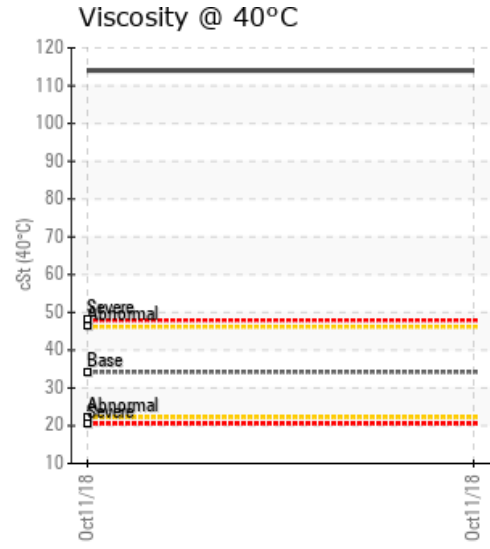
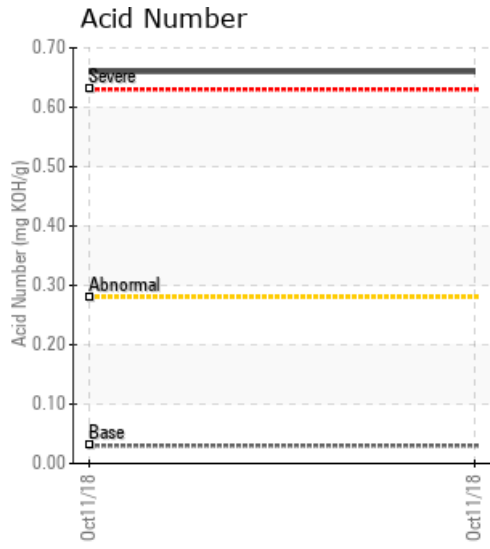
System Information
 System Volume: 0 ltr
 Bulk Operating Temp: Not Specified
 Heating Source:
 Blanket:
 Fluid: PETRO CANADA PETRO-THERM
 Make:

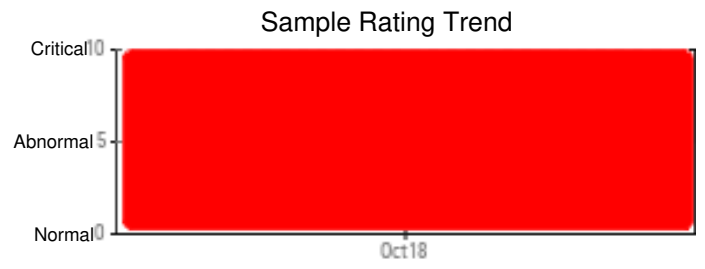
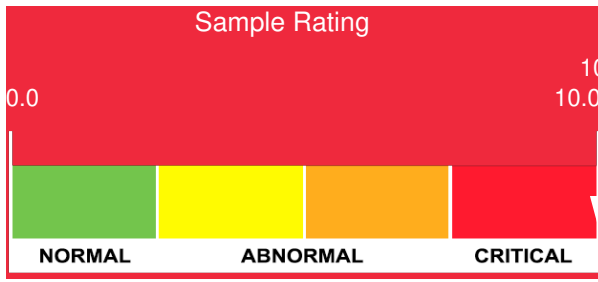
Sample Information
 Lab No: 02245900
 Analyst: Kevin McDermott
 Sample Date: 10/11/18
 Received Date: 10/18/18
 Completed: 10/22/18
 Kevin McDermott
 kevin.mcdermott@hollyfrontier.com

Recommendation: Fluid is not suitable for use and should be disposed of - suspected contamination.

Comments: Water contamination levels are severely high. Acid Number (AN) is severely high. (GCD) 10% Distillation Point is severely high. (GCD) 50% Distillation Point is severely high. (GCD) 90% Distillation Point is severely high. Zinc ppm levels are severely high. Calcium ppm levels are severely high. Visc @ 40°C is severely high. Phosphorus and sulfur ppm levels are abnormal.

| 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 | % |
| 10/11/18 | 10/18/18 | 0.0y | | 453 / 234 | 3110.7 | 114 | 0.66 | 0.169 | 834 / 446 | 917 / 492 | 1003 / 539 | 1.18 |
| Baseline Data | | | | 433 / 223 | | 34.2 | 0.03 | | 720 / 382 | 817 / 436 | 900 / 482 | 1.00 |

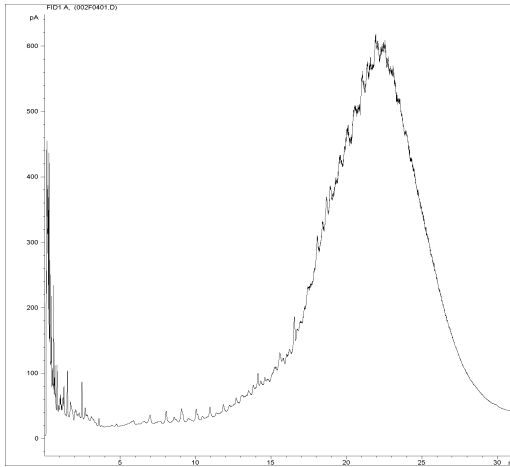




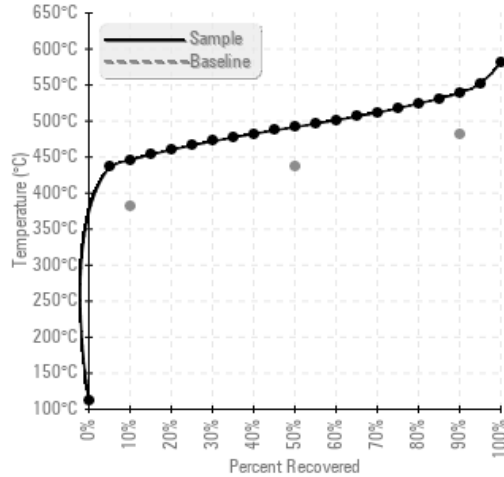
| Sample Date | Iron | Chromium | Nickel | Aluminum | Copper | Lead | Tin | Cadmium | Silver | Vanadium | Silicon | Sodium | Potassium | Titanium | Molybdenum | Antimony | Manganese | Lithium | Boron | Magnesium | Calcium | Barium | Phosphorus | Zinc |
|---------------|------|----------|--------|----------|--------|------|-----|---------|--------|----------|---------|--------|-----------|----------|------------|----------|-----------|---------|-------|-----------|---------|--------|------------|------|
| 10/11/18 | 21 | 0 | 0 | 2 | 1 | 2 | 0 | 0 | 0 | 0 | 3 | 2 | 11 | 0 | 7 | 0 | 0 | 0 | 4 | 1 | 77 | 18 | 615 | 136 |
| Baseline Data | | | 0 | 0 | | | | | | 0 | | | 0 | 0 | | | | | 0 | | | | 0 | |

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

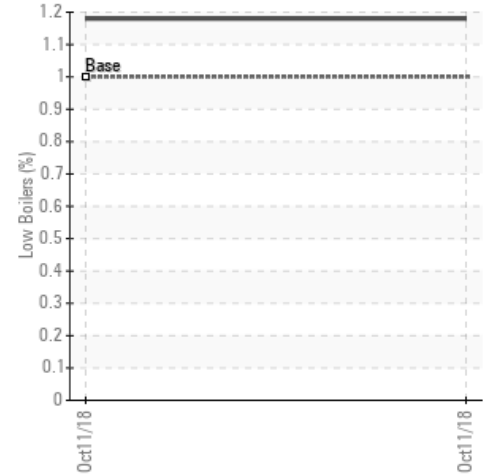
GCD Spectrum



Gas Chromatography Distillation



% Boiling < 335°C



Historical Comments

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