

## **OIL ANALYSIS REPORT**

Sample Rating Trend

WEAR

Machine Id EX0357 Component

Rear Hydraulic System Fluid PETRO CANADA HYDREX AW 46 (220 LTR)

### DIAGNOSIS

#### Recommendation

Check seals and/or filters for points of contaminant entry. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. The filter change at the time of sampling has been noted. Confirm the source of the lubricant being utilized for top-up/fill. Resample in 30-45 days to monitor this situation. Please specify the component make and model with your next sample.

#### A Wear

Iron ppm levels are abnormal. The low ferrous density (PQ) index indicates the wear metal levels are due to corrosion.

#### Contamination

There is a high amount of silt (particulates < 14 microns in size) present in the oil.

#### Fluid Condition

Additive levels indicate the addition of a different brand, or type of oil. Viscosity of sample indicates oil is within SAE 20 range, advise investigate. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

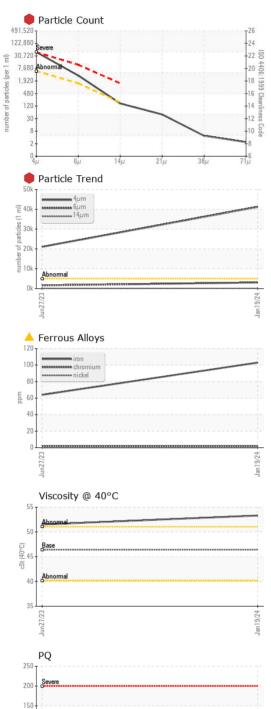
| <b>'</b>      |               |               | Jun2023    | Jan2024     |             |          |
|---------------|---------------|---------------|------------|-------------|-------------|----------|
| SAMPLE INFORM | <b>NATION</b> | method        | limit/base | current     | history1    | history2 |
| Sample Number |               | Client Info   |            | GFL0092293  | GFL0087350  |          |
| Sample Date   |               | Client Info   |            | 19 Jan 2024 | 27 Jun 2023 |          |
| Machine Age   | hrs           | Client Info   |            | 20413       | 19957       |          |
| Oil Age       | hrs           | Client Info   |            | 19957       | 2000        |          |
| Oil Changed   |               | Client Info   |            | Not Changd  | Not Changd  |          |
| Sample Status |               |               |            | SEVERE      | ABNORMAL    |          |
| CONTAMINATI   | ON            | method        | limit/base | current     | history1    | history2 |
| Water         |               | WC Method     | >0.1       | NEG         | NEG         |          |
| WEAR METALS   | S             | method        | limit/base | current     | history1    | history2 |
| PQ            |               | ASTM D8184*   |            | 5           | 0           |          |
| Iron          | ppm           | ASTM D5185(m) | >20        | <u> </u>    | <b>6</b> 4  |          |
| Chromium      | ppm           | ASTM D5185(m) | >10        | 2           | 2           |          |
| Nickel        | ppm           | ASTM D5185(m) | >10        | 0           | 0           |          |
| Titanium      | ppm           | ASTM D5185(m) |            | 0           | 0           |          |
| Silver        | ppm           | ASTM D5185(m) |            | 0           | 0           |          |
| Aluminum      | ppm           | ASTM D5185(m) | >10        | 1           | <1          |          |
| Lead          | ppm           | ASTM D5185(m) | >10        | <1          | <1          |          |
| Copper        | ppm           | ASTM D5185(m) | >75        | 5           | 5           |          |
| Tin           | ppm           | ASTM D5185(m) | >10        | <1          | <1          |          |
| Antimony      | ppm           | ASTM D5185(m) |            | 0           | <1          |          |
| Vanadium      | ppm           | ASTM D5185(m) |            | 0           | 0           |          |
| Beryllium     | ppm           | ASTM D5185(m) |            | 0           | 0           |          |
| Cadmium       | ppm           | ASTM D5185(m) |            | 0           | 0           |          |
| ADDITIVES     |               | method        | limit/base | current     | history1    | history2 |
| Boron         | ppm           | ASTM D5185(m) | 0          | 20          | 16          |          |
| Barium        | ppm           | ASTM D5185(m) | 0          | 0           | 0           |          |
| Molybdenum    | ppm           | ASTM D5185(m) | 0          | 0           | <1          |          |
| Manganese     | ppm           | ASTM D5185(m) | 0          | 1           | <1          |          |
| Magnesium     | ppm           | ASTM D5185(m) | 0          | 9           | 8           |          |
| Calcium       | ppm           | ASTM D5185(m) | 50         | 2334        | 2006        |          |
| Phosphorus    | ppm           | ASTM D5185(m) | 330        | 415         | 460         |          |
| Zinc          | ppm           | ASTM D5185(m) | 430        | 145         | 233         |          |
| Sulfur        | ppm           | ASTM D5185(m) | 760        | 2603        | 2154        |          |
| Lithium       | ppm           | ASTM D5185(m) |            | <1          | <1          |          |
| CONTAMINAN    | TS            | method        | limit/base | current     | history1    | history2 |
| Silicon       | ppm           | ASTM D5185(m) | >20        | 4           | 4           |          |
| Sodium        | ppm           | ASTM D5185(m) |            | 2           | 3           |          |
| Potassium     | ppm           | ASTM D5185(m) | >20        | 3           | 3           |          |



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# **OIL ANALYSIS REPORT**

an 19/7/



| FLUID CLEANLINESSmethodlimit/basecurrenthistory1history2Particles >4µmASTM D7647>5000411824 21040Particles >6µmASTM D7647>130030644 1624Particles >14µmASTM D7647>16014190Particles >21µmASTM D7647>1041Particles >38µmASTM D7647>1041Particles >71µmASTM D7647>320Oil CleanlinessISO 4406 (c)>19/17/1423/19/14A22/18/14VISUALmethodlimit/basecurrenthistory1history2White MetalscalarVisual*NONENONENONEYellow MetalscalarVisual*NONENONENONEYellow MetalscalarVisual*NONENONENONESittscalarVisual*NONENONENONESad/DiritscalarVisual*NONENONENONEAppearancescalarVisual*NORMLNORMLNORMLNORMLAppearancescalarVisual*NORMLNORMLNORMLNORMLAppearancescalarVisual*NORMLNORMLNORMLNORMLFree WaterscalarVisual*NORMLNORMLNORMLNORMLVisc@ 40°CcStASTM D7279m46.453.3 <td< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th></td<> |                 |        |               |            |                |                  |          |
|---|-----------------|--------|---------------|------------|----------------|------------------|----------|
| Particles >6µm  ASTM D7647  >1300  ▲ 3064  ▲ 1624     Particles >14µm  ASTM D7647  >160  141  90     Particles >21µm  ASTM D7647  >40  42  28     Particles >38µm  ASTM D7647  >10  4  1     Particles >38µm  ASTM D7647  >10  4  1     Particles >71µm  ASTM D7647  >3  2  0     Oil Cleanliness  ISO 4406 (c)  >19/17/14  23/19/14  22/18/14     VISUAL  method  limit/base  current  history1  history2    White Metal  scalar  Visual*  NONE  NONE  NONE     Yellow Metal  scalar  Visual*  NONE  NONE      Sitt  scalar  Visual*  NONE  NONE  NONE     Sold/Dirit  scalar  Visual*  NORML  NORML  NORML     Appearance  scalar  Visual*  NORML  NORML  | FLUID CLEANL    | INESS  | method        | limit/base | current        | history1         | history2 |
| Particles >14µm  ASTM D7647  >160  141  90     Particles >21µm  ASTM D7647  >40  42  28     Particles >38µm  ASTM D7647  >10  4  1     Particles >37µm  ASTM D7647  >3  2  0     Oil Cleanliness  ISO 4406 (c)  >19/17/14  23/19/14  22/18/14     VISUAL  method  limit/base  current  history1  history2    White Metal  scalar  Visual*  NONE  NONE  NONE     Yellow Metal  scalar  Visual*  NONE  NONE  NONE     Yellow Metal  scalar  Visual*  NONE  NONE  NONE     Yellow Metal  scalar  Visual*  NONE  NONE  NONE     Sitt  scalar  Visual*  NONE  NONE  NONE     Sand/Dirt  scalar  Visual*  NORML  NORML  NORML     Appearance  scalar  Visual* <td< td=""><th>Particles &gt;4µm</th><td></td><td>ASTM D7647</td><td>&gt;5000</td><td><b>•</b> 41182</td><td><b>a</b> 21040</td><td></td></td<>   | Particles >4µm  |        | ASTM D7647    | >5000      | <b>•</b> 41182 | <b>a</b> 21040   |          |
| Particles >21 µmASTM D7647>404228Particles >38µmASTM D7647>1041Particles >71 µmASTM D7647>320Oil CleanlinessISO 4406 (c)>19/17/1423/19/1422/18/14VISUALmethodlimit/basecurrenthistory1history2White MetalscalarVisual*NONENONENONEYellow MetalscalarVisual*NONENONENONEPrecipitatescalarVisual*NONENONENONESiltscalarVisual*NONENONENONESold/DirtscalarVisual*NONENONENONEAppearancescalarVisual*NORMLNORMLNORMLOdorscalarVisual*NORMLNORMLNORMLFree WaterscalarVisual*NORMLNORMLNORMLFLUID PROPERTIESmethodlimit/basecurrenthistory1history2Visc @ 40°CcStASTM D7279(m)46.453.351.5SAMPLE IMAGESmethodlimit/basecurrenthistory1history2Colorcolorimit/basecurrenthistory1history2  | Particles >6µm  |        | ASTM D7647    | >1300      | <b>A</b> 3064  | <b>1</b> 624     |          |
| Particles >38μm  ASTM D7647  >10  4  1     Particles >71μm  ASTM D7647  >3  2  0     Oil Cleanliness  ISO 4406 (c)  >19/17/14  23/19/14  A 22/18/14     VISUAL  method  limit/base  current  history1  history2    White Metal  scalar  Visual*  NONE  NONE  NONE     Yellow Metal  scalar  Visual*  NONE  NONE  NONE     Yellow Metal  scalar  Visual*  NONE  NONE  NONE     Yellow Metal  scalar  Visual*  NONE  NONE  NONE     Precipitate  scalar  Visual*  NONE  NONE  NONE     Silt  scalar  Visual*  NONE  NONE  NONE     Sand/Dirt  scalar  Visual*  NORML  NORML  NORML     Appearance  scalar  Visual*  NORML  NORML  NORML     Free Water  s   | Particles >14µm |        | ASTM D7647    | >160       | 141            | 90               |          |
| Particles >71μm  ASTM D7647  >3  2  0     Oil Cleanliness  ISO 4406 (c)  >19/17/14  23/19/14  22/18/14     VISUAL  method  limit/base  current  history1  history2    White Metal  scalar  Visual*  NONE  NONE  NONE     Yellow Metal  scalar  Visual*  NONE  NONE  NONE     Precipitate  scalar  Visual*  NONE  NONE  NONE     Silt  scalar  Visual*  NONE  NONE  NONE     Debris  scalar  Visual*  NONE  NONE  NONE     Sand/Dirt  scalar  Visual*  NONE  NONE  NONE     Appearance  scalar  Visual*  NORML  NORML  NORML     Odor  scalar  Visual*  NORML  NORML  NORML     Emulsified Water  scalar  Visual*  >0.1  NEG  NEG     Free Water   | Particles >21µm |        | ASTM D7647    | >40        | 42             | 28               |          |
| Oil Cleanliness  ISO 4406 (c)  >19/17/14  23/19/14  22/18/14     VISUAL  method  limit/base  current  history1  history2    White Metal  scalar  Visual*  NONE  NONE  NONE     Yellow Metal  scalar  Visual*  NONE  NONE  NONE     Precipitate  scalar  Visual*  NONE  NONE  NONE     Silt  scalar  Visual*  NONE  NONE  NONE     Debris  scalar  Visual*  NONE  NONE  NONE     Sand/Dirt  scalar  Visual*  NONE  NONE  NONE     Appearance  scalar  Visual*  NORML  NORML  NORML     Codor  scalar  Visual*  NORML  NORML  NORML     Free Water  scalar  Visual*  NORML  NORML  NEG     FLUID PROPERTIES  method  limit/base  current  history1  history2 <td< td=""><th>Particles &gt;38µm</th><td></td><td>ASTM D7647</td><td>&gt;10</td><td>4</td><td>1</td><td></td></td<>   | Particles >38µm |        | ASTM D7647    | >10        | 4              | 1                |          |
| VISUAL  method  limit/base  current  history1  history2    White Metal  scalar  Visual*  NONE  NONE  NONE     Yellow Metal  scalar  Visual*  NONE  NONE  NONE     Precipitate  scalar  Visual*  NONE  NONE  NONE     Silt  scalar  Visual*  NONE  NONE  NONE     Debris  scalar  Visual*  NONE  NONE  NONE     Sand/Dirt  scalar  Visual*  NONE  NONE  NONE     Appearance  scalar  Visual*  NORML  NORML  NORML     Odor  scalar  Visual*  NORML  NORML  NORML     Emulsified Water  scalar  Visual*  NORML  NORML  NORML     Free Water  scalar  Visual*  >0.1  NEG  NEG     Visc @ 40°C  cSt  ASTM D7279(m)  46.4  53.3  51.5  | Particles >71µm |        | ASTM D7647    | >3         | 2              | 0                |          |
| White Metal  scalar  Visual*  NONE  NONE  NONE     Yellow Metal  scalar  Visual*  NONE  NONE  NONE     Precipitate  scalar  Visual*  NONE  NONE  NONE     Silt  scalar  Visual*  NONE  NONE  NONE     Debris  scalar  Visual*  NONE  NONE  NONE     Sand/Dirt  scalar  Visual*  NONE  NONE  NONE     Appearance  scalar  Visual*  NORML  NORML  NORML     Odor  scalar  Visual*  NORML  NORML  NORML     Emulsified Water  scalar  Visual*  NORML  NORML  NORML     Free Water  scalar  Visual*  >0.1  NEG  NEG     FLUID PROPERTIES  method  limit/base  current  history1  history2    Visc @ 40°C  cSt  ASTM D7279(m)  46.4  53.3  51.5  | Oil Cleanliness |        | ISO 4406 (c)  | >19/17/14  | • 23/19/14     | <b>2</b> 2/18/14 |          |
| Yellow Metal  scalar  Visual*  NONE  NONE  NONE  NONE     Precipitate  scalar  Visual*  NONE  NONE  NONE  NONE     Silt  scalar  Visual*  NONE  NONE  NONE  NONE     Debris  scalar  Visual*  NONE  NONE  NONE     Sand/Dirt  scalar  Visual*  NONE  NONE  NONE     Appearance  scalar  Visual*  NORML  NORML  NORML     Odor  scalar  Visual*  NORML  NORML  NORML     Odor  scalar  Visual*  NORML  NORML  NORML     Emulsified Water  scalar  Visual*  NORML  NORML  NORML     Free Water  scalar  Visual*  >0.1  NEG  NEG     FLUID PROPERTIES  method  limit/base  current  history1  history2    Visc @ 40°C  cSt  ASTM D7279(m)  46.4  | VISUAL          |        | method        | limit/base | current        | history1         | history2 |
| PrecipitatescalarVisual*NONENONENONENONESiltscalarVisual*NONENONENONENONEDebrisscalarVisual*NONENONENONENONESand/DirtscalarVisual*NONENONENONEAppearancescalarVisual*NORMLNORMLNORMLOdorscalarVisual*NORMLNORMLNORMLEmulsified WaterscalarVisual*>0.1NEGNEGFree WaterscalarVisual*>0.1NEGNEGFLUID PROPERTIESmethodlimit/basecurrenthistory1history2Visc @ 40°CcStASTM D7279(m)46.453.351.5SAMPLE IMAGESmethodlimit/basecurrenthistory1history2ColorImageImageImageImageImage  | White Metal     | scalar | Visual*       | NONE       | NONE           | NONE             |          |
| Silt  scalar  Visual*  NONE  NONE  NONE  NONE     Debris  scalar  Visual*  NONE  NONE  NONE     Sand/Dirt  scalar  Visual*  NONE  NONE  NONE     Sand/Dirt  scalar  Visual*  NONE  NONE  NONE     Appearance  scalar  Visual*  NORML  NORML  NORML     Odor  scalar  Visual*  NORML  NORML  NORML     Odor  scalar  Visual*  NORML  NORML  NORML     Emulsified Water  scalar  Visual*  >0.1  NEG  NEG     Free Water  scalar  Visual*  >0.1  NEG  NEG     FLUID PROPERTIES  method  limit/base  current  history1  history2    Visc @ 40°C  cSt  ASTM D7279(m)  46.4  53.3  51.5     SAMPLE IMAGES  method  limit/base  current  history1  history2 </td <th>Yellow Metal</th> <td>scalar</td> <td>Visual*</td> <td>NONE</td> <td>NONE</td> <td>NONE</td> <td></td>  | Yellow Metal    | scalar | Visual*       | NONE       | NONE           | NONE             |          |
| Silt  scalar  Visual*  NONE  NONE  NONE  NONE     Debris  scalar  Visual*  NONE  NONE  NONE  NONE     Sand/Dirt  scalar  Visual*  NONE  NONE  NONE  NONE     Appearance  scalar  Visual*  NORML  NORML  NORML     Odor  scalar  Visual*  NORML  NORML  NORML     Odor  scalar  Visual*  NORML  NORML  NORML     Odor  scalar  Visual*  NORML  NORML  NORML     Emulsified Water  scalar  Visual*  >0.1  NEG  NEG     Free Water  scalar  Visual*  >0.1  NEG  NEG     FLUID PROPERTIES  method  limit/base  current  history1  history2    Visc @ 40°C  cSt  ASTM D7279(m)  46.4  53.3  51.5     SAMPLE IMAGES  method  limit/base  current  histor  | Precipitate     | scalar | Visual*       | NONE       | NONE           | NONE             |          |
| Sand/Dirt  scalar  Visual*  NONE  NONE  NONE     Appearance  scalar  Visual*  NORML  NORML  NORML     Odor  scalar  Visual*  NORML  NORML  NORML     Odor  scalar  Visual*  NORML  NORML  NORML     Emulsified Water  scalar  Visual*  >0.1  NEG  NEG     Free Water  scalar  Visual*  >0.1  NEG  NEG     FLUID PROPERTIES  method  limit/base  current  history1  history2    Visc @ 40°C  cSt  ASTM D7279(m)  46.4  53.3  51.5     SAMPLE IMAGES  method  limit/base  current  history1  history2    Color  | -               | scalar | Visual*       | NONE       | NONE           | NONE             |          |
| Sand/Dirt  scalar  Visual*  NONE  NONE  NONE     Appearance  scalar  Visual*  NORML  NORML  NORML     Odor  scalar  Visual*  NORML  NORML  NORML     Odor  scalar  Visual*  NORML  NORML  NORML     Emulsified Water  scalar  Visual*  >0.1  NEG  NEG     Free Water  scalar  Visual*  >0.1  NEG  NEG     FLUID PROPERTIES  method  limit/base  current  history1  history2    Visc @ 40°C  cSt  ASTM D7279(m)  46.4  53.3  51.5     SAMPLE IMAGES  method  limit/base  current  history1  history2    Color  |                 |        |               |            | -              |                  |          |
| Appearance  scalar  Visual*  NORML  NORML  NORML  NORML     Odor  scalar  Visual*  NORML  NORML  NORML  NORML     Emulsified Water  scalar  Visual*  >0.1  NEG  NEG     Free Water  scalar  Visual*  >0.1  NEG  NEG     FLUID PROPERTIES  method  limit/base  current  history1  history2    Visc @ 40°C  cSt  ASTM D7279(m)  46.4  53.3  51.5     SAMPLE IMAGES  method  limit/base  current  history1  history2    Color  |                 |        |               |            | -              |                  |          |
| Odor  scalar  Visual*  NORML  NORML  NORML     Emulsified Water  scalar  Visual*  >0.1  NEG  NEG     Free Water  scalar  Visual*  >0.1  NEG  NEG     FLUID PROPERTIES  method  limit/base  current  history1  history2    Visc @ 40°C  cSt  ASTM D7279(m)  46.4  53.3  51.5     SAMPLE IMAGES  method  limit/base  current  history1  history2    Color   |                 |        |               |            | -              |                  |          |
| Emulsified Water  scalar  Visual*  >0.1  NEG  NEG     Free Water  scalar  Visual*  Imit/base  current  history1  history2    FLUID PROPERTIES  method  limit/base  current  history1  history2    Visc @ 40°C  cSt  ASTM D7279(m)  46.4  53.3  51.5     SAMPLE IMAGES  method  limit/base  current  history1  history2    Color  Imit/base  current  history1  history2   |                 |        |               |            |                |                  |          |
| Free Water  scalar  Visual*  NEG  NEG     FLUID PROPERTIES  method  limit/base  current  history1  history2    Visc @ 40°C  cSt  ASTM D7279(m)  46.4  53.3  51.5     SAMPLE IMAGES  method  limit/base  current  history1  history2    Color  Imit/base  current  history1  history2  |                 |        |               |            | -              |                  |          |
| FLUID PROPERTIES  method  limit/base  current  history1  history2    Visc @ 40°C  cSt  ASTM D7279(m)  46.4  53.3  51.5     SAMPLE IMAGES  method  limit/base  current  history1  history2    Color  Imit/base  current  history1  no image  |                 |        |               |            |                |                  |          |
| Visc @ 40°C  cSt  ASTM D7279(m)  46.4  53.3  51.5     SAMPLE IMAGES  method  limit/base  current  history1  history2    Color  Image  Image  Image  Image  Image  |                 |        |               | limit/base |                |                  |          |
| SAMPLE IMAGES  method  limit/base  current  history1  history2    Color  Imit/base  Imit/base  Imit/base  Imit/base  Imit/base  Imit/base   |                 |        |               |            |                |                  |          |
| Color no image  |                 |        | ASTM D7279(m) |            | 53.3           | 51.5             |          |
|   |                 | IFS .  | method        | limit/base | current        | history1         | history2 |
|   | SAMELE IMAC     |        |               |            |                |                  |          |
|   | SAMFLE IMAC     |        |               |            |                |                  |          |
| Bottom no image   |                 |        |               |            |                |                  | no image |
| Bottom no image   |                 |        |               |            |                |                  | no image |
| Bottom no image   |                 |        |               |            |                |                  | no image |
|   |                 |        |               |            |                |                  | no image |
|   | Color           |        |               |            |                |                  |          |
|   | Color           |        |               |            |                |                  |          |
|   | Color           |        |               |            |                |                  |          |
|   | Color           |        |               |            |                |                  |          |
|   | Color           |        |               |            |                |                  |          |
|   | Color           |        |               |            |                |                  |          |
|   | Color           |        |               |            |                |                  |          |
|   | Color           |        |               |            |                |                  |          |
|   | Color           |        |               |            |                |                  |          |
|   | Color           |        |               |            |                |                  |          |
|   | Color           |        |               |            |                |                  |          |
|   | Color           |        |               |            |                |                  |          |
|   | Color           |        |               |            |                |                  |          |
|   | Color           |        |               |            |                |                  |          |
|   | Color           |        |               |            |                |                  |          |

: WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 GFL Environmental - 720 - Lafleche - Landfill Laboratory CALA Sample No. : GFL0092293 Recieved : 24 Jan 2024 17125 Lafleche Road, Lab Number : 02610886 Diagnosed : 25 Jan 2024 Moose Creek, ON ISO 17025:2017 Accredited Laboratory Unique Number : 5719981 Diagnostician : Kevin Marson CA K0C 1W0 Test Package : MOB 1 (Additional Tests: PQ, PrtCount) Contact: Charles Bergeron To discuss this sample report, contact Customer Service at 1-800-268-2131. cbergeron@gflenv.com T: (613)538-4853 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. F: