



Final Monitoring Report

Ammaria RO - Tubli
Kingdom of Bahrain

ScaleWatcher (SW) Water Treatment Report for the RO
unit, 27th January 2021



Objective

Opera Kool team is aiming to **provide solution on the challenges concerning the scaling, corrosion and other microorganism problems in RO system of Ammaria RO plant.** Scaling for RO system means the deposition of particles on a membrane, causing it to plug. It is an unwanted effect that can occur during Reverse Osmosis processes. Scaling causes a higher energy use and a shorter life span of the membranes, because these will need cleaning more often. The other problems faced due to scaling of RO systems are:-

- Scaling and corrosion affecting the whole system of the RO unit.
- Algae and bacterial challenges resulting to fouling of odour of the membrane.
- Increased power usage due to variable water parameters affecting the system.
- High maintenance which is an additional operational expenses for the plant such as replacement and maintenance shutdown of the RO unit and the membrane , periodic cleaning and application of chemical anti-scalants.

The problems stated above are the main concern and objectives, this report shows how our team was able to solve them.



Overview

- Installations of SW Industrial Model IE 4 in the bore well pump room no. 2 and IE 2 in RO plant no. 2 with pipe diameter of 3” and 2” respectively which was installed in the month of September. (1 set of coil with 40 to 50 loops)
- Initial status of some critical areas in the RO were noted:
 - *There was corrosion in bore well pump 2.
 - *Scaling was found on the pump of RO plant 2.
- OperaKool recommended a 100% non-usage of chemical water treatment upon full installation of the SW units in order to prove that it is a perfect alternative for the current water treatment implemented by Ammaria.



Ammaria RO Plant Treatment with SW Electronic Water Treatment





ScaleWatcher Installation



Around 40 coils are done on the inlet pipe of RO plant 2
Installation Date: 10th September 2020

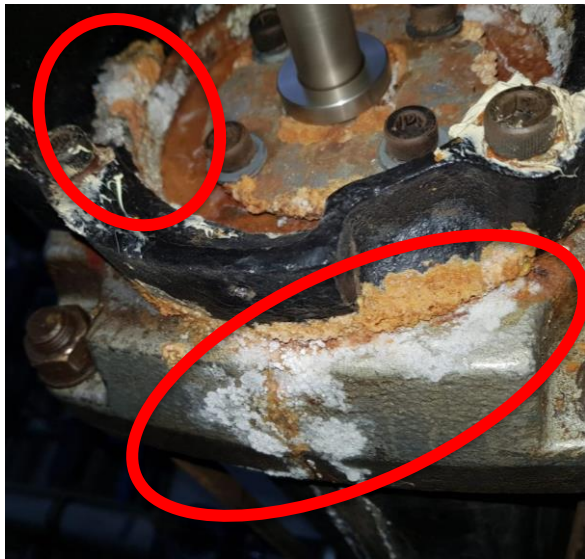


Before & After results of ScaleWatcher on RO



RO plant 2 pump

Before treatment (September), as shown in the image, the surface of the pump is covered with thick scale layers present on it



5th September 2020

After treatment (November), the image shows slight improvement in reducing scale layers.



25th November 2020

After treatment (January), the image shows significant improvement in reducing scale layers as shown in the image almost all white scale layers are being removed.

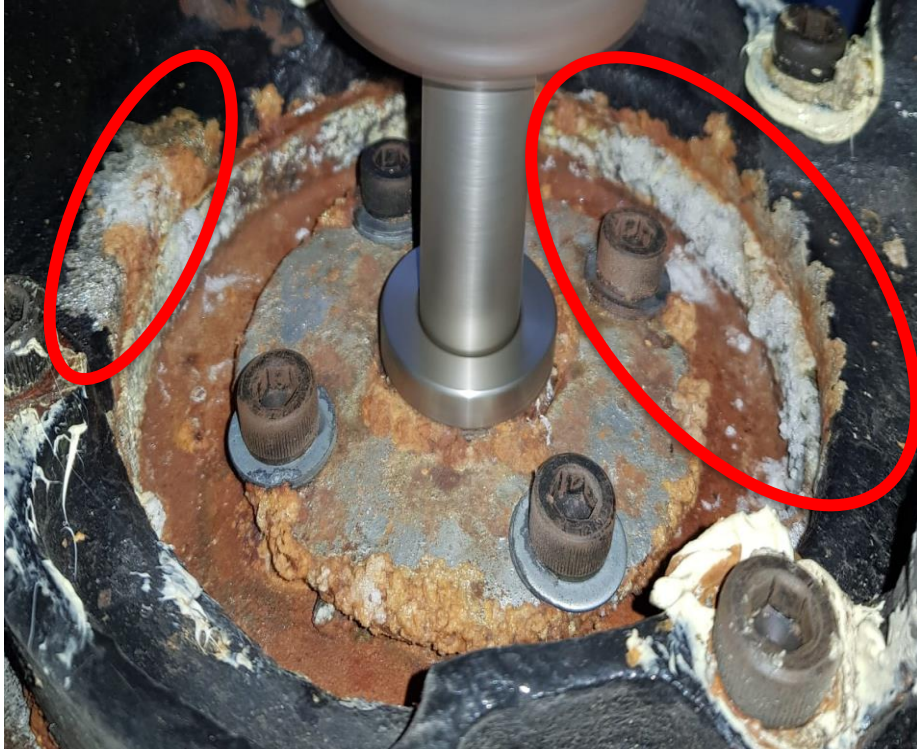


18th January 2021



RO plant 2 pump in detail

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26th January 2021



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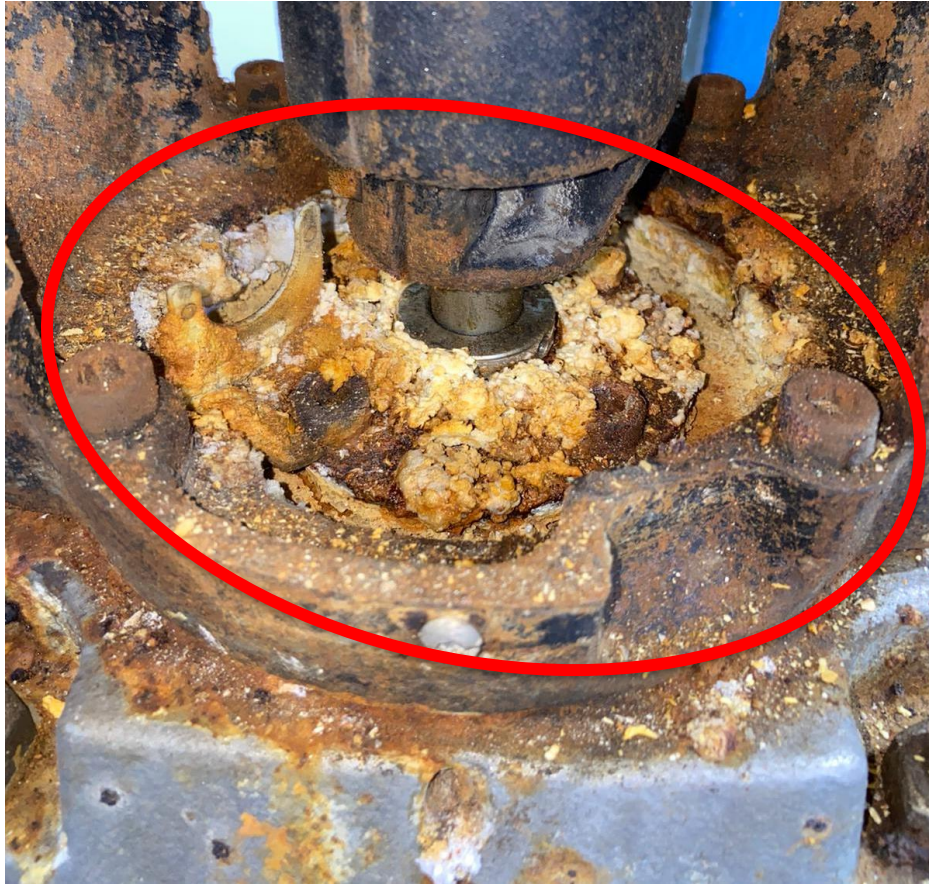


18th January 2021



SW treated pump compared to untreated pump

Untreated Pump, as shown in the image, the surface of the pump is covered with thick scale layers present on it



26th January 2021

Treated pump, the image shows significant improvement in reducing scale layers as shown in the image almost all white scale layers are being removed.



26th January 2021



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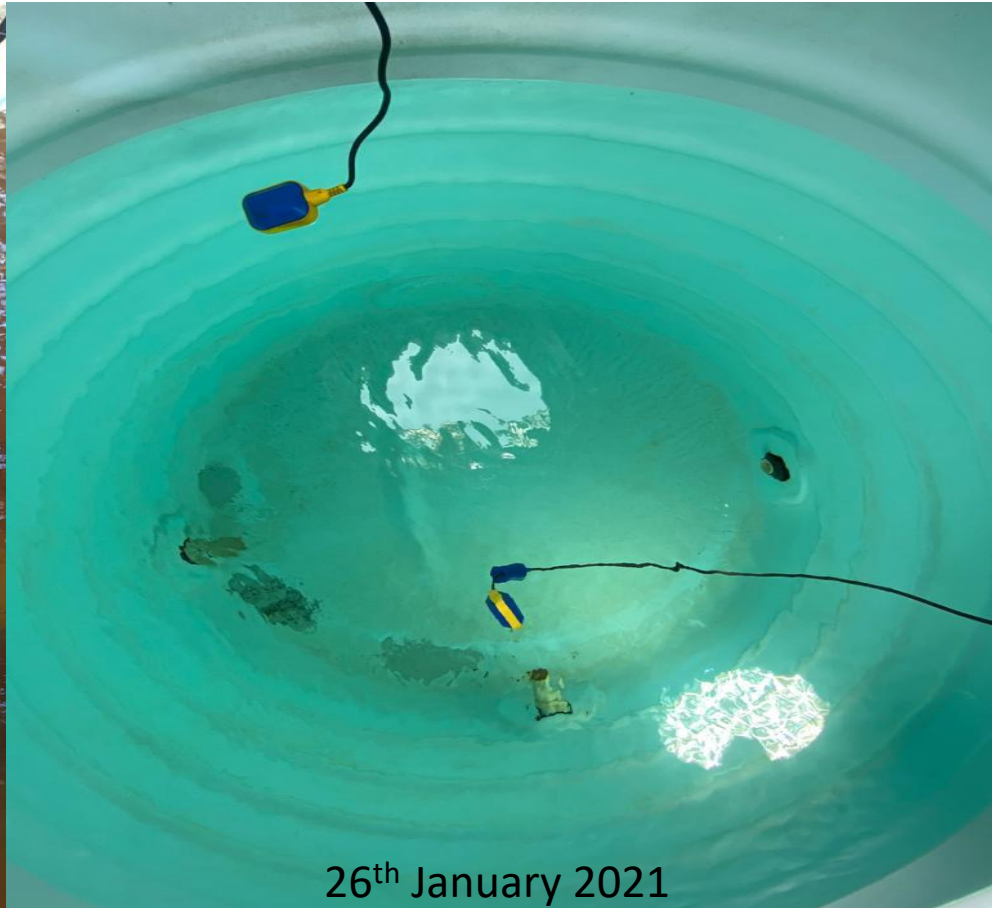


Bore well storage tank

After treatment (October), the image shows all the rust from bore well pump was cleaned and was pushed to storage tank. The tank became brown due to too much rust content



After treatment (January), the image shows all the rust from tank was cleaned and now the water is crystal clear and tank is same as new without any sediments.



pH Test

Before treatment (September), as shown in the image, the pH was slightly acidic



5th September 2020

After treatment (January), the image shows that the pH is stabilized to neutral.



18th January 2021



Observations:

- Hard scaling that has developed through time in the RO system and pump as shown in images has significantly softened and removed.
- There is no rely of any chemicals to remove scale of minerals.
- The SW industrial unit has really worked on the RO pump and has made to appear as new without the usage of chemicals.



Conclusion

- Providing an effective water treatment will ensure a significant reduction of maintenance expenses of the hotel, lesser maintenance shutdown of high invested units with longer performance period and minimal concerns on water parameters affecting any system or application.
- Achieving these results will positively increase the revenue of the plant.
- In order to achieve and maintain the ideal water parameters with a minimal expenses, we are proposing to install an Electronic Water Treatment (EWT) - ScaleWatcher to have a 24/7 water treatment.
- ScaleWatcher is a patented technology from The Netherlands proven to provide solutions to various problems associated with water.
- It is a maintenance free, non-invasive and eco-friendly water solution that guarantees to eliminate scaling, corrosion, biofilm causing the fouling of odour and significantly lower the maintenance expenses for Ammaria RO plant.



Recommendations:

- Secure a 24/7 electrical power connection for the SW Electronic Water Treatment System.
- Monitor the status of the RO and check the inner surfaces of the system and compare to the records of expenses before the SW was installed.
- Check the status of the progress of conversion the red rust and the intensity of water leaking. This will heal through time by converting the red rust into its beneficial form- “Black Magnetite”.
- Installation of SW Commercial and Industrial Models for the inlet water line of main storage tank, RO system, washing machine, steamers, chillers, pumps, swimming pool and spa area to significantly reduce maintenance expenses and provide protection to extend functionality of the said high-value equipment.



ScaleWatcher(SW) Guaranteed Product Benefits:

- 24/7 water pH stability ensuring no scaling, corrosion, biofilm and algae to develop in the water; meaning a healthy water source for the users.
- Removes old scale layers and prevents further build-up of new scales.
- Improves cleaning properties of water resulting to lesser amount used resulting to savings for the company.
- Reduces or prevents algae and bacterial growth in the water line (ex. Legionella).
- Eliminates and reduces corrosion and removes rust and replaces it with a black layer called Black Magnetite.
- Zero usage of water softener and other chemical treatments (ex. Broxo Salt).
- No chemicals for descaling.
- No expensive maintenance, non-invasive system and guaranteed environmentally friendly.
- Guaranteed protection of pipeline with lesser maintenance costs and shutdown.
- Prolonged shelf life of existing system or high invested system such as water pumps, filtration and pipelines.
- Increased water pressure in the pipelines and higher water yield for the RO system.
- Cleaner status of drinking glasses, plates and cutlery with no undesirable water markings resulting to its longer usage of the company as compared before the installation of ScaleWatcher.



Benefits

–ScaleWatcher will Save

- Money
- Energy
- Water
- Time
- Safe and Environmentally Friendly



Quality Assurance on SW Mode of Action- Health Declaration Assurance Aligned to EU Standards

Health Declaration

Most natural water contains calcium and carbonate ions that form – depending on temperature and other conditions – several crystal structures like calcite and aragonite. Calcite is essential for the human body – so it should remain in the water. But it should not remain in the pipe, as this would increase maintenance costs.

Scalewatcher treatment follows this rule: It does not remove any calcium components from the water, but influences crystal formation. Calcium and Carbonate ions no longer form particles with matted structures, but smaller crystals with a rounded shape. These will no longer adhere to the pipe walls, but are flushed through the pipe by the flow of water.

The Scalewatcher electronic hard water treatment system operates with a signal cable, wound around the pipe work. It emits a weak magnetic and electric field around the inside and outside of the pipe work which affects the calcium molecule formation.

The Scalewatcher system neither adds nor removes anything from the water and there is no physical contact. **So the water quality is not changed by the Scalewatcher. It has no adverse effect on health and can be consumed in the normal way.** In the stomach, the Ca-related content is dissolved by the acidity and available for the human metabolism.

Since 1989 over 300,000 units have been sold worldwide for residential use. There has never been any suspicion that related a Scalewatcher system to health problems of consumers nor has there been any reference to health problems associated with the product from any organization either government or consumer.

Good drinking water is rare and expensive. So SW treatment will not change water quality, but will protect pipes and water related equipment and reduce maintenance costs. That's what the SW is made for.



The World Green Building Council specifies only NON-CHEMICAL water treatment such as the FMW/SW, currently registered with the US and UK Green Building Councils.



OperaKool

ENVIRONMENTAL CONTROLLERS

Your SERVICE
SPECIALIST in saving
water, money and
energy for the
Kingdom of Bahrain
and the rest of the
GCC Region



Team OperaKool #@yourservice

