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STANDARD GAUGE RAIL LINK TO FISHERMAN ISLANDS

IMPACT ASSESSMENT STUDY

DRAFT FINAL REPORT

VOLUME I - MAIN REPORT

JULY 1992

MAUNSELL PROPRIETARY LIMITED

REFERENCES

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The overtopping in 1893 was caused by a major flood in the Brisbane River. This flood is the largest flood recorded, in terms of peak flood levels for the Brisbane River, since the rail line was constructed. The maximum flood height recorded at the Brisbane City Gauge for the flood was approximately 8.25 m AHD. Under present day conditions, this equates to a probable frequency of occurrence in any one year of approximately 1:4000 (Brisbane River Floodplain Maps, 1975). This extraordinarily low probability is a result of the extensive flood mitigation that has occurred on the Brisbane River since 1893, such as the Somerset Dam, Wivenhoe Dam and the extensive maintenance dredging of the Brisbane River for navigation (Australian Littoral Society Inc. 1990).

The level of the line where overtopping occurred in June 1967 is 2.29 m AHD. If this overtopping was caused by a Brisbane River flood it would correspond to a level of approximately 8 m AHD at the Brisbane City Gauge. No flood of this magnitude was recorded in the Brisbane River in 1967 (Australian Littoral Society Inc. 1990). From information obtained from the Department of Transport the maximum level recorded at Brisbane Bar due to tidal and storm surge influences for June 1967 was 1.6 m AHD. It is most likely that the overtopping was caused by a combination of this storm surge recorded at Brisbane Bar and a storm in the local catchment. There may have been other extenuating circumstances that contributed to this local flooding, such as a major blockage at the crossing adjacent to where the rail was overtopped.

BULIMBA CREEK

Bulimba Creek has the largest catchment of the creeks crossing this section of the rail line with a catchment area upstream of approximately 120 km^2. The minimum level of the rail line at the crossing of Bulimba Creek is 2.54 m AHD and the recorded peak flood height for the 1893 flood was 3.39 m AHD.

For a major Brisbane River flood a peak level of 2.54 m AHD (the minimum rail line level) at the Bulimba Power House equates to a level of 8 m AHD at the Brisbane City Gauge. This flood event has a probable frequency of 1:3500. It can therefore be concluded that since the major flood mitigation works it would take a very rare Brisbane River flood event to overtop the rail line at Bulimba Creek.

From the point of view of local flooding the BCC 1 in 100 year flood level immediately upstream of the rail line was quoted as 3.30 m AHD in the "Lower Bulimba Creek Hydraulic Study" (GHD 1985). The January 1974 storm with the associated downstream tidal variation, selected as the 1 in 50 year design event in this study, gave a peak level upstream of the rail line of 2.30 m AHD. As the minimum level of the rail line is 2.54 m AHD a local flood event in the Bulimba Creek catchment that would overtop the rail line is considered to be between a 50 year and 100 year average recurrence interval.

There are works being considered for the rail crossing of Bulimba Creek that are the subject of other flooding investigations. These works may change the conclusions made above relating to local flooding.

NORMAN CREEK

Norman Creek is the only other major creek that the rail line crosses and has a catchment

The alluvial clay soils are generally saturated, of very soft to firm consistency and above the optimum moisture content for compaction purposes. Therefore the material is not well suited for use as embankment fill.

12.1.3 Park Road Interchange

The Park Road interchange between Dutton Park and Buranda stations will require major civil engineering works including the construction of bridge overpasses or relatively deep cuts through existing embankments and natural formations.

Geological materials within the interchange area are likely to comprise residual soils overlying weathered Ipswich Coal Measures. The lithology of the Ipswich Coal Measures is probably one of the weaker of the Unit A profiles and careful consideration is required for deep cuts and for heavily loaded foundations.

From a geotechnical point of view the option of overpasses would appear preferable compared to the excavation and tunnel option.

12.2 HYDROLOGY

12.2.1 Qualitative Assessment Of Flood Impacts

Detailed design of the bridges and culverts required for the proposed standard gauge rail link have not yet been completed. It is therefore impossible to complete a quantitative assessment of the likely flood impacts at present. In general the proposal is to duplicate the existing structures where required. The following is a discussion of the potential of the proposal to impact on flooding processes.

MAJOR FLOODING OF THE BRISBANE RIVER

The rail line crosses parts of the Brisbane River floodplain that would be utilised as backwater storage in a major flood event. Water velocities in these areas will generally be slow moving and simply duplicating existing structures is not likely to have a significant impact.

LOCAL FLOODING BULIMBA CREEK

As stated in Section 11.2 there are other proposed works for the Bulimba Creek crossing, currently being designed by QR, and the relative impacts of these works on flooding is presently being investigated by others. For this reason the relative impacts of standard gauge works at Bulimba Creek have not been discussed in this report.

LOCAL FLOODING NORMAN CREEK

Norman Creek is the only other creek that drains a significant catchment area. If the present bridge is duplicated there is the potential for an increase in backwater. The backwater produced by dual bridges is naturally larger than that for a single bridge, yet less than the value which would result by considering the two bridges separately.

(iv) The impacts of the forecast traffic patterns with the project are :

- the running of trains nearer to existing properties on the north side between Dutton Park and Lytton Junction;
- the scheduling of coal, grain and freight trains over 24 hours, free from the existing constraints due to scheduling of passenger services.

20.5 PHYSICAL CONDITIONS (Refer Sections 5.0, 12.0)

(i) A desk study of the likely geotechnical issues along the route has shown that there are no foreseen problem areas that sound engineering cannot overcome.

From a geotechnical point of view, the overpass Option (1) would appear preferable to the underpass Option (2) on the basis of available information.

(ii) The proposed standard gauge rail link will only be overtopped by a very rare event in the Brisbane River. The most susceptible point on the rail line was determined to be the low point near the crossing of Bridgewater Creek. It was estimated that it would take a Brisbane River flood event with a probable frequency of 1:7000 to overtop this section of the line. Flooding of the rail line from local catchment runoff is a matter to be considered at the detailed design stage for each of the crossings.

The worst case scenario, for determining flood impacts, would be a simple duplication of all existing structures i.e. some crossing may be improved if they are redesigned, and if a second structure is constructed at any crossing it is not likely that it would be designed to be more restrictive than the existing one. If all structures are duplicated the impact on Brisbane River flooding is expected to be negligible. However, simply duplicating a structure has the potential to impact on local flooding by increasing upstream afflux. The design of each structure should ensure that no existing flooding problems are exacerbated.

(iii) The major impacts to the water quality of Bulimba, Norman, Coorparoo and Bridgewater Creeks of the proposed standard gauge rail link will be those associated with the construction and potential erosion of soil along the development corridor. Adequate soil erosion control measures, in the form of on site surface drainage controls and sediment control devices such as sedimentation basins will be required to contain all site stormwater runoff. With planned revegetation these techniques will provide sufficient sedimentation prior to the discharge of stormwater runoff to the waterways thereby minimising the water quality impacts.

(iv) After prolonged dry periods the coal moisture content can become very low. Under such conditions, dust emitted from the wagons during transportation may be quite dense. The emission data collected for this study related to coal with quite a high moisture content, and as a consequence the wagons emitted very little dust during the monitoring. It is expected that coal having a low moisture content (eg. less

than 6%) would result in emissions being greater than measured by a typical factor of 12. There is therefore a wide variation of dust emitted depending on the moisture content of the coal.

(v) Unless the moisture content of coal is maintained quite high (approaching 20%) or unless other dust suppression measures are taken it is likely that a 20 minute average criterion of 460 ug/m^3 for coal dust will be exceeded at residences only 30 metres from the track for very stable and neutral atmospheric conditions.

20.6 LAND USE, TOWN PLANNING AND AMENITY (Refer Sections 5.3, 8.0, 12.0, 15.0)

(i) The standard gauge rail link will not impact on the existing Town Plan.

(ii) The project will require property resumptions, which are currently being negotiated between QR and the owners involving :

- whole resumption of 18 properties;
- Part (strip) resumption of 82 properties;
- Demolition or Relocation of 16 houses and commercial properties.

The final extent of resumptions and housing relocation/demolition is yet to be determined. The above information is as advised by QR in May 1992.

(iii) No impact is expected on workforce characteristics.

(iv) The impact on persons required to relocate from houses to be resumed is not expected to be significant as :

- several are already renting from QR and hence do not have an expectancy of permanency;
- alternative housing is available in similar environments;
- QR are in the process of negotiation with owners of properties to be resumed.

(v) Resumption of housing which leaves isolated pockets (e.g. Vanda Street - south side) may cause pressure to change to commercial or service trade zones.

(vi) Rezoning to residential uses near Pritchard Street Lindum, on the east side would leave a 20 metre buffer. It is suggested this buffer be increased.

(vii) BCC policy is to not permit industry east of the corridor at Lindum. It is suggested that residential use should not be allowed as an alternative.