

## **DRAINAGE AND WATER QUALITY**

### **1 Water Quality of Storm Water Run-off from the road area**

#### **1.1 General**

Assuming a ten fold increase in pollutants due to the anticipated and designed for ten fold increase in traffic the proposed removal of about 50% of pollutants would result in a five fold increase in total pollutants.

This would be an unacceptable long term negative impact on the water quality in the affected area particularly as much of it is World Heritage area.

To make matters worse the claimed removal rate of 50% seems unachievable and in our view totally unrealistic. As shown below the basic assumptions underlying this report are wrong and the proposed treatment system is unrealistic.

The proposed project would not be able to preserve water quality in WHA and result in a significant negative impact on water quality in WHA. Consequently the ministerial council should refuse approval for the required rezoning.

#### **1.2 First Flush (2.3.2 Appendix F in Water Quality.pdf)**

It seems that the notion that the first flush of rain carries the vast majority of pollutants with subsequent runoff being relative 'clean' is arrived at by a 'column leaching' experiment flushing 200ml of water ten times through a column of sediment (volume and dimensions are not specified) and then analysing pollutants washed out of the sediment.

This is a totally in-appropriate comparison. The test conditions have nothing to do with rain falling on road surface and then running off. Just because these 'column leach' experiments are carried out on sediments collected from the Kuranda Range Road does not mean that these experiments have any relevance at all to the problem of pollutants in rain run-off from bitumen and concrete surfaces.

Running water through sediment columns can give no reliable information on the amount of pollutants picked up by rain water running over bitumen or concrete surfaces after month of accumulation (unless DMR intends to have a permanent layer of sediments on the proposed road surface). This is very poor science indeed and to see the whole water quality argument based on such inappropriate experiments is appalling. For starters there would be very different conditions: pollutants to be removed from storm water are on the road surface rather than in sediments alongside the road. Furthermore rain hitting and then running over bitumen would behave quite differently from water percolating through sediments.

Using 'column leaching' to define rainfall and runoff events on road surfaces is poor science, to use such methodology in this project affecting WHA is irresponsible.

I challenge the implication that rain run-off from an oily road surface after the initial 10-30mm contains no significant pollutants any more.

More appropriate and relevant studies should have been carried out. Studies should have been designed to show pollutant levels in simulated rain-run-off on concrete and bitumen surfaces in a range of conditions (allowing for different timespans between rains and different rainfall intensities, patterns and durations).

#### **1.3 Removing pollutants from Run-off**

The report suggests a system of holding tanks capable of containing the 'first flush' to allow for later settlement and treatment.

### **1.3.1 System sizing:**

Considering the reports own recommendation (Page6: In North Queensland the peak flow should be equivalent to 80 L/s/ha) simple arithmetics reveal that for every linear meter of road ~1000 liters have to be collectible in catchment devices for treatment of 'first flush' only.

The report subsequently ignores its own recommendation and calculates catchment devices using lower peak flows. Despite undersizing catchment devices it goes on to conclude that:

*"The footprint and expense of trapping volumes of this order is greater than practical. As such it will be necessary to either:*

*\_ reduce the size of collection catchments and have more small traps; or*

*\_ design treatment devices that are capable of meeting the TFR that corresponds to the first flush so that detention is minimised."*

Smaller sized collector tanks are seemingly not feasible considering that even the smallest given collection area of 500 m<sup>2</sup> would require a 20,000 litre tank situated every 20 meters of the road. Since after many years of planning there is no treatment device designed nor found to be available elsewhere which could handle real-time treatment of these large flows it is highly likely that no such devices would be found.

Please note that all the above calculations are based on DMR figures which are arrived at by the seriously floored 'Column leach' experiment.

### **1.3.2 Realistic FNQ Climate Conditions**

In reality due to our seasons we have periods of several month without any rain causing significant build-up of pollutants on the road surfaces followed by possibly very intense rainfall during the thunderstorm season which might exceed 50-100mm in less than half an hour. Assuming that any treatment system could successfully remove even just the majority of pollutants in such conditions seems highly unrealistic. This report is spending a lot of time talking about parameters, design considerations and possibilities but it has no viable and workable answer to the important question of water treatment.

**1.3.3 Page79:** *"It is anticipated that the remaining research work will identify sections of the road where treatment (gross pollutants, suspended solids and hydrocarbons) will be required. At this stage it is expected that this will be limited to sections of the road closest to sensitive aquatic environments such as Avondale and Streets Creek."*

May we point out that almost all of the works area is inside of the catchments of those two creeks and considering treatment only for the areas closest to those water courses would result in pollutants arriving in those creeks in the long term rather than the short term as well as polluting smaller creeks on the way.

This is totally irresponsible and unacceptable but indicative of DMR's attitude to WHA.

**1.3.4 Page64:** "Results from this preliminary experiment indicate that zeolites are effective absorbers of dissolved heavy metals in runoff waters over a period of 1 week, particularly of Zn. Compost treatment appears to be effective for Pb and Zn but counter-effective for Cd, Cu and Ni. Further investigations into the rate of absorption of metals by zeolites are required for this mineral to be considered as a component of remediation traps in roadside environments."

Should we be surprised that this statement fails to clarify that zeolite has hardly any effect on levels of Nickel and the highly poisonous Cadmium. Nor is there any explanation on how a one week treatment period can be guaranteed before the next storm water event.

The claim of its effect on Zink and Lead also needs to be questioned since DMR has not even included the actual experiment in this report. Last not least due to petrol not containing lead anymore the only advantage of zeolite is the possibility that it might remove a large quantity of zink. What reads like a promising solution to water quality turns out to be very limited after only glancing scrutiny.

**1.3.5 Page83:** "It is suggested that additional issues requiring investigation are to:

\_ determine an acceptable level of contaminants that will allow ecosystems within roadside

corridors in the WTWHA to be sustainable;  
\_ determine where anticipated water quality from the Kuranda Range Road will meet the required water quality standard without treatment; and  
\_ determine the necessary capture rates for contaminants in order to achieve the required water quality standard."

Inside WHA there surely should be no release of untreated water from this proposed road  
What DMR seems to be saying here is "you give us permission to build this road and we will look at what we can do about wate quality.

1st\_ Determining what level of contaminants is acceptable would require researching fauna and flora not even described by science. How can we otherwise say in confidence that certain levels of eg cadmium are acceptable. This world heritage area might harbour as yet undiscovered microbes which would tolerate only extremely low level of cadmium but they have a high importance in rainforest ecology. Consequently the approach has to be zero pollutants released into world heritage.

2nd\_ see above and 1.3.3

3rd\_ even the proposed capture mechanisms discussed in 1.3.1 would be unfeasible and inadequate."

It seems to be obvious that DMR has no effective and satisfactory strategy to deal with water quality. Rather than admitting this fact, they try to give the impression that such strategies can be found in the future without any feasible indication of possible solutions. Please note that the goal is to see how much they can pollute and where they do not have to treat water and what required capture rates are. Nowhere is there a commitment to actually ensure that water released into WHA shall be treated to remove

It would be irresponsible to permit this project to go ahead on those seemingly empty promises. Fact is there is no viable treatment option available after years of studies, consequently water quality cannot be guaranteed and permits should be refused.

## **2 Construction Run-off**

No reference to treatment of run-off during construction could be found. In a phone conversation Paul Jones stated that no special strategy exists for construction run-off and that DMR intends to get treatment options described in the Water Quality report installed as soon as possible during construction. This effectively means that no treatment of construction runoff is planned at all - an issue of great concern!

We note that due to exposed cuts and other earthworkd it will be unavoidable to have large volumes of silt being carried into WHA streams (as well as explosives and leakage from machinery and drilling equipment.

Such a careless approach considering the 10-20 year effect of construction runoff on WHA is unacceptable.

## **3 Leaching of concrete structures**

Common sense dictates that all concrete leaches lime

By how much is the Ph of the area going to increase in the long term and what influence is this going to have on fauna and flora?

DMR has been made aware of this issue but has totally ignored it like many other potential negative effects.

In closing the Water Quality report is based on an in-appropriate experiment and has clearly failed to

demonstrate the possibility of treating road run-off to an acceptable standard and totally ignores runoff during the very long construction period.

There is no realistic solution for treatment of road run-off, construction runoff and concrete leaching, issues which will inevitably affect world heritage areas. Please do not approve this project without having effective measures to deal with these. The fact that DMR has not come up with any satisfactory measures after over five years of planning is a reliable indication that there are none.