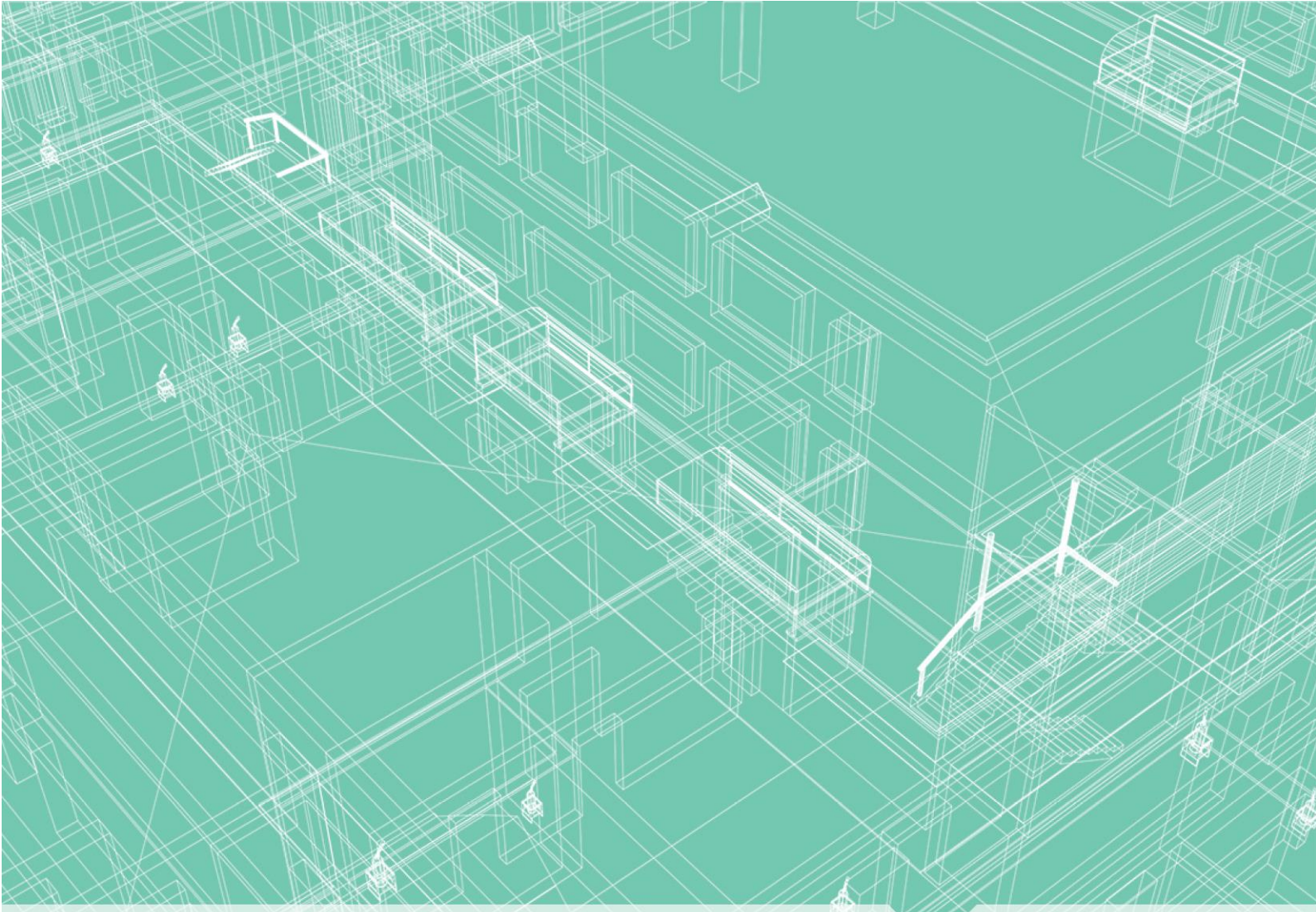

PRELIMINARY DANGEROUS GOODS SCREENING REPORT

HAMMONDCARE WAHROONGA STAGE 2
STATE SIGNIFICANT DEVELOPMENT APPLICATION (SSDA)
SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS (SEARS)

JHA

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DOCUMENT CONTROL SHEET

Title	SSDA SEARs Preliminary Screening Report – Dangerous Goods (DG)
Project Name	HammondCare Wahroonga Stage 2 Redevelopment
Project Number	220521
Description	Report
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Revision History

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HammondCare Malcolm Taylor	REV	A	B						
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CONTENTS

1 EXECUTIVE SUMMARY

This Preliminary Screening Report – Dangerous Goods (DG) Report is submitted to the Department of Planning and Environment (DPE) in support of a State Significant Development Application (SSD-45121248) for the redevelopment of part of the site at 4-12 Neringah Avenue South, Wahroonga for the purposes of delivering additional community health services, seniors housing, as well as upgraded palliative care facilities that will contribute to the broader operation of 'Neringah Hospital.' The extent of the site is shown below.

Figure 1 Outline of the site, with the portion of the site subject to the SCC shaded dark red (R4 zone)

Specifically, this SSDA seeks approval for the following:

- Site preparation works comprising:
  - Demolition of the Neringah Hospital building, kiosk, and existing at-grade carparks;
  - Clearing of nominated vegetation on the proposed development areas;
  - Bulk earthworks including basement excavation; and
  - Remediation works where necessary across the site.
- Construction and use of an integrated seniors housing and health services facility across two buildings ranging from 4-5 storeys above ground, comprising:
  - 2 basement levels containing minimum of 130 car parking spaces and service dock;
  - 12 residential aged care facility beds (extension to existing Stage 1 provision);
  - 18 palliative care hospice beds (Schedule 3 health services facility);
  - Community healthcare services, including outpatient palliative care, centre for positive aging and Hammond at Home;

  - 57 seniors housing dwellings;
  - On-site administration, amenities, and ancillary operations spaces.
- Ground level and on-building landscaping works, including the provision of a through site pedestrian link connecting Archdale Park and Balcombe Park;
- Public domain works, specifically, regrading of part of the pedestrian walkway known as 'Archdale Walk' to provide accessible connection; and
- Extension and augmentation of infrastructure and services as required including new site signage

This report has been prepared to respond to the Secretary's Environmental Assessment Requirements (SEARs) for SSD-45121248 that were issued on 24 June 2022. A table referencing responses has been provided overleaf.

2 INTRODUCTION

2.1 PURPOSE

Under this scope, JHA has been engaged to conduct a preliminary screening assessment of Dangerous Goods (DG) associated with the proposed HammondCare Wahroonga Stage 2 Redevelopment.

The purpose of this report is to respond to relevant criteria identified in the State Significant Development Application (SSDA) / Secretary's Environmental Assessment Requirements (SEARs) submission. Specifically, this report aims to address the following items:

16. Hazards and Risks • Where there are dangerous goods and hazardous materials associated with the development provide a preliminary risk screening in accordance with Chapter 3 of SEPP (Resilience and Hazards) 2021. • Where required by SEPP (Resilience and Hazards) 2021, provide a Preliminary Hazard Analysis prepared in accordance with *Hazardous Industry Planning Advisory Paper No.6 – Guidelines for Hazard Analysis*. • If the development is adjacent to or on land in a pipeline corridor, report on consultation outcomes with the operator of the pipeline, and prepare a hazard analysis.	• Preliminary Hazard Analysis

2.2 LIMITATIONS

The information, assumptions and assessment contained within this report is based solely upon information provided to JHA, which includes:

- Preliminary Design Documentation
- Temporary relocation and safe storage of existing DG onsite, associated with buildings scheduled for demolition, for eventual relocation into new development DG storage facilities
- Existing site diesel generator and associated diesel storage tank to be retained at southern campus
- Existing site diesel generator and associated diesel storage tank to be relocated as part of this project
- Anticipated DG chemicals required to support operations at a site of this nature
- Requirement for bulk storage and reticulation of medical gases.

Note that existing DG onsite associated with buildings and infrastructure not directly associated with the redevelopment is not addressed as part of this report.

The preparation of this SSDA SEARs DG Screening Report serves as a starting point and should not be considered a comprehensive Dangerous Goods Assessment for the proposed Development.

The purpose of this report is to conduct a preliminary screening of DG stored onsite, in order to satisfy the requirements set-out for the SSDA and demonstrate a commitment to the appropriate planning and implementation in accordance with relevant Regulations, Standards and Guidelines.

2.3 PROJECT SCOPE OVERVIEW

- Site preparation works comprising:
  - Demolition of the Neringah Hospital building, kiosk, and existing at-grade carparks;

  - Clearing of nominated vegetation on the proposed development areas;
  - Bulk earthworks including basement excavation; and
  - Remediation works where necessary across the site.
- Construction and use of an integrated seniors housing and health services facility across two buildings ranging from 4-5 storeys above ground, comprising:
  - 2 basement levels containing minimum of 130 car parking spaces and service dock;
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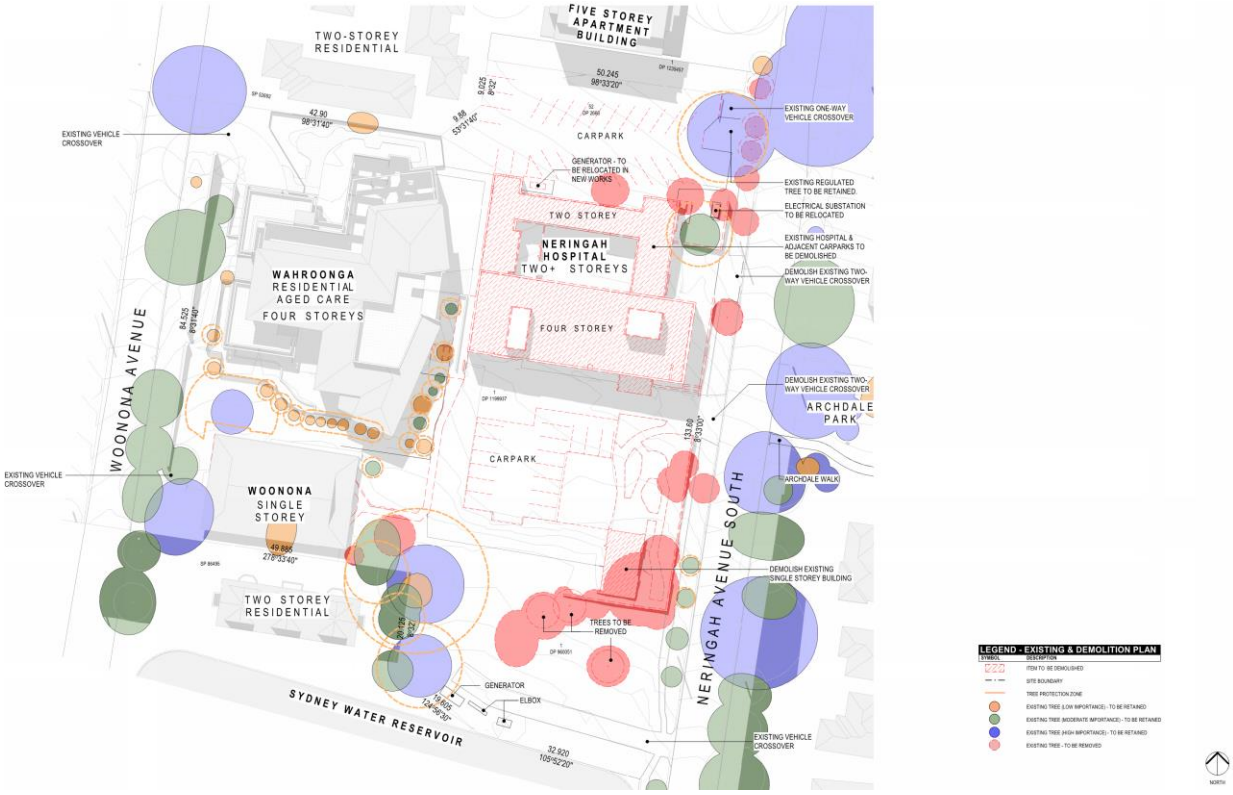


Figure 2 Existing Site Layout & Proposed Demolition Plan

Figure 3 Proposed Site Plan

3 PROJECT DANGEROUS GOODS PLANNING & OBLIGATIONS

3.1 OVERVIEW

The management of hazardous chemicals and procedures regarding the storage and handling of Dangerous Goods (DG) is crucial to the ongoing safety and operations of any space utilising hazardous chemicals. Such DG includes but is not limited to: Class 2 flammable or non-flammable gases, Class 3 flammable liquids, Class 5 oxidising agents, Class 8 corrosive chemicals.

Flammable gases and liquids play a key role in the design, management and operations of laboratories, as these chemicals can create an explosive atmosphere (or hazardous area). If not appropriately planned, designed, stored and handled, flammable goods give rise to the potential for explosions and/or fires. The purpose of a classification in accordance with AS/NZS 60079.10 is to assist the facility owner/operator(s) in maintaining the integrity of the electrical apparatus and equipment within designated hazardous zones to meet the requirements of AS/NZS 3000 and AS/NZS 60079.14.

3.2 REFERENCED DOCUMENTS

1. NSW Work Health and Safety Regulation 2017
2. State Environmental Planning Policy (Resilience and Hazards) 2021
3. Managing risks of hazardous chemicals in the workplace Code of code of practice;
4. Australian Standard AS/NZS 60079.10.1 Classification of areas
5. Australian Standard AS 4332: The Storage and Handling of Gases in Cylinders
6. AS 1940: The storage and handling of flammable and combustible liquids
7. AS/NZS 4681: The storage and handling of Class 9 (miscellaneous) dangerous goods and articles
8. AS/NZS 3833: The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers.
9. AS 4326: The storage and handling of oxidising agents
10. AS 1020: The control of undesirable static electricity
11. AS1894 - 1997 - The storage and handling of non-flammable cryogenic and refrigerated liquids
12. Australian-Code-for-the-Transport-of-Dangerous-Goods-by-Road&Rail-7.6
13. ChemWatch Gold FFX Health and Safety Directorate V2
14. Engineering Services Guidelines.

3.3 REGULATORY FRAMEWORK

NSW Work Health and Safety Regulation 2017 Chapter 7, Part 7.1 'Hazardous Chemicals' *"applies to:*

a) the use, handling and storage of hazardous chemicals at a workplace and the generation of hazardous substances at a workplace, and
b) a pipeline used to convey a hazardous chemical."

Division 5 'Control of Risk' of Chapter 7 provides a high level framework for the supply, storage and handling of Dangerous Chemicals; and the obligations of the Persons Conducting Businesses or Undertakings (PCBU) under the following subsections:

- Subdivision 1 General obligations relating to the management of risk
- Subdivision 2 Spills and damage

- Subdivision 3 Emergency plans and safety equipment
- Subdivision 4 Storage and handling systems

3.4 PERSONS CONDUCTING BUSINESSES OR UNDERTAKINGS (PCBU)

The Persons Conducting Businesses or Undertakings (PCBU) are ultimately responsible for meeting the obligations set out in NSW Work Health and Safety Regulation 2017.

During the site enabling, demolition and construction phases onsite it, is anticipated that the head contractor will serve as the primary PCBU and shall be responsible for the:

1. Identification, storage, handling and/or disposal of existing clients' DG onsite within existing buildings under the current project scope, which is:
    a. Scheduled for safe removal from site and disposal
    b. Scheduled for relocation and storage onsite during demolition and construction phases
2. Identification, storage, handling and/or disposal of DG required onsite to facilitate demolition and construction works
3. The planning, design, installation and handover of DG and associated infrastructure for the proposed Campus Development.

Upon completion and handover of the project, the client's authorised representatives' for the site will assume responsibility as the campus PCBU(s).

3.5 RISK MANAGEMENT

There are a number of ways to control the risks associated with hazardous chemicals, with application of the Hierarchy of Controls serving as a widely utilised protocol.

Control measures are ranked and applied from the highest level of protection and reliability to the lowest.

Elimination should always be the aim in the first instance. Where this is not reasonably practicable, the risk must be minimised by using one or more of the approaches that follow in descending order:

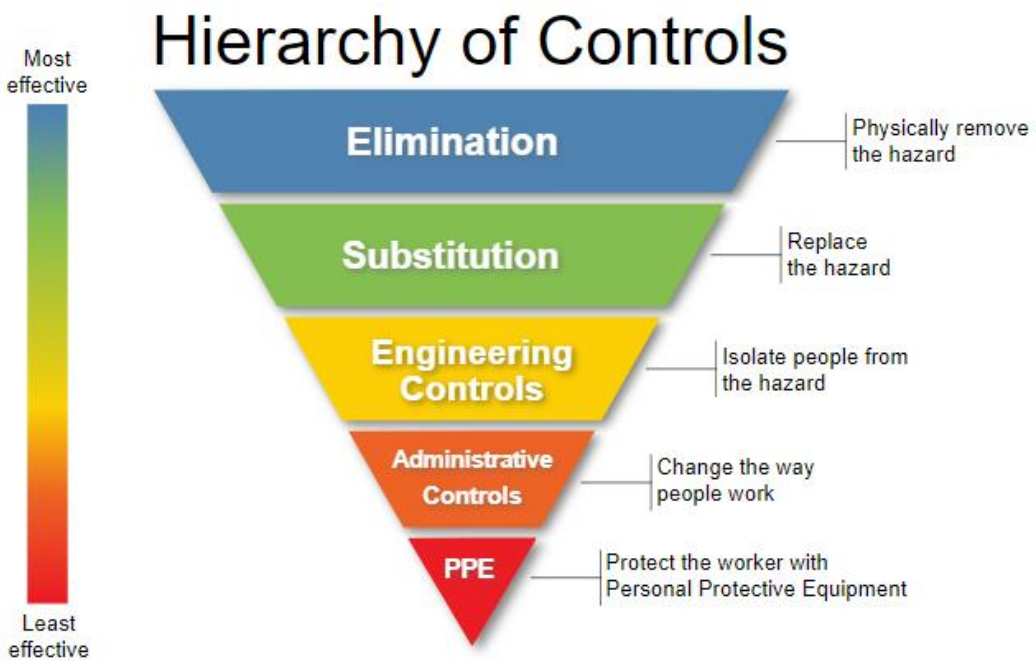


Figure 4 Hierarchy of Control - Infographic by the USA NIOSH

Administrative control measures and PPE (secondary Controls) rely upon the actions of personnel and their willingness to adhere to the control and processes in place. For this reason, these two measures should serve as a last resort when applying the Hierarchy of Controls.

As designers have limited capacity to influence the ongoing application of administrative controls and the use of PPE, their scope of risk management in Safety in Design is limited to the development of substitution, isolation or engineering controls (primary Controls).

4 STATE ENVIRONMENTAL PLANNING POLICY (RESILIENCE AND HAZARDS) 2021 OBLIGATIONS

The purpose of this report is to respond to relevant criteria identified in the State Significant Development Application (SSDA) / Secretary's Environmental Assessment Requirements (SEARs) submission. Specifically, this report aims to address the following items:

16. Hazards and Risks • Where there are dangerous goods and hazardous materials associated with the development provide a preliminary risk screening in accordance with Chapter 3 of SEPP (Resilience and Hazards) 2021. • Where required by SEPP (Resilience and Hazards) 2021, provide a Preliminary Hazard Analysis prepared in accordance with *Hazardous Industry Planning Advisory Paper No.6 – Guidelines for Hazard Analysis*. • If the development is adjacent to or on land in a pipeline corridor, report on consultation outcomes with the operator of the pipeline, and prepare a hazard analysis.	• Preliminary Hazard Analysis

4.1 SEPP CHAPTER 3 HAZARDOUS AND OFFENSIVE DEVELOPMENT

The following excerpts are included to provide the reader with an overview of SEPP Chapter 3 definitions.

Reference: https://legislation.nsw.gov.au/view/html/inforce/current/epi-2021-0730#ch.3

3.1 Aims, objectives etc – excerpt from SEPP:

"This Chapter aims—

(a) to amend the definitions of hazardous and offensive industries where used in environmental planning instruments, and

(b) to render ineffective a provision of any environmental planning instrument that prohibits development for the purpose of a storage facility on the ground that the facility is hazardous or offensive if it is not a hazardous or offensive storage establishment as defined in this Chapter, and

(c) to require development consent for hazardous or offensive development proposed to be carried out in the Western Division, and

(d) to ensure that in ***determining whether a development is a hazardous or offensive industry****, any measures proposed to be employed to reduce the impact of the development are taken into account, and*

(e) to ensure that in considering any application to carry out potentially hazardous or offensive development, the consent authority has sufficient information to assess whether the development is hazardous or offensive and to impose conditions to reduce or minimise any adverse impact, and

(f) to require the advertising of applications to carry out any such development."

3.2 Definitions of "potentially hazardous industry" and "potentially offensive industry" – excerpt from SEPP:

"In this Chapter—

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.

potentially offensive industry *means a development for the purposes of an 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 emit a polluting discharge (including for example, noise) in a manner which would have a significant adverse impact in the locality or on the existing or likely future development on other land, and includes an offensive industry and an offensive storage establishment."*

3.3 Other definitions – excerpt from SEPP:

(1) In this Chapter—

hazardous industry *means a development for the purposes of an industry which, when the development is in operation and when all measures proposed to reduce or minimise its impact on the locality have been employed (including, for example, measures to isolate the development from existing or likely future development on other land in the locality), would pose a significant risk in relation to the locality—*

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

hazardous storage establishment *means any establishment where goods, materials or products are stored which, when in operation and when all measures proposed to reduce or minimise its impact on the locality have been employed (including, for example, measures to isolate the establishment from existing or likely future development on the other land in the locality), would pose a significant risk in relation to the locality—*

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

offensive industry *means a development for the purposes of an industry which, when the development is in operation and when all measures proposed to reduce or minimise its impact on the locality have been employed (including, for example, measures to isolate the development from existing or likely future development on other land in the locality), would emit a polluting discharge (including, for example, noise) in a manner which would have a significant adverse impact in the locality or on the existing or likely future development on other land in the locality.*

offensive storage establishment *means any establishment where goods, materials or products are stored which, when in operation and when all measures proposed to reduce or minimise its impact on the locality have been employed (including, for example, measures to isolate the establishment from existing or likely future development on other land in the locality), would emit a polluting discharge (including, for example, noise) in a manner which would have a significant adverse impact in the locality or on the existing or likely future development on other land in the locality.*

the Act *means the Environmental Planning and Assessment Act 1979.*

4.2 APPLICABILITY TO SITE

4.2.1 POTENTIALLY HAZARDOUS INDUSTRY

Onsite Stand-by Diesel Generators

The existing site contains 2-off existing diesel generating sets. 1-off existing generator is to remain in its current location, the other is proposed for decommissioning and relocation under the proposed development.

The diesel generators onsite will be required to provide stand-by power to nominated critical infrastructure and are therefore required to facilitate operations onsite.

Diesel is a Combustible Liquid (Class C1) and designated Dangerous Good (DG), and there will be ongoing storage, handling and delivery operations associated with this infrastructure.

Excerpt from NSW Government Planning: Hazardous and Offensive Development Application Guidelines Applying SEPP 33 Section 7:

"If combustible liquids of class C1 are present on site and are stored in a separate bund or within a storage area where there are no flammable materials stored they are not considered to be potentially hazardous. If, however, they are stored with other flammable liquids, that is, class 3PGI, II or III, then they are to be treated as class 3PGIII, because under these circumstances they may contribute fuel to a fire."

Based on the above excerpt and with consideration to the fact that diesel associated with the generating sets will NOT be collocated with other DG, the storage and handling of diesel directly associated with the stand-by generators is NOT considered to be potentially hazardous.

Miscellaneous DG associated with client operations

The new development will also necessitate the storage, handling and delivery of medical gases, flammable and corrosive liquids, numerous of which will be designated DG. The quantities of each DG class anticipated to be held onsite have not yet been fully established; however, the quantities required and anticipated to be handled onsite are expected to be well below those stated for each Class of DG in the below table taken from NSW Government Planning: Hazardous and Offensive Development Application Guidelines Applying SEPP 33 Section 7.

It is therefore anticipated that the quantities of DG required by the development do NOT constitute a designated as potentially hazardous in accordance with SEPP requirements.

Table 1: Screening Method to be Used

Class	Method to Use/Minimum Quantity
1.1	Use graph at Figure 5 if greater than 100 kg
1.2-1.3	Table 3
2.1 — pressurised (excluding LPG)	Figure 6 graph if greater than 100 kg
2.1 — liquefied (pressure) (excluding LPG)	Figure 7 graph if greater than 500 kg
LPG (above ground)	table 3
LPG (underground)	table 3
2.3	table 3
3PGI	Figure 8 graph if greater than 2 tonne
3PGII	Figure 9 graph if greater than 5 tonne
3PGIII	Figure 9 graph if greater than 5 tonne
4	table 3
5	table 3
6	table 3
7	table 3
8	table 3

Table 2: Transportation Screening Thresholds

	Vehicle Movements		**Minimum quantity***	
	Cumulative	Peak	**per load (tonne)**	
Class	Annual *or*	Weekly	Bulk	Packages
1	see note	see note	see note	
2.1	>500	>30	2	5
2.3	>100	>6	1	2
3PGI	>500	>30	1	1
3PGII	>750	>45	3	10
3PGIII	>1000	>60	10	no limit
4.1	>200	>12	1	2
4.2	>100	>3	2	5
4.3	>200	>12	5	10
5	>500	>30	2	5
6.1	all	all	1	3
6.2	see note	see note	see note	
7	see note	see note	see note	
8	>500	>30	2	5
9	>1000	>60	no limit	

Table 3: General Screening Threshold Quantities

Class	Screening Threshold	Description
1.2	5 tonne	or are located within 100 m of a residential area
1.3	10 tonne	or are located within 100 m of a residential area
2.1	(LPG only — not including automotive retail outlets[1])	
	10 tonne or16 m^3	if stored above ground
	40 tonne or 64 m^3	if stored underground or mounded
2.3	5 tonne	anhydrous ammonia, kept in the same manner as for liquefied flammable gases and not kept for sale
	1 tonne	chlorine and sulfur dioxide stored as liquefied gas in containers <100 kg
	2.5 tonne	chlorine and sulphur dioxide stored as liquefied gas in containers >100 kg
	100 kg	liquefied gas kept in or on premises
	100 kg	other poisonous gases
4.1	5 tonne	
4.2	1 tonne	
4.3	1 tonne	
5.1	25 tonne	ammonium nitrate — high density fertiliser grade, kept on land zoned rural where rural industry is carried out, if the depot is at least 50 metres from the site boundary
	5 tonne	ammonium nitrate — elsewhere
	2.5 tonne	dry pool chlorine — if at a dedicated
		pool supply shop, in containers <30 kg
	1 tonne	dry pool chlorine — if at a dedicated pool supply shop, in containers >30 kg
	5 tonne	any other class 5.1
5.2	10 tonne	
6.1	0.5 tonne	packing group I
	2.5 tonne	packing groups II and III
6.2	0.5 tonne	includes clinical waste
7	all	should demonstrate compliance with Australian codes
8	5 tonne	packing group I
	25 tonne	packing group II
	50 tonne	packing group III

Note: *The classes used are those referred to in the Australian Dangerous Goods Code and are explained in Appendix 7.*

Figure 7: Class 2.1 Flammable Gases Liquefied Under Pressure (Excluding LPG)

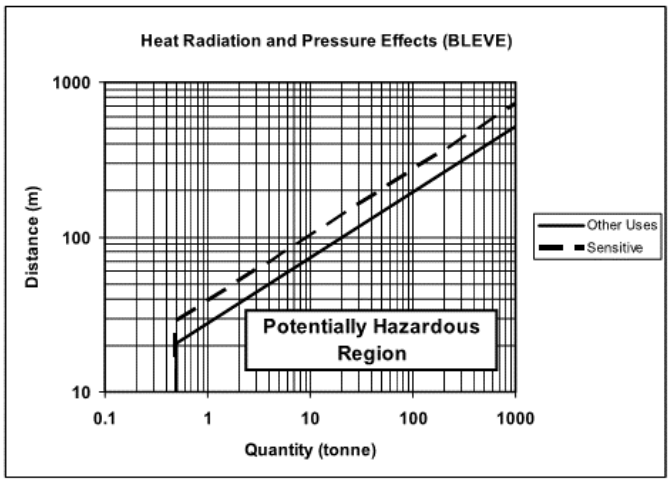


Figure 8: Class 3PGI Flammable Liquids

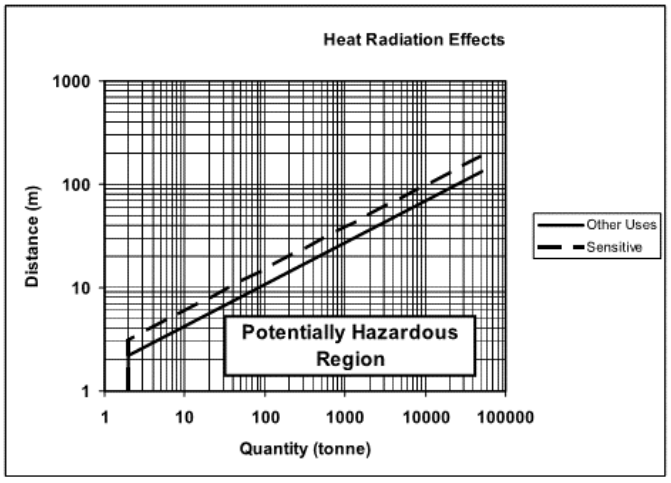
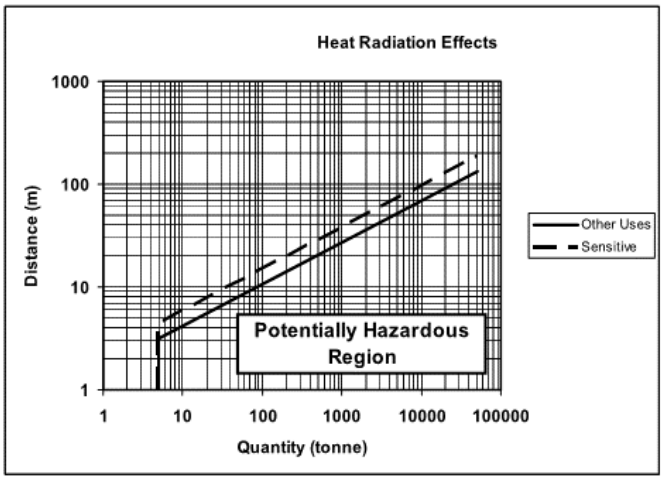


Figure 9: Class 3PGII and 3PGIII Flammable Liquids



4.2.2 POTENTIALLY OFFENSIVE INDUSTRY

Noting the above considerations, the development does NOT constitute a designated as potentially offensive industry based on DG considerations.

4.2.3 SUMMARY

Based on preliminary assessment in accordance NSW Government Planning: Hazardous and Offensive Development Application Guidelines Applying SEPP 33, the proposed development does NOT meet the definitions of 'a potentially hazardous industry, nor those of a 'potentially offensive industry'. Therefore, a Preliminary Hazardous Assessment (PHA) should not be required as part of the SSDA submission.

5 DANGEROUS GOODS

As part of the site redevelopment, the project team and/or contractor, in consultation with the client, shall develop and implement appropriate risk management strategies to facilitate the planning, design, storage, handling and processing of DG onsite, both during and post site redevelopment.

In consultation with the client, the following shall be undertaken during the project design and construction phases:

1. Appoint a client Person or Persons Conducting Businesses or Undertakings (PCBU), and during the Design and Construction phases, a nominated Project PCBU for the head contractor
2. Develop appropriate procedures for:
   - purchase of chemicals
   - storage of chemicals
   - use of chemicals
   - what to do in emergencies
   - disposal of chemicals
3. Provide staff with access to CSIS package and Safety Data Sheets
4. Establish and maintain a chemical register
5. Provide access to risk assessment information
6. Arrange appropriate training for all staff
7. Plan how to manage contractors bringing chemicals on site.

5.1 PLANNING DURING THE DESIGN DEVELOPMENT PHASE

During Design Development a detailed DG Planning Report is to be produced to assist the architect and builder in the planning and establishment of compliant DG Storage, reticulation, handling, processing and disposal practices.

5.2 STORAGE STRATEGIES

Existing and DG onsite is anticipated to be currently stored within a number of designated chemical stores and/or purpose built storage cabinets/cages.

In order to facilitate proposed demolition, construction and ultimately client operations, all DG onsite is to be installed within a suitably designed and constructed Chemical Store (or stores), with smaller Chemical Cabinets and/or cages to be established locally to preparation and application spaces.

DG associated with existing building and infrastructure onsite which does not specifically form part of this redevelopment is not considered in this report.

DG associated with the existing hospital buildings scheduled for demolition shall be safely removed and stored in a temporary storage facility until such time as new permanent storage facilities are established.

New and existing DG onsite will typically fall within the following categories:

- Class 2.1 Flammable Gases
- Class 2.2 Non-flammable / non-toxic gases
- Class 3 Flammable Liquids

- Class 4.1 Flammable Solids
- Class 5.1 Oxidising Agents
- Class 6 Toxic Substances
- Class 8 Corrosives
- Class 9 Miscellaneous Dangerous Goods

It is anticipated that hazardous chemicals are to be delivered by road transport to the campus via a nominated good receiving area, before being transferred into chemical storage cabinets and/or shelves within the nominated Chemical Store or stores.

Small quantities can then be transferred on a needs basis into smaller Chemical Cabinets and/or cages to be established locally to preparation and application spaces.

Decanting is to occur in accordance with AS/NZS 2243.10 within Fume Cabinets in the preparation areas used for this purpose.

The above is applicable to operations both during the demolition and construction phases, as well as under operations ultimately to be conducted by the client's end-users.

5.3 SPECIFIC STORAGE STRATEGIES OVERVIEW

Each DG Class comes with its own associated risks.

5.3.1 CLASS 2.1 GASES

Class 2.1 gases represent elements which, when mixed with air in certain proportions, will form an explosive gas atmosphere.

Minor quantities of Class 2.1 such as aerosols can be stored on dedicated shelves.

Where larger quantities are to be stored, they should be enclosed within a dedicated Class 2.1 Storage Cage, as this will aid in ventilation around the containers.

Figure 5 Aerosols Only Cage

Should larger compressed gas cylinders be required on site, these shall be stored within a bulk lockable Storage Cage, with the conduct of a HazAn and Hazardous Area Classification to occur.

5.3.2 CLASS 3 LIQUIDS

Class 3 liquids are capable of producing a flammable vapour under any foreseeable operating conditions.

It is proposed that Class 3 liquids be installed within dedicated Flammable Storage Cabinets. Subject to the quantities proposed onsite at any time, this could be in a larger central 250L Storage Cabinet, with smaller Cabinets distributed throughout the Campus for daily use.

Figure 6 250L Flammable Storage Cabinet - Storemasta

5.3.3 GLASS 4 SOLIDS

As stated on the Australian Institute of Dangerous Goods Consultants Website:

"Class 4 is divided into three divisions as follows:

Division 4.1 Flammable solids

Solids which, under conditions encountered in transport, are readily combustible or may cause or contribute to fire through friction; self-reactive substances which are liable to undergo a strongly exothermic reaction; solid desensitized explosives which may explode if not diluted sufficiently;

Division 4.2 Substances liable to spontaneous combustion

Substances which are liable to spontaneous heating under normal conditions encountered in transport, or to heating up in contact with air, and being then liable to catch fire;

Division 4.3 Substances which in contact with water emit flammable gases

Substances which, by interaction with water, are liable to become spontaneously flammable or to give off flammable gases in dangerous quantities."

Noting the minor quantities for Class 4 solids anticipated for use onsite, it is proposed that these materials can be stored within a dedicated Minor Class 4 Storage shelve or within a small dedicated Storage Cabinet.

5.3.4 CLASS 5 OXIDISING AGENTS

Class 5 Oxidising Agents are chemicals which give rise to oxygen during reaction, there-by increasing the risks associated with combustion where other potentially flammable or explosive elements are present.

It is proposed that Class 5 chemicals be installed within a dedicated Storage Cabinet which is adequately segregated from other DG in accordance with AS/NZS 3833.

5.3.5 CLASS 6 TOXIC SUBSTANCES

Toxic substances are those with the potential to cause death, serious injury or to harm if swallowed, inhaled or in some cases by direct skin contact.

5.3.6 CLASS 8 CORROSIVES

Corrosives are substances which, through chemical action, can cause varying levels of damage when in contact with living tissue.

5.3.7 CLASS 9 MISCELLANEOUS DANGEROUS GOODS

Class 9 chemicals are miscellaneous dangerous goods which do not fall in any of the previous categories, but still constitute dangerous goods which can prove harmful to persons, other living organisms and/or the environment

5.3.8 CLASS 6, 8, 9 STORAGE

It is proposed that these materials be co-located within a central storage areas, with consideration to the segregation requirements of AS/NZS 3833.

5.4 ADDITIONAL REQUIREMENTS

Additional requirements to be planned and implemented as the project progresses are:

- Ventilation,
- Fire protection,
- Signage,
- Local emergency showers and/or eye wash stations
- Segregation

The principles and protocols around these items will be further developed in consultation with the project design team, project manager, the client, and other key stakeholders.

Purpose built containers and cabinets (such as those from Storemasta) provide the benefit of:

- *"A spill containment sump in the floor of the container to catch spills*
- *Louvered walls to disperse hazardous vapours into the outside atmosphere*
- *Non-combustible construction to provide structural integrity in the event of a fire*
- *Dangerous goods signage to warn workers of hazardous chemicals".*

5.5 SEGREGATION BETWEEN DIFFERENT CLASSES OF DG

Dangerous Goods above minor quantities are to be segregated according to the below Table from AS/NZS 3833 The Storage and Handling of Mixed Classes of Dangerous Goods.

CLASS		2		3	4			5		6	8
COMPRESSED GASES 2.1 Flammable	2	Compatible	KEEP APART	Segregate from	Segregate from	Segregate from	Segregate from	Segregate from	ISOLATE	KEEP APART	KEEP APART
2.2 Non-flammable/ non-toxic	2	KEEP APART	Compatible	KEEP APART	Segregation may be necessary	Segregate from	Segregation may be necessary	Segregation may be necessary	Segregate from	Segregation may be necessary	KEEP APART
FLAMMABLE LIQUIDS (and Combustible liquids)	3	Segregate from	KEEP APART	Compatible	KEEP APART	Segregate from	Segregate from	Segregate from	ISOLATE	KEEP APART	KEEP APART
FLAMMABLE SOLIDS 4.1 Flammable solids	4	Segregate from	Segregation may be necessary	KEEP APART	Compatible	KEEP APART	Segregate from	Segregate from	Segregate from	KEEP APART	Segregation may be necessary
4.2 Spontaneously combustible	4	Segregate from	Segregate from	Segregate from	KEEP APART	Compatible	KEEP APART	Segregate from	ISOLATE	KEEP APART	KEEP APART
4.3 Dangerous when wet	4	Segregate from	Segregation may be necessary	Segregate from	Segregate from	KEEP APART	Compatible	KEEP APART	Segregate from	Segregation may be necessary	Segregation may be necessary
OXIDISING SUBSTANCES 5.1 Oxidising agents	5	Segregate from	Segregation may be necessary	Segregate from	Segregate from	Segregate from	KEEP APART	*	Segregate from	KEEP APART	KEEP APART
5.2 Organic peroxides	5	ISOLATE	Segregate from	ISOLATE	Segregate from	ISOLATE	Segregate from	Segregate from	Compatible	KEEP APART	KEEP APART
TOXIC SUBSTANCES	6	KEEP APART	Segregation may be necessary	KEEP APART	KEEP APART	KEEP APART	Segregation may be necessary	KEEP APART	KEEP APART	Compatible	Segregation may be necessary
CORROSIVE SUBSTANCES	8	KEEP APART	KEEP APART	KEEP APART	Segregation may be necessary	KEEP APART	Segregation may be necessary	KEEP APART	KEEP APART	Segregation may be necessary	*

LEGEND

Compatible — Dangerous goods of the same Class should be compatible; consult MSDS or suppliers about requirements for individual substances

KEEP APART — Dangerous Goods of these Classes should be kept apart by at least 3m. Consult the MSDS or supplier

* — Dangerous goods of the same Class could be incompatible or react dangerously, consult the MSDS or suppliers about requirements for individual substances

Segregate from — These combinations of Dangerous Goods should be segregated by at least 5m and kept in separate compounds or building compartments.

Segregation may be necessary — Segregation of these Classes may be necessary. Consult the MSDS or supplier

ISOLATE — This requirement applies to organic peroxides, for which dedicated stores or storage cabinets are recommended. Adequate separation from other buildings and boundaries is required.

Figure 7 Segregation Table from AS/NZS 3833

5.6 HAZARDOUS AREAS

Where flammable goods (Class 3, Class 2.1) are stored and handled, a site specific Hazard Analysis (HazAn) shall be undertaken; and where required, a Hazardous Area Classification (HAC) or Classifications in accordance with AS/NZS 60079.10 developed.

5.6.1 RESPONSIBILITY FOR CLASSIFICATION

In accordance with AS/NZS 3000 Clause 7.7.2.1 Responsibility for Classification: *"The responsibility for classification of a hazardous area rests with the persons or parties in control of the installation."*

5.6.2 HAZARDOUS AREA DEFINITION

A Hazardous Area is defined in AS/NZS 60079.0 Clause 3.2 and AS/NZS 3000 Clause 7.7.2.2 as:

"area in which an explosive atmosphere is present, or may be expected to be present, in quantities such as to require special precautions for the construction, installation and use of electrical apparatus".

An explosive atmosphere is defined in AS/NZS 60079.0 as:

"mixture with air, under atmospheric conditions, of flammable substances in the form of gas vapour, dust, fibres, or flyings which, after ignition, permits self-sustaining flame propagation".

AS/NZS 60079.10.1 deals with the assessment and potential classification of Hazardous areas associated with flammable gases and vapours.

5.6.3 CLASSIFICATION OBJECTIVES

Area classification is a method of analysing and classifying the environment where explosive gas atmospheres may occur so as to facilitate the proper selection and installation of equipment to be used safely in that environment. The classification also takes into account the ignition characteristics of the gas or vapour such as ignition energy (gas group) and ignition temperature (temperature class).

5.6.4 HAZARDOUS ZONING

Hazardous areas are assessed and classified based on the likelihood, frequency and duration of flammable vapour/gas/air mixtures occurring. The following classification zones apply in reference to the methodology presented in AS/NZS 60079.10.1:

Zone 0: *An area in which an explosive gas atmosphere is present continuously or for long periods or frequently.*

Zone 1: *An area in which an explosive gas atmosphere is likely to occur in normal operation occasionally.*

Zone 2: *An area in which an explosive gas atmosphere is not likely to occur in normal operation but, if it does occur, it will exist for a short period only.*

5.6.5 APPLICATION TO PROJECT

It is anticipated that a HazAn and potential subsequent HAC will be required for the following spaces as part of project delivery, handover and ongoing client operations:

- Bulk storage of flammable goods, including any centralised locations, as well as local Flammable Storage Cabinets and cages

- 'Wet' laboratories benchtops, floors and fume cupboards in which flammable goods are utilised.

5.7 OPERATIONAL CONSIDERATIONS

Safe handling of DG is dependant largely upon the application of Secondary Measures – Administrative control measures and PPE. This means that safe handling is dependent on the development of and adherence to robust safe dangerous goods handling practices. These safe work methods are required to ensure the use of the dangerous goods facilities comply with the appropriate standards and meet regulatory requirements; and most importantly achieving a level of risk for students, staff and visitors that is assessed as low, As Far As Is Reasonably Practicable (AFAIRP).

The implemented risk management strategies associated with storage and handling of each DG Class need to address the entire process, from Delivery and storage, to potential decanting and chemical usage in operations and learns, through to appropriate disposal.

While larger (20L containers) provide the perceived benefit of simplified storage and potentially reduced regularity of restocking, they also bring about additional risks associated with decanting and spill containment. Therefore, as far as practicable, it is recommended that chemicals be procured and stored in smaller <1L closed containers. In the case of flammable liquids, this can also reduce the likelihood of Hazardous Areas being present or induced through storage and potential spillage of larger quantities.

5.8 BULK DIESEL STORAGE TANKS, DAY TANKS AND ASSOCIATED INFRASTRUCTURE

Where permanent stand-by power generation is installed the ESG calls for 24-hours back-up supply, which would necessitates a site storage tank.

While above ground bulk storage tanks are more economical, it is anticipated that underground tank(s) will be preferred for the development.

The generator fuel system will be complete with fill point, vent pipe, fuel pipe lines, filtration system, pumps, monitoring and alarm annunciation. Pumps shall be configured as N+1 for fuel transfer from the bulk tank to the day tanks.

A fill point, located in an area accessible by heavy vehicles is required for diesel refill will also be required for each tank.

The design selection and siting of bulk diesel storage tanks, as well as associated infrastructure shall be undertaken in strict accordance with the requirements set-out in AS 1940 The storage and handling of flammable and combustible liquids. Requirements include, but are not limited to:

- Ventilation,
- Fire protection,
- Signage,
- Local emergency showers and/or eye wash stations
- Segregation from building elements and other materials.

The principles and protocols around these items will be further developed in consultation with the project design team, project manager, the client, and other key stakeholders.

5.9 MEDICAL GASES BULK STORAGE COMPOUND

It is anticipated that a bulk storage compound will be established for containment of medical gases, from which respective gases will be reticulated throughout the campus. The compound shall be sited, constructed and configured in strict accordance with the requirements set-out in

- ESG,
- AS4332: The Storage and Handling of Gases in Cylinders
- AS/NZS 4681: The storage and handling of Class 9 (miscellaneous) dangerous goods and articles
- AS/NZS 3833: The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers.
- 8. AS 4326: The storage and handling of oxidising agents

Requirements include, but are not limited to:

- Ventilation,
- Fire protection,
- Signage,
- Local emergency showers and/or eye wash stations
- Segregation from building elements and other materials.

The principles and protocols around these items will be further developed in consultation with the project design team, project manager, the client, and other key stakeholders.

6 EXISTING DG ONSITE

As the project progresses into Schematic Design, a detailed assessment of the existing Chemical Register and audit of the existing stores impacted by the development is to be undertaken to fully categorise all DG in accordance with Australian standards, as well as with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

6.1.1 IMPACT OF DEMOLITION / CONSTRUCTION WORKS

At this Stage, it is understood that the client will want to retain the existing chemicals stored on site for eventual use in the planned redevelopment. Therefore, at temporary means of safe storage needs to be implemented for the duration of the Redevelopment Program.

It is anticipated that the contractor will liaise with the client to establish a suitable location for temporary installation within either an approved DG Store, and/or a series of approved Dangerous Goods Cabinets or storage units.

Class 3 Flammable Liquids shall be stored within an approved Flammable Storage Cabinet(s).

Class 2.1 Gases should be stored within an approved Gas Cage.

1-off existing diesel generator is scheduled for relocation as part of the development. The relocated installation shall be in strict accordance with AS 1940 The storage and handling of flammable and combustible liquids and AS 3010 Electrical installations - Generating sets.

6.2 POTENTIAL FOR SITE BULK DG CONSOLIDATION

Subject to the development of Staging during forthcoming Design and Planning Phases, a permanent central location could be established for the bulk consolidation of the client's bulk DG. This could either constitute a bespoke DG Store or an approved purpose built Container.

This would potentially simplify the ongoing management of DG storage and delivery, with smaller quantities to be housed within the local cabinets.

Each department could then establish smaller DG cabinets for various class in the local vicinity of operations.

6.3 DISPOSAL OF EXISTING DG

Any existing DG onsite which is identified for disposal shall be handled, transported and disposed of in accordance with Australian Standards and NSW Regulations and Guidelines.

7 CONCLUSION

This Report serves as a starting point for the appropriate planning and implementation of strategies associated with Dangerous Goods required to support the client's operations.

As the design progresses, this report should be expanded upon to provide a comprehensive Dangerous Goods Report for the project. This may also entail the Conduct of detailed Hazard Analysis' and/or Hazardous Area Classifications (HAC).

Based on preliminary assessment, the diesel fuel associated with the generating sets will NOT be collocated with other DG, the storage and handling of diesel directly associated with the stand-by generators is NOT considered to be potentially hazardous.

The new development will also necessitate the storage, handling and delivery of medical gases, flammable and corrosive liquids, numerous of which will be designated DG. The quantities of each DG class anticipated to be held onsite have not yet been fully established; however, the quantities required and anticipated to be handled onsite are expected to be well below those stated for each Class of DG in the below table taken from NSW Government Planning: Hazardous and Offensive Development Application Guidelines Applying SEPP 33 Section 7.

Based on preliminary assessment, it is further anticipated that the quantities of DG required by the development do NOT constitute a designated as potentially hazardous in accordance with SEPP requirements.

Noting the above considerations, the development does NOT constitute a designated as potentially offensive industry based on DG considerations.

Based on preliminary assessment in accordance NSW Government Planning: Hazardous and Offensive Development Application Guidelines Applying SEPP 33, the proposed development does NOT meet the definitions of 'a potentially hazardous industry, nor those of a 'potentially offensive industry'. Therefore, a Preliminary Hazardous Assessment (PHA) should not be required as part of the SSDA submission.

APPENDIX A – JHA TEAM

LUKE WHEELER | ASSOCIATE

A passionate and highly motivated Electrical Engineer, Luke is experienced in electrical design and project delivery across a variety of sectors, including Defence, Health Infrastructure, Aged Care, Education, Government and Commercial Infrastructure.

Together with his building services and site infrastructure expertise, Luke brings significant experience in Hazardous Areas & Explosives Areas classification and design. Luke also brings previous practical experience as an electrician in the construction industry.

QUALIFICATIONS

- Bachelor of Engineering (Electrical) Hons, UTS
- Supervisor Certificate (Licensed Electrician)

CERTIFICATIONS

- Hazardous Areas Classification and Design
- Installation and Maintenance of Electrical Equipment in Hazardous Areas (EEHA)

KEY PROJECT EXPERIENCE

Project: PFAS Groundwater treatment Facilities Infrastructure: RAAF Base Tindal, RAAF Base Williamtown.

Scope: Design & construction of 2 PFAS Groundwater Treatment Systems at Tindal and augmentation of existing systems at Williamtown.

Role: Electrical infrastructure design; earthing, bonding and lighting protection systems design; hazardous areas design review and certification.

Project: Defence National Hazardous Areas Survey & Compliance Project.

Scope: National program - Identification and management of Hazardous Areas and Explosives Areas

Role: Hazardous and explosives areas identification, classification and inspection; technical review role; rectification planning.

Project: New Air Combat Capability (NACC), RAAF Williamtown, NSW.

Scope: Facilities and infrastructure for the NACC NSW.

Role: Electrical design; Development of the Hazardous and Explosives Areas Electrical Specification.

Project: BP Naval Base Service Station.

SCOPE: DESIGN AND CONSTRUCTION OF A NEW SERVICE STATION.

ROLE: PRE-HANDOVER COMPLIANCE INSPECTION; REMEDIATION IDENTIFICATION.

Project: Costco Petrol Station, Moorabbin VIC.

Scope: Construction of new commercial fueling station.

Role: Hazardous area classification, electrical design.

Project: UNSW ANFF and Mining Engineering Laboratories.

Scope: Facility upgrade.

Role: Hazardous area classification.

Project: HMAS Stirling Redevelopment Project Stage 3A.

Scope: Design and construction of base dangerous goods facilities.

Role: Hazardous Areas electrical design.

Project: Defence Establishment Orchard Hills Surface Weapons Complex Explosives Area Classification.

Scope: Assessment, classification and equipment inspection.

Role: Facilities classification and inspection.

Project: Defence Fuel Installation (DFI) Upgrade, HMAS Albatross NSW.

Scope: Upgrade of DFI facility infrastructure.

Role: Peer review of contractor D&C electrical documentation.

Project: Rio Tinto West Angelas Aerodrome Refueling Facility.

Scope: Facility upgrade.

Role: Earthing, bonding and lightning protection design.

Project: Orora Paper Mill Botany – Wastewater Treatment Plant

Scope: New wastewater treatment facility.

Role: Third party visual inspection of construction works.

TIAN SONG | DIRECTOR/SENIOR MECHANICAL ENGINEER

Tian is a chartered mechanical engineer with RPEQ and NPER endorsement. Tian has a broad range of experience within the building services industry, specializing in mechanical services HVAC design and other specialist services including medical gas, reverse osmosis dialysis water systems, pneumatic tube, oil/lubricant systems, and compressed air systems. His project experience include leading the mechanical design on the $500M Cairns Base Hospital Redevelopment, with the design period over 3 years.

Tian has a strong focus on leading and working collaboratively within project teams to develop robust and well thought out engineering solutions.

QUALIFICATIONS

BEng (Hons I)

AFFILIATIONS

MIEAust, CPEng, NER

RPEQ, AIDGC, NT Building Practitioner

KEY PROJECT EXPERIENCE

- 17 Construction Squadron Relocation and Workshop Facilities, Amberley, QLD – Dangerous Goods & Hazardous Area Consultant
- 21 Construction Squadron Relocation and Workshop Facilities, Amberley, QLD – Dangerous Goods & Hazardous Area Consultant
- Enhanced Land Force Stage 2 Phase B, 8 & 9 Royal Australian Regiment (RAR) Precinct, Enoggera, QLD – Dangerous Goods & Hazardous Area Consultant
- Enhanced Land Force Stage 2 Phase B, 2 Construction Engineer Regiment (CER) Precinct, Enoggera, QLD – Dangerous Goods & Hazardous Area Consultant
- Australian Light Armoured Vehicle (ASLAV) Simulator Facility, Darwin, NT – Dangerous Goods & Hazardous Area Consultant
- Brisbane Girls Grammar School Science Precinct – Dangerous Goods & Hazardous Area Consultant
- University of Queensland Sir William MacGregor Laboratory Refurbishment – Dangerous Goods & Hazardous Area Consultant
- University of Queensland Skerman Laboratory Refurbishment – Dangerous Goods & Hazardous Area Consultant
- QLD Tafe Ashmore Plumbing Tower – Dangerous Goods & Hazardous Area Consultant
- Joint Logistics Unit (JLU) NQ Workshop Facilities, Townsville, QLD – Dangerous Goods & Hazardous Area Consultant