

REPORT

PRELIMINARY RISK SCREENING

SEPP (RESILIENCE AND HAZARDS) 2021

AMERICOLD PROSPECT EXPANSION

BECA PTY LTD

DOCUMENT NO: 21693-RP-002
REVISION: 0
DATE: 05-Oct-2022

DOCUMENT REVISION RECORD

Rev	Date	Description	Prepared	Checked	Approved	Method of issue
A	29-Sep-2022	Issued to Client for comments	O. Alim	G. Peach	G. Peach	Email [PDF]
0	05-Oct-2022	Reissued as final with no comments	O. Alim	G. Peach	G. Peach	Email [PDF]

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Title: Report Preliminary Risk Screening SEPP (Resilience and Hazards) 2021 Americold Prospect Expansion	QA verified: K. Shen
	Date: 05-Oct-2022

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ABBREVIATIONS

ADGC	Australian Dangerous Goods Code
DA	Development Application
DG	Dangerous Goods
DPE	(NSW) Department of Planning and Environment
EIS	Environmental Impact Statement
EP&A	Environmental Planning and Assessment
ESD	Emergency Shutdown
GHS	Globally Harmonised System
HIPAP	Hazardous Industries Planning Advisory Paper
LEL	Lower Explosive Limit
LGA	Local Government Area
NSW	New South Wales
PHA	Preliminary Hazard Analysis
SCADA	Supervisory Control and Data Acquisition
SDS	Safety Data Sheet
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SRD	State and Regional Development
SSD	State Significant Development

1. INTRODUCTION

1.1. Requirement for study

Americold Logistics Pty Ltd (Americold) is proposing to extend its existing temperature-controlled warehouse facility at 554-562 Reservoir Road, Prospect, NSW. The proposed development will provide additional cold storage capacity to meet future predicted demand. The proposal includes a new additional ammonia charged refrigeration system, separate and independent to the existing refrigeration system.

The proposal is a State Significant Development (SSD) under the State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP) and requires an Environmental Impact Statement (EIS) to accompany the Development Application (DA), in accordance with the Environmental Planning and Assessment (EP&A) Regulation.

The 'Hazards and Risks' component of the Planning Secretary's Environmental Assessment Requirements (SEARs) requires a preliminary risk screening to be completed in accordance with the SEPP (Resilience and Hazards) 2021.

Americold has commissioned Beca Pty Ltd (Beca) to prepare an EIS for the proposed development. Beca has retained Sherpa Consulting Pty Ltd (Sherpa) to undertake the preliminary risk screening for input to the EIS.

1.2. Objectives

The objectives of the preliminary risk screening were to:

- Determine whether the proposed development is considered as 'potentially hazardous' within the meaning of the SEPP
- Establish whether a Preliminary Hazard Analysis (PHA) is required and document the basis for the decision.

The NSW Department of Planning and Environment (DPE) screening guideline *Hazardous & Offensive Development Application Guidelines – Applying SEPP 33*, Ref [1], was used to undertake the preliminary risk screening.

Note: SEPP No. 33 *Hazardous and Offensive Development* has been consolidated into SEPP (Resilience and Hazards) 2021. It now forms Chapter 3 of the Resilience and Hazards SEPP. Supporting documentation and guidance may still refer to SEPP 33.

1.3. Scope

The scope of the preliminary risk screening included:

- Storage and handling of Dangerous Goods (DG) within the site boundary
- DG transport movements to-and-from the site.

1.4. Exclusions and limitations

The study exclusions and limitations are as follows:

- This study only covered assessment and determination of the 'potentially hazardous' nature of the proposed development. Aspects of the SEPP (Resilience and Hazards) 2021 covering management of 'potentially offensive' aspects of the proposed development are excluded.
- The proposed ammonia refrigeration circuit is independent of the existing refrigeration circuit. The proposed circuit has been assessed in the context of the overall site operations and DG inventory, but the risk screening was carried out against the proposed circuit only. Sherpa has not revisited the approval process for the existing circuit.
- The assessment made in this study was based on information on the proposed development provided to Sherpa at the time (e.g. location, types and quantities of materials that may be stored and/or handled at the facility for future operations). As the proposed development is at the concept design phase, these cannot be verified.
- Hazardous materials and DG used during construction activities were excluded from the assessment.

2. FACILITY DESCRIPTION

2.1. Location and surrounding land uses

The site is located at 554-562 Reservoir Road, Prospect, NSW. Access to the site is via Reservoir Road, north-east of the intersection with Prospect Highway. The site is situated within the Cumberland City Council Local Government Area (LGA). The site location is shown in Figure 2.1.

The site covers approximately 6.6 hectares located in an industrial zoned area. The land use surrounding the site is predominantly industrial in nature. An overview of the surrounding land uses is shown in Figure 2.2.

The nearest sensitive land use is the Berry Patch Pre-School and Long Day Care Centre located approximately 80 m west of the site boundary.

The nearest residential dwellings are located approximately 25 m north of the site boundary at 566-568 Reservoir Road, noting this is an industrial zone. The nearest cluster of dwellings in an area zoned for residential use is located approximately 500 m east of the site boundary.

The nearest identified recreational land use is the Raging Waters Water Park located approximately 500 m west of the site boundary.

Figure 2.1: Site location



Figure 2.2: Overview of surrounding land uses



2.2. Site overview

Americold provides supply chain solutions including temperature-controlled storage and distribution network connecting food producers, processors, distributors, and retailers to consumers.

The existing facility includes:

- An office and administration building
- Two cold storage warehouses
- Two plant rooms
- Vehicle parking areas.

The refrigeration system is a continuously run operation. The two existing plant rooms are interconnected via piping for the refrigerant system. The total liquid ammonia at the existing facility refrigeration system is approximately 10 tonnes, mainly stored in the Main Liquid Receiver, intercoolers and accumulator vessels. The site layout including locations of the existing plant rooms and main ammonia inventories are shown in Figure 2.3.

The staff and visitor car parking are located (1) along the northern boundary and (2) east of the northern cold storage warehouse. Heavy vehicle parking and loading facilities are located between the two existing cold storage warehouses.

The facility manning level is:

- Office/administration: 55 staff
- Operations (per shift): 94 staff (morning), 81 staff (afternoon), 4 staff (night).

2.3. Proposed development

The proposed development comprises the following:

- A new 5,140 m² freezer building extension and annexe to the east of the existing southern warehouse. The extension is intended to provide capacity for approximately 13,450 frozen pallets and will include a new refrigeration circuit to service the new freezer building.
- A new plant room.
- A new battery storage room to enable the charging, storage and changeover of batteries used for materials handling equipment.
- Alterations and/or upgrades to the site access and roads, parking and loading arrangements including:
 - Construction of a new staff and visitor site access, to eliminate traffic conflicts between heavy and passenger vehicles.

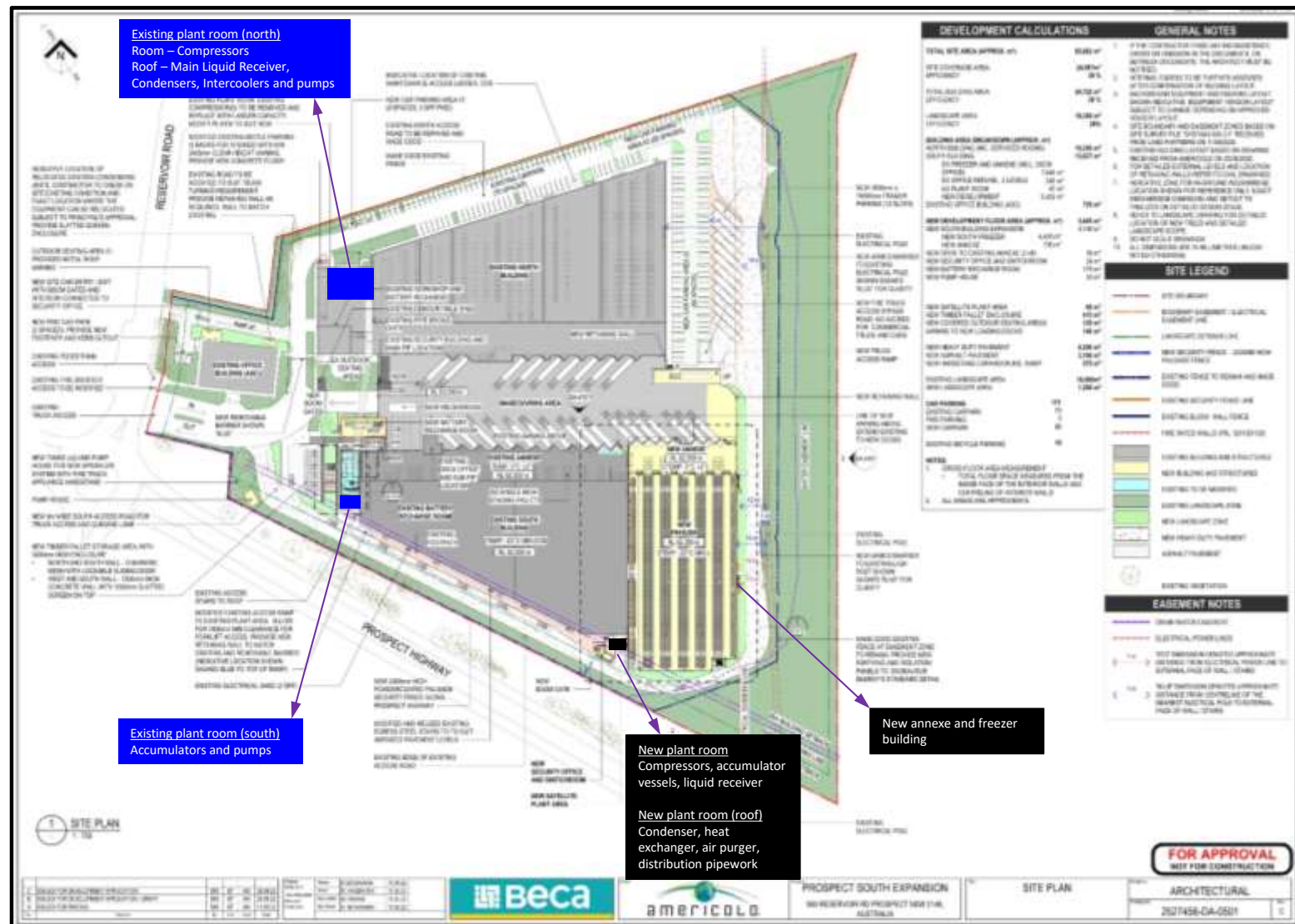
- Construction of 93 new staff/visitor vehicle carparks (including three accessible spaces) to the north and east of the existing northern warehouse.
 - Construction of two new accessible carparks adjacent to the existing office building.
 - Sealing of the southern and eastern portions of the site access road with heavy duty pavement.
 - Construction of new Armco barriers protecting the power poles to the east of the site.
 - Repaving of the existing car parking access.
 - Minor corner modifications to enhance truck turning and manoeuvrability.
 - New boom gates.
 - Construction of new loading docks.
 - Construction of a new heavy vehicle turnaround and 12 new trailer parking spots to the east of the existing northern warehouse.
- A new fire water pump house and two new firewater tanks.
 - A new timber pallet storage area with 3 m high masonry walls.
 - A new staff outdoor seating area with awning.
 - A new security office with boom gates.
 - A new weighbridge.
 - Internal refurbishment of the existing staff amenities, lunchroom/outdoor eating area, locker room and transport office, located in an existing building to the immediate west of the southern warehouse.
 - Additional site landscaping.

The proposed development will be located and constructed within the existing site boundary.

The ammonia inventory required to service the new freezer building will be approximately 0.8 tonnes. The new refrigeration circuit will be separate and independent to the existing circuit.

The site layout showing the existing facilities and proposed development (i.e. new freezer building and plant room) is shown in Figure 2.3.

Figure 2.3: Site layout – Existing and proposed facility



2.4. Proposed new ammonia refrigeration circuit

Ammonia is used as a refrigerant onsite and is circulated around the refrigeration circuit. The proposed development includes provision of a new ammonia charged refrigeration circuit, separate and independent to the existing refrigeration circuit. An overview of the new ammonia refrigeration system is provided in Table 2.1.

Table 2.1: Overview - new ammonia refrigeration circuit

Item	New refrigeration circuit
Ammonia inventory	0.8 tonnes
Associated equipment	<p><u>New plant room</u></p> <ul style="list-style-type: none"> Reciprocating compressors (x4) Suction accumulators (x2) including oil drain vessels Liquid receiver (x1) Water pumps (x4) <p><u>New plant room roof</u></p> <ul style="list-style-type: none"> Evaporative condenser (x1) Air purger (x1) Shell and tube heat exchanger (x1) Distribution pipework
Operating conditions	<ul style="list-style-type: none"> Compressor Discharge (1250kPa / +35°C) High Suction Side (265kPa / -4°C) Low Suction Side (20kPa / -30°C) Flow Rate: 2,560 kg/hr
Recharge	<p>Mode: 230 kg ammonia skids (via hose connection)</p> <p>Recharge frequency: approximately once every 5 years</p>
Safety systems	<ul style="list-style-type: none"> Low range ammonia detection in plant room High range Lower Explosive Limit (LEL) ammonia detection in plant room Shunt trip electrical isolation in plant room Continuous ventilation in plant room Emergency ventilation in plant room including Ex'E motors and anti-static blades Emergency lighting in plantroom Electrical isolation from outside of plantroom Exhaust fan activation from inside & outside of plant room. <p>During day shift, alarm is attended by the refrigeration team for response and/or troubleshooting. During night shift, remote alert notification on alarms is sent to the refrigeration team.</p>

Item	New refrigeration circuit
Emergency shutdown (ESD)	<p>In addition to confirmed gas detection, ESD can also be initiated manually either from the field (ESD button) or from the SCADA control system. ESD initiation will:</p> <ul style="list-style-type: none"> • Close the ESD valves • The damper(s) on the ventilation system in the affected room will fully open • The outlet damper will open to allow the ammonia laden air to be drawn from the affected room and vented to atmosphere via an elevated vent.

3. PRELIMINARY RISK SCREENING

3.1. Overview

The objective of the preliminary risk screening was to determine whether the proposed development is considered as 'potentially hazardous' in the context of SEPP (Resilience and Hazards) 2021.

SEPP (Resilience and Hazards) 2021, Ref [2], defines potentially hazardous industry as follows:

'Potentially hazardous industry' means a development for the purposes of any industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would pose a significant risk in relation to the locality:

- (a) to human health, life or property, or
- (b) to the biophysical environment,

And includes a hazardous industry and a hazardous storage establishment.

Development proposals that are classified as 'potentially hazardous' industry must undergo a PHA as per the requirements set in HIPAP No. 6 *Guidelines for Hazard Analysis*, Ref [3], to determine the risk to people, property and the environment. If the residual risk exceeds the acceptability criteria, the development is considered as a 'hazardous industry' and may not be permissible within NSW.

To determine whether a proposed development is potentially hazardous, the NSW DPE *Applying SEPP 33* guideline, Ref [1], is used to undertake the risk screening process. The risk screening process considers the type and quantity of hazardous materials to be stored on site, distance of the storage area to the nearest site boundary, as well as the expected number of transport movements.

'Hazardous materials' are defined within the guideline as substances that fall within the classification of the Australian Dangerous Goods Code (ADGC), i.e. have a DG classification. Detail of the DG classification is typically obtained from the materials' Safety Data Sheet (SDS).

The *Applying SEPP 33* guideline is based on the 7th edition of ADGC, Ref [4], and refers to hazardous chemicals by their DG classification. In this document, substances will be referred to by their DG classification rather than their classification under the Globally Harmonized System (GHS), which is used in the ADGC Edition 7.6 or newer, Ref [5].

Risk screening is undertaken by comparing the storage quantity and the number of road movements of the hazardous materials with the screening threshold specified in the guideline. The screening threshold presents the quantities below which it can be assumed that significant offsite risk is unlikely.

3.2. Risk screening

3.2.1. Storage and handling

Ammonia is the only DG that will be stored and handled on site in significant quantities for use in the closed system refrigeration circuits. The ammonia quantities for the existing and new refrigeration circuits and the relevant risk screening threshold are presented in Table 3.1.

Following consultation with the DPE, a cumulative risk assessment for the entire site (existing plus proposed development) is not required if the new refrigerant circuit fulfills the following aspects:

1. The new refrigeration circuit is independent to the existing refrigeration circuit (i.e. no shared pipework, no means to tie-in the circuits to provide redundancy from one to another). This will be established in the design basis.
2. The ammonia storage and handling in the new refrigeration circuit is below the risk screening threshold. This is demonstrated in Table 3.1.

Note: There will be no other DG stored and handled onsite in significant quantities except ammonia.

3. The new refrigeration circuit is located at the optimal position that is away from the existing refrigerant circuit and surrounding land users (potential offsite receptors).
 - The new plant room where the new refrigeration circuit equipment (liquid receiver, condenser, compressors, etc) is housed, is situated at the south-east corner of the site. This is away from the Berry Patch Day Care Centre and residential dwellings (immediately north of the site at Reservoir Road), located approximately 240 m and 250 m, respectively.
 - The new plant room is located approximately 200 m and 140 m from the north and south plant rooms respectively, where the existing refrigeration circuit equipment are located.

As the new refrigeration circuit will be designed to meet the above aspects, the outcome of this risk screening was based on the storage and handling of ammonia associated with the new refrigeration circuit only, i.e. below the screening threshold.

3.2.2. Transport

Risk screening for transportation of hazardous material is presented in Table 3.2. Generally, the facility will not transport any hazardous materials or DG to and from the site. Approximately once every 5 years recharge of ammonia into the circuit will be required using 230 kg skids. This is below the screening threshold for transportation.

Table 3.1: Hazardous material storage – screening summary

Material	DG Class	Category	Storage threshold	Location	Quantity	Exceed threshold?	Remarks
Anhydrous ammonia	2.3 8 (subclass)	Toxic gas	5 tonnes (Note 1)	Proposed refrigeration circuit	0.8 tonnes	No	Quantity is below the screening threshold.
				Existing refrigeration circuit	10 tonnes	-	Cumulative assessment for the entire site (existing plus proposed development) is not required. Refer to Section 3.2.1. Risk screening was based on the storage and handling of ammonia associated with the new refrigeration circuit only. This line is included for information only - the <i>Applying SEPP</i> 33 guideline requires that all hazardous materials onsite (including existing operation) which are in proximity to the proposed development to be reported.
Note 1: Threshold applies to anhydrous ammonia, kept in the same manner as for liquified flammable gases and not kept for resale. The proposed refrigeration circuit meets these requirements.							

Table 3.2: Hazardous material transportation – screening summary

Material	DG Class	Category	Transport threshold		Exceed threshold?	Remarks
			Movements	Min. Quantity		
Anhydrous ammonia	2.3 8 (subclass)	Toxic gas	>100 (annual) >6 (weekly)	1 tonne (bulk) 2 tonnes (packages)	No	Number of movements will not be exceeded (recharge using 230 kg skids every 5 years – applies for both existing and proposed circuits).

3.3. Other risk factors

Appendix 2 of *Applying SEPP 33* outlines other risk factors for consideration to identify hazards outside the scope of the DG risk screening method. An assessment of the other factors is presented in Table 3.3.

Table 3.3: Assessment against other risk factors

Risk Factor	Commentary	Additional risk?
1. Incompatible materials (hazardous and non-hazardous materials)	Ammonia is the only DG that will be stored and handled on site in significant quantities. Other hazardous materials stored onsite that are not specifically included in the risk screening are stored in small quantities and no hazards with the potential to cause significant offsite impacts were identified.	No
2. Any wastes that could be hazardous	The proposed development will not generate any hazardous waste.	No
3. Existence of dusts in confined areas	The proposed development will not result in dust generation.	No
4. Types of activities the hazardous materials are associated with 5. Storage or processing operations involving high (or extremely low) temperatures and/or pressures	Ammonia will be used as a refrigerant, circulated around a vapour compression refrigeration circuit. Ammonia undergoes phase changes through the refrigeration cycle (i.e. compression, condensation, expansion, evaporation). To date, ammonia is one of the most commonly used refrigerants in large industrial systems to process and preserve most food and beverages (International Institute of Ammonia Refrigeration).	No
6. Incompatible, reactive or unstable materials and process conditions that could lead to uncontrolled reaction or decomposition	Ammonia will be used as a refrigerant in a closed-loop refrigeration circuit. No known issues with incompatibility, reactivity or potential instability due to the process conditions associated with the vapour compression refrigeration cycles.	No
7. Details of known past incidents involving hazardous materials and processes in similar industries	Ammonia leaks from refrigeration systems have occurred at similar facilities (food processing and distribution warehouses). However, given the ammonia quantity is below the screening threshold and proposed engineering and procedural controls will be implemented (as per the existing facility), addition of the new refrigeration circuit is not expected to introduce significant contribution to existing risk from the existing refrigeration circuit.	No

3.4. Industries that may fall within SEPP 33

Appendix 3 of *Applying SEPP 33* provides a list of industries that may be potentially hazardous. It is noted that this list is illustrative rather than exhaustive. The current edition of the guideline does not specifically include food storage and distribution warehouse facilities in the example industry listing that may be potentially hazardous. However, it identifies the food processing industry as potentially hazardous due to the potential impact of (ammonia) refrigerant leak.

Given the ammonia quantity in the new refrigeration circuit is below the risk screening threshold and proposed engineering and procedural controls will be implemented as per the existing facility (e.g. preventative maintenance program, gas detection with alarms and trip functions, forced mechanical ventilation for the plant room), addition of the new refrigeration circuit is not expected to introduce significant contribution to existing risk from the existing refrigeration circuit.

3.5. Conclusions

To address the 'Hazards and Risks' assessment requirements of the SEARs, a preliminary risk screening in accordance with the SEPP (Resilience and Hazards) 2021 was completed.

The risk screening found that the proposed development is not considered as 'potentially hazardous' and does not require a PHA. The main findings of the preliminary risk screening are summarised as follows:

- The new refrigeration circuit is assessed independently of the existing circuit as it meets the following criteria:
 1. The new refrigeration circuit is independent to the existing refrigeration circuit (i.e. no shared pipework, no means to tie-in the circuits to provide redundancy from one to another). This will be established in the design basis.
 2. The ammonia storage and handling in the new refrigeration circuit is below the risk screening threshold. There will be no other DG stored and handled onsite in significant quantities except ammonia.
 3. The new refrigeration circuit is located at the optimal position that is away from the existing refrigerant circuit and surrounding land users (potential offsite receptors).
 - The new plant room where the new refrigeration circuit equipment is housed, is situated at the south-east corner of the site. This is away from the Berry Patch Day Care Centre and residential dwellings (immediately north of the site at Reservoir Road), located approximately 240 m and 250 m, respectively.
 - The new plant room is located approximately 200 m and 140 m from the north and south plant rooms respectively, where the existing refrigeration circuit equipment are located.

The risk screening concluded that:

- The storage and transport of DG for the proposed development do not exceed the relevant risk screening threshold.
- There are no other risk factors identified for the proposed development that would present additional risk to the overall facility.
- The addition of the new refrigeration circuit is not expected to introduce significant contribution to existing risk from the existing refrigeration circuit. The proposed engineering and procedural controls will be implemented as per existing facility.

The assessment is valid on the basis that:

- The new refrigeration circuit is independent to the existing circuit, with no means to connect the circuits, and
- The new location for the new circuit is optimised with respect to separation distances to sensitive and residential offsite receptors. The location selection is based on the available space on site for the new circuit and optimising the distribution pipework for the new cold store.

4. REFERENCES

- [1] NSW Department of Planning, "Hazardous and Offensive Development Application Guidelines - Applying SEPP 33," 2011.
- [2] NSW Government, "State Environmental Planning Policy (Resilience and Hazards)," 2021.
- [3] NSW Department of Planning, "Hazardous Industry Planning Advisory Paper No 6 - Hazard Analysis," 2011.
- [4] National Transport Commission, "Australian Code for the Transport of Dangerous Goods by Road and Rail Edition 7," January 2009.
- [5] National Transport Commission, "Australian Code for the Transport of Dangerous Goods by Road and Rail Edition 7.7," 2020.