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Dear Bill,

Re: 37-39 Pavesi St, Guildford West NSW

Executive Summary

This and our letter of 10 August 2015 and together they represent a screening of hazards and risks that may affect 37-39 Pavesi St, Guildford West. Our screening has looked at

- Buried services
- Transportation of Dangerous Goods
- Neighboring industrial facilities that may handle or store Dangerous Goods

Our screening has found no source or risk that exceeds the suggested criteria presented by the NSW Department of Planning. Rezoning of the land should not be precluded on the basis of hazards and risks.

Introduction

This letter follows on from our letter of 10 August 2015 and provides further information about three industrial facilities nearby to the Pavesi St site. These facilities are:

- Coca Cola Amatil
- C&S Coolroom Services
- Cootes Transport (McAleese Group)

Coca Cola Amatil have since vacated the premises at 1-15 Sturt St. The northern half of the site has been leased to an unknown organization. The southern half is currently for lease.

We contacted **C&S Coolroom Services** on 16 December 2015. They informed us that they do not handle or store significant quantities of Dangerous Goods at their site.

We contacted **McAleese** and were informed that they distribute LPG and Ammonia. They stated that tankers have a capacity of up to 40,000L. McAleese stated that these tankers are normally empty and they agreed with our suggestion of using 8 hours a week as a conservative estimate of the frequency with which full tankers are present.

Methodology

We have modelled releases of both LPG and Ammonia from this facility. The software package used for this modelling was TNO Effects V10.0.0.

The Pavesi St site is approximately 420m from the edge of the McAleese facility.

Because of this we have discounted minor releases from piping and equipment attached to the road tankers and have focused on four scenarios:

- A catastrophic failure of a tanker containing ammonia
- A leak through a hole of 100mm diameter at the bottom of a tank containing ammonia
- A catastrophic failure of a tanker containing LPG
- A leak through a hole of 100mm diameter at the bottom of a tank containing LPG

Our model used the following inputs:

Table 1: Model inputs

Input	Value
Chemical for LPG	Propane
Wind Speed	10km/h
Ground Roughness	Suburb or forest
Air temperature	17.6°C
Pasquil Atmospheric Stability	D
Solar Radiation	183W/m ²
Relative Humidity	62%
Direction to McAleese site	North-west
Amount of time wind is blowing from the north west	• 7% at 9am • 22% at 3pm • An average of 15%
Vessel temperature	17.6°C
Vessel pressure	Vapour pressure corresponding to vessel temperature
Vessel liquid level	85%
Consequences for LPG	• Boiling Liquid Expanding Vapour Explosion (BLEVE) • Vapour Cloud Explosion (VCE) • Flash fire
Risk Curve for VCE calculation	10 (Detonation)
Consequences for Ammonia	Toxic effects

Pool fires and jet fires were discounted due to the distance of the Pavesi St site and because the Pavesi St site is shielded from direct line of site by the Cumberland Highway and its associated noise barrier.

The suggested risk criteria for residential developments in the vicinity of potentially hazardous facilities are given in HIPAP 4.

Table 2: Risk criteria from HIPAP 4

Criteria	Value
Risk of individual fatality	One in a million per year
Risk of injury from heat radiation	Should not exceed 4.7kW/m ² at a frequency of more than 50 chances in a million per year
Risk of injury from explosion overpressure	Should not exceed 7kPa at a frequency of more than 50 chances in a million per year
Risk of injury from toxic concentrations (taken to be exposure above ERPG-2 levels)	Should not exceed a frequency of more than 10 chances in a million per year
Risk of irritation from toxic concentrations (taken to be exposure above ERPG-3 levels)	Should not exceed a frequency of more than 50 chances in a million per year

Results - Ammonia

Our model generated the following results:

Table 3: Results from Ammonia release scenarios

Scenario	Distance to ERPG-3 (Fatality Risk)	Distance to ERPG-2 (Injury Risk)	Distance to ERPG-1 (Irritation Risk)
Instantaneous Release	1.4km	4.6km	11.2km
Leak	1.7km	5.3km	11.7km

From the results above, the consequence of an instantaneous release or a leak may include fatality, injury and irritation at the Pavesi St site.

The frequency at which these scenarios occur has been estimated by the TNO in the Purple Book. The frequency of an instantaneous release is 5×10^{-7} per year. The frequency of a continuous release results resulting in a complete loss of inventory is also 5×10^{-7} per year. The combined frequency of an event that may affect the site is 1×10^{-6} per year.

The risk to the Pavesi St site is further reduced by the following:

- Full tankers are estimated to be present only for 8 hours per week (4.8% of the time)
- The wind is blowing from the north-west for only 15% of the time

As a result, the risk to the Pavesi St site for fatality, injury and irritation is estimated to be 7.2×10^{-9} per year. This is below the NSW Department of Planning's criteria as presented in HIPAP 4.

Results - LPG

Our model generated the following results:

Table 4: Results from LPG release scenarios

Scenario	Result	Chance of fatality at Pavesi St site	Chance of injury at Pavesi St site
BLEVE	6.5kW/m ² at 420m from release	No	Yes
VCE – Catastrophic Rupture & Leak	5.5kPa at 420m from release	No	No
Flash fire – Catastrophic Rupture	172m to Lower Flammability Limit	No	No
Flash fire – Leak	179m to Lower Flammability Limit	No	No

From the results above, there is no chance of fatality at the Pavesi St site.

While the heat radiation consequence of a BLEVE exceeds 4.7kW/m² and may cause injuries, it is noted that a BLEVE only results in a transient heat flux with no extended exposure. Given the low likelihood of this occurring, it does not exceed the injury risk criteria of 50 chances in a million per year.

Conclusion

Our results show that the risk to the Pavesi St site from the McAleese facility is below the criteria published by the NSW Department of Planning.

Rezoning of the land should not be precluded on the basis of hazard and risk from neighbouring industrial facilities.

References

1. NSW Department of Planning; Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Land Use Safety Planning (HIPAP4); January 2011
2. The Netherlands Organization of Applied Scientific Research (TNO); Methods for the calculation of physical effects 'Yellow Book' 3rd edition; 2005
3. The Netherlands Organization of Applied Scientific Research (TNO); Guideline for quantitative risk assessment 'Purple Book' 3rd edition; 2005
4. Bureau of Meteorology; Climate statistics for Australian locations (Bankstown Airport AWS)

Best regards,



Mat Collin
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