

# **OIL ANALYSIS REPORT**

### Sample Rating Trend



#### Area 600HP Machine Id 9902 [600HP] Component

**Diesel Engine** 

PETRO CANADA DURON SHP 10W30 (--- GAL)

# DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil.

## Fluid Condition

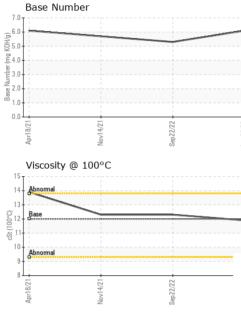
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		PCA0101256	PCA0067785	PCA0055694
Sample Date		Client Info		23 Aug 2023	22 Sep 2022	14 Nov 2021
Machine Age	hrs	Client Info		24591	21670	18057
Oil Age	hrs	Client Info		3000	3100	3000
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	15	21	16
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm		>4	0	<1	0
Titanium	ppm	ASTM D5185m	- 1	0	<1	0
Silver	ppm	ASTM D5185m	>3	0	<1	<1
Aluminum	ppm	ASTM D5185m	>20	2	2	<1
Lead	ppm	ASTM D5185m	>40	0	0	<1
Copper	ppm		>330	<1	1	1
Tin	ppm		>15	0	<1	<1
Antimony	ppm	ASTM D5185m	210			0
Vanadium	ppm	ASTM D5185m		0	1	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
	ppm					
Boron	ppm	ASTM D5185m	2	0	0	2
Boron Barium	ppm	ASTM D5185m ASTM D5185m	2 0	0 0	0	2 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50	0 0 71	0	2
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0	0 0 71 <1	0 0 68 1	2 0 59 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0 950	0 0 71 <1 1216	0 0 68 1 1033	2 0 59 <1 936
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0 950 1050	0 0 71 <1 1216 1417	0 0 68 1 1033 1161	2 0 59 <1 936 1364
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0 950	0 0 71 <1 1216 1417 1237	0 0 68 1 1033	2 0 59 <1 936
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 950 1050 995	0 0 71 <1 1216 1417	0 0 68 1 1033 1161 1139	2 0 59 <1 936 1364 1138
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0 950 1050 995 1180	0 0 71 <1 1216 1417 1237 1560	0 0 68 1 1033 1161 1139 1363	2 0 59 <1 936 1364 1138 1211
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0 950 1050 995 1180 2600	0 0 71 <1 1216 1417 1237 1560 3962	0 0 68 1 1033 1161 1139 1363 3250	2 0 59 <1 936 1364 1138 1211 2673
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 950 1050 995 1180 2600	0 0 71 <1 1216 1417 1237 1560 3962 current	0 0 68 1 1033 1161 1139 1363 3250 history1	2 0 59 <1 936 1364 1138 1211 2673 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 950 1050 995 1180 2600 <b>limit/base</b> >25	0 0 71 <1 1216 1417 1237 1560 3962 current 5	0 0 68 1 1033 1161 1139 1363 3250 history1 6	2 0 59 <1 936 1364 1138 1211 2673 history2 7
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 950 1050 995 1180 2600 <b>limit/base</b> >25	0 0 71 <1 1216 1417 1237 1560 3962 current 5 9	0 0 68 1 1033 1161 1139 1363 3250 history1 6 10	2 0 59 <1 936 1364 1138 1211 2673 history2 7 8
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	2 0 50 950 1050 995 1180 2600 <b>limit/base</b> >25 >20	0 0 71 <1 1216 1417 1237 1560 3962 current 5 9 0	0 0 68 1 1033 1161 1139 1363 3250 history1 6 10 0	2 0 59 <1 936 1364 1138 1211 2673 history2 7 8 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	2 0 50 0 950 1050 995 1180 2600 <b>limit/base</b> >25 -20 <b>limit/base</b>	0 0 71 <1 1216 1417 1237 1560 3962 current 5 9 0 0	0 0 68 1 1033 1161 1139 1363 3250 history1 6 10 0 0 history1	2 0 59 <1 936 1364 1138 1211 2673 history2 7 8 <1 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m	2 0 50 0 950 1050 995 1180 2600 <b>Imit/base</b> >25 >20 <b>Imit/base</b> >3	0 0 71 <1 1216 1417 1237 1560 3962 current 5 9 0 0 current 0.1	0 0 68 1 1033 1161 1139 1363 3250 history1 6 10 0 history1 0.2	2 0 59 <1 936 1364 1138 1211 2673 history2 7 8 <1 history2 0.1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	2 0 50 0 950 1050 995 1180 2600 <i>imit/base</i> >25 >20 <i>imit/base</i> >3 >20	0 0 71 <1 1216 1417 1237 1560 3962 <i>current</i> 5 9 0 <i>current</i> 0.1 11.1	0 0 68 1 1033 1161 1139 1363 3250 history1 6 10 0 bistory1 0.2 14.1	2 0 59 <1 936 1364 1138 1211 2673 history2 7 8 <1 8 <1 history2 0.1 11.8
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	2 0 50 0 950 1050 995 1180 2600 <b>imit/base</b> >25 <b>imit/base</b> >3 >20	0 0 71 <1 1216 1417 1237 1560 3962 <u>current</u> 5 9 0 0 <u>current</u> 0.1 11.1 20.9	0 0 68 1 1033 1161 1139 1363 3250 history1 6 10 0 <u>history1</u> 0.2 14.1 26.3	2 0 59 <1 936 1364 1138 1211 2673 <b>history2</b> 7 8 <1 <b>history2</b> 0.1 11.8 24.1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844	2 0 50 0 950 1050 995 1180 2600 <b>imit/base</b> >25 >20 <b>imit/base</b> >3 >20 >30	0 0 71 <1 1216 1417 1237 1560 3962 <i>current</i> 5 9 0 <i>current</i> 0.1 11.1 20.9 <i>current</i>	0 0 68 1 1033 1161 1139 1363 3250 history1 6 10 0 history1 0.2 14.1 26.3 history1	2 0 59 <1 936 1364 1138 1211 2673 history2 7 8 <1 history2 0.1 11.8 24.1 history2



# **OIL ANALYSIS REPORT**

VISUAL



		White Metal	scalar *	Visual	NONE	NONE	NONE	NONE
		Yellow Metal	scalar *	Visual	NONE	NONE	NONE	NONE
		Precipitate		Visual	NONE	NONE	NONE	NONE
		Silt		Visual	NONE	NONE	NONE	NONE
		Debris		Visual	NONE	NONE	NONE	NONE
		Sand/Dirt	scalar *	Visual	NONE	NONE	NONE	NONE
Sep 22/22	Aug23/23	Appearance	scalar *	Visual	NORML	NORML	NORML	NORML
Sep	Aug	Odor	scalar *	Visual	NORML	NORML	NORML	NORML
		Emulsified Water	scalar *	Visual	>0.2	NEG	NEG	NEG
		Free Water		Visual		NEG	NEG	NEG
		FLUID PROP			limit/base	current	history1	history2
		Visc @ 100°C	cSt A	ASTM D445	12.00	11.9	12.3	12.3
		GRAPHS						
		Ferrous Alloys						
12		iron						
Sep 22/22		20 - nickel						
S								
		15- E						
		udd 10						
		10-						
		5-						
			And and a second s		Hanna			
		Apr1 8/2'	CU CC	1717	Aug23/23			
		Apr		7dae	Aug2			
		Non-ferrous Met	als					
	<sup>10</sup> T							
		copper						
		8 - management tin						
		E						
		udd 4						
		4 2 0	**************************************		3			
		4 2 0	**************************************	771770	023/23 <b>1</b>			
		4 4 1 1 1 1 1 1 1 1 1 1 1 1 1		77777 dae	Aug23/23			
		Viscosity @ 1000		77777 dag		Base Number		
		Viscosity @ 100 <sup>4</sup>		Japan Japa	7.0	°⊤		
		Viscosity @ 1000		gebruit tester	7.0			
		Viscosity @ 1000		9421777	7.0			
		Viscosity @ 1000			7.0			
		Viscosity @ 1000			7.0			
		Viscosity @ 1000			7.0			
		Viscosity @ 1000			7.0			
		Viscosity @ 1000			7.0	D		
		Viscosity @ 1000	°C		7.1 6.1 (0) (5.1 ) (0) (5.1 ) (0) (5.1 ) (0) (5.1 ) (0) (5.1 ) (0) (5.1) (0)			
		Viscosity @ 1000	°C		7.1 6.1 (0) (5.1 ) (0) (5.1 ) (0) (5.1 ) (0) (5.1 ) (0) (5.1 ) (0) (5.1) (0)		4/2) 2.22	
		Viscosity @ 1000			7.1 6.1 (0) (5.1 ) (0) (5.1 ) (0) (5.1 ) (0) (5.1 ) (0) (5.1 ) (0) (5.1) (0)		Novr 4/2	
		Viscosity @ 1000	°C		7.1 6.1 (0, H5.1 uu) 10 10 10 10 10 10 10 11 1.1	April821		
	Laboratory	Viscosity @ 1000 Viscosity @ 1000 boomal boomal Court	°C	n Ave., Car	7.1 (0)H5.1 (0	April821	Company - Hig	h Plains - 600l
NAB	Sample No.	Viscosity @ 1000 Viscosity @ 1000 Control of the second se	°C	n Ave., Car : 08 S	7.1 6.1 0,0,5,1 1,1 0,1 0,1 0,1 0,1 0,1 0,1 0	April821	Company - Hig	h <b>Plains - 600l</b> ′ East Loop 2
	Sample No. Lab Number	Viscosity @ 1000 Viscosity @ 1000 Abnomal	°C - 501 Madiso Received Diagnosec	n Ave., Car : 08 S : 12 S	7.1 6.1 ()(h)(y)(h)(h)(h)(h)(h)(h)(h)(h)(h)(h)(h)(h)(h)	April821	Company - Hig	h <b>Plains - 600l</b> ' East Loop 2 LUBBOCK, 1
	Sample No. Lab Number Unique Number	Viscosity @ 1000 Viscosity & Viscosity @ 1000 Viscosity & Viscosity & Visco	°C	n Ave., Car : 08 S : 12 S	7.1 6.1 0,0,5,1 1,1 0,1 0,1 0,1 0,1 0,1 0,1 0	April821	Company - Higl 1717	h <b>Plains - 600l</b> Zast Loop 2 LUBBOCK, <sup>-</sup> US 794
ficate L2367	Sample No. Lab Number Unique Number Test Package	Viscosity @ 1000 Viscosity & Viscosity @ 1000 Viscosity & Viscosity & Visco	°C - 501 Madiso Received Diagnosec Diagnostic	n Ave., Car : 08 S : 12 S ian : Don	7.1 6.1 ()(h)(h)(h)(h)(h)(h)(h)(h)(h)(h)(h)(h)(h	April821	Company - Higl 1717 Contact	h <b>Plains - 600l</b> ' East Loop 2 LUBBOCK, <sup>-</sup>

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)