

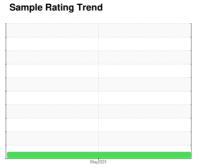
# **OIL ANALYSIS REPORT**



# **MINING** ME-011 CATERPILLAR 279D GTL05779

Diesel Engine

SHELL RIMULA SUPER SAE 15W40 (--- GAL)





### DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

### Contamination

There is no indication of any contamination in the

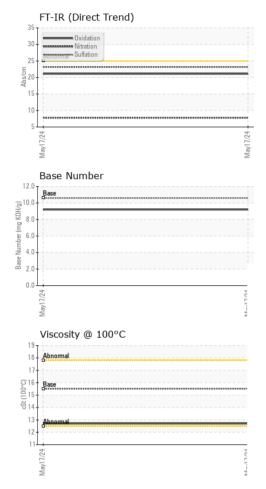
### **Fluid Condition**

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

Client Info   WC0928523	SAE 15W4U (-	· GAL)			May/2024		
Client Info	SAMPLE INFOR	RMATION	method	limit/base	current	history1	history2
Machine Age   hrs   Client Info   0	Sample Number		Client Info		WC0928523		
Dil Age	Sample Date		Client Info		17 May 2024		
Client Info   N/A	Machine Age	hrs	Client Info		2281		
CONTAMINATION   method   limit/base   current   history1   history2	Oil Age	hrs	Client Info		0		
CONTAMINATION	-		Client Info		N/A		
Water   WC Method   S5   C1.0   C1.0   C2.0   NEG   C3.0   C3.0	Sample Status				NORMAL		
Water         WC Method         >0.2         NEG             Glycol         WC Method         Imitibase         current         history1         history2           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         <1             Chromium         ppm         ASTM D5185m         >20         <1             Nickel         ppm         ASTM D5185m         >2         0             Silver         ppm         ASTM D5185m         >2         0             Silver         ppm         ASTM D5185m         >2         5             Silver         ppm         ASTM D5185m         >2         0             Silver         ppm         ASTM D5185m         >2         5             Silver         ppm         ASTM D5185m         >40         <1             Copper         ppm         ASTM D5185m         0 <td>CONTAMINATIO</td> <td>N</td> <td>method</td> <td>limit/base</td> <td>current</td> <td>history1</td> <td>history2</td>	CONTAMINATIO	N	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>5	<1.0		
WEAR METALS	Water		WC Method	>0.2	NEG		
ASTM D5185m   STM D5185m   Part   P	Glycol		WC Method		NEG		
ASTM D5185m   >20	WEAR METALS		method	limit/base	current	history1	history2
Nickel	ron	ppm	ASTM D5185m	>100	17		
ASTM D5185m   >2	Chromium	ppm	ASTM D5185m	>20	<1		
Silver	Nickel	ppm	ASTM D5185m	>2	0		
Aluminum	Titanium	ppm	ASTM D5185m	>2	<1		
Lead	Silver	ppm	ASTM D5185m	>2	0		
Copper	Aluminum	ppm	ASTM D5185m	>25	5		
Tin	Lead	ppm	ASTM D5185m	>40	<1		
Vanadium         ppm         ASTM D5185m         0             Cadmium         ppm         ASTM D5185m         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         49             Barium         ppm         ASTM D5185m         0             Molybdenum         ppm         ASTM D5185m         44             Manganese         ppm         ASTM D5185m         506             Magnesium         ppm         ASTM D5185m         2840         1743             Calcium         ppm         ASTM D5185m         2840         1743             Phosphorus         ppm         ASTM D5185m         1270         1154             Sulfur         ppm         ASTM D5185m         2829         3047             CONTAMINANTS         method         limit/base         current         history1         history2           Sodium <td>Copper</td> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;330</td> <td>2</td> <td></td> <td></td>	Copper	ppm	ASTM D5185m	>330	2		
ADDITIVES	Tin	ppm	ASTM D5185m	>15	<1		
ADDITIVES	Vanadium	ppm	ASTM D5185m		0		
Boron	Cadmium	ppm	ASTM D5185m		0		
Barium	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         44             Manganese         ppm         ASTM D5185m         <1	Boron	ppm	ASTM D5185m		49		
Manganese         ppm         ASTM D5185m         <1             Calcium         ppm         ASTM D5185m         506             Calcium         ppm         ASTM D5185m         2840         1743             Phosphorus         ppm         ASTM D5185m         1150         1009             Zinc         ppm         ASTM D5185m         1270         1154             Sulfur         ppm         ASTM D5185m         2829         3047             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         22             Sodium         ppm         ASTM D5185m         >20         4             Potassium         ppm         ASTM D5185m         >20         4             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2	Barium	ppm	ASTM D5185m		0		
Magnesium         ppm         ASTM D5185m         506             Calcium         ppm         ASTM D5185m         2840         1743             Phosphorus         ppm         ASTM D5185m         1150         1009             Zinc         ppm         ASTM D5185m         1270         1154             Sulfur         ppm         ASTM D5185m         2829         3047             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         22             Sodium         ppm         ASTM D5185m         >0             Potassium         ppm         ASTM D5185m         >20         4             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         7.8             Sulfation         Abs/.1mm         *ASTM D7415         >30         23.1	Molybdenum	ppm	ASTM D5185m		44		
Calcium         ppm         ASTM D5185m         2840         1743             Phosphorus         ppm         ASTM D5185m         1150         1009             Zinc         ppm         ASTM D5185m         1270         1154             Sulfur         ppm         ASTM D5185m         2829         3047             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         22             Sodium         ppm         ASTM D5185m         >0             Potassium         ppm         ASTM D5185m         >20         4             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2             Sulfation         Abs/.mm         *ASTM D7415         >30         23.1             FLUID DEGRADATION         method         limit/base	Manganese	ppm	ASTM D5185m		<1		
Phosphorus         ppm         ASTM D5185m         1150         1009             Zinc         ppm         ASTM D5185m         1270         1154             Sulfur         ppm         ASTM D5185m         2829         3047             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         22             Sodium         ppm         ASTM D5185m         0             Potassium         ppm         ASTM D5185m         >20         4             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2             Nitration         Abs/cm         *ASTM D7415         >30         23.1             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 <th< td=""><td>Magnesium</td><td>ppm</td><td>ASTM D5185m</td><td></td><td>506</td><td></td><td></td></th<>	Magnesium	ppm	ASTM D5185m		506		
Zinc   ppm   ASTM D5185m   1270   1154       Sulfur   ppm   ASTM D5185m   2829   3047             CONTAMINANTS   method   limit/base   current   history1   history2     Silicon   ppm   ASTM D5185m   >25   22         Sodium   ppm   ASTM D5185m   0         Potassium   ppm   ASTM D5185m   >20   4         INFRA-RED   method   limit/base   current   history1   history2     Soot %   *ASTM D7844   >3   0.2         Nitration   Abs/cm   *ASTM D7624   >20   7.8         Sulfation   Abs/.1mm   *ASTM D7415   >30   23.1         FLUID DEGRADATION   method   limit/base   current   history1   history2     Oxidation   Abs/.1mm   *ASTM D7414   >25   21.1	Calcium	ppm	ASTM D5185m	2840	1743		
Sulfur         ppm         ASTM D5185m         2829         3047             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         22             Sodium         ppm         ASTM D5185m         0             Potassium         ppm         ASTM D5185m         >20         4             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2             Nitration         Abs/cm         *ASTM D7624         >20         7.8             Sulfation         Abs/.1mm         *ASTM D7415         >30         23.1             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         21.1	Phosphorus	ppm	ASTM D5185m	1150	1009		
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         22             Sodium         ppm         ASTM D5185m         0             Potassium         ppm         ASTM D5185m         >20         4            INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2             Nitration         Abs/cm         *ASTM D7624         >20         7.8             Sulfation         Abs/.1mm         *ASTM D7415         >30         23.1             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         21.1	Zinc	ppm	ASTM D5185m	1270	1154		
Silicon   ppm   ASTM D5185m   >25   22	Sulfur	ppm	ASTM D5185m	2829	3047		
Sodium	CONTAMINANT	S	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         4             INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.2             Nitration         Abs/cm         *ASTM D7624         >20         7.8             Sulfation         Abs/.1mm         *ASTM D7415         >30         23.1             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         21.1		ppm	ASTM D5185m	>25	22		
INFRA-RED	Sodium	ppm	ASTM D5185m		0		
Soot %         *ASTM D7844         >3         0.2             Nitration         Abs/cm         *ASTM D7624         >20         7.8             Sulfation         Abs/.1mm         *ASTM D7415         >30         23.1             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         21.1	Potassium	ppm	ASTM D5185m	>20	4		
Nitration         Abs/cm         *ASTM D7624         >20         7.8             Sulfation         Abs/.1mm         *ASTM D7415         >30         23.1             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         21.1	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         23.1             FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         21.1	Soot %	%	*ASTM D7844	>3	0.2		
FLUID DEGRADATION method limit/base current history1 history2  Oxidation Abs/.1mm *ASTM D7414 >25 21.1	Nitration	Abs/cm	*ASTM D7624	>20	7.8		
Oxidation	Sulfation	Abs/.1mm	*ASTM D7415	>30	23.1		
	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 10.6 9.2	Oxidation	Abs/.1mm	*ASTM D7414	>25	21.1		
	Base Number (BN)	mg KOH/g	ASTM D2896	10.6	9.2		

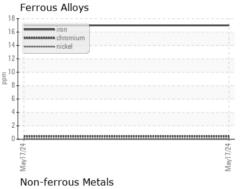


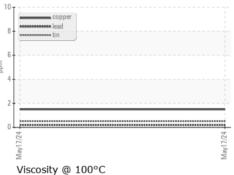
## **OIL ANALYSIS REPORT**

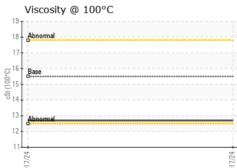


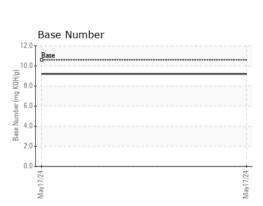
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE		
Yellow Metal	scalar	*Visual	NONE	NONE		
Precipitate	scalar	*Visual	NONE	NONE		
Silt	scalar	*Visual	NONE	NONE		
Debris	scalar	*Visual	NONE	NONE		
Sand/Dirt	scalar	*Visual	NONE	NONE		
Appearance	scalar	*Visual	NORML	NORML		
Odor	scalar	*Visual	NORML	NORML		
<b>Emulsified Water</b>	scalar	*Visual	>0.2	NEG		
Free Water	scalar	*Visual		NEG		
FLUID PROPERT	IEC	method	limit/hase	current	history1	history2

FLUID PROPER	HES	method	limit/base		nistory1	history2
Visc @ 100°C	cSt	ASTM D445	15.5	12.7		













Certificate 12367

Report Id: CONPEV [WUSCAR] 06202336 (Generated: 06/10/2024 17:02:19) Rev: 1

Sample No.

: WC0928523 Lab Number : 06202336 Unique Number : 11069797

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 06 Jun 2024 **Tested** : 10 Jun 2024

Diagnosed

: 10 Jun 2024 - Wes Davis Test Package : CONST ( Additional Tests: TBN )

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.

2968 HIGHWAY Z PEVELY, MO US 63070-3260 Contact: Steve Bell steve.bell@coviacorp.com T: (870)214-7848

**COVIA - PEVELY - 056** 

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

Contact/Location: Steve Bell - CONPEV