



OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	ABNORMAL
FLUID CONDITION	NORMAL

Area
RIG 1
Machine Id
WHITE STAR 2450 R1-P-01G
Component
Gearbox
Fluid
GEAR OIL ISO 460 (--- GAL)

RECOMMENDATION

We recommend you service the filters on this component if applicable. Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		KL0014251	KL0013869	KL0014024
Sample Date		Client Info		10 May 2024	20 Mar 2024	16 Feb 2024
Machine Age	days	Client Info		45412	45326	45338
Oil Age	days	Client Info		0	0	0
Filter Age	days	Client Info		0	0	0
Oil Changed		Client Info		N/A	N/A	N/A
Filter Changed		Client Info		N/A	N/A	N/A
Sample Status				ABNORMAL	ABNORMAL	ABNORMAL

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>200	152	▲ 222	▲ 332
Chromium	ppm	ASTM D5185m	>10	1	3	2
Nickel	ppm	ASTM D5185m	>10	<1	2	2
Titanium	ppm	ASTM D5185m		<1	1	1
Silver	ppm	ASTM D5185m		0	0	0
Aluminum	ppm	ASTM D5185m	>25	8	● 26	● 25
Lead	ppm	ASTM D5185m	>50	0	0	<1
Copper	ppm	ASTM D5185m	>200	11	21	51
Tin	ppm	ASTM D5185m	>10	0	0	0
Vanadium	ppm	ASTM D5185m		0	0	<1
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE

CONTAMINATION

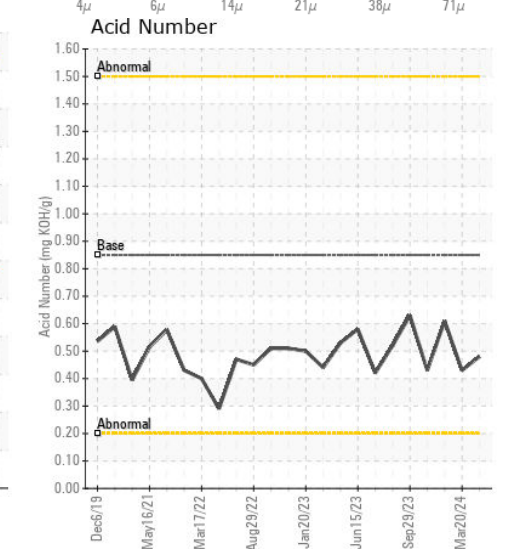
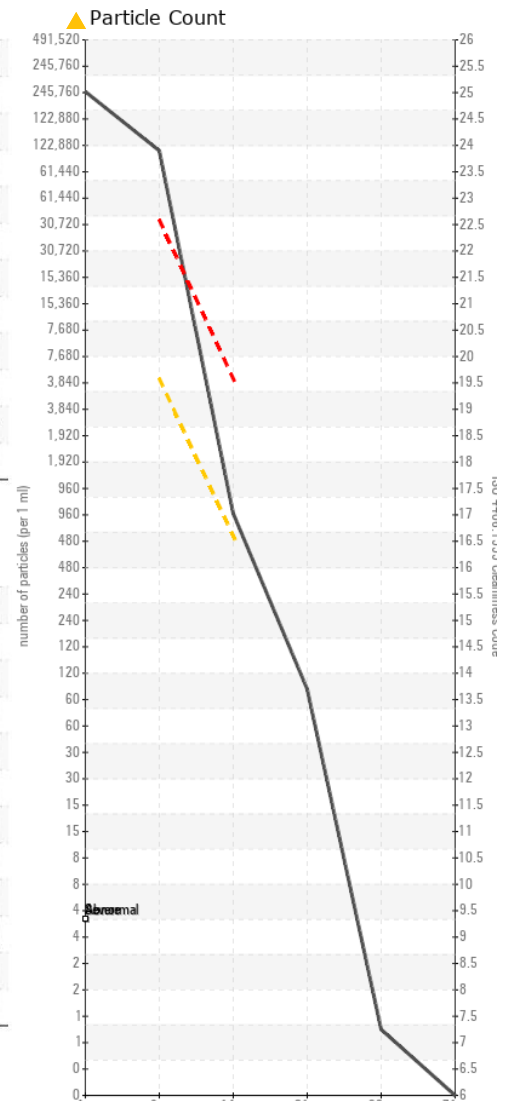
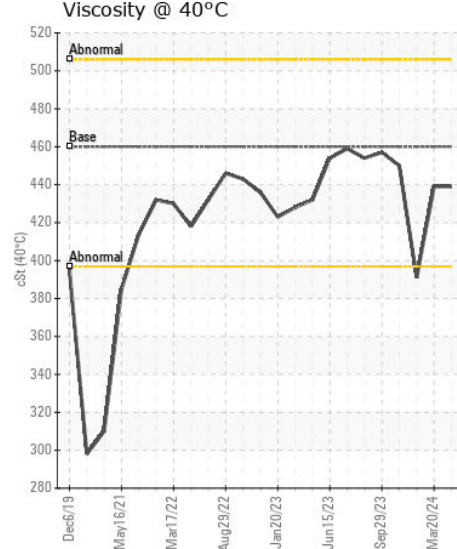
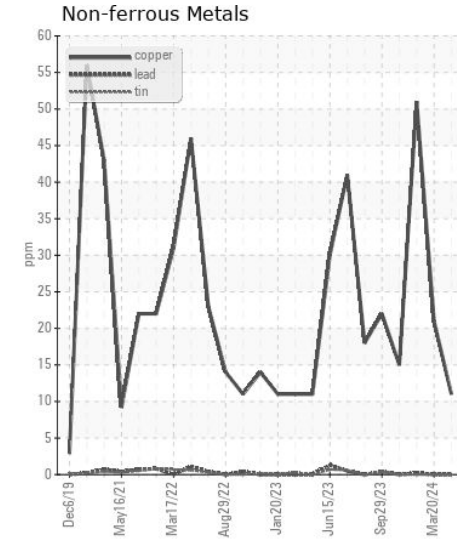
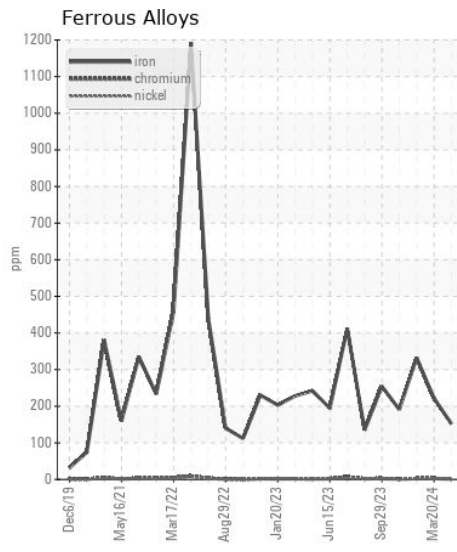
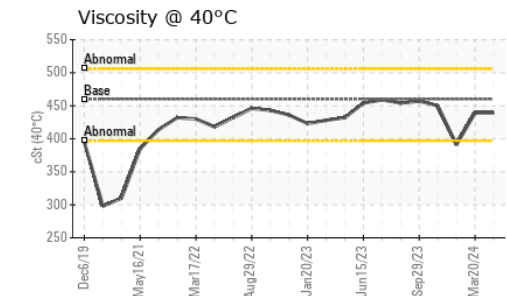
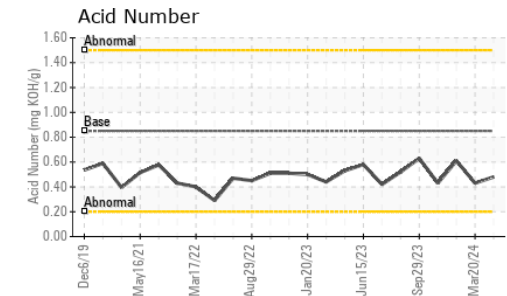
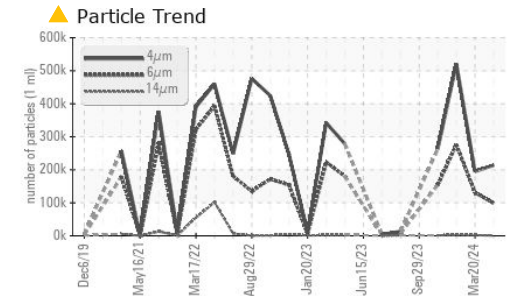
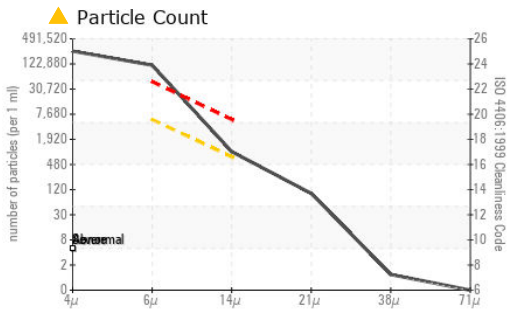
There is a high amount of particulates present in the oil.

Silicon	ppm	ASTM D5185m	>50	33	▲ 85	▲ 88
Potassium	ppm	ASTM D5185m	>20	5	14	91
Water		WC Method	>0.2	NEG	NEG	NEG
Particles >4µm		ASTM D7647		214090	194912	520610
Particles >6µm		ASTM D7647	>5000	▲ 98813	▲ 131332	▲ 276543
Particles >14µm		ASTM D7647	>640	● 856	▲ 2036	▲ 2277
Particles >21µm		ASTM D7647	>160	86	87	▲ 210
Particles >38µm		ASTM D7647	>40	1	1	3
Particles >71µm		ASTM D7647	>10	0	0	0
Oil Cleanliness		ISO 4406 (c)	>19/16	▲ 24/17	▲ 24/18	▲ 25/18
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	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG

FLUID CONDITION

The AN level is acceptable for this fluid. The condition of the oil is acceptable for the time in service.

Sodium	ppm	ASTM D5185m		65	108	164
Boron	ppm	ASTM D5185m	50	16	12	38
Barium	ppm	ASTM D5185m	15	2	4	41
Molybdenum	ppm	ASTM D5185m	15	2	7	12
Manganese	ppm	ASTM D5185m		1	2	3
Magnesium	ppm	ASTM D5185m	50	11	19	56
Calcium	ppm	ASTM D5185m	50	103	55	176
Phosphorus	ppm	ASTM D5185m	350	231	229	248
Zinc	ppm	ASTM D5185m	100	28	23	69
Sulfur	ppm	ASTM D5185m	12500	9014	8836	6293
Acid Number (AN)	mg KOH/g	ASTM D8045	0.85	0.48	0.43	0.61
Visc @ 40°C	cSt	ASTM D445	460	439	439	391



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : KL0014251 **Received** : 24 May 2024
Lab Number : 06191002 **Tested** : 30 May 2024
Unique Number : 11047754 **Diagnosed** : 30 May 2024 - Angela Borella
Test Package : MOB 2 (Additional Tests: PrtCount)

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.

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

CITADEL DRILLING
 7550 W 120
 ODESSA, TX
 US 79763
 Contact: MIKE COMBDEN
 mcombden@citadelldrilling.com
 T: (780)955-5509
 F: