FIGURE 7 – PMF FLOOD – HEIGHT AHD

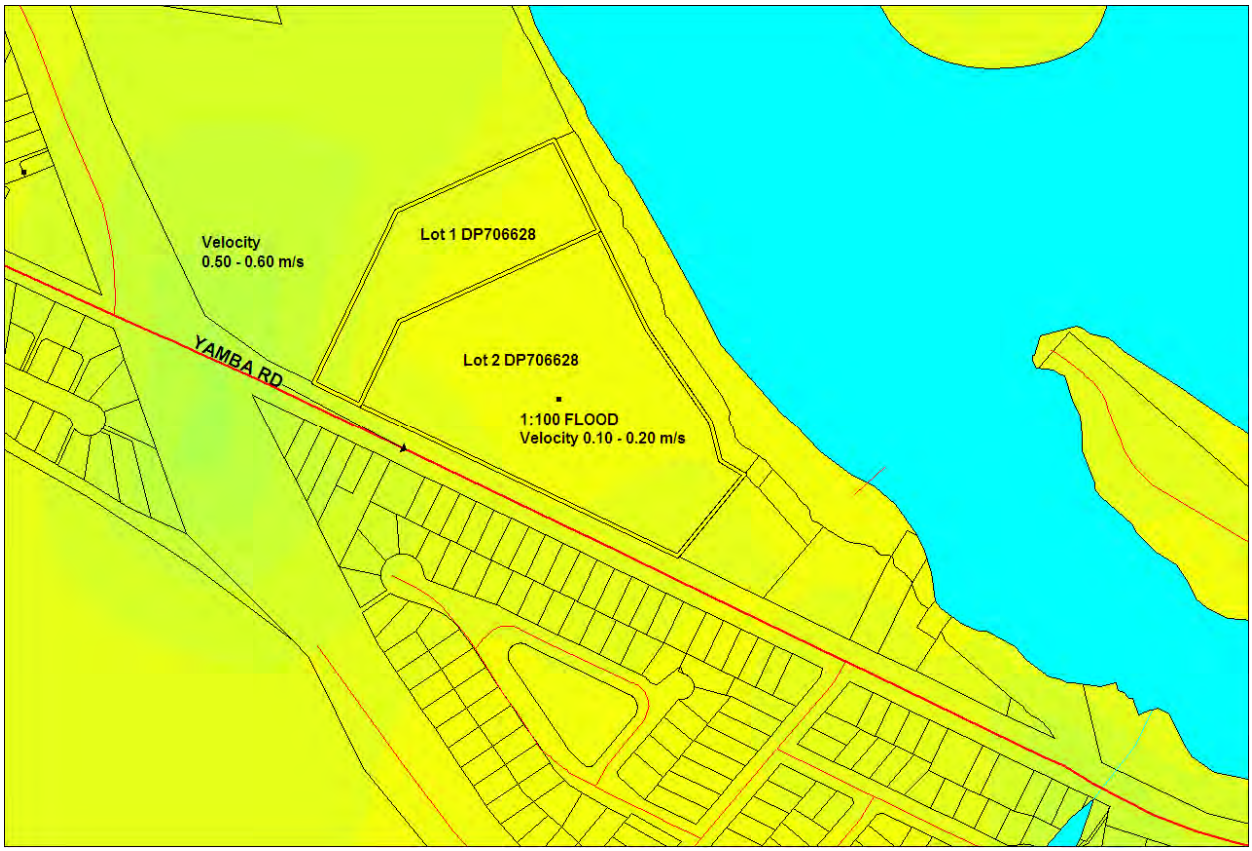

FIGURE 8 – PMF FLOOD – VELOCITY M/S

Appendix D

WBM Flood Impact Assessment

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14 September, 2006

ÂCOR Consultants Pty Ltd
Level 1, 24 Falcon Street
PO Box 822
Crows Nest 2065

Attention: Michael Goodwin

RE: BLUE DOLPHIN FLOOD IMPACT ASSESSMENT

WBM was commissioned by ÂCOR Consultants Pty Ltd to investigate the impacts associated with the filling of a parcel of land currently identified as the Blue Dolphin Caravan Park. The site borders Yamba Road to the south and the Clarence River to the north. This letter presents the findings of the investigation.

The locations of the proposed fill scenarios are shown in Figure 1 to Figure 6. The scope of the investigation was to assess the impact of proposed filling of the Blue Dolphin Caravan Park site and the cumulative effects of the neighbouring development south of Yamba Road. The neighbouring development is highlighted in the figures as," Rural Residential Area" and " Residential Area Filling".

The investigation was undertaken using a 1D/2D calibrated hydraulic model developed by WBM for the Clarence River County Council. Four scenarios were considered, including:

a) Existing Conditions;

b) Filling of the entire property currently operating as the Blue Dolphin Holiday Resort to 2.4mAHD, above the 100 year ARI event level. This is referred to as Fill Scenario A.

c) Proposed filling of a parcel of land in West Yamba, south of Yamba Road. The parcel of land in West Yamba was based on a past flood impact assessment undertaken by WBM in 2004 for the Clarence Valley Council. The area of land was identified in the previous assessment as Option 9. Option 9 included the filling of land above the 100 year ARI event level for areas zoned for residential use. Areas zones as rural residential were not filled. Two 60m wide floodways were also included in the site design. This development scenario is referred to as Fill Scenario B

d) Filling of the entire property currently operating as the Blue Dolphin Holiday Resort to 2.4mAHD, above the 100-year ARI event level (Fill Scenario A) combined with proposed filling of a parcel of land in West Yamba (Fill Scenario B). The combined assessment of Fill Scenario A and Fill Scenario B will give an indication of the overall impact of the developments in the Yamba area. This is development scenario is referred to as Fill Scenario C.

The 20-year and 100-year ARI events were used for the analysis. Figure 1 through Figure 6 show the effects of Fill Scenarios A, B and C compared with peak flood levels associated with the existing topography. In Figures 2 to 3:

- The blue shades indicate a reduction in flood level; and
- The yellow, orange and red shades indicate an increase in flood level.

Figure 1 and Figure 2 represent the impacts of Fill Scenario A on the peak 100-year and 20-year ARI event flood levels. For both events there is a slight decrease in flood level to the south west of the proposed site. Currently, during the flooding of the Clarence River the predominant flow direction across the Blue Dolphin Caravan Park is north/south. The flow is dominated by the storm tide at the mouth of the Clarence River. Due to the southwestern corner of the Blue Dolphin Caravan Park being in the flow shadow of the proposed filling, flood levels in the area have decreased slightly. Fill Scenario A results in decreases in peak flood level to 60mm for the 100 year ARI event and 15mm for the 20 year ARI event. This is a beneficial impact for the neighbouring properties on the southern side of Yamba Road.

Figure 3 and Figure 4 represent the impacts of Fill Scenario B on the peak 100-year and 20-year ARI event flood levels. For Scenario B during the 100 year ARI event impacts range from small increases up to 10mm and decreases to 50mm.These impacts occur to the north, northeast and west of the site. During the 20 year ARI event, impacts resulting from Scenario B range from localised increases to 20mm and significant decreases ranging from to 150mm extending approximately 1.5km to the east of the site. These impacts are not associated with the proposed development of Blue Dolphin Caravan Park. These impacts are caused by the proposed West Yamba Filling.

Figure 5 and Figure 6 represent the impacts of Fill Scenario C on the peak 100-year and 20-year ARI event flood levels. Impacts of Scenario C are of a similar scale and magnitude to Scenario B for both the 20-year and 100 year ARI events. A general comparison of the Fill Scenario B and Fill Scenario C impacts highlight that the filling of the Blue Dolphin Caravan Park reduces the impacts resulting from Fill Scenario B. This reduction in impact is due to the residential and rural residential developments being in the flow shadow of the filled Blue Dolphin Caravan Park.

In summary, this investigation aimed to assess the impact of the proposed filling of the Blue Dolphin Caravan Park above the 100-year ARI event flood level. The assessment investigated the impacts of the proposed development independently and in combination with the neighbouring development south of Yamba Road. This approach was used to highlight the cumulative impacts of both developments. It was found that the filling of the Blue Dolphin Caravan independently had a non-worsening effect on flood levels, based on the 100 year and 20 year ARI modelling results. Similarly, results show the combined filling of the Blue Dolphin Caravan Park with the neighbouring development in West Yamba reduces the minor impacts resulting from the West Yamba Development.

Should you require any further information or explanation of the analysis and results please do not hesitate to call.

Yours Faithfully
WBM Oceanics Australia

Chris Huxley

Project Engineer - Flooding Group

Impacts of Filling - Scenario A - 100 Year ARI Flood Event **Figure 1**

Impacts of Filling - Scenario A - 20 Year ARI Flood Event **Figure 2**