

CONSULTANTS

Level 7, 104 Melbourne Street  
South Brisbane Qld 4101

PO Box 3635  
SOUTH BRISBANE Qld  
4101

T 07 3844 5900

# Preliminary Hazard Analysis

FIFE Qld Health Warehouse & Fitout, 104 Bandara Street, Richlands

Prepared for: McNab Developments (QLD) Pty Ltd

Document no: NA250215-DG-04

Revision no: A

## Disclaimer

This Report has been prepared in accordance with the scope of services described in the agreement between ACOR Consultants and the Client. The Report relies upon data, surveys, measurements and results based on instructions from, and in consultation with, the Client. Except as otherwise stated, ACOR Consultants has not attempted to verify the accuracy or completeness of any information provided by the Client. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that changes may be required to the Report. Changes in circumstances or facts, the passage of time, manifestation of latent conditions or impacts of future events may also impact on the accuracy, completeness or currency of the information or material set out in this Report. This Report has been prepared solely for use by the Client, ACOR Consultants Pty Ltd and its related body corporates accepts no responsibility for its use by any third parties without the specific authorisation of ACOR Consultants. ACOR Consultants reserves the right to alter, amend, discontinue, vary or otherwise change any information, material or service at any time without subsequent notification. All access to, or use of, the information or material is at the user's risk and ACOR Consultants Pty Ltd and its related body corporates accepts no responsibility for the results of any actions taken on the basis of information or material provided, nor for its accuracy, completeness or currency. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this Report, to the extent permitted by law.

## Revisions

Revision	Description	Date	Prepared by	Approved by
A	Draft for Review	18/09/2025	Jack Parsons Scott Tamasauskas	Imran Shaik (RPEQ 28416)

## Review Panel

Division/ office	Name

### COPYRIGHT

This document, including the concepts and information contained within it, are the property of ACOR Consultants Pty Ltd or any of its related or associated entities. Use or copying of this document in whole or in part without the written permission of ACOR Consultants Pty Ltd constitutes an infringement of copyright. No part of this document may be copied, reproduced, adapted, transmitted or stored in a retrieval system in any form or by any means without written permission or unless otherwise permitted under the Copyright Act 1968. Removal or modification of any copyright or other proprietary protection from this document will be a breach of copyright.

© ACOR Consultants Pty Limited

All intellectual property and copyright reserved.

## Table of Contents

Abbreviations .....	5
Definitions .....	6
Limitations .....	7
1 Introduction .....	8
1.1 Background .....	8
2 Objective .....	8
3 Scope .....	8
4 Criteria .....	9
5 Methodology .....	10
5.1 Hazard Identification .....	11
5.2 Risk Assessment .....	11
6 Site Description .....	12
6.1 Site Layout.....	12
6.2 Dangerous Goods Storage .....	13
6.3 Site Processes .....	13
6.4 Surrounding Land Uses.....	13
7 Risk Assessment.....	15
7.1 Hazard Identification .....	15
7.1.1 Fire .....	15
7.1.2 Scenario 1 – Ignition of Leak of Class 3 Dangerous Goods in the Dangerous Goods Storage Leading to Fire.....	16
7.1.3 Scenario 2 – Ignition of Leak of Class 3 Dangerous Goods in the Unloading Area Leading to Fire .....	16
7.1.4 Scenario 3 – Fire Spreading to Class 3 Dangerous Goods Storage .....	16
7.1.5 Scenario 4 – Fire Spreading to Class 3 Dangerous Goods During Unloading .....	17
7.2 Controls.....	17
7.3 Risk Assessment Table .....	18
7.4 Discussion .....	20
7.5 Risk Evaluation.....	20
8 Conclusion .....	20
Appendix A Brisbane City Council City Plan 2014 Table 9.3.12.3.H .....	21
Appendix B Risk Matrix and Criteria .....	22
B.1 Risk Matrix .....	22
B.2 Risk Criteria .....	23

## List of Figures

Figure 1 Flowchart for Determining the Appropriate Level of PHA .....	10
Figure 2 Site Location .....	12
Figure 3 Site Layout .....	12
Figure 4 Site Location, II Industry Investigation Zones in Purple, IN3 Industry (General Industry C) Zones in Pink .....	14

## List of Tables

Table 1 Abbreviations .....	5
Table 2 Definition List .....	6
Table 3 DG Stored .....	13
Table 4 Evaluation of Risks Against SC 6.15 Risk Criteria .....	20

## Abbreviations

Table 1 Abbreviations

Abbreviation	Description
ACOR	ACOR Consultants
ALARP	As low as reasonably practicable
AS	Australian standard
AS/NZS	Australian / New Zealand standard
BCC	Brisbane City Council
DG	Dangerous goods
ERP	Emergency response plan
FRL	Fire resistance level
HCF	Hazardous chemical facility
MHF	Major hazard facilities
N/A	Not applicable
PG	Packing Group
PHA	Preliminary Hazard Analysis
PPE	Personal protective equipment
SDS	Safety data sheets

## Definitions

Table 2 Definition List

Terms	Definition
Aerosol	A non-refillable receptacle made of metal, glass, or plastics, containing a gas, compressed, liquefied or dissolved under pressure, with or without a liquid, paste or powder and fitted with a release device allowing the contents to be ejected as solid or liquid particles in suspension in a gas, as a foam, paste or powder or in a liquid state or in a gaseous state.
Combustible liquid	Any liquid, other than a flammable liquid, that has a flash point, and has a fire point that is less than its boiling point. For the purpose of AS 3833, combustible liquids are divided into two classes as follows: Class C1 - A combustible liquid that has a closed cup flash point of greater than 60°C and no greater than 93°C. (dangerous goods for storage) Class C2 - A combustible liquid that - has a flash point of greater 93°C; or has been excluded from being a flammable liquid by any of the criteria for sustaining combustion. (non-dangerous goods)
Corrosive substances	Are substances or mixtures which, by chemical action, will cause irreversible damage to the skin, or in the case of leakage, will materially damage, or even destroy, metals or other goods. Note - Such substances are listed as Class 8 corrosive substances in the ADG Code or meet the classification criteria specified in that Code for corrosive substances.
Fire resistance level	The grading period, in minutes, determined in accordance with AS 1530.4 for — (a) structural adequacy; (b) integrity; and (c) insulation and expressed in that order (e.g. 60/60/30)
Hazardous Area	An area (three-dimensional space) in which an explosive atmosphere, due to flammable gas or flammable vapour, is or may be expected to be present, in quantities such as to require special precautions for the construction, installation and use of equipment.
Ignition source	A source of energy sufficient to ignite a flammable atmosphere. Examples of ignition sources include naked flames, exposed incandescent material, electrical welding arcs, mechanical sparks, electrical discharge due to static electricity.
Incompatible	Dangerous goods that are — (a) likely to interact with other goods so as to increase the risk when mixed or otherwise brought into contact with the dangerous goods; (b) listed in the ADG Code or this Standard as being incompatible; or (c) declared by the regulatory authority as being incompatible. In relation to materials for construction of the storage and handling facility, including packaging, transfer equipment, containers, items of equipment, spill containment or racking the material likely to interact with the dangerous goods such that it is weakened or damaged.
Label (for Dangerous Goods)	A class or division diamond used to communicate the hazard(s) of the dangerous goods
On-site protected place	A building where people are employed within the property boundary, including offices, warehouses, manufacturing or processing areas, amenities, and other dangerous goods stores where quantities exceed minor storage.
Package	A complete product of the packaging operation, consisting of the packaging and its contents, prepared for Transport.
Public place	Any place other than private property, open to the public, which the public has a right to use, and which includes a public road.

Terms	Definition
React dangerously	React in a manner that directly creates a hazard due to the reaction. Examples of dangerous reactions are — (a) combustion and/or evolution of considerable heat; (b) evolution of flammable, toxic or asphyxiant gases; (c) the formation of corrosive substances; or (d) the formation of unstable substances.
Reasonably practicable	That which is, or was at a particular time, reasonably able to be done to ensure health and safety, taking into account and weighing up all relevant matters including: (a) the likelihood of the hazard or the risk concerned occurring. (b) the degree of harm that might result from the hazard or the risk. (c) what the person concerned knows, or ought reasonably to know, about the hazard or risk, and ways of eliminating or minimising the risk. (d) the availability and suitability of ways to eliminate or minimise the risk. (e) after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.
Segregation	The isolation of incompatible goods from each other within the store.
Sensitive uses	A use that is a childcare centre, a community care centre, a community residence, a detention facility, a dual occupancy, a dwelling house, a dwelling unit, an educational establishment, a health care service, a hospital, a hotel, to the extent the hotel provides accommodation for tourists or travellers, a multiple dwelling, a relocatable home park, a residential care facility, a resort complex, a retirement facility, rooming accommodation, rural workers' accommodation, short-term accommodation or a tourist park.
Separation	Isolation of dangerous goods from protected places, on-site protected places, boundaries and other dangerous goods stores.
Shall	Indicates that a statement is mandatory
Should	Indicates a recommendation

## Limitations

This report has been produced based on the information available to ACOR at the time of production. Should the proposed design change, then the contents of this report may need to be updated to reflect the change in the risk profile present at the Facility.

## 1 Introduction

McNab Developments (QLD) Pty Ltd has engaged ACOR Consultants to provide dangerous goods (DG) consulting services for the proposed QLD Health Warehouse and Fitout at 104 Bandara Street, Richlands QLD 4077 (the Facility).

### 1.1 Background

Performance Outcome (PO) 3 of Brisbane City Council (BCC) City Plan 2014 Part 9.3.12 (Industry Code) requires that developments minimise the risk to public safety, property and the environment from technological hazards such as fire, explosion and toxic releases occurring on site to achieve hazard and risk criteria defined in Table 9.3.12.3.1 of the Industry Code.

PO3 provides an acceptable outcome (AO) for developments which store quantities below the maximum quantities set out in Table 9.3.12.3.H of the Industry Code (reproduced in Appendix A). The Facility stores Class 3 flammable liquids in the DG Store which exceeds the maximum quantity from the Industry Code (as documented by ACOR in Section 2.7 of NA250215-DG-02), and therefore must demonstrate that PO3 is achieved.

It is noted within the Industry Code that a preliminary hazard analysis (PHA) report prepared in accordance with the Industrial Hazard and Risk Assessment Planning Scheme Policy can assist in demonstrating achievement of PO3.

## 2 Objective

This PHA report is to demonstrate achievement of PO3 of BCC City Plan 2014 Industry Code. To achieve PO3, this document shall demonstrate that the development minimises the risk to public safety, property and the environment from technological hazards such as fire, explosion and toxic releases occurring on site.

## 3 Scope

The scope of this report includes the proposed dangerous goods identified in Table 3 of this report located at 104 Bandara Street, Richlands QLD 4077.

The PHA has been conducted per the guidelines of the BCC Industrial Hazard and Risk Assessment Planning Scheme Policy (SC6.15). These guidelines provide information BCC may request for a development application, and advice on how a developer may satisfy the requirements of PO3 of the Industry Code.

As per SC6.15, this report is to:

- Identify the potential hazards associated with the development;
- Identify sensitive uses that may be affected by hazards and risks relevant to the development;
- Analyse each hazard in terms of consequence to people and the biophysical environment and likelihood of occurrence;
- Quantify the analysis and estimate the resultant risks to surrounding land uses and the environment;
- Assess the risks in terms of the location, land use planning implications and hazard and risk criteria and ensure that the proposed safeguards are adequate and that the development will not impose an unacceptable level of risk;
- Document results of the hazard and risk assessment, including comparison to Hazard and risk criteria, and graphical representation of results at gridded receptors; and
- Describe the best available hazard and risk control measures to be applied by the development to minimise hazard and risk impacts.

This report only covers the PHA, based on information available at the time of the analysis. Depending on the outcome of the PHA, further studies may be required as the design progresses, including a final hazard analysis which is the PHA updated to consider any changes to the hazards or design which may impact the outcomes of the analysis.

## 4 Criteria

The assessment will be based on the current versions of legislation and Australian Standards which are deemed to be applicable during the project. The following publications were referenced:

Planning Codes and Guidelines:

- Brisbane City Council City Plan 2014 (v32)
  - Industry Code (9.3.12); and
  - Industrial Hazard and Risk Assessment Planning Scheme Policy (SC6.15).

Australian Standards:

- AS 1940-2017: The storage and handling of flammable and combustible liquids; and
- AS 3833-2024: The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers.

## 5 Methodology

Per the guidelines of SC6.15 there are three levels of PHA that can be applied to the analysis of risk. These are part of a graded approach to risk assessment and are:

- Level 1 assessment – qualitative,
- Level 2 assessment – partially quantitative, and
- Level 3 assessment – quantitative.

The level is determined based on the nature, scale and location of the development. The analysis shall be capable of demonstrating that there is evidence that the risk posed by the Facility to adjacent properties and sensitive land uses has been adequately addressed. If a level of analysis is completed but there is insufficient evidence that risks have been adequately addressed, then a greater level of analysis is needed. This is summarised in Figure 1.

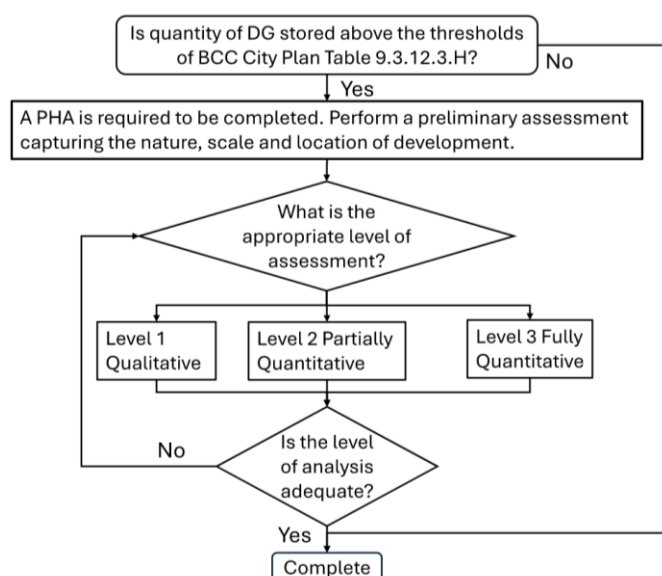


Figure 1 Flowchart for Determining the Appropriate Level of PHA

Based on experience with similar industries, the choice was made to undertake a Level 1 qualitative analysis. A Level 1 qualitative approach is based on comprehensive hazard identification, to show that a significant hazard is not present. The method is described in the following sections and comprises:

- Hazard Identification; and
- Risk Assessment.

Regardless of the level of analysis, a description of the site is required, including the following:

- The location and layout of the site;
- The quantity and types of DG stored on site;
- The storage and processes that takes place on site; and
- The uses of the land surrounding the site.

## 5.1 Hazard Identification

Hazardous scenarios were identified by review of the following:

- Properties of any hazardous chemicals handled at the site;
- Processes involving hazardous chemicals at the site; and
- Surrounding activities which may impact, or be impacted by, dangerous goods.

## 5.2 Risk Assessment

For each hazardous scenario identified, the frequency of the scenario eventuating at the potential consequences were determined to assess the unmitigated risk presented by the hazardous scenario, through the use of a 5x5 risk matrix.

Risks were then assessed with consideration to the controls which were in place, to evaluate if the risks to sensitive land uses have been reduced to tolerable levels, as low as reasonably practicable (ALARP).

Where risks were found to not be reduced ALARP, additional controls were identified with consideration to the hierarchy of control to ensure effectiveness of controls and avoid reliance on one specific type of control.

The risk matrix and criteria used in this analysis are documented under Appendix B.

## 6 Site Description

### 6.1 Site Layout

The Facility is in the south-west of Brisbane City Council at 104 Bandara Street, Richlands QLD 4077.

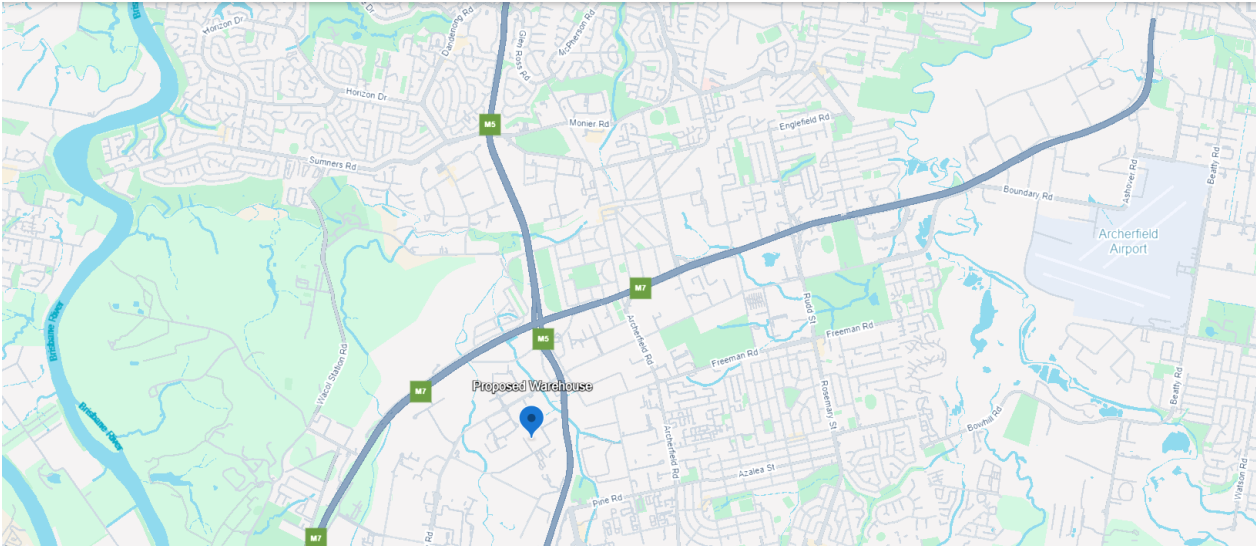


Figure 2 Site Location

The Facility's proposed layout is made up of several separated storage areas, along with an administrative block as seen in Figure 3. Those storage areas containing DG are highlighted in the figure, being the DG Store and the Warehouse.

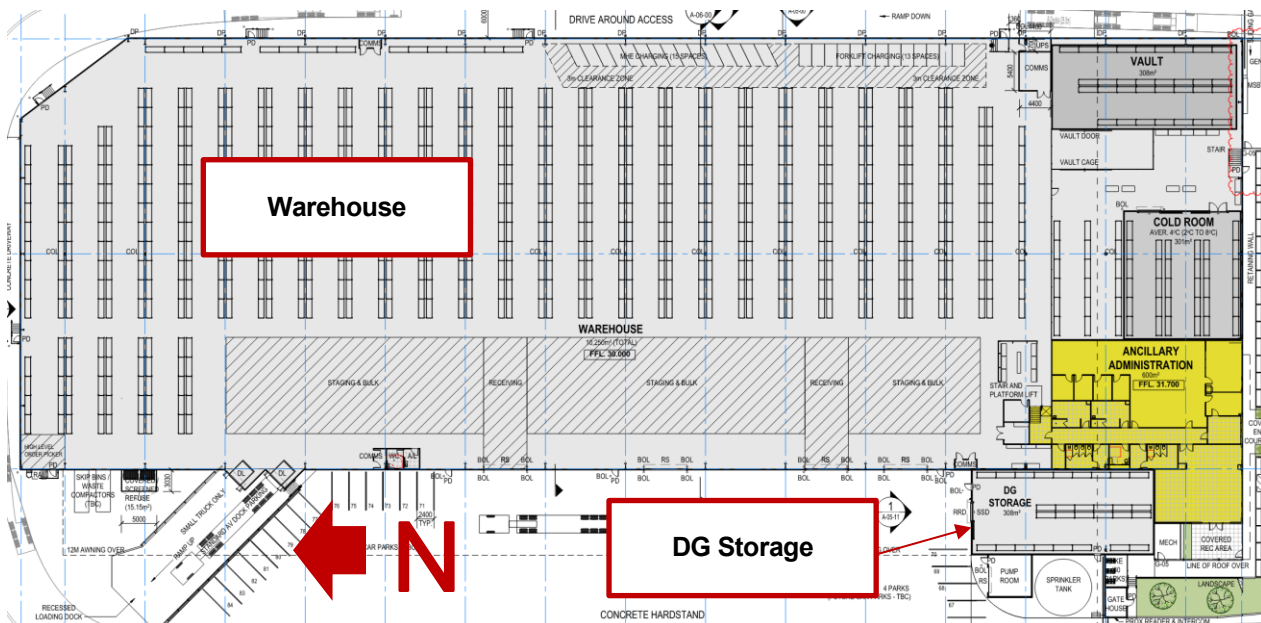


Figure 3 Site Layout

## 6.2 Dangerous Goods Storage

Dangerous goods are stored in packages within the maximum quantities in the areas shown in Table 3.

Table 3 DG Stored

Storage location	ADG Code Class/Division	Chemical	Max Storage Quantity
DG Store (Racking & Pallet)	Class 3	Flammable liquids	99,720 L
DG Store (Cage)	Division 2.1	Flammable aerosols	180 L
DG Store (Cabinet)	Class 8	Corrosive Substances	100 L
Warehouse (Racking & Pallet)	Class 9	Miscellaneous DG	8,500 L

The requirement for a PHA was triggered by the quantities of flammable liquids exceeding 50,000 kg. Quantities of other stored chemicals were below the threshold quantities of the BCC Planning Code (as noted under Appendix A) and represent comparatively minor hazards.

## 6.3 Site Processes

The proposed Facility is to serve as centralised consumable storage for QLD Health operations. As such there are the following activities occurring on site:

- Truck loading and unloading;
- Forklift and other material handling equipment (MHE) manoeuvring;
- Charging of forklifts and other MHE;
- Shelf/racking loading and unloading;
- Manual handling; and
- Administrative operations.

## 6.4 Surrounding Land Uses

Figure 4 shows the zoning of the Facility (Proposed Warehouse in the figure) and the surrounding properties. The Facility is on Plan Lot 161 on SP118192. The Facility currently being zoned as 'II Industry Investigation' and as such its development and further zoning into land for industrial activities is dependent on it not impinging any existing or intended use of adjacent areas.



Figure 4 Site Location, II Industry Investigation Zones in Purple, IN3 Industry (General Industry C) Zones in Pink

Neighbouring sites to the south and west are zoned as 'II Industry Investigation' (same as the Facility), meaning it is not currently being used as, but is being protected for, suitable industrial activities subject to further planning and investigation. Beyond these sites to the west is land zoned as 'OS2 Open Space (District)', which is for use as a park.

Otherwise, land to the immediate north and east of the Facility is zoned as 'IN3 Industry (General Industry C)'. As such this land provides for high impact industry uses and compatible medium impact industry. Additionally, it is also used for large format logistics and distribution warehouses. Importantly this land is separated from sensitive land uses to minimise the likelihood of environmental harm. The adjacent land uses include the following:

- Statewide Cleaning Cloths (QLD) Pty
- Eaton Hydraulics
- Danfoss
- Motorcycle Specialties
- Superior Coaters
- Aufey Logistics
- CAPS Australia – Brisbane
- Dowdens Pumping & Water Treatment – Brisbane
- Norwest Productions
- Alltruck Bodies

Since the surrounding land uses are similarly zoned industrial sites, there are no sensitive land uses in the surrounding area, with the nearest sensitive land use being a residential zone approximately 650 m away. As surrounding land uses are industrial which could be potentially handling dangerous goods, particular consideration must be given to the potential for off-site impacts or impacts from neighbouring facilities.

## 7 Risk Assessment

### 7.1 Hazard Identification

Potential hazards have been identified based on:

- The properties of the substances being handled and stored;
- The conditions of use;
- The quantities involved;
- The location of the storage / handling with respect to the site boundary; and
- The surrounding land uses, with respect to their proximity to storage locations.

Additionally, the following workplace alerts to WorkSafe QLD involving flammable liquids were reviewed in determining the potential hazards and to inform the selection of controls.

- Fire hazard of static electricity when handling flammable liquids – 22<sup>nd</sup> October 2009
- Two workers burnt in chemical explosion – May 2018
- Four injured in workplace explosion – November 2021
- Worker burned in fuel explosion – August 2019
- Worker burnt in fuel vapour explosion – Multiple Incidents
- Worker burned in pump room explosion – 11<sup>th</sup> January 2018
- Worker seriously burned in vehicle gas tank fire – 2015
- Worker burned following chemical explosion – November 2021

Based on the review of the properties of the goods identified, conditions of use and prior incidents, the following four scenarios were identified and are discussed in the following sections:

- Ignition of leak of Class 3 dangerous goods storage leading to fire;
- Ignition of leak of Class 3 dangerous goods in the unloading area leading to fire;
- Fire spreading to Class 3 dangerous goods storage; and
- Fire spreading to Class 3 dangerous goods during unloading.

#### 7.1.1 Fire

For a fire to occur, first flammable material has to be released (i.e. packaging must be compromised) to form flammable vapour. Once a vapour cloud forms, this can develop into a fire following ignition.

Potential causes for a release of material include:

- Impact by vehicles or equipment;
- Package drop;
- Faulty packaging;
- Puncture by damaged pallets;
- Overloading; and
- Poor stock management.

Potential sources of ignition include:

- Open flames;
- Hot surfaces;
- Electrical sparks;
- Incendive sparks; and
- Friction.

In order for an explosion to occur following ignition (rather than a fire), a significant amount of flammable vapour is required, or confinement or congestion of the vapour cloud which would lead to acceleration of flame front. As the store is not significantly confined or congested, and goods stored are flammable liquids, an explosion is considered unlikely to occur.

### **7.1.2 Scenario 1 – Ignition of Leak of Class 3 Dangerous Goods in the Dangerous Goods Storage Leading to Fire**

Scenario 1 covers the scenario of a fire involving Class 3 dangerous goods in the dangerous goods storage. In the absence of controls, a fire in the dangerous goods storage has the potential to involve large amounts of Class 3 flammable material and therefore may develop into a large fire with the potential to cause serious damage to equipment and structures on-site.

As the dangerous goods storage is over 20 m from the boundary, it is unlikely that such a fire scenario would cause any significant off-site thermal effects however it can be expected that a large smoke plume would develop with potential health effects to anyone exposed. As the materials stored in the dangerous goods storage are not severely toxic or corrosive, this smoke plume is not expected to present an elevated potential for harm over any other warehouse fire.

### **7.1.3 Scenario 2 – Ignition of Leak of Class 3 Dangerous Goods in the Unloading Area Leading to Fire**

Scenario 2 covers the scenario of a fire involving Class 3 dangerous goods in the unloading area. In the absence of controls, a fire in the unloading area has the potential to involve the remainder of the vehicle load and therefore may develop into a moderate fire with the potential to damage the nearby building.

As the unloading area for dangerous goods is over 20 m from the boundary, it is unlikely that such a fire scenario would cause any significant off-site thermal effects.

### **7.1.4 Scenario 3 – Fire Spreading to Class 3 Dangerous Goods Storage**

Scenario 3 covers the scenario of a fire elsewhere on the site spreading to the Class 3 dangerous goods in the dangerous goods storage. In the absence of controls, a fire in the dangerous goods storage has the potential to involve large amounts of Class 3 flammable material and therefore may develop into a large fire with the potential to cause serious damage to equipment and structures on-site.

As the dangerous goods storage is over 20 m from the boundary, it is unlikely that such a fire scenario would cause any significant off-site thermal effects however it can be expected that a large smoke plume would develop with potential health effects to anyone exposed. As the materials stored in the dangerous goods storage are not severely toxic or corrosive, this smoke plume is not expected to present an elevated potential for harm over any other warehouse fire.

### 7.1.5 Scenario 4 – Fire Spreading to Class 3 Dangerous Goods During Unloading

Scenario 2 covers the scenario of a fire elsewhere on the site spreading to the Class 3 dangerous goods in the unloading area during unloading. In the absence of controls, a fire in the unloading area has the potential to involve the remainder of the vehicle load and therefore may develop into a moderate fire with the potential to damage the nearby building.

As the unloading area for dangerous goods is over 20 m from the boundary, it is unlikely that such a fire scenario would cause any significant off-site thermal effects.

## 7.2 Controls

The following are the relevant controls in place based on the scenarios to be analysed:

- Inherent protective elements:
  - No PG I dangerous goods are kept at the site;
  - All packages are less than 1 L, reducing quantity available for spill;
  - Packages are palletised and wrapped, reducing likelihood of damage; and
  - Packages are compliant with Australian Dangerous Goods (ADG) Code.
- Engineering Controls:
  - DG Store is separated from the rest of the facility and on all sides by FRL 240/240/240 firewalls and appropriately rated fire doors;
  - Small quantities of corrosive substances are stored in a fire resistant cabinet;
  - Aerosols are stored in a cage to prevent projectile hazards;
  - The DG store has spill containment in threshold ramps and sump, with overflow directed to underground tanks;
  - The connection between the underground containment and the DG store has a fire trap to prevent fire spread between compartments;
  - The DG store is provided with coverage by extinguishers, foam hose reels and fire hydrants;
  - Electrical equipment is kept to a minimum within the store and where installed is in accordance with the hazardous area classification;
  - Fire detection is provided to the DG store;
  - There is a road around the perimeter of the facility, allowing trucks to drive forward without need for reversing to exit the site; and
  - The store is provided with ventilation to minimise vapour accumulation.
- Administrative Controls:
  - All packages to remain closed in storage, with no transfer of DG;
  - Personnel are to be trained in the properties of dangerous goods kept and working in hazardous areas (i.e. to avoid introduction of ignition sources);
  - Store procedures to ensure stock inspections, control and housekeeping;
  - Procedures to inspect incoming goods prior to receipt;
  - Any maintenance within the store would be carried out under hot work permit; and
  - Spill response procedures.

### 7.3 Risk Assessment Table

A risk assessment was undertaken for the hazardous scenarios identified in Section 7.1, based on the risk criteria set out in Section B.2 and controls in Section 7.2. This assessment is summarised in the table below.

Ref	Hazardous Scenario	Consequences	Initial Risk			Controls in Place / Actions Recommended	Residual Risk		
			L	C	R		L	C	R
1	Ignition of leak of Class 3 dangerous goods storage leading to fire	<ul style="list-style-type: none"> <li>Fire involving the entire Class 3 dangerous goods store</li> <li>Fire spreading to other areas at the facility</li> </ul>	M	VH	H	<ul style="list-style-type: none"> <li>No PG I dangerous goods are kept at the site.</li> <li>All packages are less than 1 L, reducing quantity available for spill.</li> <li>Packages are palletised and wrapped, reducing likelihood of damage.</li> <li>Packages are compliant with Australian Dangerous Goods (ADG) Code.</li> <li>DG Store is separated from the rest of the facility and on all sides by FRL 240/240/240 firewalls and appropriately rated fire doors.</li> <li>The DG store is provided with coverage by extinguishers, foam hose reels and fire hydrants.</li> <li>Electrical equipment is kept to a minimum within the store and where installed is in accordance with the hazardous area classification.</li> <li>The store is provided with ventilation to minimise vapour accumulation.</li> <li>Fire detection is provided to the DG store.</li> <li>All packages to remain closed in storage, with no transfer of DG.</li> <li>Personnel are to be trained in the properties of dangerous goods kept and working in hazardous areas (i.e. to avoid introduction of ignition sources).</li> <li>Store procedures to ensure stock inspections, control and housekeeping.</li> <li>Any maintenance within the store would be carried out under hot work permit.</li> <li>Spill response procedures.</li> </ul>	L	M	L
2	Ignition of leak of Class 3 dangerous goods in the unloading area leading to fire	<ul style="list-style-type: none"> <li>Fire in the unloading area potentially damaging the facility</li> </ul>	M	M	M	<ul style="list-style-type: none"> <li>No PG I dangerous goods are kept at the site.</li> <li>All packages are less than 1 L, reducing quantity available for spill.</li> <li>Packages are palletised and wrapped, reducing likelihood of damage.</li> <li>Packages are compliant with Australian Dangerous Goods (ADG) Code.</li> <li>The unloading area is provided with coverage by extinguishers and fire hydrants.</li> <li>There is a road around the perimeter of the facility, allowing trucks to drive forward without need for reversing to exit the site.</li> <li>Personnel are to be trained in the properties of dangerous goods kept and working in hazardous areas (i.e. to avoid introduction of ignition sources).</li> <li>Procedures to inspect incoming goods prior to receipt.</li> <li>Spill response procedures.</li> </ul>	L	L	L

Ref	Hazardous Scenario	Consequences	Initial Risk			Controls in Place / Actions Recommended	Residual Risk		
			L	C	R		L	C	R
3	Fire spreading to Class 3 dangerous goods storage	<ul style="list-style-type: none"> <li>Fire involving the entire Class 3 dangerous goods store</li> <li>Fire spreading to other areas at the facility</li> </ul>	L	VH	H	<ul style="list-style-type: none"> <li>No PG I dangerous goods are kept at the site.</li> <li>All packages are less than 1 L, reducing quantity available for spill.</li> <li>Packages are palletised and wrapped, reducing likelihood of damage.</li> <li>Packages are compliant with Australian Dangerous Goods (ADG) Code.</li> <li>DG Store is separated from the rest of the facility and on all sides by FRL 240/240/240 firewalls and appropriately rated fire doors.</li> <li>The DG store is provided with coverage by extinguishers, foam hose reels and fire hydrants.</li> <li>Electrical equipment is kept to a minimum within the store and where installed is in accordance with the hazardous area classification.</li> <li>The store is provided with ventilation to minimise vapour accumulation.</li> <li>The connection between the underground containment and the DG store has a fire trap to prevent fire spread between compartments.</li> <li>Fire detection is provided to the DG store.</li> <li>All packages to remain closed in storage, with no transfer of DG.</li> <li>Personnel are to be trained in the properties of dangerous goods kept and working in hazardous areas (i.e. to avoid introduction of ignition sources).</li> <li>Store procedures to ensure stock inspections, control and housekeeping.</li> <li>Procedures to inspect incoming goods prior to receipt.</li> <li>Any maintenance within the store would be carried out under hot work permit.</li> <li>Spill response procedures.</li> </ul>	VL	M	L
4	Fire spreading to Class 3 dangerous goods during unloading	<ul style="list-style-type: none"> <li>Fire in the unloading area potentially damaging the facility</li> </ul>	VL	M	L	<ul style="list-style-type: none"> <li>No PG I dangerous goods are kept at the site.</li> <li>All packages are less than 1 L, reducing quantity available for spill.</li> <li>Packages are palletised and wrapped, reducing likelihood of damage.</li> <li>Packages are compliant with Australian Dangerous Goods (ADG) Code.</li> <li>The unloading area is provided with coverage by extinguishers and fire hydrants.</li> <li>There is a road around the perimeter of the facility, allowing trucks to drive forward without need for reversing to exit the site.</li> <li>Personnel are to be trained in the properties of dangerous goods kept and working in hazardous areas (i.e. to avoid introduction of ignition sources).</li> <li>Procedures to inspect incoming goods prior to receipt.</li> <li>Spill response procedures.</li> </ul>	VL	L	VL

## 7.4 Discussion

The controls implemented at the facility are in accordance with AS 3833, AS 4681 and the QLD WHS Regulations.

The facility is typical of dangerous goods warehouses and the hazard identification did not identify any abnormal storage or handling of dangerous goods. Therefore the facility is within the coverage of the relevant standard and it is appropriate to implement the controls from these standards and codes of practice.

A dangerous goods report has been produced and hazardous area classification undertaken for the site to ensure that any required design measures are implemented as part of the construction for the facility.

## 7.5 Risk Evaluation

The risks presented are evaluated against the qualitative risk criteria set out in SC 6.15 in the following table.

Table 4 Evaluation of Risks Against SC 6.15 Risk Criteria

Criteria	Response
All 'avoidable' risks should be avoided, including the investigation of alternative locations and alternative technologies to ensure that risks are not introduced in an area where feasible alternatives are possible and justified.	The facility is required to store dangerous goods stock to meet operational requirements for QLD Health sites. No 'avoidable' risks have been identified.
The risk from a major hazard is reduced wherever practicable, irrespective of the numerical value of the cumulative risk level from the whole installation. If the consequences (effects) of an identified hazardous incident are significant to people and the environment, then all feasible measures (including alternative locations) are adopted so that the likelihood of such an incident occurring is made very low.	Risks are reduced in accordance with the recommended controls from the relevant Australian Standards and QLD Regulations in order to reduce the likelihood of an incident occurring as low as is reasonably practicable. Off-site thermal impacts are not reasonably anticipated.
The consequences of the more likely hazardous events (i.e. those of high probability of occurrence) are contained within the boundaries of the site.	Risks are reduced in accordance with the recommended controls from the relevant Australian Standards and QLD Regulations in order to reduce the likelihood of an incident occurring as low as is reasonably practicable. Off-site thermal impacts are not reasonably anticipated.
Where there is an existing high risk from a hazardous facility, additional hazardous development does not occur if they add significantly to that existing risk.	There is no existing hazardous facility at the location identified.

## 8 Conclusion

Following a Level 1 hazard analysis, it has been determined that as the QLD Health Warehouse has been designed with consideration to the hazards presented by the dangerous goods kept at the facility in accordance with the relevant Australian Standards and Regulations, and the dangerous goods have been located such that off-site impacts are unlikely, the risks presented by those dangerous goods are considered to have been reduced ALARP and meet the qualitative risk criteria under SC 6.15 of the Brisbane City Council City Plan 2014.

As the development is located in an industrial area, there have been no sensitive uses identified in the surrounding area which may potentially be impacted by a hazardous event at the facility.

Therefore Level 1 hazard analysis is considered to demonstrate that the proposed development does not result in any sensitive uses being exposed to unacceptable levels of risk due to industrial hazards. A Level 2 or Level 3 hazard analysis is not required.

## Appendix A Brisbane City Council City Plan 2014 Table 9.3.12.3.H

The following table excerpt (limited to relevant dangerous goods Classes) is reproduced from the Brisbane City Council City Plan Industry Code, 9.3.12.

Name	Class	Quantity (tonnes)
Flammable gases	Class 2.1	2
Flammable liquids	Class 3 PGI	20
	Class 3 PGII	50
	Class 3 PGIII	100
	Any mix of chemicals from any Packing Group where none of the items exceeds the threshold quantity on their own.	100
Combustible liquids (as defined by AS1940-2004 The storage and handling of flammable and combustible liquids)	C1/C2	500
Corrosive substances	Class 8 PGI	1.25
	Class 8 PGII	10
	Class 8 PGIII	25
	Any mix of chemicals from any Packing Group where none of the items exceeds the threshold quantity on their own.	25
Miscellaneous named substances	Class 9	10

## Appendix B Risk Matrix and Criteria

### B.1 Risk Matrix

A 5x5 risk matrix was used to allow for assessment of the identified hazards, as shown below.

		Likelihood / Frequency				
		Very Low	Low	Medium	High	Very High
Consequences	Very Low	Very Low	Very Low	Low	Low	Low
	Low	Very Low	Low	Low	Low	Medium
	Medium	Low	Low	Medium	Medium	High
	High	Low	Medium	Medium	High	Extreme
	Very High	Medium	High	Extreme	Extreme	Extreme

For the purposes of this assessment, the following categories of consequences and likelihood were used:

Category	Consequences	Likelihood / Frequency
Very Low	Minor loss of containment Dealt with by site personnel No harm to personnel No environmental damage	May occur only in exceptional circumstances / Once in a thousand years
Low	Loss of containment Minor fire No structural damage No significant harm to personnel No long term environmental damage	Could occur in some circumstances / Once in a hundred years
Medium	Major loss of containment Fire Some structural damage Minor injuries or personnel affected by fumes Some environmental damage	Might occur at some time / Once in ten years
High	Total loss of containment Major fire Major structural damage Injuries or harm to personnel requiring hospitalisation Death Impact largely confined to site	Will probably occur in most circumstances / Less than once a year
Very High	Significant impact beyond the boundaries of the site	It is expected to occur in most circumstances / More than once a year

## **B.2 Risk Criteria**

The qualitative risk criteria are set out in SC 6.15 as follows:

- All 'avoidable' risks should be avoided, including the investigation of alternative locations and alternative technologies to ensure that risks are not introduced in an area where feasible alternatives are possible and justified.
- The risk from a major hazard is reduced wherever practicable, irrespective of the numerical value of the cumulative risk level from the whole installation. If the consequences (effects) of an identified hazardous incident are significant to people and the environment, then all feasible measures (including alternative locations) are adopted so that the likelihood of such an incident occurring is made very low.
- The consequences of the more likely hazardous events (i.e. those of high probability of occurrence) are contained within the boundaries of the site.
- Where there is an existing high risk from a hazardous facility, additional hazardous development does not occur if they add significantly to that existing risk.