



# OIL ANALYSIS REPORT

|                 |          |
|-----------------|----------|
| WEAR            | NORMAL   |
| CONTAMINATION   | NORMAL   |
| FLUID CONDITION | ABNORMAL |

Machine Id  
**11 RUDDINGTON**  
 Component  
**Diesel Engine**  
 Fluid  
**PETRO CANADA XR 4 SAE 15W40 (--- LTR)**

## RECOMMENDATION

Confirm the source of the lubricant being utilized for top-up/fill. Resample at the next service interval to monitor. Please specify the component make and model with your next sample.

| Test           | UOM | Method      | Limit/Abn | Current     | History1    | History2    |
|----------------|-----|-------------|-----------|-------------|-------------|-------------|
| Sample Number  |     | Client Info |           | WC0914909   | WC0810815   | WC0678628   |
| Sample Date    |     | Client Info |           | 29 Apr 2024 | 03 May 2023 | 19 May 2022 |
| Machine Age    | yrs | Client Info |           | 0           | 0           | 0           |
| Oil Age        | yrs | Client Info |           | 0           | 0           | 0           |
| Filter Age     | yrs | Client Info |           | 0           | 0           | 0           |
| Oil Changed    |     | Client Info |           | N/A         | N/A         | N/A         |
| Filter Changed |     | Client Info |           | N/A         | N/A         | N/A         |
| Sample Status  |     |             |           | ABNORMAL    | ABNORMAL    | NORMAL      |

## WEAR

All component wear rates are normal.

|              |        |               |      |      |     |     |
|--------------|--------|---------------|------|------|-----|-----|
| Iron         | ppm    | ASTM D5185(m) | >100 | 12   | 10  | 8   |
| Chromium     | ppm    | ASTM D5185(m) | >20  | 0    | 0   | 0   |
| Nickel       | ppm    | ASTM D5185(m) | >4   | 0    | <1  | 0   |
| Titanium     | ppm    | ASTM D5185(m) |      | <1   | <1  | <1  |
| Silver       | ppm    | ASTM D5185(m) | >3   | 0    | 0   | 0   |
| Aluminum     | ppm    | ASTM D5185(m) | >20  | 2    | 1   | 2   |
| Lead         | ppm    | ASTM D5185(m) | >40  | 0    | 0   | 0   |
| Copper       | ppm    | ASTM D5185(m) | >330 | <1   | <1  | <1  |
| Tin          | ppm    | ASTM D5185(m) | >15  | 0    | 0   | 0   |
| Vanadium     | ppm    | ASTM D5185(m) |      | 0    | 0   | 0   |
| White Metal  | scalar | Visual*       | NONE | NONE | --- | --- |
| Yellow Metal | scalar | Visual*       | NONE | NONE | --- | --- |

## CONTAMINATION

Tests indicate that there is no fuel present in the oil. There is no indication of any contamination in the oil.

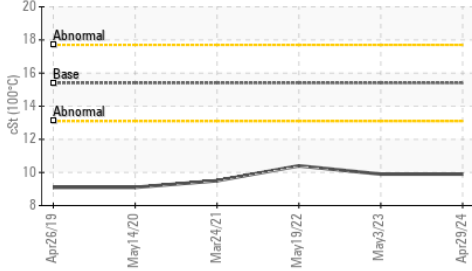
|                  |          |               |       |       |       |       |
|------------------|----------|---------------|-------|-------|-------|-------|
| Silicon          | ppm      | ASTM D5185(m) | >25   | 4     | 6     | 6     |
| Potassium        | ppm      | ASTM D5185(m) | >20   | 19    | <1    | <1    |
| Fuel             | %        | ASTM D7593*   | >5    | 0.0   | 0.4   | <1.0  |
| Water            |          | WC Method     | >0.2  | NEG   | NEG   | NEG   |
| Glycol           | %        | ASTM D7922*   |       | 0.0   | NEG   | NEG   |
| Soot %           | %        | ASTM D7844*   | >3    | 0     | 0     | 0     |
| Nitration        | Abs/cm   | ASTM D7624*   | >20   | 4.9   | 6.3   | 6.6   |
| Sulfation        | Abs/.1mm | ASTM D7415*   | >30   | 14.4  | 15.3  | 17.4  |
| Silt             | scalar   | Visual*       | NONE  | NONE  | ---   | ---   |
| Debris           | scalar   | Visual*       | NONE  | NONE  | ---   | ---   |
| Sand/Dirt        | scalar   | Visual*       | NONE  | VLITE | ---   | ---   |
| Appearance       | scalar   | Visual*       | NORML | NORML | ---   | ---   |
| Odor             | scalar   | Visual*       | NORML | NORML | NORML | NORML |
| Emulsified Water | scalar   | Visual*       | >0.2  | NEG   | NEG   | NEG   |

## FLUID CONDITION

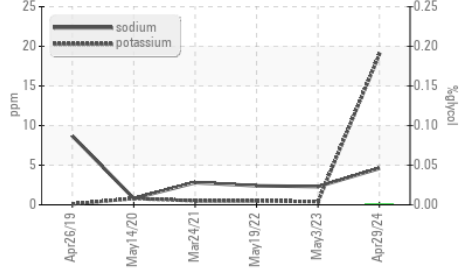
Viscosity of sample indicates oil is within SAE 30 range, advise investigate. This plus the additive levels indicates that this is not the same brand, or type of oil as reported. The condition of the oil is acceptable for the time in service.

|              |          |               |      |       |       |      |
|--------------|----------|---------------|------|-------|-------|------|
| Sodium       | ppm      | ASTM D5185(m) |      | 5     | 2     | 2    |
| Boron        | ppm      | ASTM D5185(m) | 1    | 68    | 33    | 68   |
| Barium       | ppm      | ASTM D5185(m) | 1    | 0     | 0     | 0    |
| Molybdenum   | ppm      | ASTM D5185(m) | 1    | 134   | 58    | 58   |
| Manganese    | ppm      | ASTM D5185(m) |      | <1    | <1    | <1   |
| Magnesium    | ppm      | ASTM D5185(m) | 10   | 436   | 384   | 660  |
| Calcium      | ppm      | ASTM D5185(m) | 3032 | 1176  | 999   | 1000 |
| Phosphorus   | ppm      | ASTM D5185(m) | 1054 | 576   | 529   | 591  |
| Zinc         | ppm      | ASTM D5185(m) | 1332 | 687   | 584   | 693  |
| Sulfur       | ppm      | ASTM D5185(m) | 3985 | 1490  | 1494  | 1700 |
| Oxidation    | Abs/.1mm | ASTM D7414*   | >25  | 7.8   | 8.3   | 12.4 |
| Visc @ 100°C | cSt      | ASTM D7279(m) | 15.4 | ▲ 9.9 | ▲ 9.9 | 10.4 |

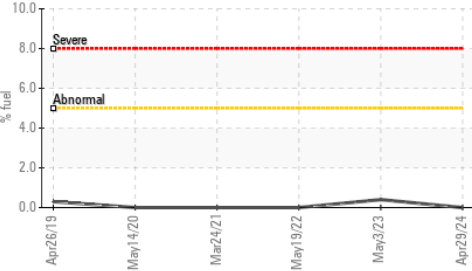
▲ Viscosity @ 100°C



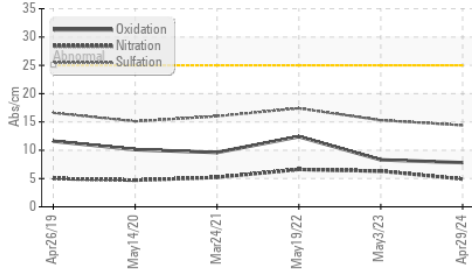
Glycol Contamination



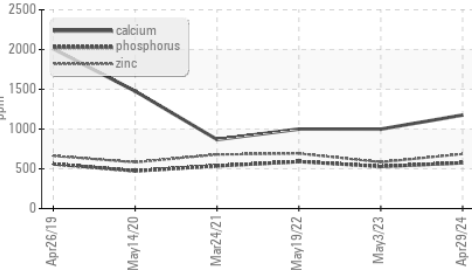
Fuel Dilution



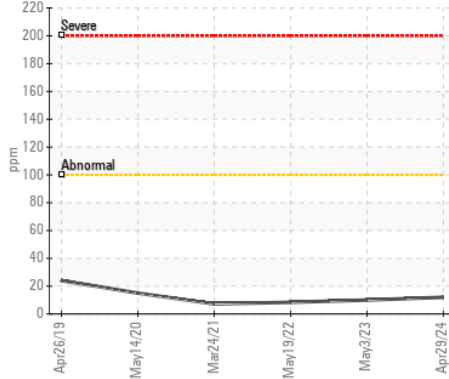
FT-IR (Direct Trend)



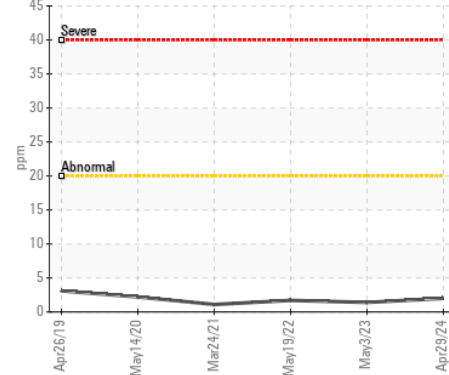
Additives



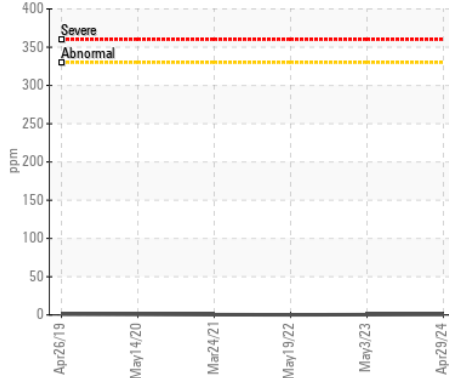
Iron (ppm)



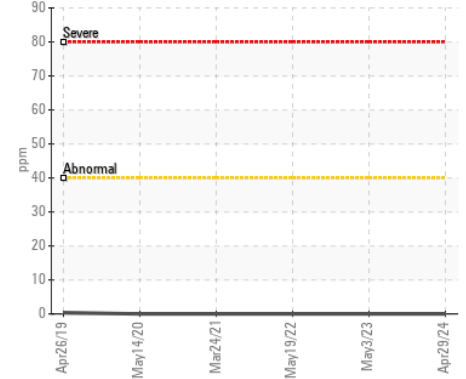
Aluminum (ppm)



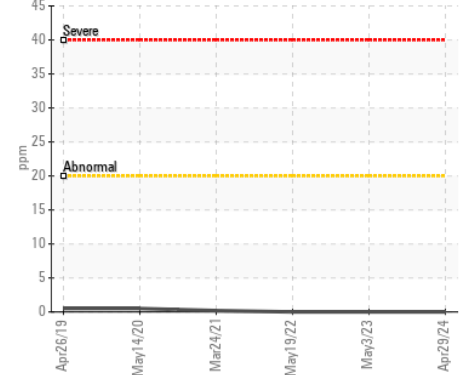
Copper (ppm)



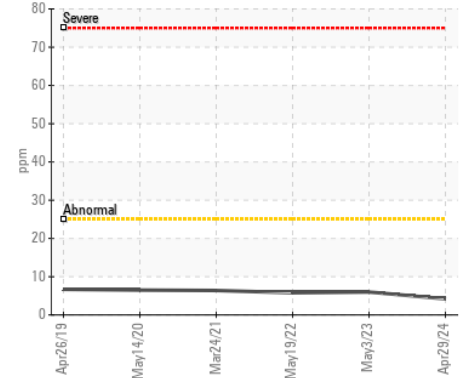
Lead (ppm)



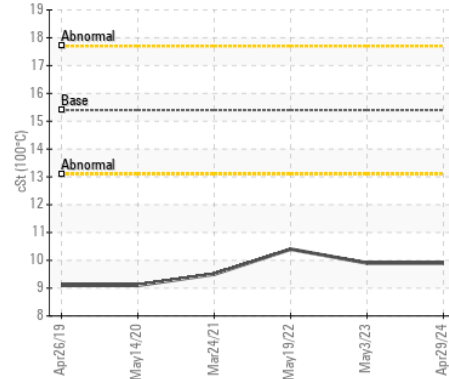
Chromium (ppm)



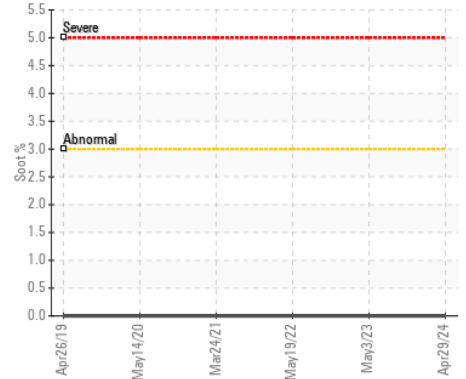
Silicon (ppm)



▲ Viscosity @ 100°C



Soot %



**Laboratory** : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9  
**Sample No.** : WC0914909  
**Lab Number** : 02633030  
**Unique Number** : 5774183  
**Test Package** : MOB 1 ( Additional Tests: FUELDILUTION, Glycol, PercentFuel, Visual )

**NORTHERN GENERATOR CO. LTD.**  
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To discuss this sample report, contact Customer Service at 1-800-268-2131.  
 Test denoted (\*) outside scope of accreditation, (m) method modified, (e) tested at external lab.  
 Validity of results and interpretation are based on the sample and information as supplied.