

Date 18<sup>th</sup> September 2009

Our Ref: 211418-002-2009

Trevor Dillon  
 Director  
 Macarthur Strata  
 PO Box 205  
 Narellan, NSW, 2567  
 Trevor@macarthurstrata.com.au

Dear Trevor,

**Re: Monthly and Fortnightly Visits to the Nangarin Vineyard Estate STP**

The monthly visit to the Nangarin Vineyard Estate Sewage Treatment Plant (STP) was carried out on the 20<sup>th</sup> August 2009 and the following fortnightly visit carried out on the 2<sup>nd</sup> September 2009. The purpose of this report is to detail the inspection, monitoring and works undertaken at that visit.

**Water Quality**

The water quality results recorded during the monthly visit (20/08/2009) were similar to the historical data collected at the site during the previous 6 months. However, those recorded during the fortnightly visit (02/09/2009) differed and are explained below. The water quality results collected during the visit are displayed in Table 1 below. The historical results are presented in the spreadsheet accompanying this report.

**Table 1: Physiochemical data**

Analyte	Units	Plant		Pond	
		20/08/09	02/09/09	20/08/09	02/09/09
Temperature	°C	15.60	14.87	12.71	12.26
Conductivity	µS/cm	529.3	524.5	500.6	489.5
pH	pH Units	5.68	5.76	7.65	10.41
Dissolved Oxygen	%	93.6	23.4	110.8	143.5
Dissolved Oxygen	mg/L	9.34	2.36	11.78	15.51
Chlorine	mg/L	0.05	0.04	-	

The dissolved oxygen levels measured in the plant holding tanks during the fortnightly visit was the lowest it has been at any point during the previous 6 months. A site inspection identified that the final tank in the treatment process was discharging via the overflow pipe, and not pumping into the holding tanks as outlined below. It is believed that the low dissolved oxygen content recorded was due to the lack of water being pumped into a holding tank over the period, and not the DO of the water actually exiting the plant.

The pH has remained low in the plant sample, when compared to historical results, and indicated acid producing bacteria are prevalent in the activated sludge. The pH level recorded in the Pond during the fortnightly visit was the highest recorded at any point during the previous 6 months and may be attributed to environmental factors. The dissolved oxygen was also elevated. Free residual chlorine has remained low during the two visits to sites; however it has been noted that the chlorine level in the drums has been decreasing and that the pump is therefore functioning.

Water samples were collected during the visit on the 20<sup>th</sup> August 2009; they are next due to be collected during the monthly sampling event in the week of the 14<sup>th</sup> September 2009. Shown in Table 2 below are the results for the last round of water quality testing carried out during the monthly visit.

**Table 2: Water Quality**

Analyte	Units	Plant	Pond
BOD	mg/L	10	9
SS	mg/L	57	58
Total Diss. Solids	mg/L	420	380
Ammonia	mg/L N	0.81	0.06
Nitrate	mg/L N	32	20
Nitrite	mg/L N	<0.01	0.25
T. Oxid. Nitrogen	mg/L N	32	20
T. Kjel Nitrogen	mg/L N	9.0	6.0
Total Nitrogen	mg/L N	41.0	26.0
Total Phosphorus	mg/L P	12.0	5.90
pH	pH units	5.5	9.6
<i>E. Coli</i>	CFU/100mL	5300	-

As mentioned in the previous report elevated *E.coli* results have been recorded recently in treated water. Ecowise increased the chlorine dosage to address the problem of the elevated *E.coli* results. As noted above, the chlorine level has not returned to the desired range since this occurrence.

The suspended solids were again high and it is expected that the upcoming de-sludging of the tanks will help to address this problem. All other analytes measured were similar to the historical data collected over the previous 6 months with the exception of an elevated Total Nitrogen and Total Phosphorus level in the Pond sample, once again potentially reflecting environmental concentration and a limited flow into the pond..

### **Plant Functionality**

During the visits the plant was noted to be fully operational, both blowers were working and the aeration in the tanks was normal.

As mentioned in the previous report the chlorine dosing pump was altered to provide an increased delivery of chlorine. The concentration of chlorine will be altered to ultimately fall within the range of 0.2 – 0.5 mg/L. However, during the subsequent visits it has been noted that the chlorine level has not increased to the desired range. Ecowise plans to have the electrician to site to assess whether the chlorine pump is functioning at full capacity.

During the site visit, it was noted that water was flowing out of the final treatment tank via the overflow pipe and that no water was discharging from the sample tap. Ecowise identified that the problem was most likely caused by a failure to the pump in the final tank. The electrician and plumber were both called to site to address the problem. The faulty pump was identified and fixed and the plant was able to pump water into the holding tanks.

When the electrician was on site to address the problem of the faulty pump he noted that there were a number of pieces of equipment located in each of the tanks that had been switched off or the circuits disconnected. Ecowise and the electrician intend to identify in the coming weeks what these pieces of equipment are and whether or not they should be operational.

### **Plant Upgrades**

The plumber has installed the Magnetic Flow meter on site and Ecowise is currently waiting on the electrician to connect power to the meter so the flow rate can be measured during the site visits.

The plumber has also begun to replace the broken aeration pipe work to each of the tanks.

However, the plumber has found that the pipes are a lot more brittle than originally thought and the job is more difficult than expected. After a conversation with the plumber on the 17<sup>th</sup> September, Ecowise expects the upgrade to the pipe work to be completed in the coming weeks.

A quote for the painting of the pipe work has also been accepted by Macarthur Strata and Ecowise and it is expected that the painting will begin once the plumber has finished installing the new pipe work.

Please do not hesitate to contact Tony Farrugia, Danielle Baker or Tristan Newton-McGee on 02 4721 3477 to discuss further.

Yours sincerely,

Danielle Baker

Senior Consultant