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USG
Greenville, MS

The following is a summary report from the September 2023 quarterly oil analysis at your facility. Please let us know if there are any questions or comments. As always, it has been a pleasure to serve USG-Greenville, MS. If there are any comments or questions, do not hesitate to contact us.

Sincerely,

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Komatsu Press Clutch and Brake

Iron is lower on the microscopic scale, but we noted some larger pieces of ferrous debris, so steel wear might not have actually improved. Insolubles were also pretty high at 0.5%, and it would be good to flush those out. Silicon is still elevated too, so make sure there aren't any places dirt could enter the system. **CHANGE OIL SOON**

ELEMENTS IN PARTS PER MILLION									
	MI/HR on Oil		UNIT / LOCATION AVERAGES						UNIVERSAL AVERAGES
	MI/HR on Unit								
	Sample Date	9/11/2023		5/6/2023	8/8/2022	3/11/2022	7/15/2021	4/13/2021	
	Make Up Oil Added								
	ALUMINUM	2	0	1	0	0	0	4	1
	CHROMIUM	0	0	1	1	0	1	2	0
	IRON	**111**	45	**136**	**249**	**234**	**220**	6	66
	COPPER	5	3	11	3	7	4	10	23
	LEAD	0	0	0	1	0	0	4	1
	TIN	0	0	2	0	0	0	1	2
	MOLYBDENUM	0	0	0	0	0	0	0	0
	NICKEL	0	0	0	0	0	0	0	0
	MANGANESE	1	0	1	2	2	2	0	0
	SILVER	0	0	0	0	0	0	0	0
	TITANIUM	0	0	0	0	0	0	0	0
	POTASSIUM	0	1	0	0	0	0	0	0
	BORON	1	1	4	0	1	0	0	1
	SILICON	**15**	1	**15**	2	2	1	6	4
	SODIUM	2	2	3	2	2	2	2	2
	CALCIUM	85	108	108	115	115	106	111	110
	MAGNESIUM	0	0	0	0	0	0	0	2
	PHOSPHORUS	126	449	363	468	457	443	456	436
	ZINC	9	5	15	4	4	3	2	257
	BARIUM	0	0	0	0	0	0	0	0

PROPERTIES			Values Should Be*					
	SUS Viscosity @ 210°F	42.9		39.8	39.8	39.2	39.5	39.8
	cSt Viscosity @ 100°C	5.06		4.09	4.12	3.91	4.02	4.12
	Flashpoint in °F	345		380	350	400	SHORT	465
	Fuel %	-		-	-	-	-	-
	Antifreeze %	-		-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Insolubles %	**0.5**	<0.1	TR	**0.1**	**0.1**	**0.1**	0.3
	TBN							
	TAN					0.2		
	ISO Code					23/20/17		

#3 Board Line Drive Gearbox

Iron is a lot lower than in the last few reports, and chromium and nickel are too. There's still enough iron in this sample to recommend an oil change though. This gear lube had an ISO 150 or 200-grade viscosity, and insolubles were fine at 0.2%. **OIL IS OK FOR USE**

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil		UNIT / LOCATION AVERAGES						UNIVERSAL AVERAGES
	MI/HR on Unit								
	Sample Date	9/11/2023		5/6/2023	8/8/2022	3/11/2022	7/15/2021	4/13/2021	
	Make Up Oil Added								
	ALUMINUM	0	1	0	0	1	1	0	1
	CHROMIUM	1	1	**5**	3	2	1	1	0
	IRON	**189**	59	**738**	**452**	**296**	**126**	76	65
	COPPER	1	5	2	1	2	1	1	2
	LEAD	0	0	1	1	0	1	0	0
	TIN	0	0	0	0	0	0	0	0
	MOLYBDENUM	1	0	3	1	1	0	0	22
	NICKEL	1	0	**5**	3	2	1	0	0
	MANGANESE	3	1	7	5	3	2	1	1
	SILVER	0	0	0	0	0	0	0	0
	TITANIUM	0	0	0	0	0	0	0	0
	POTASSIUM	0	1	0	0	0	0	0	1
	BORON	8	12	15	10	17	12	8	27
	SILICON	5	5	6	5	5	4	4	10
	SODIUM	4	9	10	8	8	7	7	5
	CALCIUM	7	7	5	5	6	5	5	13
	MAGNESIUM	1	1	0	0	1	1	1	1
	PHOSPHORUS	351	312	341	343	338	329	320	430
	ZINC	68	31	28	32	32	28	25	22
	BARIUM	0	0	0	0	0	0	0	0

			Values Should Be*					
PROPERTIES	SUS Viscosity @ 210°F	87.2		90.0	91.0	90.9	91.9	92.1
	cSt Viscosity @ 100°C	17.31		17.98	18.21	18.19	18.43	18.48
	Flashpoint in °F	450		460	450	490	475	500
	Fuel %	-		-	-	-	-	-
	Antifreeze %	-		-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Insolubles %	0.2	<0.6	0.3	0.2	0.3	0.1	TR
	TBN							
	TAN					0.4		
	ISO Code					24/23/17		

Hydropulper Gearbox

There were still globs of non-metallic debris in this sample, (likely from drain pipe) though it's not correlating with excess wear or insolubles, and in fact, copper reached its lowest value on the page. With otherwise good results, it might be okay to run this same oil for another cycle. Check back next service to keep monitoring **OIL IS OK FOR USE**

ELEMENTS IN PARTS PER MILLION									
	MI/HR on Oil		UNIT / LOCATION AVERAGES						UNIVERSAL AVERAGES
	MI/HR on Unit								
	Sample Date	9/12/2023		5/6/2023	8/8/2022	3/11/2022	7/22/2021	4/13/2021	
	Make Up Oil Added								
	ALUMINUM	0	1	0	1	1	2	3	1
	CHROMIUM	1	1	2	1	1	1	1	0
	IRON	11	59	37	14	21	35	53	65
	COPPER	3	5	8	5	6	25	28	2
	LEAD	0	0	0	0	0	0	1	0
	TIN	0	0	0	0	0	0	0	0
	MOLYBDENUM	0	0	0	0	0	0	0	22
	NICKEL	0	0	0	0	0	0	0	0
	MANGANESE	0	1	1	0	0	0	1	1
	SILVER	0	0	0	0	0	0	1	0
	TITANIUM	0	0	0	0	0	0	0	0
	POTASSIUM	0	1	1	0	1	2	1	1
	BORON	16	12	17	16	16	12	16	27
	SILICON	4	5	6	3	4	5	12	10
	SODIUM	6	9	5	1	2	2	4	5
	CALCIUM	7	7	7	3	5	6	19	13
	MAGNESIUM	1	1	2	1	2	1	3	1
	PHOSPHORUS	324	312	329	340	333	307	298	430
	ZINC	23	31	52	23	47	114	110	22
	BARIUM	0	0	0	0	0	0	0	0

PROPERTIES			Values Should Be*					
	SUS Viscosity @ 210°F	91.2		92.4	94.0	89.8	85.6	77.0
	cSt Viscosity @ 100°C	18.27		18.55	18.95	17.94	16.90	14.77
	Flashpoint in °F	455		480	465	480	460	475
	Fuel %	-		-	-	-	-	-
	Antifreeze %	-		-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.9
	Insolubles %	0.2	<0.6	0.4	0.1	TR	0.2	0.1
	TBN							
	TAN					1.1		
	ISO Code					24/22/18		

Hi-Pressure Hydraulic Pump (Water Jet System)

A little less silicon showed up this time, but chromium is higher. It's not high enough to show a definite problem, but make sure there aren't any points of dirt ingress, in case some of the silicon is abrasive. If none are found, this oil can see more use. No water or solids were noted. **OIL IS OK FOR USE**

	MI/HR on Oil		UNIT / LOCATION AVERAGES						UNIVERSAL AVERAGES
	MI/HR on Unit								
	Sample Date	9/12/2023		5/6/2023	8/8/2022	3/11/2022	8/2/2021	4/13/2021	
	Make Up Oil Added								
ELEMENTS IN PARTS PER MILLION	ALUMINUM	0	0	0	0	0	1	2	0
	CHROMIUM	**5**	1	3	1	1	2	2	0
	IRON	1	2	1	1	2	10	**12**	3
	COPPER	3	5	3	5	4	**35**	**35**	5
	LEAD	0	1	0	0	0	4	4	1
	TIN	0	0	0	0	0	0	1	0
	MOLYBDENUM	2	1	2	4	5	0	0	1
	NICKEL	0	0	0	0	0	0	0	0
	MANGANESE	0	0	0	0	0	0	0	0
	SILVER	0	0	0	0	0	0	0	0
	TITANIUM	0	0	0	0	0	0	0	0
	POTASSIUM	0	0	0	0	0	0	0	1
	BORON	3	1	3	3	4	1	0	2
	SILICON	**70**	9	**104**	**49**	3	4	2	2
	SODIUM	3	2	3	3	2	2	1	3
	CALCIUM	43	43	60	72	69	54	69	85
	MAGNESIUM	48	10	40	51	65	1	0	6
	PHOSPHORUS	311	288	308	314	308	355	370	361
	ZINC	312	309	319	342	349	162	158	411
	BARIUM	0	0	0	0	0	0	0	0
			Values Should Be*						
PROPERTIES	SUS Viscosity @ 210°F	47.3		48.6	49.8	47.5	44.0	43.1	
	cSt Viscosity @ 100°C	6.43		6.84	7.20	6.50	5.41	5.13	
	Flashpoint in °F	430		465	400	440	410	395	
	Fuel %	-		-	-	-	-	-	
	Antifreeze %	-		-	-	-	-	-	
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Insolubles %	0.0	<0.1	0.0	**0.2**	0.0	**0.1**	TR	
	TBN								
	TAN					0.4			
	ISO Code					21/19/16			