DESCRIPTION:	Zone 5. 12 Monthly Lubrication Maintenance	**FREQUENCY:**	12 Months
LOCATION:	ST22 Oxley Creek WRP	**STD JOB ID:**	LTS058

	Oil and Grease required:	**Maintenance Group**
	Castrol Alpha SP220 oil.	Stage 1 to 4 Bioreactors
	Castrol EPL2 grease.	Stage 1 to 4 RAS Pumps
	Castrol AP3 Grease.	Stage 1 to 4 WAS Pumps
	Castrol White Oil	Stage 1 to 4 Scum Pumps
	Castrol Molub Alloy 936F	Final Settling Tanks 1 to 8
		Service Water Pumps
	References	
	Procedural Steps	
	Bioreactor 1 to 4	
	Lubricate all valve spindles with Molub Alloy 936F.	
	There are three manual valves on each Bioreactor with exposed spindles. Two are on weirs in the tanks and are in closed position. The third valve is at the side of each Bioreactor in fully open position. They will have to be operated through full range of travel in order to lubricate the spindle. Notify operations of the intention to do this and leave them in the same position before greasing the stems.	
	There are three valves on Manhole No.5. Located between Bioreactor 2 and 3. Two are rotork valves in fully open position. One is a manual valve in fully closed position. They will have to be operated through full range of travel in order to lubricate the spindle. Notify operations of the intention to do this and leave them in the same position before greasing the stems.	
	Lubricate **8 off** Mixed Liquor Pump hoists with Molub Alloy 936F. (Pivot point, swivel worm gear and winch gears)	
	Stage 1 to 4 RAS Pumps (8 off)	
	Pump intermediate chamber lube - drain and refill with White Oil 15BP	
	***If intermediate chamber has pressurised oil bottle fitted check the pressure.**	
	Pump gear chamber lube- drain and refill with SP220	
	Motor Gear unit lube - drain and refill with SP220	
	Remove coupling cover and inspect coupling for any obvious signs of possible failure	
	Measure the backlash between the spider and the hub - if more than 5 mm - replace the spider	
	Check pipe work and valving for leaks and defects.	
	Stage 1 to 4 WAS Pumps (4 off)	
	Pump intermediate/buffer chamber lube - drain and refill with White Oil 15BP	
	***If intermediate chamber has pressurised oil bottle fitted check the pressure.**	
	Pump gear chamber lube- drain and refill with SP220	
	Motor Gear unit lube - drain and refill with SP220	
	Remove coupling cover and inspect coupling for any obvious signs of possible failure	
	Measure the backlash between the spider and the hub - if more than 5 mm - replace the spider	
	Check pipe work and valving for leaks and defects.	
	Remove top of swing flex check valve and check condition of flap and seat.	

Depressurize Buffer Chamber

IMPORTANT:

Your pump is equipped with a pressurized oil canister. When you are working on the mechanical seals you must depressurize the buffer chamber before you remove the seals.

Whenever the mechanical seals are removed from the pump, a pressure test is highly recommended after re-installation of the mechanical seals and wet-end parts. This test will confirm that installation has been successful and no o-rings have been cut or pinched in the process. The pressurized oil bottle itself is ideal for this pressure test.

Pressure Testing:

1. **Test for proper seal installation:** Install a pressurized oil bottle at the empty buffer chamber port at the top of the pump. With the provided hand pump or other air source, pressurize the bottle (no oil in chamber) to approximately 21 psi (1.5 bar) and observe the gauge. Pressure should hold steady for at least 15 minutes. Then depressurize the bottle, remove it, re-fill the buffer chamber and re-install the pressurized oil bottle. A specific pressure is to be set on the oil bottle which is specific to your pump's operating pressure. Review the following page for instructions on determining and setting the pressure for your pump's buffer chamber.
2. If the buffer chamber does not hold pressure it will be necessary to disassemble and recheck all o-rings for damage, and the lobe core surfaces for proper preparation. Check also that the seal cartridge is seated fully into the pump body and the cartridge outer body is flush with pump body.
3. Re-install pump outer door (front pump cover) to complete assembly.

Use the included Hand Pump to add pressure inside the **empty** blocking chamber.

21psi equals about 1.5 bar on your pressure gauge.

Repressurizing Pump *after* completed maintenance

The pressurized buffer chamber canister (oil bottle) provides a constant pressure against the mechanical seal helping to prevent infiltration of material from a higher pressure in the pumping chamber. The semi-opaque container also allows easy monitoring of the oil level.

1. Fill the buffer chamber completely using the same oil as that used in the gearbox, ie. 80W90 hypoid gear oil.

2. If a non-pressurized oil bottle has been previously installed, remove and discard the bottle and the check valve installed under the bottle. Install the pressurized oil bottle, screwing it directly to the buffer chamber. On belt drive units, a hose kit is necessary to mount the bottle in a remote location.

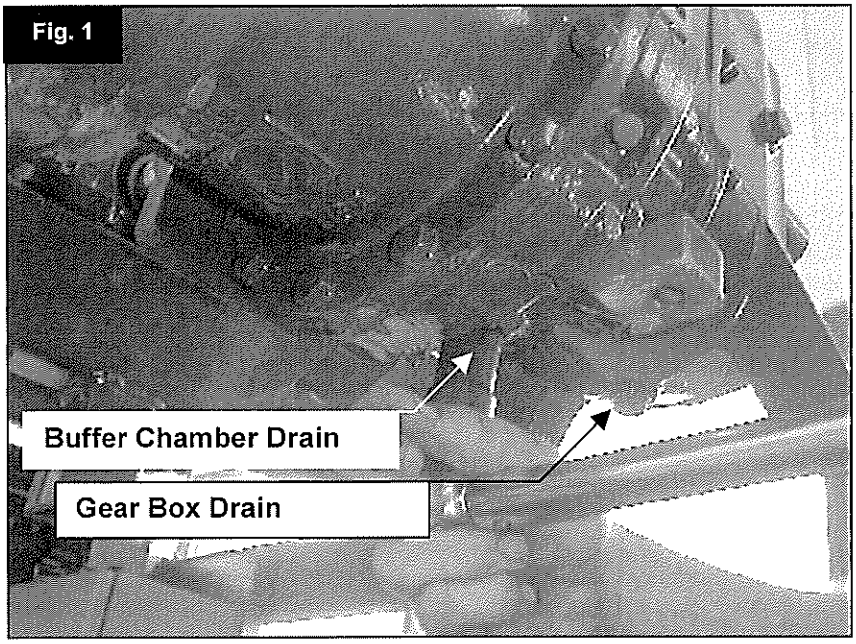
3. Fill the pressurized oil bottle about 1/4 full with buffer chamber oil (see above). Using the supplied hand pump, pressurize the buffer chamber using the formula: 1/2 of normal pump operating pressure plus 7 psi. For example, if your pump normally has a pressure head on the suction side of 2 psi and a discharge pressure of 30 psi, the operating pressure is 32 psi. Pressurize the oil bottle to (1/2 x 32) + 7 = 23 psi.
   It's as easy as a b c. Just fill in the blanks:

Step	Suction Pressure	*Plus*	Discharge Pressure	*Equals*	Operating Pressure
a		**+**		**=**	

	Operating Pressure	*Divided by*		*Equals*	½ Differential Pressure
b		**÷**	**2**	**=**	

	½ Differential Pressure	*Plus*	PSI	*Equals*	Gauge Pressure
c		**+**	**7psi**	**=**	

Drain Pump Oil Reservoirs



NOTE: *Your pump is supplied with a pressurized oil bottle. Release pressure and unscrew oil bottle from the pump.*

To begin service to the pump wet-end drain oil from the buffer chamber by loosening and removing the bottom drain plug. Remove the pressurized oil bottle from the top of the chamber at the same time. Place it in a safe place for reuse.
Place a drain pan under the pump to catch the quenching oil. Remove the buffer chamber drain bolt (**Fig. 1**) located on the bottom of the pump. This part will be reused.

Inspect the oil for foreign bodies or other evidence of contamination, as this may indicate mechanical seal failure.

Remove the top bolt on the gear case of the pump, and save for re-use. Place an oil collection pan under the pump, and loosen and remove the bottom drain plug from the gear case of the pump. Inspect the oil for foreign bodies and other contaminants. This may be an indicator of the lip seal performance, or gear/bearing damage.

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	Stage 1 to 4 Scum Pumps (2 off)
	Pump intermediate chamber lube - drain and refill with White Oil 15BP
	***If intermediate chamber has pressurised oil bottle fitted check the pressure.**
	Pump gear chamber lube- drain and refill with SP220
	Motor Gear unit lube - drain and refill with SP220
	Remove coupling cover and inspect coupling for any obvious signs of possible failure
	Measure the backlash between the spider and the hub - if more than 5 mm - replace the spider
	Check pipe work and valving for leaks and defects.
	Remove top of swing flex check valve and check condition of flap and seat.
	Final Settling Tanks 1 to 8
	Apply (8) shots of EPL2 grease to the centre slewing ring bearing grease nipple.
	Apply (8) shots of AP3 to each of the centre pivot shafts grease nipples.(if grease nipples are fitted)
	Clean out grease build up from drive/idler bearing housings.
	Visually inspect the roller bearing and repack the housing with EPL2 grease.
	Drain and replace the gear motor oil with SP220.
	Check condition of Drive and idler Wheels.
	High Pressure Service Water Pump (3 off)
	****2 located at Service Water Pump Station. 1 located behind pump station on top of round pit.****
	****The pump located at the outfall belongs to the Golf Club. QUU does not maintain that pump.****
	Grease pump bearings with 4 shots of AP3 grease.
	Check pipe work and valving for leaks and defects.
	Remove top of swing flex check valve and check condition of flap and seat.