

## **OIL ANALYSIS REPORT**







Machine Id **204478** Component

Diesel Engine

PETRO CANADA DURON HP 15W40 (--- QTS)

### DIAGNOSIS

#### Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

#### Contamination

Fuel content negligible. There is no indication of any contamination in the oil.

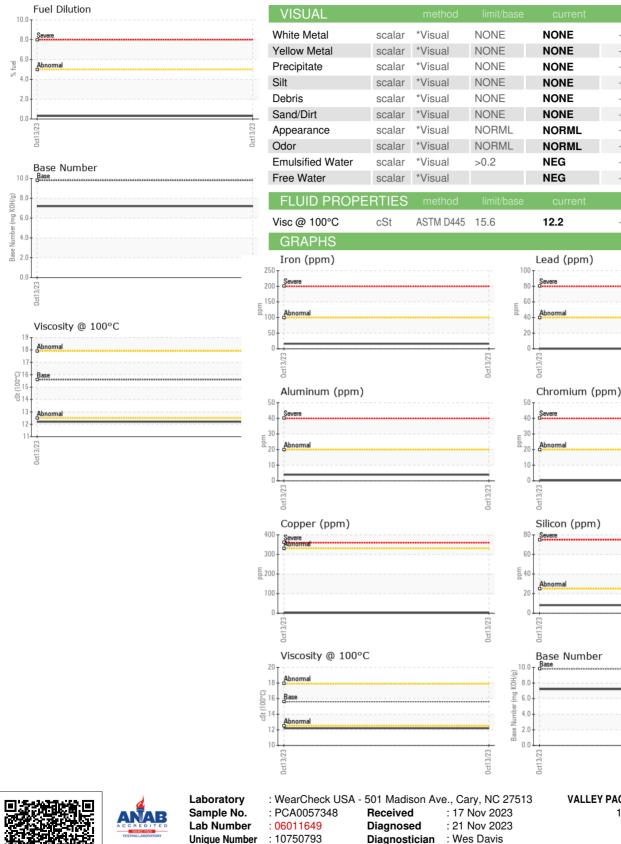
#### Fluid Condition

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

Sample Date      Client Info      13 Oct 2023          Wachine Age      mis      Client Info      118853          Oil Age      mis      Client Info      19862          Oil Changed      Client Info      Changed          CONTAMINATION      method      Imit/base      current      history1         CONTAMINATION      method      Imit/base      current      history1         Water      WC Method      >0.2      NEG          WEAR METALS      method      Imit/base      current      history1      history2        Vickel      ppm      ASTM D5185m      >20      <1          Silver      ppm      ASTM D5185m      >4      <1          Silver      ppm      ASTM D5185m      >4      <1          Aluminum      ppm      ASTM D5185m      >20      4          Copper      ppm </th <th>SAMPLE INFORM</th> <th>MATION</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age      mis      Client Info      118953          Dil Age      mis      Client Info      19862          Dil Changed      Client Info      19862          Sample Status      Client Info      19862          CONTAMINATION      method      Imit/base      current      History1      History2        Water      WC Method      >0.2      NEG          WEAR METALS      method      Imit/base      current      History1      History2        Wear      ppm      ASTM 05185m      >10.0      16          Nickel      ppm      ASTM 05185m      >4      <1          Nickel      ppm      ASTM 05185m      >4      0          Auminum      ppm      ASTM 05185m      >30      2          Vanadium      ppm      ASTM 05185m      20           Vanadium <t< th=""><th>Sample Number</th><th></th><th>Client Info</th><th></th><th>PCA0057348</th><th></th><th></th></t<>	Sample Number		Client Info		PCA0057348		
Dil Age      mis      Client Info      19862          Sample Status      Client Info      Changed          Sample Status      imil/base      current      history1      imil/base        GONTAMINATION      method      imil/base      current      history1      history2        Water      WC Method      >0.2      NEG          WEAR METALS      method      imil/base      current      history1      history2        Iron      ppm      ASTM D5185m      >10.0      16          WEAR METALS      method      imil/base      current      history1      n=-        Nickel      ppm      ASTM D5185m      >4      -1          Silver      ppm      ASTM D5185m      >3      <1          Aluminum      ppm      ASTM D5185m      >30      2          Read      ppm      ASTM D5185m      2           Readaniu	Sample Date		Client Info		13 Oct 2023		
Chi Changed      Client Info      Changed NORMAL          Sample Status      Image: Statu	Machine Age	mls	Client Info		118953		
Sample Status      Image: Normal st	Oil Age	mls	Client Info		19862		
CONTAMINATION    method    limit/base    current    history1    history2      Water    WC Method    >0.2    NEG        Silvol    WC Method    NEG        WEAR METALS    method    limit/base    current    history1    history2      Iron    ppm    ASTM D5185m    >100    16        Nickel    ppm    ASTM D5185m    >20    <1        Nickel    ppm    ASTM D5185m    >3    <1        Aluminum    ppm    ASTM D5185m    >20    4        Nickel    ppm    ASTM D5185m    >30    2        Aluminum    ppm    ASTM D5185m    >10    0        Astm D5185m    >330    2         Astm D5185m    0          Manadum    ppm    ASTM D5185m    59        Molybdenum <t< th=""><th>Oil Changed</th><th></th><th>Client Info</th><th></th><th>Changed</th><th></th><th></th></t<>	Oil Changed		Client Info		Changed		
Water      WC Method      >0.2      NEG          Glycol      WC Method      Imil/base      current      history1      history2        WEAR METALS      method      Imil/base      current      history1      history2        Iron      ppm      ASTM D5185m      >100      16          Chromium      ppm      ASTM D5185m      >20      <1          Nickel      ppm      ASTM D5185m      >3      <1          Aluminum      ppm      ASTM D5185m      >3      <1          Aluminum      ppm      ASTM D5185m      >20      4          Copper      ppm      ASTM D5185m      >30      2          Vanadium      ppm      ASTM D5185m      >30      2          ASTM D5185m      >59             Maganese      ppm      ASTM D5185m      955	Sample Status				NORMAL		
Calycol      WC Method      NEG          WEAR METALS      method      imit/base      current      history1      history2        Iron      ppm      ASTM D5185m      >100      16          Chromium      ppm      ASTM D5185m      >20      <1          Nickel      ppm      ASTM D5185m      >3      <11          Silver      ppm      ASTM D5185m      >3      <11          Aduminum      ppm      ASTM D5185m      >40      0          Aduminum      ppm      ASTM D5185m      >15      <1          Adadition      ppm      ASTM D5185m      0           Adadition      ppm      ASTM D5185m      0           Adadition      ppm      ASTM D5185m      0           Adadition      ppm      ASTM D5185m      59       -	CONTAMINATI	ON	method	limit/base	current	history1	history2
WEAR METALS      method      limit/base      current      history1      history2        iron      ppm      ASTM D5185m      >20      -1          Nickel      ppm      ASTM D5185m      >20      -1          Nickel      ppm      ASTM D5185m      >20      -1          Silver      ppm      ASTM D5185m      >20      4          Aluminum      ppm      ASTM D5185m      >20      4          Lead      ppm      ASTM D5185m      >20      4          Copper      ppm      ASTM D5185m      >33.0      2          Cadmium      ppm      ASTM D5185m      0           ADDITVES      method      limit/base      current      history1      history2        Barium      ppm      ASTM D5185m      0           Magnesium      ppm      ASTM D5185m      59	Water		WC Method	>0.2	NEG		
ron      ppm      ASTM D5185m      >100      16          Chromium      ppm      ASTM D5185m      >20      <1          Nickel      ppm      ASTM D5185m      >4      <1          Silver      ppm      ASTM D5185m      >3      <1          Aluminum      ppm      ASTM D5185m      >30      2          Lead      ppm      ASTM D5185m      >30      2          Copper      ppm      ASTM D5185m      >15      <1          Vanadium      ppm      ASTM D5185m      >15      <1          Vanadium      ppm      ASTM D5185m      0           ADDITIVES      method      limit/base      current      history1      history2        Barium      ppm      ASTM D5185m      59          Magnesium      ppm      ASTM D5185m      595	Glycol		WC Method		NEG		
Dromium      ppm      ASTM D5185m      >20      <1	WEAR METALS	S	method	limit/base	current	history1	history2
Chromium      ppm      ASTM D5185m      >20      <1	Iron	mqq	ASTM D5185m	>100	16		
Nickel      ppm      ASTM D5185m      >4      <1	Chromium		ASTM D5185m	>20	<1		
Titanium      ppm      ASTM D5185m      0          Silver      ppm      ASTM D5185m      >3      <1          Aluminum      ppm      ASTM D5185m      >20      4          Aluminum      ppm      ASTM D5185m      >20      4          Copper      ppm      ASTM D5185m      >40      0          Vanadium      ppm      ASTM D5185m      >40      0          Vanadium      ppm      ASTM D5185m      0           ADDITVES      method      limit/base      current      history1      history2        Boron      ppm      ASTM D5185m      0          Molybdenum      ppm      ASTM D5185m      59          Maganesium      ppm      ASTM D5185m      955          Magnesium      ppm      ASTM D5185m      2618	Nickel		ASTM D5185m	>4	<1		
Silver      ppm      ASTM D5185m      >3      <1	Titanium		ASTM D5185m		0		
Aluminum      ppm      ASTM D5185m      >20      4          Lead      ppm      ASTM D5185m      >40      0          Copper      ppm      ASTM D5185m      >330      2          Vanadium      ppm      ASTM D5185m      >15      <1          Cadmium      ppm      ASTM D5185m      0           ADDITIVES      method      limit/base      current      history1      history2        Boron      ppm      ASTM D5185m      2          Maganese      ppm      ASTM D5185m      0          Maganese      ppm      ASTM D5185m      59          Maganese      ppm      ASTM D5185m      955          Maganese      ppm      ASTM D5185m      1035          Sulfur      ppm      ASTM D5185m      >25      8	Silver		ASTM D5185m	>3	<1		
Copper      ppm      ASTM D5185m      >330      2          Tin      ppm      ASTM D5185m      >15      <1          Vanadium      ppm      ASTM D5185m      0          Cadmium      ppm      ASTM D5185m      0          ADDITIVES      method      limit/base      current      history1      history2        Boron      ppm      ASTM D5185m      2          Barium      ppm      ASTM D5185m      59          Magnese      ppm      ASTM D5185m      955          Magnesium      ppm      ASTM D5185m      1068          Calcium      ppm      ASTM D5185m      1035          Sulfur      ppm      ASTM D5185m      2618          Sulfur      ppm      ASTM D5185m      22          Solifum      ppm      ASTM D5185m	Aluminum		ASTM D5185m	>20	4		
Tin      ppm      ASTM D5185m      >15      <1	Lead	ppm	ASTM D5185m	>40	0		
Vanadium      ppm      ASTM D5185m      0          Cadmium      ppm      ASTM D5185m      0          ADDITIVES      method      limit/base      current      history1      history2        Boron      ppm      ASTM D5185m      2          Barium      ppm      ASTM D5185m      0          Molybdenum      ppm      ASTM D5185m      59          Manganese      ppm      ASTM D5185m      595          Magnesium      ppm      ASTM D5185m      955          Calcium      ppm      ASTM D5185m      1068          Vitro      ppm      ASTM D5185m      2618          Sulfur      ppm      ASTM D5185m      >25      8          Soliton      ppm      ASTM D5185m      >20      3          Soldium      ppm      ASTM D5185m      >20	Copper	ppm	ASTM D5185m	>330	2		
CadmiumppmASTM D5185m0ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185m2BariumppmASTM D5185m0MolybdenumppmASTM D5185m59ManganeseppmASTM D5185m59ManganeseppmASTM D5185m955CalciumppmASTM D5185m1068PhosphorusppmASTM D5185m1035VincppmASTM D5185m1283SulfurppmASTM D5185m2618SoliconppmASTM D5185m22PotassiumppmASTM D5185m22Fuel%ASTM D5185m22NitrationppmASTM D5185m22Soot %%*ASTM D7844>30.5NitrationAbs/cm*ASTM D7624>209.6SulfationAbs/tmm*ASTM D7644>30.5NotrationAbs/tmm*ASTM D7644>3022.3SulfationAbs/tmm*ASTM D7644>30.5SulfationAbs/tmm*ASTM D7644>30.5	Tin	ppm	ASTM D5185m	>15	<1		
ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185m2BariumppmASTM D5185m0MolybdenumppmASTM D5185m59ManganeseppmASTM D5185m955MagnesiumppmASTM D5185m955CalciumppmASTM D5185m1068PhosphorusppmASTM D5185m1035ZincppmASTM D5185m1283SulfurppmASTM D5185m2618CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>203PotassiumppmASTM D5185m>203INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>30.5NitrationAbs/cm*ASTM D7624>209.6SulfationAbs/fmm*ASTM D7415>3022.3DxidationAbs/fmm*ASTM D7414>2519.3CovidationAbs/fmm*ASTM D7414>2519.3	Vanadium	ppm	ASTM D5185m		0		
Boron      ppm      ASTM D5185m      2          Barium      ppm      ASTM D5185m      0          Molybdenum      ppm      ASTM D5185m      599          Manganese      ppm      ASTM D5185m      <1          Magnesium      ppm      ASTM D5185m      955          Calcium      ppm      ASTM D5185m      955          Calcium      ppm      ASTM D5185m      1068          Phosphorus      ppm      ASTM D5185m      1035          Sulfur      ppm      ASTM D5185m      1035          Sulfur      ppm      ASTM D5185m      26118          Sulfur      ppm      ASTM D5185m      >25      8          Solicon      ppm      ASTM D5185m      >20      3          Fuel      %      ASTM D5185m      >20      3<	Cadmium	ppm	ASTM D5185m		0		
Barium      ppm      ASTM D5185m      0          Molybdenum      ppm      ASTM D5185m      59          Manganese      ppm      ASTM D5185m      955          Magnesium      ppm      ASTM D5185m      955          Calcium      ppm      ASTM D5185m      1068          Calcium      ppm      ASTM D5185m      1035          Calcium      ppm      ASTM D5185m      1035          Zinc      ppm      ASTM D5185m      1035          Sulfur      ppm      ASTM D5185m      2618          CONTAMINANTS      method      limit/base      current      history1      history2        Solicon      ppm      ASTM D5185m      >20      3          Potassium      ppm      ASTM D5185m      >20      3          Fuel      %      ASTM D5185m	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum      ppm      ASTM D5185m      59          Manganese      ppm      ASTM D5185m      <1          Magnesium      ppm      ASTM D5185m      955          Calcium      ppm      ASTM D5185m      1068          Phosphorus      ppm      ASTM D5185m      1035          Zinc      ppm      ASTM D5185m      1035          Sulfur      ppm      ASTM D5185m      2618          Sulfur      ppm      ASTM D5185m      >25      8          CONTAMINANTS      method      limit/base      current      history1      history2        Silicon      ppm      ASTM D5185m      >20      3          Sodium      ppm      ASTM D5185m      >20      3          Fuel      %      ASTM D5185m      >20      3     Sodium      ppm      ASTM	Boron	ppm	ASTM D5185m		2		
Manganese      ppm      ASTM D5185m      <1	Barium	ppm	ASTM D5185m		0		
Magnesium      ppm      ASTM D5185m      955          Calcium      ppm      ASTM D5185m      1068          Phosphorus      ppm      ASTM D5185m      1035          Zinc      ppm      ASTM D5185m      1283          Sulfur      ppm      ASTM D5185m      2618          CONTAMINANTS      method      limit/base      current      history1      history2        Silicon      ppm      ASTM D5185m      >25      8          Sodium      ppm      ASTM D5185m      >20      3          Potassium      ppm      ASTM D5185m      >20      3          Fuel      %      ASTM D5185m      >20      3          INFRA-RED      method      limit/base      current      history1      history2        Soot %      %      *ASTM D7844      >3      0.5          Sulfat	Molybdenum	ppm	ASTM D5185m		59		
Calcium      ppm      ASTM D5185m      1068          Phosphorus      ppm      ASTM D5185m      1035          Zinc      ppm      ASTM D5185m      1283          Sulfur      ppm      ASTM D5185m      2618          CONTAMINANTS      method      limit/base      current      history1      history2        Silicon      ppm      ASTM D5185m      >25      8          Sodium      ppm      ASTM D5185m      >25      8          Sodium      ppm      ASTM D5185m      >20      3          Potassium      ppm      ASTM D5185m      >20      3          Fuel      %      ASTM D5185m      >20      3          Ntration      Abs/cm      *ASTM D7844      >3      0.5          Sulfation      Abs/cm      *ASTM D7624      >20      9.6	Manganese	ppm			<1		
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ZincppmASTM D5185m1283SulfurppmASTM D5185m2618CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>258SodiumppmASTM D5185m>203PotassiumppmASTM D5185m>203Fuel%ASTM D5185m>203INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>30.5NitrationAbs/cm*ASTM D7624>209.6SulfationAbs/1mm*ASTM D7415>3022.3FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2519.3	Calcium	ppm	ASTM D5185m		1068		
SulfurppmASTM D5185m2618CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>258SodiumppmASTM D5185m>203PotassiumppmASTM D5185m>203Fuel%ASTM D5185m>203INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>30.5NitrationAbs/cm*ASTM D7624>209.6SulfationAbs/1mm*ASTM D7415>3022.3FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2519.3							
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Silicon      ppm      ASTM D5185m      >25      8          Sodium      ppm      ASTM D5185m      2           Potassium      ppm      ASTM D5185m      >20      3          Fuel      %      ASTM D5185m      >20      3          INFRA-RED      method      limit/base      current      history1      history2        Soot %      %      *ASTM D7844      >3      0.5          Soot %      %      *ASTM D7624      >20      9.6          Sulfation      Abs/cm      *ASTM D7624      >30      22.3          FLUID DEGRADATION      method      limit/base      current      history1      history2        Oxidation      Abs/.1mm      *ASTM D7414      >25      19.3			ASTM D5185m		2618		
Sodium      ppm      ASTM D5185m      2          Potassium      ppm      ASTM D5185m      >20      3          Fuel      %      ASTM D5185m      >20      3          INFRA-RED      method      limit/base      current      history1      history2        Soot %      %      *ASTM D7844      >3      0.5          Nitration      Abs/cm      *ASTM D7624      >20      9.6          Sulfation      Abs/.1mm      *ASTM D7415      >30      22.3          FLUID DEGRADATION      method      limit/base      current      history1      history2        Oxidation      Abs/.1mm      *ASTM D7414      >25      19.3	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium      ppm      ASTM D5185m      >20      3          Fuel      %      ASTM D3524      >5      0.3          INFRA-RED      method      limit/base      current      history1      history2        Soot %      %      *ASTM D7844      >3      0.5          Nitration      Abs/cm      *ASTM D7624      >20      9.6          Sulfation      Abs/.1mm      *ASTM D7415      >30      22.3          FLUID DEGRADATION      method      limit/base      current      history1      history2        Oxidation      Abs/.1mm      *ASTM D7414      >25      19.3	Silicon	ppm		>25	8		
Fuel      %      ASTM D3524      >5      0.3          INFRA-RED      method      limit/base      current      history1      history2        Soot %      %      *ASTM D7844      >3      0.5          Nitration      Abs/cm      *ASTM D7624      >20      9.6          Sulfation      Abs/.1mm      *ASTM D7415      >30      22.3          FLUID DEGRADATION      method      limit/base      current      history1      history2        Oxidation      Abs/.1mm      *ASTM D7414      >25      19.3	Sodium						
INFRA-RED    method    limit/base    current    history1    history2      Soot %    %    *ASTM D7844    >3    0.5        Nitration    Abs/cm    *ASTM D7624    >20    9.6        Sulfation    Abs/.1mm    *ASTM D7415    >30    22.3        FLUID DEGRADATION    method    limit/base    current    history1    history2      Oxidation    Abs/.1mm    *ASTM D7414    >25    19.3	Potassium						
Soot %      %      *ASTM D7844      >3      0.5          Nitration      Abs/cm      *ASTM D7624      >20      9.6          Sulfation      Abs/.1mm      *ASTM D7415      >30      22.3          FLUID DEGRADATION      method      limit/base      current      history1      history2        Oxidation      Abs/.1mm      *ASTM D7414      >25      19.3	Fuel	%	ASTM D3524	>5	0.3		
Nitration      Abs/cm      *ASTM D7624      >20      9.6          Sulfation      Abs/.1mm      *ASTM D7415      >30      22.3          FLUID DEGRADATION      method      limit/base      current      history1      history2        Oxidation      Abs/.1mm      *ASTM D7414      >25      19.3	INFRA-RED		method	limit/base	current	history1	history2
Sulfation      Abs/.1mm      *ASTM D7415      >30      22.3          FLUID DEGRADATION      method      limit/base      current      history1      history2        Oxidation      Abs/.1mm      *ASTM D7414      >25      19.3	Soot %	%		>3	0.5		
FLUID DEGRADATION  method  limit/base  current  history1  history2    Oxidation  Abs/.1mm  *ASTM D7414  >25  19.3	Nitration	Abs/cm		>20			
Oxidation Abs/.1mm *ASTM D7414 >25 19.3	Sulfation	Abs/.1mm	*ASTM D7415	>30	22.3		
	FLUID DEGRAD	DATION	method	limit/base	current	history1	history2
Base Number (BN)      mg KOH/g      ASTM D2896      9.8      7.20	Oxidation	Abs/.1mm	*ASTM D7414	>25	19.3		
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	7.20		



# **OIL ANALYSIS REPORT**



Test Package : MOB 2 (Additional Tests: FuelDilution, PercentFuel)

To discuss this sample report, contact Customer Service at 1-800-237-1369.

\* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

VALLEY PACIFIC PETROLEUM SERVICES **152 FRANK WEST CIRCLE** STOCKTON, CA US 95206 Contact: MARCEY LIGHTFOOT marcey.lightfoot@vpps.net T: (209)461-3611 F: (209)888-6196 Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Certificate L2367

Contact/Location: MARCEY LIGHTFOOT - VALSTO