

# **OIL ANALYSIS REPORT**

KEMP QUARRIES / RIVER VALLEY OZARK

# 



NORMAL

## MOBIL DELVAC 1300 SUPER15W40 (--- GAL)

SAMPLE INFORMATION method

Sample Rating Trend

DIAG	NOSIS	

Recommendation

Resample at the next service interval to monitor.

WL033 Component Diesel Engine

Fluic

### Wear

All component wear rates are normal.

### Contamination

There is no indication of any contamination in the oil.

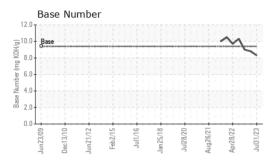
### Fluid Condition

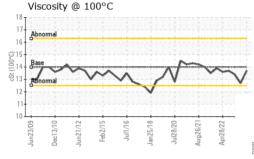
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Date     Client Info     31 Jul 2023     23 May 2023     28 Feb 2023       Machine Age     hrs     Client Info     42005     41725     41433       Oil Age     hrs     Client Info     40191     40191     41433       Oil Changed     Client Info     N/A     N/A     N/A     ABNORMAL       Sample Status     Imitibase     current     history1     History2       Fuel     WC Method     >5     <1.0     <1.0     <1.0       Glycol     WC Method     >5     <1.0     <1.0     <1.0       Krim Difism     >100     29     32     121     <1.0       Chromium     ppm     ASTM D5165m     >20     <1     <1     1       Nickel     ppm     ASTM D5165m     >2     <1     0     <1     1     1     2     4     1     1     1     1     1     2     4     1     1     1     1     1     1     1     1     1     1     1	Sample Number		Client Info		PCA0069687	PCA0084649	PCA0084671
Machine Age     hrs     Client Info     42005     41725     41433       Oil Age     hrs     Client Info     40191     40191     41433       Oil Changed     Client Info     N/A     N/A     N/A     N/A       Sample Status     Imit/base     current     history1     history2       Fuel     WC Method     >5     <1.0     <1.0     <1.0       Glycol     WC Method     >5     <1.0     <1.0     <1.0       WEAR METALS     method     imit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >20     <1     <1     <1       Nickel     ppm     ASTM D5185m     >2     <1     <1     1     2     <1     <1     1     2     <1     <1     1     2     <1     <1     1     2     <1     <1     1     2     <1     <1     1     2     <1     <1     1     2     <1     <1     1     2     1	,						
Oil Age     hrs     Client Info     40191     41433       Oil Changed     Client Info     N/A     N/A     N/A       Sample Status     Imit/base     NORMAL     NORMAL     ABNORMAL       CONTAMINATION     method     Imit/base     eurrent     history1     history2       Fuel     WC Method     >5     <1.0     <1.0     <1.0       Glycol     WC Method     >5     <1.0     <1.0     NEG       VEAR METALS     method     Imit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >20     <1     <1     <1       Nickel     ppm     ASTM D5185m     >22     <1     <1     1       Silver     ppm     ASTM D5185m     >22     0     0     0       Aluminum     ppm     ASTM D5185m     >22     <1     <1     1       Lead     ppm     ASTM D5185m     >25     <1     2     <1       Vanadium     ppm     ASTM D5185m		hrs					
Oli Changed     Client Info     N/A     N/A     N/A     N/A       Sample Status     Image: Contramination of the status     Image: Contramination of the status     NormAL     NormAL     ABNORMAL       CONTAMINATION     method     imit/base     current     history1     history2       Fuel     WC Method     >5     <1.0	•						
Sample Status     NORMAL     NORMAL     NORMAL     ABNORMAL       CONTAMINATION     method     limit/base     current     history1     history2       Fuel     WC Method     >5     <1.0     <1.0     <1.0       Glycol     WC Method     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >20     <1     <1     <1       Nickel     ppm     ASTM D5185m     >22     <1     0     <1     1       Silver     ppm     ASTM D5185m     >22     <1     <1     1     2       Copper     ppm     ASTM D5185m     >25     <1     2     4     1       Lead     ppm     ASTM D5185m     >330     6     8     14     1       Copper     ppm     ASTM D5185m     >15     <1     2     <1       Cadmium     ppm     ASTM D5185m     0     0     0	-						
CONTAMINATION     method     limit/base     current     history1     history2       Fuel     WC Method     >5     <1.0     <1.0     <1.0       Glycol     WC Method     >5     <1.0     <1.0     <1.0       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >20     <1     <1     <1       Nickel     ppm     ASTM D5185m     >2     <1     0     <1       Silver     ppm     ASTM D5185m     >2     <1     <1     1       Silver     ppm     ASTM D5185m     >2     0     0     0       Auminum     ppm     ASTM D5185m     >2     0     0     0       Auminum     ppm     ASTM D5185m     >2     0     0     0       Copper     ppm     ASTM D5185m     >15     <1     2     <1       Vanadium     ppm     ASTM D5185m     0     <1     5     4  <	-						
Fuel     WC Method     >5     <1.0			mothod	limit/baco	-		-
Glycol     WC Method     NEG     NEG     NEG       WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >20     <1     <1     <1       Nickel     ppm     ASTM D5185m     >20     <1     <1     <1       Nickel     ppm     ASTM D5185m     >2     <1     0     <1       Silver     ppm     ASTM D5185m     >2     0     0     0       Aluminum     ppm     ASTM D5185m     >2     0     0     0       Aluminum     ppm     ASTM D5185m     >2     0     0     0       Copper     ppm     ASTM D5185m     >15     <1     2     <1       Vanadium     ppm     ASTM D5185m     0     0     0     0       Cadmium     ppm     ASTM D5185m     0     62     62     58       Barium     ppm     ASTM D5185m     0     1030     978     867  C							
WEAR METALS     method     limit/base     current     history1     history2       Iron     ppm     ASTM D5185m     >100     29     32     A     121       Chromium     ppm     ASTM D5185m     >20     <1     <1     <1     <1       Nickel     ppm     ASTM D5185m     >2     <1     0     <1     1       Silver     ppm     ASTM D5185m     >2     <1     <1     1     2       Copper     ppm     ASTM D5185m     >2     <1     1     1     2       Copper     ppm     ASTM D5185m     >2     <1     0     0     <1       Lead     ppm     ASTM D5185m     >2     <1     2     <1     Vanadium     ppm     ASTM D5185m     0				>5			
Iron     ppm     ASTM D5185m     >100     29     32     121       Chromium     ppm     ASTM D5185m     >20     <1     <1     <1       Nickel     ppm     ASTM D5185m     >2     <1     0     <1       Silver     ppm     ASTM D5185m     >2     0     0     0       Aluminum     ppm     ASTM D5185m     >2     0     0     0       Aluminum     ppm     ASTM D5185m     >2     <1     1     2       Copper     ppm     ASTM D5185m     >330     6     8     14       Tin     ppm     ASTM D5185m     >15     <1     2     <1       Vanadium     ppm     ASTM D5185m     0     <1     0     0       Cadmium     ppm     ASTM D5185m     0     <1     5     4       Barium     ppm     ASTM D5185m     0     <1     0     0       Molybdenum     ppm     ASTM D5185m     0     62     62	,				NEG	NLG	
Chromium     ppm     ASTM D5185m     >20     <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel     ppm     ASTM D5185m     >2     <1	Iron	ppm	ASTM D5185m	>100	29	32	<b>1</b> 21
Titanium     ppm     ASTM D5185m     >2     <1	Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Silver     ppm     ASTM D5185m     >2     0     0     0       Aluminum     ppm     ASTM D5185m     >25     <1     2     4       Lead     ppm     ASTM D5185m     >40     1     1     2       Copper     ppm     ASTM D5185m     >330     6     8     14       Tin     ppm     ASTM D5185m     >15     <1     2     <1       Vanadium     ppm     ASTM D5185m     >15     <1     0     0       Cadmium     ppm     ASTM D5185m     0     <1     0     0       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     62     62     58       Magnesium     ppm     ASTM D5185m     0     1030     978     867       Calcium     ppm     ASTM D5185m     0     1030     978     3109       Calcium     ppm     ASTM D5185m     1178     1124	Nickel	ppm	ASTM D5185m	>2	<1	0	
Aluminum     ppm     ASTM D5185m     >25     <1	Titanium	ppm	ASTM D5185m	>2		<1	
Lead     ppm     ASTM D5185m     >40     1     1     2       Copper     ppm     ASTM D5185m     >330     6     8     14       Tin     ppm     ASTM D5185m     >15     <1     2     <1       Vanadium     ppm     ASTM D5185m     >15     <1     0     0     <1       Cadmium     ppm     ASTM D5185m     0     0     0     <1     0     0       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     <1     5     4       Barium     ppm     ASTM D5185m     0     62     62     58       Maganese     ppm     ASTM D5185m     <11     <1     1     1031       Phosphorus     ppm     ASTM D5185m     <1     1368     1306     1187       Sulfur     ppm     ASTM D5185m     >25     6     5     22       Solifum     ppm     ASTM D5185m <th>Silver</th> <th>ppm</th> <th></th> <th></th> <th>-</th> <th></th> <th></th>	Silver	ppm			-		
Copper     ppm     ASTM D5185m     >330     6     8     14       Tin     ppm     ASTM D5185m     >15     <1     2     <1       Vanadium     ppm     ASTM D5185m     >15     <1     0     0     <1       Cadmium     ppm     ASTM D5185m      0     0     0     0       ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     <1     5     4       Barium     ppm     ASTM D5185m     0     622     622     58       Marganese     ppm     ASTM D5185m     0     1030     978     867       Calcium     ppm     ASTM D5185m     0     1030     978     867       Calcium     ppm     ASTM D5185m     0     1030     978     867       Sulfur     ppm     ASTM D5185m     1178     1124     1031       Phosphorus     ppm     ASTM D5185m     225	Aluminum	ppm	ASTM D5185m	>25		2	
Tin     ppm     ASTM D5185m     >15     <1	Lead	ppm					
Vanadium     ppm     ASTM D5185m     0     0     <1	Copper	ppm			-		
Cadmium     ppm     ASTM D5185m     <1	Tin	ppm	ASTM D5185m	>15	<1		<1
ADDITIVES     method     limit/base     current     history1     history2       Boron     ppm     ASTM D5185m     0     <1     5     4       Barium     ppm     ASTM D5185m     0     0     0     0       Molybdenum     ppm     ASTM D5185m     0     62     62     58       Manganese     ppm     ASTM D5185m     0     1030     978     867       Calcium     ppm     ASTM D5185m     0     1030     978     867       Calcium     ppm     ASTM D5185m     0     1030     978     867       Calcium     ppm     ASTM D5185m     1178     1124     1031       Phosphorus     ppm     ASTM D5185m     1368     1306     1187       Sulfur     ppm     ASTM D5185m     3966     3766     3109       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >20     1     <1     6	Vanadium	ppm	ASTM D5185m		0	0	
Boron     ppm     ASTM D5185m     0     <1	Cadmium	ppm	ASTM D5185m		<1	0	0
Barium     ppm     ASTM D5185m     0     0     0     0     0       Molybdenum     ppm     ASTM D5185m     0     62     62     58       Manganese     ppm     ASTM D5185m      <1     1       Magnesium     ppm     ASTM D5185m     0     1030     978     867       Calcium     ppm     ASTM D5185m     0     1030     978     867       Calcium     ppm     ASTM D5185m     0     1030     978     867       Calcium     ppm     ASTM D5185m     1178     1124     1031       Phosphorus     ppm     ASTM D5185m     1094     1089     943       Zinc     ppm     ASTM D5185m     1368     1306     1187       Sulfur     ppm     ASTM D5185m     3966     3766     3109       CONTAMINANTS     method     limit/base     current     history1     history2       Solicon     ppm     ASTM D5185m     >20     1     <1     6  <	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum     ppm     ASTM D5185m     0     62     62     58       Manganese     ppm     ASTM D5185m      <1     1     1       Magnesium     ppm     ASTM D5185m     0     1030     978     867       Calcium     ppm     ASTM D5185m     0     1030     978     867       Calcium     ppm     ASTM D5185m     0     1030     978     867       Calcium     ppm     ASTM D5185m     1178     1124     1031       Phosphorus     ppm     ASTM D5185m     1094     1089     943       Zinc     ppm     ASTM D5185m     1368     1306     1187       Sulfur     ppm     ASTM D5185m     3966     3766     3109       CONTAMINANTS     method     limit/base     current     history1     history2       Solicon     ppm     ASTM D5185m     >20     1     <1     6       INFRA-RED     method     limit/base     current     history1     history2	Boron	ppm	ASTM D5185m	0	<1	5	4
Manganese     ppm     ASTM D5185m     <1	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium     ppm     ASTM D5185m     0     1030     978     867       Calcium     ppm     ASTM D5185m     1178     1124     1031       Phosphorus     ppm     ASTM D5185m     1094     1089     943       Zinc     ppm     ASTM D5185m     1094     1089     943       Zinc     ppm     ASTM D5185m     1368     1306     1187       Sulfur     ppm     ASTM D5185m     3966     3766     3109       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     6     5     22       Sodium     ppm     ASTM D5185m     >20     1     <1     6       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     1.1     0.5     0.8       Nitration     Abs/.mm     *ASTM D7624     >20     8.2     7.8     8.7	Molybdenum	ppm	ASTM D5185m	0	62	62	58
Calcium     ppm     ASTM D5185m     1178     1124     1031       Phosphorus     ppm     ASTM D5185m     1094     1089     943       Zinc     ppm     ASTM D5185m     1368     1306     1187       Sulfur     ppm     ASTM D5185m     3966     3766     3109       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     6     5     22       Sodium     ppm     ASTM D5185m     >20     1     <1     6       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     1.1     0.5     0.8       Nitration     Abs/cm< *ASTM D7624     >20     8.2     7.8     8.7       Sulfation     Abs/.1mm     *ASTM D7414     >30     20.3     20.6     20.1       FLUID DEGRADATION     method     limit/base     current     history1     history2 </th <th>Manganese</th> <th>ppm</th> <th>ASTM D5185m</th> <th></th> <th>&lt;1</th> <th>&lt;1</th> <th>1</th>	Manganese	ppm	ASTM D5185m		<1	<1	1
Phosphorus     ppm     ASTM D5185m     1094     1089     943       Zinc     ppm     ASTM D5185m     1368     1306     1187       Sulfur     ppm     ASTM D5185m     3966     3766     3109       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     6     5     22       Sodium     ppm     ASTM D5185m     >25     6     5     22       Sodium     ppm     ASTM D5185m     >20     1     <1     6       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     1.1     0.5     0.8       Nitration     Abs/cm     *ASTM D7624     >20     8.2     7.8     8.7       Sulfation     Abs/.1mm     *ASTM D7415     >30     20.3     20.6     20.1       FLUID DEGRADATION     method     limit/base     current     history1	Magnesium	ppm	ASTM D5185m	0	1030	978	867
Zinc     ppm     ASTM D5185m     1368     1306     1187       Sulfur     ppm     ASTM D5185m     3966     3766     3109       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     6     5     22       Sodium     ppm     ASTM D5185m     >20     1     <1     6       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     1.1     0.5     0.8       Nitration     Abs/cm     *ASTM D7624     >20     8.2     7.8     8.7       Sulfation     Abs/.1mm     *ASTM D7624     >20     8.2     7.8     8.7       Sulfation     Abs/.1mm     *ASTM D7415     >30     20.3     20.6     20.1       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25	Calcium	ppm	ASTM D5185m		1178	1124	1031
Sulfur     ppm     ASTM D5185m     3966     3766     3109       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >25     6     5     22       Sodium     ppm     ASTM D5185m     >20     1     <1     6       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     1.1     0.5     0.8       Nitration     Abs/cm     *ASTM D7624     >20     8.2     7.8     8.7       Sulfation     Abs/.1mm     *ASTM D7615     >30     20.3     20.6     20.1       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     15.7     16.1     15.4	Phosphorus	ppm	ASTM D5185m		1094	1089	943
CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m<>25     6     5     22       Sodium     ppm     ASTM D5185m<>20     1     2     53       Potassium     ppm     ASTM D5185m     >20     1     <1     6       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844<>3     1.1     0.5     0.8       Nitration     Abs/cm     *ASTM D7624<>20     8.2     7.8     8.7       Sulfation     Abs/.1mm     *ASTM D7415<>30     20.3     20.6     20.1       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414<>25     15.7     16.1     15.4	Zinc	ppm	ASTM D5185m		1368	1306	1187
Silicon     ppm     ASTM D5185m     >25     6     5     22       Sodium     ppm     ASTM D5185m     >20     4     2     53       Potassium     ppm     ASTM D5185m     >20     1     <1	Sulfur	ppm	ASTM D5185m		3966	3766	3109
Sodium     ppm     ASTM D5185m     4     2     53       Potassium     ppm     ASTM D5185m<>20     1     <1     6       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844<>3     1.1     0.5     0.8       Nitration     Abs/cm     *ASTM D7624<>20     8.2     7.8     8.7       Sulfation     Abs/.1mm     *ASTM D7415<>30     20.3     20.6     20.1       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414<>25     15.7     16.1     15.4	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium     ppm     ASTM D5185m     >20     1     <1	Silicon	ppm	ASTM D5185m	>25	6	5	22
INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     >3     1.1     0.5     0.8       Nitration     Abs/cm     *ASTM D7624     >20     8.2     7.8     8.7       Sulfation     Abs/.tmm     *ASTM D7415     >30     20.3     20.6     20.1       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.tmm     *ASTM D7414     >25     15.7     16.1     15.4	Sodium	ppm	ASTM D5185m		4	2	53
Soot %     %     *ASTM D7844     >3     1.1     0.5     0.8       Nitration     Abs/cm     *ASTM D7624     >20     8.2     7.8     8.7       Sulfation     Abs/.1mm     *ASTM D7415     >30     20.3     20.6     20.1       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     15.7     16.1     15.4	Potassium	ppm	ASTM D5185m	>20	1	<1	6
Nitration     Abs/cm     *ASTM D7624     >20     8.2     7.8     8.7       Sulfation     Abs/.1mm     *ASTM D7415     >30     20.3     20.6     20.1       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     15.7     16.1     15.4	INFRA-RED		method	limit/base	current	history1	history2
Nitration     Abs/cm     *ASTM D7624     >20     8.2     7.8     8.7       Sulfation     Abs/.1mm     *ASTM D7415     >30     20.3     20.6     20.1       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     15.7     16.1     15.4	Soot %	%	*ASTM D7844	>3	1.1	0.5	0.8
Sulfation     Abs/.1mm     *ASTM D7415     >30     20.3     20.6     20.1       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     15.7     16.1     15.4	Nitration						
Oxidation Abs/.1mm *ASTM D7414 >25 15.7 16.1 15.4	Sulfation						
Oxidation Abs/.1mm *ASTM D7414 >25 15.7 16.1 15.4	FLUID DEGRA	DAT <u>ION</u>	method	limi <u>t/base</u>	current	history1	history2
				>25	15.7		
	Base Number (BN)	mg KOH/g	ASTM D2896		8.3	8.8	9.0



# **OIL ANALYSIS REPORT**







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

St (100°C)

Laboratory

Sample No.

Lab Number

Unique Number

Certificate L2367