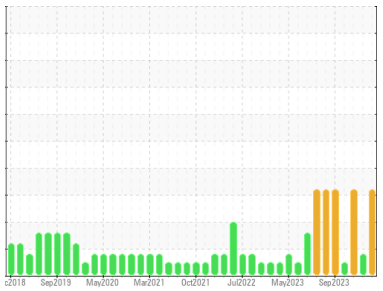
Hilcorp Alaska, LLC

OIL ANALYSIS REPORT

Sample Rating Trend



DIRT

Area
IRIG [6730519]
Machine Id
IRIG-PRM-PMUD-0301 IRIG-PRM-PMUD-0301 #1 MUD PUMP
Component
Pump
Fluid
MOBIL SHC 632 (140 GAL)

DIAGNOSIS

Recommendation
We advise that you check all areas where dirt can enter the system. Resample at the next service interval to monitor.

Wear
All component wear rates are normal.

Contamination
There is a high amount of silt (particulates < 14 microns in size) present in the oil. Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress.

Fluid Condition
The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**HLC0002819**	HLC0003033	HLC0003064
Sample Date		Client Info		**25 Mar 2024**	20 Feb 2024	05 Feb 2024
Machine Age	hrs	Client Info		**20390**	20054	19974
Oil Age	hrs	Client Info		**0**	0	0
Oil Changed		Client Info		**Filtered**	Not Changd	N/A
Sample Status				**ABNORMAL**	ABNORMAL	ABNORMAL

CONTAMINATION		method	limit/base	current	history1	history2
Water		WC Method	>.1	**NEG**	NEG	NEG

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>90	**49**	32	43
Chromium	ppm	ASTM D5185m	>5	**<1**	<1	1
Nickel	ppm	ASTM D5185m	>5	**0**	0	0
Titanium	ppm	ASTM D5185m	>3	**<1**	1	2
Silver	ppm	ASTM D5185m	>3	**0**	0	0
Aluminum	ppm	ASTM D5185m	>7	**26**	18	25
Lead	ppm	ASTM D5185m	>12	**0**	0	0
Copper	ppm	ASTM D5185m	>30	**2**	2	3
Tin	ppm	ASTM D5185m	>9	**0**	<1	0
Vanadium	ppm	ASTM D5185m		**0**	0	0
Cadmium	ppm	ASTM D5185m		**0**	0	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		**0**	0	0
Barium	ppm	ASTM D5185m		**6**	2	4
Molybdenum	ppm	ASTM D5185m		**0**	0	0
Manganese	ppm	ASTM D5185m		**0**	<1	<1
Magnesium	ppm	ASTM D5185m		**3**	4	1
Calcium	ppm	ASTM D5185m		**14**	11	10
Phosphorus	ppm	ASTM D5185m		**450**	420	425
Zinc	ppm	ASTM D5185m		**0**	0	0
Sulfur	ppm	ASTM D5185m		**0**	30	46

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>60	**72**	52	69
Sodium	ppm	ASTM D5185m		**29**	21	32
Potassium	ppm	ASTM D5185m	>20	**20**	15	20

FLUID CLEANLINESS		method	limit/base	current	history1	history2
Particles >4µm		ASTM D7647	>320000	**177689**	---	277070
Particles >6µm		ASTM D7647	>40000	**83156**	---	67328
Particles >14µm		ASTM D7647	>640	**424**	---	118
Particles >21µm		ASTM D7647	>160	**28**	---	14
Particles >38µm		ASTM D7647	>40	**5**	---	0
Particles >71µm		ASTM D7647	>10	**4**	---	0
Oil Cleanliness		ISO 4406 (c)	>25/22/16	**25/24/16**	---	25/23/14

FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045		**0.38**	0.40	0.37

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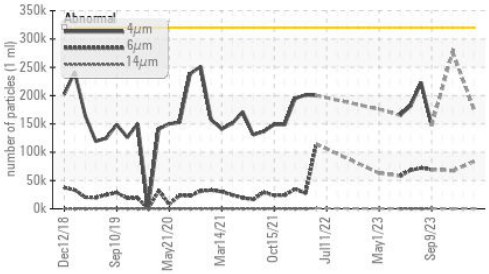
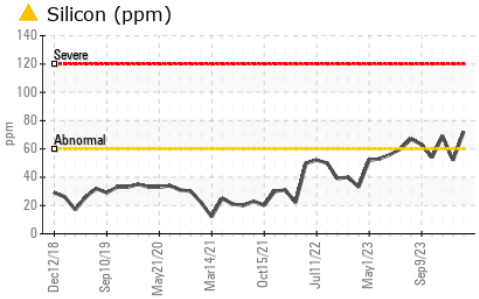
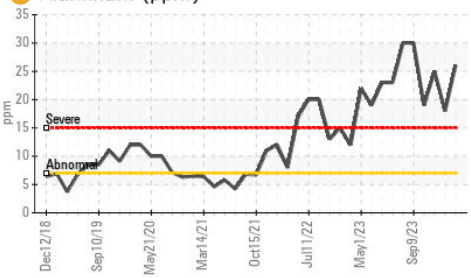
Particle Trend



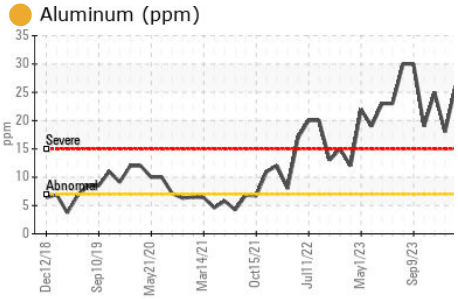
Silicon (ppm)



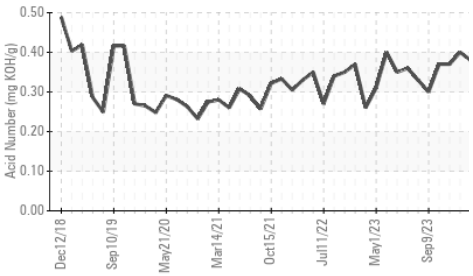
Aluminum (ppm)



Aluminum (ppm)



Acid Number



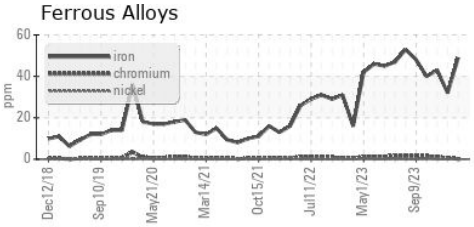
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	▲ MODER	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	LIGHT
Sand/Dirt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Appearance	scalar	*Visual	NORML	**NORML**	NORML	NORML
Odor	scalar	*Visual	NORML	**NORML**	NORML	NORML
Emulsified Water	scalar	*Visual	>.1	**NEG**	NEG	NEG
Free Water	scalar	*Visual		**NEG**	NEG	NEG

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445	325.8	**488**	484	485

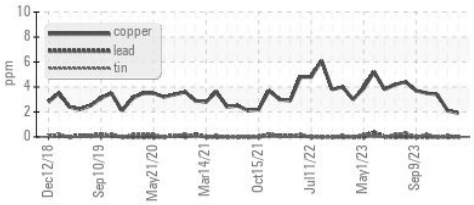
SAMPLE IMAGES	method	limit/base	current	history1	history2
Color					
Bottom					

GRAPHS

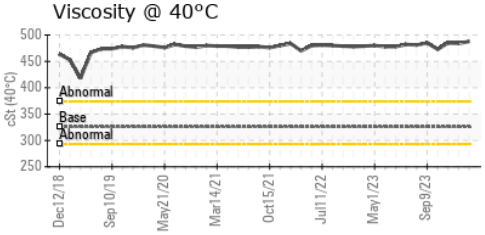
Ferrous Alloys



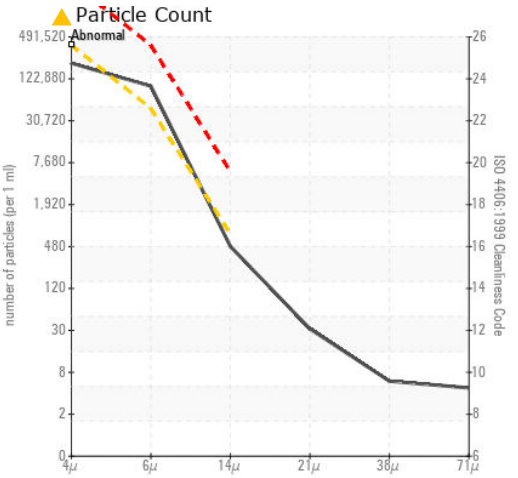
Non-ferrous Metals



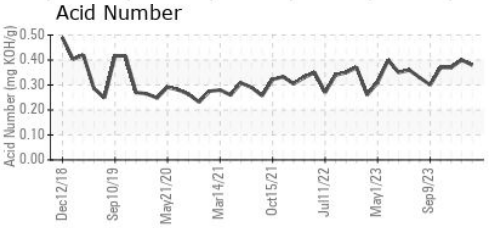
Viscosity @ 40°C



Particle Count



Acid Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : HLC0002819
Lab Number : 06147488
Unique Number : 10977566
Test Package : IND 2 (Additional Tests: PrtCount)

Received : 12 Apr 2024
Tested : 18 Apr 2024
Diagnosed : 18 Apr 2024 - Jonathan Hester

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)

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T: (907)670-3231
F: x:

Report Id: BPEMPU [WUSCAR] 06147488 (Generated: 04/18/2024 14:58:53) Rev: 1

Contact/Location: Evan Reilly - BPEMPU