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Approval no: DEV-2026-FLA-5515

Date: 13 August 2026



CONSULTANTS

Level 7, 104 Melbourne Street
South Brisbane Qld 4101

PO Box 3635
SOUTH BRISBANE Qld 4101

T 07 3844 5900

Preliminary Dangerous Goods Report

Proposed Development of Estate Lot 14 of the Flagstone Logistics Estate,
North Maclean QLD

Prepared for: CH Hydrangea Pty Ltd

ACOR Document no: NA250760-01

Revision no: 0

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Revisions

Revision	Description	Date	Prepared by	Approved by
A	Issued for Review	19/05/2025	Jack Parsons	Scott Tamasauskas Imran Shaik (RPEQ)
0	Final Report for Planning Application	30/05/2025	Jack Parsons	Scott Tamasauskas Imran Shaik (RPEQ)

Review Panel

Division/ office	Name

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Limitations

ACOR Consultants Pty Ltd (ACOR) has provided guidance based on the information provided by CH Hydrangea Pty Ltd (on behalf of the proposed tenant) in relation to the storage quantities, locations and design layout. emergency response plans, etc.

Should the storage conditions or volumes change the contents and findings in the report shall be reviewed, and the risks associated with any change assessed and controlled.

Criteria

The review and assessment were carried out based on the following criteria:

- Work Health and Safety Act 2011 (QLD)
- Work Health and Safety Regulation 2011 (QLD); and

Applicable Australian Standards and Codes of Practice relating to the proposed storages:

- AS 3833–2024: The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers; and
- ISO 31000–2018: Risk Management – Guidelines.

The proposed tenant has also provided details associated with their design and operation.

1 Introduction

This Dangerous Goods Report has been prepared on behalf of CH Hydrangea Pty Ltd (Applicant) in support of a development application over part of the land at 4499-4651 Mount Lindesay Highway, North Maclean QLD 4280 and described as part of Lot 39 on SP338781 (site). The Applicant's PDA Development Application seeks approval for a Development Permit for a Material Change of Use for a Warehouse (Distribution Centre) and Low Impact Industry.

The proposed development will function as a distribution centre for the tenant, for the receipt, warehousing, storing and distribution of products, and will include a facility that enables material to be printed for distribution, and limited storage of dangerous goods. The proposed development will operate 24 hours a day, 7 days a week and will be located within Stage 2 of the overarching PDA Development Approval for the Flagstone Logistics Estate (EDQ Reference: DEV2018/961/18)

This report is to provide preliminary advice for the designers to understand the key requirements and considerations related to the proposed storage of dangerous goods (DG) at the Facility.

2 Scope

This report documents the dangerous goods storage requirements for the 'Packages' and identifies hazards relating to the storage and handling of dangerous goods advise designers to minimise the risk of dangerous goods storage and handling.

The dangerous goods storage area will be divided into areas according to the dangerous goods classes kept.

3.2 Quantity Assessment

3.2.1 Hazardous Chemical Workplace

A hazardous chemical register is required for those workplaces that surpass the threshold quantities in Regulation 328 of *Work Health and Safety Regulation 2011 (QLD)*, summarised in Table 2.

Table 2 Hazardous Chemical Workplace Threshold Quantities

Dangerous Goods	Threshold Quantities	Proposed Tenant Qty (kg/L)
Compressed gas of Class 2.1 (excluding LP gas)	50 L	18,000 ^{Note}
Dangerous goods Class 3	250 L	20,000
Any dangerous goods other than those stated above, i.e. Classes 4.1, 5, 6	100 L	7,320

Note: An assumption that 50% of the gross weight is flammable propellant has been made, based on a total product mass of 36 tonnes. Typical aerosols contain between 20-40% propellant, but can range up to 60%. To more accurately assess the amount of propellant which contributes towards the threshold, compositions would have to be established on a product basis.

As the proposed quantities to be stored exceed those in Table 2, a hazardous chemical register shall be produced per Regulation 346. The register shall include a list of all hazardous chemicals handled or stored, as well as an up-to-date SDS for each chemical, stored in a readily accessible location.

3.2.2 Placard and Manifest Quantities

The dangerous goods stored onsite exceeds the manifest quantities outlined in Schedule 11 of the Work Health and Safety Regulations 2011 (QLD), as per Appendix A.1. This requires the following:

- Outer warning placards (HAZCHEM signs) to be installed;
- Class placards (Class diamonds) to be displayed for each storage that exceeds placarding quantity;
- A notification to be made to WorkSafe QLD (Form 73 - Notification of a Manifest Quantity Workplace);
- A dangerous goods manifest and site plan to be prepared;
- An emergency management plan to be prepared and lodged with the Queensland Fire Department.

3.2.3 Major Hazard Facility

Sites containing 'Relevant hazardous chemicals' as laid out in Schedule 15 of the *Work Health and Safety Regulation 2011 (QLD)*, above thresholds defined in Tables 15.1, 15.2, 15.3, are subject to assessment to determine if they are to be managed as Major Hazard Facilities (MHFs).

All applications for dangerous goods sites where dangerous goods may be present above a critical quantity (10% of the MHF threshold) are considered by Workplace Health and Safety Queensland's major hazard team to determine if the site should be declared as an MHF.

Table 3 Major Hazard Facility Comparison

Hazardous Material	Description	Threshold Qty (t)	Proposed Tenant Qty (t)
Compressed and Liquefied Gases	Compressed or liquefied gases of division 2.1 or subsidiary risk 2.1	200	18 ^{Note 1}
Flammable Materials	Liquids that meet the criteria for class 3 packing group II or III	50,000	20
Oxidising Materials	Oxidising materials that meet the criteria for division 5.1 packing group I or II	200	0 ^{Note 2}
Peroxides	Organic peroxides that meet the criteria for division 5.2	200	
Toxic Solids and Liquids	Materials that meet the criteria for toxic in table 15.3	200	1.32 ^{Note 3}

Note 1: An assumption that 50% of the gross weight is flammable propellant has been made, based on a gross mass of 36 tonnes. The tenant is committed to ensuring that the actual storage of flammable aerosols does not exceed 10% of the MHF threshold quantity.

Note 2: Based on the SDSs received, no materials of packing group I or II are included.

Note 3: SDSs received have not included those of assumed Class 6.1 products containing nicotine. Generic SDSs have been sourced for nicotine, which indicate the toxicity level is greater than or equal to that defined by the criteria in table 15.3 for toxic chemicals.

The critical quantity for the site is determined below:

$$\frac{q_1}{Q_1} + \frac{q_2}{Q_2} + \dots + \frac{q_n}{Q_n} = \frac{18}{200} + \frac{20}{50000} + \frac{0}{200} + \frac{1.32}{200} = 0.097 < 0.1$$

The quantity of dangerous goods stored within the Distribution Centre will not exceed 10% of the MHF threshold quantity under Schedule 15 of the *Work Health and Safety Regulation 2011 (QLD)*. The site is therefore not a Hazardous Chemical Facility as defined by *State Development Assessment Provisions v3.0 – State Code 21 (QLD)* and will not meet or exceed the thresholds at Schedule 2, Part 2, Section 8 of the Environmental Protection Regulation 2019 (EP Reg) for an Environmentally Relevant Activity.

3.2.4 Planning Scheme

The development comes under the Greater Flagstone Priority Development Area Development Scheme which is administered by EDQ, but is located within the Logan City Council local government area.

It is understood that where the Priority Development Area Development Scheme does not have relevant assessment benchmarks, reference is often made to the Logan Planning Scheme 2015. The Hazardous Chemicals assessment benchmarks (PO5 and PO6) have been considered and the acceptable outcomes (AO5 and AO6) proposed to be met:

Table 4 Logan Planning Scheme 2015 Hazardous Chemicals Assessment Benchmarks

Performance Outcome	Acceptable Outcomes	Response
Buildings containing fire-risk hazardous chemicals are designed to detect the early stages of a fire situation and notify a designated person.	Buildings containing fire-risk hazardous chemicals are provided with 24 hour monitored fire detection system for early detection of a fire event.	The facility is proposed to operate 24 hours a day, 7 days a week and will be provided with fire detection.
Aboveground storage areas containing hazardous chemicals and fuels are designed with a spill containment system.	Bunded areas for the storage of hazardous chemicals and fuels are provided: ▪ In a separate enclosed area with an impervious floor; ▪ Of a capacity at least 100% of the largest tank or package plus 25% of the combined capacity; and ▪ Covered by sufficient roofing to prevent the egress of rainwater entering the bunded area if the storage is outside.	A bunded area meeting these requirements is proposed. The hazardous chemical storage areas are indoors.

4 Basis of Assessment

Based on the requirements of the proposed tenant, hazardous storage shall conform to Australian Standards for storage and handling of dangerous goods, as well as Safe Work Australia Codes of Practice. Further, hazardous atmospheres are to be identified and controlled, which shall be conducted in further reports as part of detailed design.

As a retail distribution centre storing dangerous goods only in retail packages, the DG storage areas are assessed against the requirements of Section 3 of AS 3833-2024. Refer to Appendix A.2 for retail package size limit.

5 Dangerous Goods Design Requirements

The requirements of AS 3833 are discussed in the following sections.

5.1 Segregation of Retail Packages

The Dangerous Goods Storage Area as discussed is split into multiple separate rooms for different types of DG as described in Table 1 to minimise the likelihood of interaction between chemicals that are incompatible or which may react dangerously with each other.

A guideline for the segregation required between dangerous goods of different classes is summarised in Table 5 below.

Table 5 Segregation guide of dangerous goods

Classes	2.1	3	4.1	5.1	6.1	8
2.1	C	C*	C*	RD	IC	IC
3	C*	C	C*	RD	IC	IC
4.1	C*	C*	C	RD	D	IC
5.1	RD	RD	RD	OX	RD*	RD
6.1	IC	IC	RD	RD*	C	SDS
8	IC	IC	IC	RD	SDS	SDS

Notes: IC = incompatible; RD = react dangerously; C = compatible

SDS = Segregation of these classes may be required. Consult safety data sheet (SDS) or the supplier. Particular attention should be given to Class 8 DG, as it contains acids and alkalis which are either incompatible or react dangerous with each other.

OX = Between different families of oxidizing agents, there is significant reactivity. Consult SDSs to determine incompatibility.

* Generally, as indicated (either compatible or react dangerously), however, in some cases they may not be, as such SDSs should be consulted.

The store needs to be designed such that:

- Incompatible chemicals shall:
 - Be kept in separate compounds,
 - Segregated by 3 m, and 1 m if both/all substances are solids, or
 - Stored in a secondary containment device
- Chemicals that react dangerously shall:
 - Be kept in separate compounds, with separate drainage systems,
 - And be segregated by 3 m as measure from the upper interior edge of the bund.

Segregation distances may be measured around screen walls having an FRL of 120/120/120.

5.2 Storage Area

The storage area shall be constructed in accordance with the following requirements:

- Comply with National Construction Code (NCC) requirements.
- Racks and shelves shall be structurally sound and designed to withstand maximum load of storage. Material of construction shall be chemical resistance and compatible with the dangerous goods being stored.
- Materials of construction shall be non-combustible.
- Retail distribution centres are required to be separated from protected places by a wall having an FRL of at least 120/120/120, with doors having an FRL of at least -/120/30
- Design and installation shall permit safe and easy access to all stock for personnel.
- Dangerous goods shall be stored in a way that allows safe and free passages to exits.
- Liquids shall not be stored above powders and solids. Liquids in glass bottles shall be stored at lower levels.
- The integrity of packaging shall be checked upon receipt of goods. If the packaging is damaged or leaking, the item shall be removed to a safe location for repair or repackaging. Items that cannot be repaired or repackaged shall be disposed of in accordance with statutory requirements.
- Aerosol storage has the following specific requirements:
 - Stored within non-combustible strong mesh enclosures (i.e. caged); or dispersed throughout the store;
 - Stored under cover and protected from exposure to the weather and direct sunlight;
 - Kept at least 3 m from any source of heat or ignition; and
 - Stored in a manner that reduces the risk of collapse of stacks or any damage to the aerosol containers.

5.3 Fire Protection

The fire protection requirements as per AS/NZS 3833 Table 9.3 must include:

- Portable fire extinguishers (9 kg; dry chemical powder or foam) at all entrances to the room and internally positioned along exit routes to achieve a maximum of 10 m travel distance.
- Fire hose reels shall be:
 - Provided in locations to the satisfaction of local fire authority
 - Provided on every storey of building where total floor area used for dangerous goods storage exceeds 300 m²
 - Sufficient number to reach any part of the store, including top of rack storage, and no point is beyond an arc formed by a radius of two thirds of the hose length measured from the hose concerned
- Fire Hydrants which shall conform to AS 2419.1 and requirements of the fire authority.

5.4 Spillage Containment

The storage of dangerous goods in the DG storage area is classified as retail distribution centre as the DG package size meets the maximum retail package sizes.

- For all liquid dangerous goods, the capacity of spill containment shall be at least 100% of the largest package size + 25% of total storage capacity up to 10,000 L, together with 10% of storage capacity beyond 10,000 L. If any fire sprinklers are installed, the containment capacity must be increased by at least 20 minutes of sprinkler firewater output. This increase can be designed to account for the largest number of sprinklers expected to be operating simultaneously in a reasonably foreseeable incident.
- It is noted that under the planning scheme (as referenced in Section 3.2.4), a larger capacity of 25% of the total storage capacity must be met as an acceptable outcome. This larger capacity should be met.

The general requirements for spillage containment as per AS/NZS 3833 are summarised below:

- All spills and leaks shall be isolated, cleaned up promptly and disposed appropriately.
- Spill response kits shall be readily available for use on the premise.
- The material of the bund should be suitable for use in containing the spill, chemically resistant to all stored liquids and fire resistant. Corrosive substance bunding for example will need to be lined with a suitable coating (epoxy or similar) to prevent attack by substances it contains.
- Shields can be used to deflect any leaks into a compound. The shields shall be non-combustible, chemically resistant to the goods stored and positioned so that they do not impede ventilation.
- The drainage of any fire water or rainwater to outside the bund shall either be:
 - Via a suitable interceptor or separator (e.g. a molecular sieve); or
 - After sampling and testing of the water.

5.5 Ventilation

The dangerous goods storage area is assessed to the requirement of retail distribution centre under AS/NZS 3833, which require adequate natural or mechanical ventilation to disperse any dusts, mists or vapour.

Natural Ventilation must be achieved through:

- Low level vents every 3 m of wall, or 1.4 m if there is only one external wall
- High-level vents on opposing walls to low level vents, place high enough above the highest package to ensure effective movement of air.
- Roof vents, ridge vents, or rotating cowl vents may also be used.
- Vents shall have a net free area of at least 0.1 m²

Mechanical Ventilation must be achieved through:

- Locating termination points (for fresh-air and draw-off ducts) on opposite walls immediately above upper limit of compound, and no further than 5 m apart.
- A system that can achieve the greater of 5 m³/min, or 0.3 m³/m² of floor area, and
- Air velocity out the outlet shall be greater than 300 m/s

5.6 Control of Ignition sources

Due to the storage of flammable dangerous goods (Class 2, 3 and 4) within the storage area room, hazardous area shall be considered as part of the design. Any electrical installation within the room shall be located outside the hazardous area where possible, and any installation within the hazardous area shall be compliant, including lighting. These may include:

- Heating sources such as stoves, heaters or shrink-wrapping equipment;
- Electrical fittings such as alarms, lighting, card access system; and
- Mechanical handling equipment (MHE) such as forklifts.

The storage of flammable dangerous goods shall be located at least 3 m away from any source of heat or ignition.

A hazardous area classification (HAC) must be undertaken to allow for designers and users to understand the extents of any hazardous zones and design electrical installations appropriately.

5.7 Signage

The following signage shall be provided for the site and for individual stores:

- Operational Signage;
- Emergency Services Signage; and
- Dangerous Goods Placarding.

5.8 Lighting

- Store to be provided with a lighting with sufficient luminance (at least 50 lx) to provide safe working conditions to enable clear visibility of all markings on packages, labels and signs
- Where flammable dangerous goods are stored, hazardous area requirements may apply.

5.9 Impact Protection

Bollards, crash barriers or other suitable protective barriers shall be installed where there is a risk of the goods, racking or shelving being damaged by vehicular traffic, including fork-lift trucks. Such protective barriers shall be maintained in good condition. This may be installing bollard on the outer corner of the racks if required.

All fire protection equipment and piping/valves shall also be protected from impact by traffic or by a projectile during a fire.

5.10 Activities Within Dangerous Goods Storage Area

The primary function of the DG storage area shall be for storage of dangerous goods. Activities such as decanting, repacking (other than to meet orders), blending, battery charging, parking, or maintenance of vehicles shall not be carried out within 3 m of the storage area.

5.11 Emergency Management

- Access and escape routes shall be clearly defined and kept clear at all times
- Appropriate protective equipment shall be provided and used in emergencies; and
- Emergency plan shall be developed on site and all personnel shall be well trained and informed of the plan.

5.12 Emergency Information

The following signage shall be provided at the entrance to premise:

- Site manifest box
- Emergency services information panel
- Outer warning placard ('HAZCHEM')

Appendix A Information for Reference

A.1 Dangerous Goods Manifest Quantity

Dangerous goods placard quantity and manifest quantity for QLD.

Table 6 Manifest and Placarding Quantity Limits

Description of Dangerous Goods	GHS Classification	Placarding Quantity	Manifest Quantity	Expected Quantity
Aerosols	Category 1, category 2, category 3 or any combination of these categories	5,000 L	10,000 L	36,000 L
Flammable Liquids	Category 2	250 L	2,500 L	20,000 L ^{Note 1}
	Category 3	1,000 L	10,000 L	-
Flammable Solids	Category 1	250 kg	2,500 kg	1,000 kg ^{Note 2}
	Category 2	1,000 kg	10,000 kg	
Oxidising Liquids and Oxidising Solids	Category 1	50 L/kg	500 L/kg	6,000 L/kg ^{Note 3}
	Category 2	250 L/kg	2,500 L/kg	
	Category 3	1,000 L/kg	10,000 L/kg	
Organic Peroxides	Type A	5 L/kg	50 L/kg	
	Type B	50 L/kg	500 L/kg	
	Type C-F	250 L/kg	2,500 L/kg	
Acute Toxicity	Category 1	50 L/kg	500 L/kg	1,320 L/kg ^{Note 4}
	Category 2	250 L/kg	2,500 L/kg	
	Category 3	1,000 L/kg	10,000 L/kg	
Skin corrosion	Category 1A	250 L/kg	2,500 L/kg	28,680 L/kg ^{Note 5}
	Category 1B	1,000 L/kg	10,000 L/kg	
	Category 1C	1,000 L/kg	10,000 L/kg	
Corrosive to metals	Category 1	250 L/kg	2,500 L/kg	

Note 1 – As the flammable liquids stored are Class 3 DG, they shall be equivalent to at least category 3 flammable liquids. Therefore, regardless of the packing group (PG), the manifest quantity shall be exceeded.

Note 2 – As the quantities indicated sit between the placarding and manifest quantities of category 1 and category 2, regardless of the PG of the flammable solids stored, flammable solids represent placarding quantities, and do not surpass manifest quantities.

Note 3 – Based on the SDSs received the oxidising and organic peroxides are limited to PG III. It is most likely that the quantities will exceed placarding quantities but not manifest quantities. It is the responsibility of the tenant to monitor stock levels and take appropriate action when placarding or manifest quantities are exceeded.

Note 4 – As PG and quantities of toxic substances are unknown, an assessment as to whether the placard or manifest quantities are surpassed cannot be conducted. Upon receiving SDS for goods, as well as their quantities an accurate assessment will be made. Unless over 500 L/kg is PG I, then the quantities should be below manifest quantities, which is the expected outcome.

Note 5 –As quantities surpass the manifest quantities of the lowest categories, the specific PG of each product is not required to make the assessment.

A.2 Retail Package Size

Table 7 is extracted from AS 3833-2024: The storage and handling of mixed classes of DGs, in packages and intermediate bulk containers.

Table 7 AS/NZS 3833 Retail Package Size Limit

Dangerous Goods	Class/Div	Maximum Package Size	Additional comments
Flammable gas	Division 2.1	1L	
Aerosols	Class 2	1L	No div 2.3 or 6.1 sub risk
Flammable liquids	Class 3	20L	Manufactured product included.
Flammable solids	Division 4.1	500 g or mL	Other than firelighters, which may be 3 kg.
Oxidising substance	Division 5.1	20 kg or 20L 10kg*	* only if pool chlorine in granulated or tablet form. Powder follows 20kg restriction.
Toxic	Division 6.1	20 kg or L	
Corrosive Substances	Class 8 PG II	5 kg or L	
Corrosive Substances	Class 8 PG III	20 kg or L	
Miscellaneous	Class 9	20 kg or L	Excludes lithium or sodium batteries which may be 50 kg.