

# Veticon Consulting Pty. Ltd.

Erosion and Sediment Control

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Land Stabilisation and Phytoremediation

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## RE: ASSESSMENT ON THE EFFECTIVENESS OF THE VETIVER SYSTEM IN EFFLUENT DISPOSAL AT WATTS BRIDGE MEMORIAL AIR AIRFIELD

### BACKGROUND ON EFFLUENT

This assessment is based on the data provided by Bill Finland in 2005.

- Maximum Input about 50kL/month ie 1 670L/day
- Total N from 100-26 mg/L, averaging 68mg/L
- Total P from 19-2.3 mg/L, averaging 10.6mg/L

### WELL MONITORING RESULTS

November 2007

Test	Units	Well 1	Well 2	Well 3	Well 4
pH	pH Unit	7.1	7.2	7.1	7.2
Total Phosphorus as P	mg/L	0.067	0.22	0.12	0.21
Ammonia N	mg/L	<0.06	0.062	<0.06	0.28
Nitrite N	mg/L	0.023	0.026	<0.02	0.026
Nitrate N	mg/L	0.036	6.8	13	0.10
Nitrite+Nitrate N	mg/L	0.059	6.8	13	0.13
Faecal Coliforms (MF)	cfu/100mL	<10	<10	<10	<10

### Comments

1. All pH values are near neutral from 7.1-7.2
2. Well 4 is inside the bund wall and the closest to the vetiver planting so it is expected that this well would have the highest level of nutrients. But it has very low nutrient levels, showing that Vetiver grass has done its job very well
3. Nutrient levels from well 1 are consistent with the expectation as it is outside the bund wall and further away from the vetiver planting
4. Nutrient levels from well 3 are unusually high, higher than normally secondary treated effluent. This may be resulted from leakage from old pipes near by. It is recommended that this problem be investigated and repaired as required.

5. Nutrient levels from well 2 are also high and also most likely resulted from some leakage from well 3.
6. If only data from wells 1 and 4 are used, then the average **Total N is only 0.095mg/L and Total P of 0.138mg/L.**
7. Even if all 4 wells data are used the average **N is only 4.95mg/L and for P 0.12138mg/L.**
8. The EPA limits to discharge to **waterways** is **<15mg/L for N and <1mg/L for P.** The limits for discharging to forest or grassland are much higher.
9. The nutrient levels recorded so far, both inside and outside the bund wall are well below the limits mentioned above.

**May 2008**

Test	Units	Well 1	Well 2	Well 3	Well 4
<b>pH</b>	pH Unit	6.9	6.7	7.2	7.0
<b>Total Phosphorus P</b>	mg/L	0.091	0.068	0.33	0.12
<b>Ammonia N</b>	mg/L	0.14	0.051	0.49	0.13
<b>Nitrite N</b>	mg/L	<0.002	<0.002	0.007	0.003
<b>Nitrate N</b>	mg/L	0.026	0.24	0.16	0.097
<b>Nitrite+Nitrate N</b>	mg/L	0.026	0.24	0.17	0.10
<b>Faecal Coliforms (MF)</b>	cfu/100mL	<10	<10	20	<10

#### **Comments**

1. All pH values are near neutral from 6.7-7.2
2. As expected, after the repair of the leaking pipe, ground water samples from all four wells, both inside and outside the bund, are very low
3. The nutrient levels from ground water of all the wells are well below the EPA limits to discharge to **waterways** of **<15mg/L for N and <1mg/L for P.** The limits for discharging to forest or grassland are much higher.

#### **SOIL SAMPLING**

Soil test data, taken in November 2007, showed the typical nutrient levels of the texture contrast soil (Sandy Podzolic) of land under pasture in the region. These results supported the data of ground water testing, indicating no seepage to the surrounding pasture.

#### **CONCLUSION**

These data indicate that when properly applied the Vetiver System is very effective in the disposal of the effluent discharged from sewage system. The success of this project depends very much on the proper implementation and subsequent management of the site and therefore it is strongly recommended that the present management procedure to be continued.



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