

# **Addendum To Dangerous Goods Transport QRA, Denison St, Hillsdale**

# 1. Addendum to Report

The Dangerous Goods Transport QRA, Denison St, Hillsdale was performed by Scott Lister to inform the JRPP on the risks posed by Dangerous Goods (DG) transport on the proposed Bunnings site.

Traffic movements used in the QRA were conservative and were based on:

- ROAR survey data – actual traffic counts collected;
- maximum potential traffic movements from the BIP based on maximum approved operational capacity; and
- consultation with BIP operators.

The general principle applied was to model “the worst case scenario” and as such the higher number from the above sources was used. This approach allowed a level of conservatism to be applied to the model.

Notwithstanding, prior to the JRPP determining the application, the Department was made aware of a concern relating to the traffic movement data used for Class 2.1 travelling north on Denison Street past the BIP which was associated with port activities.

To address this concern, a ‘sensitivity analysis’ was undertaken to calculate the contribution of the Class 2.1 through movements on the overall risk. The outcome of this analysis was provided to the JRPP prior to its determination of the Bunnings application.

This involved increasing Class 2.1 north bound through traffic from the bulk liquids port to 4,000 movements per year and re-calculating the overall risk.

This addendum presents the results of the sensitivity analysis.

## 1.1 Risk Results

### 1.1.1 Individual risk from DG transport

The updated risk results with the increase in north bound LPG traffic has been termed the “2014 current case sensitivity”, and should be compared with the 2014 current case in the report. The 2014 current case sensitivity individual risk contours with the increase in LPG movements are presented in Figure 1.

As would be expected with the increase in LGP movements, Figure 1 shows an increase in the footprint of the individual risk contours. The 10 chances in a million (1E-5 red line) per year of fatality contour is restricted to the center of the major intersections. The 1 in a million (1E-6 green line) per year and 0.5 in a million (5E-7 blue line) fatalities per year contours have widened to the south of Gate 3 compared to the previous 2014 current case plot.

It is evident from Figure 1 that the 5 chances in a million per year (5E-6 yellow line) fatality contour does not encroach onto proposed Bunnings development site. Investigation of the major risk contributors indicates that the near field fatality risk at the Bunnings site is driven by releases of PGP and LPG with early ignition and the resultant fireball. However, the LPG

contribution from the northward through traffic is not the complete contribution to individual risk, which is why the overall risk result does not increase in direct proportion to the increase in LPG northward through traffic.

The far field consequences continue to be driven by chlorine gas toxic impacts. Chlorine gas release cases account for over 97% of far field fatality risk. (i.e. at the extremity of the contours presented).

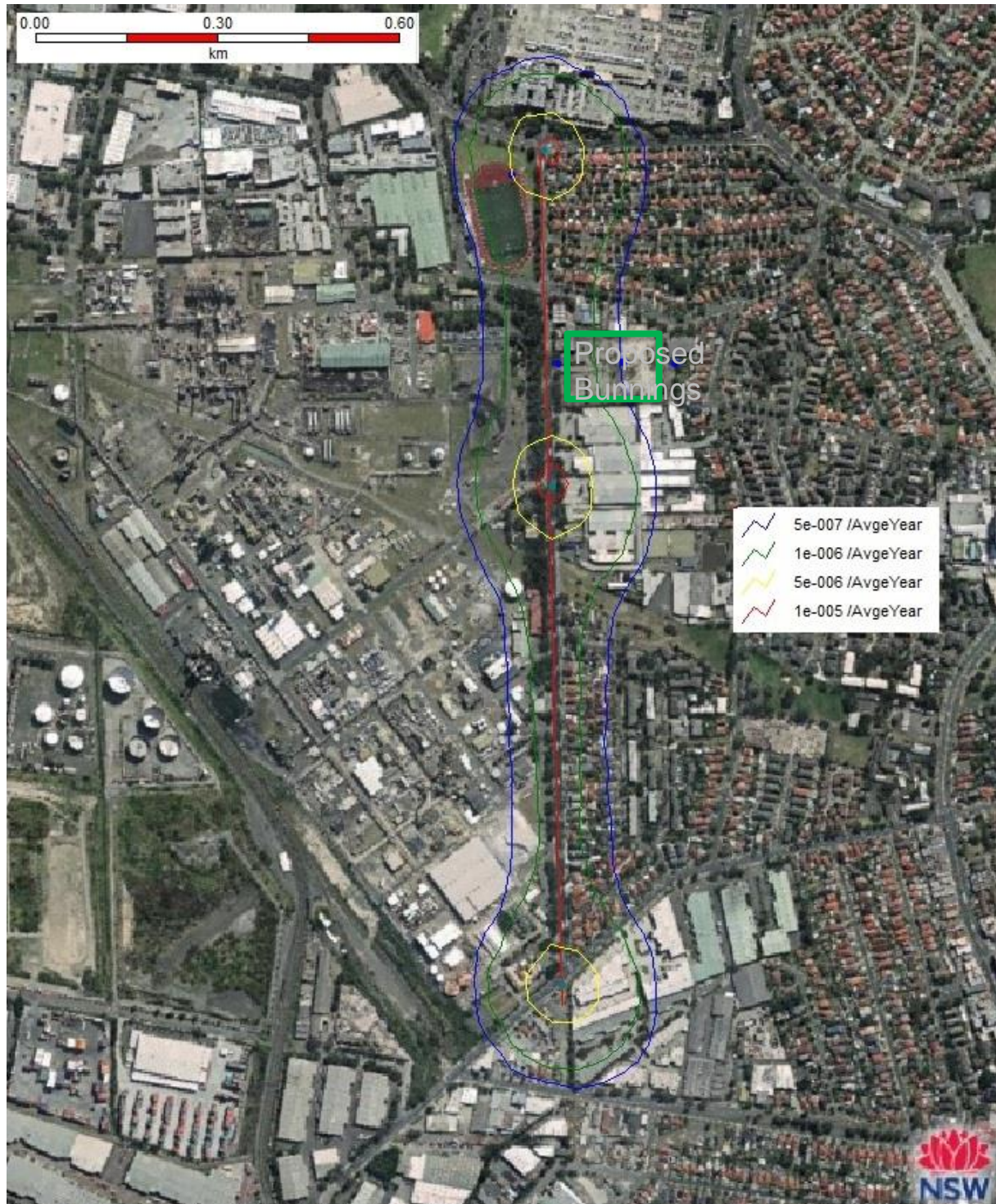


Figure 1 Location Specific Individual Fatality Risk – 2014 current case sensitivity

### 1.1.2 Denison St DG and BIP Individual Risks at Bunnings

The risks from the BIP (i.e. fixed facilities) and DG on Denison St (i.e. transport) have been brought together. Risks at the western side of the Bunnings development are based on the BIP QRA of 2102 and risks from DG transport are those calculated in this analysis. Individual risks for the specific locations of the western side of the Bunnings site facing the BIP are presented as Figure 2, for both the BIP, DG in Denison St and the combined result. It shows the maximum risk at the Bunnings site is 2.8 chances in a million per year which is less than the 5 chances in a million per year criterion for commercial development. It also shows that for the combined results, the individual risk criterion is satisfied.

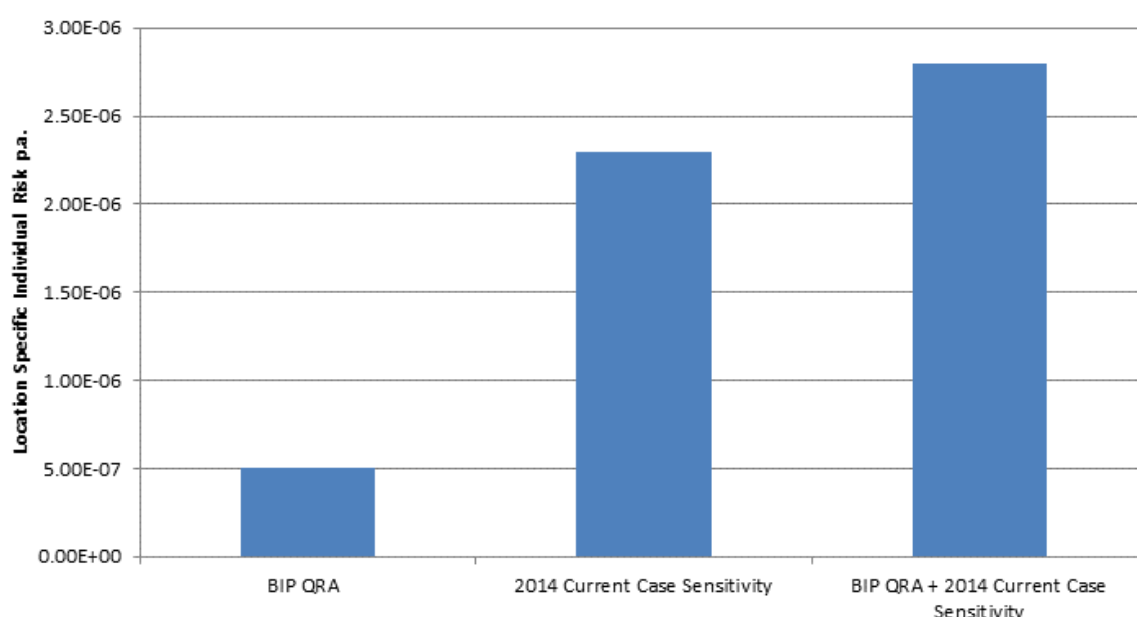
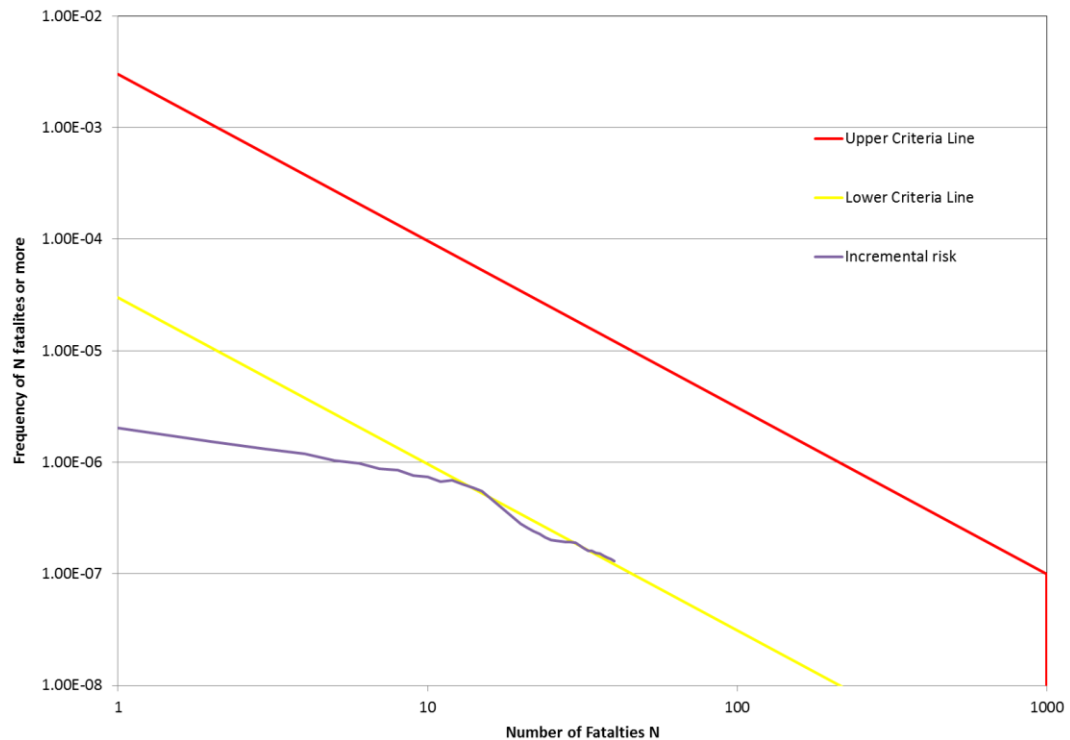


Figure 2 Individual risks at Western Side of Bunnings Site

### 1.1.3 Incremental Societal Risk

The incremental societal risk associated with the proposed Bunnings development for the 2014 current case sensitivity is presented as Figure 3.

The results show that for the 2014 current case sensitivity the curve for the proposed Bunnings falls on the lower criteria line and so the proposed Bunnings development should hence not be precluded based on increased societal risk.



**Figure 3 Incremental Societal Risk Based on 2014 Current Case Sensitivity**

#### 1.1.4 Overall Societal Risk

The societal risk curve representing the 2014 current case sensitivity societal risk is shown in Figure 4. Figure 4 illustrates that the societal risk lies in the middle to upper part of the ALARP region. This indicates that the movement of DG along Denison St is acceptable provided that all reasonably practicable risk reduction measures have been implemented.

The 2014 current case sensitivity combined BIP and DG transport societal risk curve is shown in Figure 5. The combination of the societal risk generated from DG movement and the BIP indicates a very small rise in the overall societal risk profile. The combined FN curve is still in the ALARP region and below the upper criteria line.



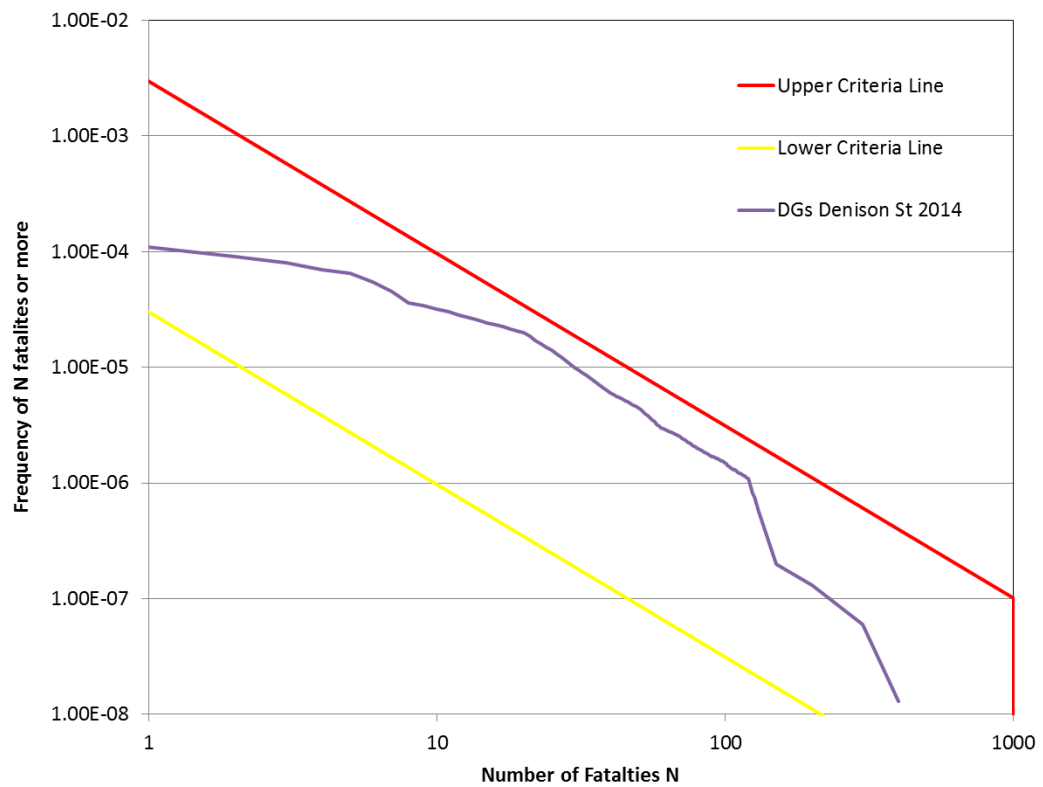
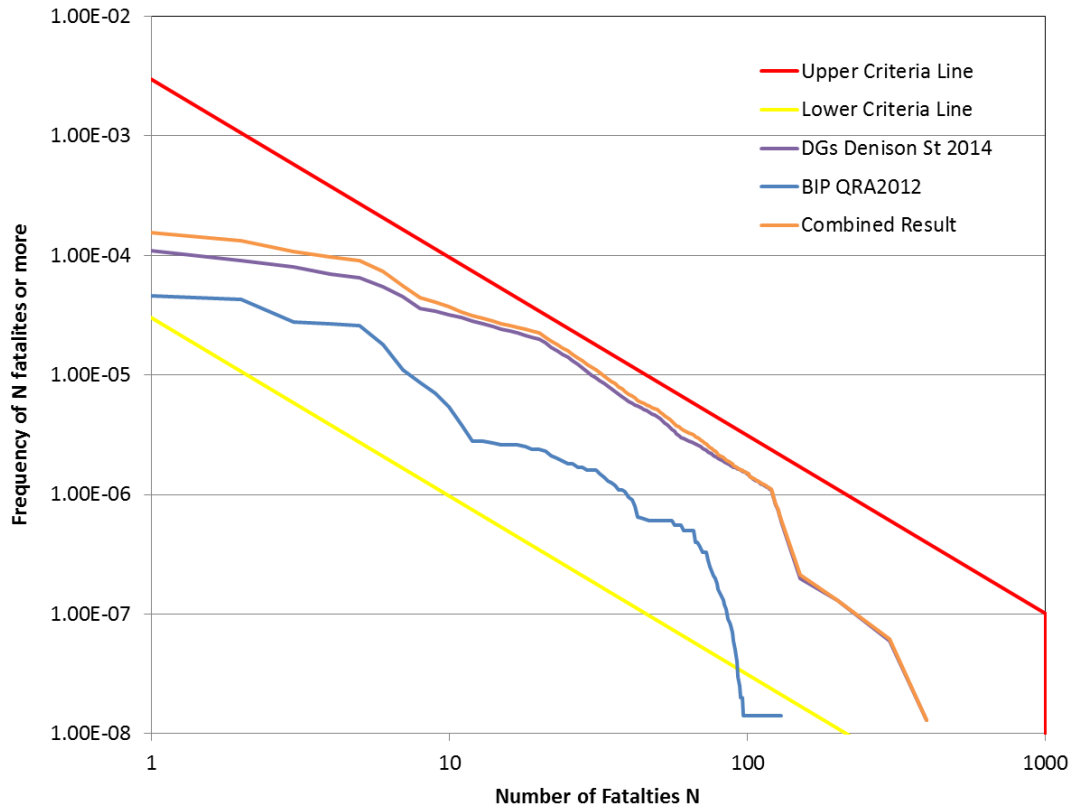


Figure 4 FN Curve Based - 2014 current case sensitivity



**Figure 5 FN Curve – Combined BIP QRA and Denison St DG Movements Based on 2014 current case sensitivity**

## 1.2 Conclusion

The sensitivity analysis performed indicates that the conclusions drawn previously in the report remain valid.

No new recommendations are made as a result of the addendum.