Preliminary Hazard Analysis

Rouse Hill Hospital (RHH)

Health Infrastructure

1 Reserve Road, St Leonards NSW 2065

Prepared by:

SLR Consulting Australia

SLR Project No.: 610.031818.00001

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6 August 2025

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Revision Record

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1.3	6 August 2025	Craig Simpson	Ewan Cummins	Craig Simpson
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Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Health Infrastructure (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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1.0 Executive Summary

SLR Consulting Australia Pty Ltd (SLR Consulting) has been engaged by Health Infrastructure to assess the potential impacts of the proposed State Significant Development Application (SSDA) for the Rouse Hill Hospital (RHH) Development, at the corner of Windsor Road and Commercial Road, Rouse Hill, New South Wales (NSW) 2155 (SSD-96248991).

This report addressed the Project in relation to Hazards & Risk in accordance with State Environmental Planning Policy (Resilience and Hazards) 2021 (the SEPP).

A two-stage process is undertaken. Firstly a Preliminary Risk Screening (PRS) assesses the storage and transport of specific dangerous goods classes that have the potential for significant, off-site effects If screening thresholds for the identified dangerous goods are exceeded, the SEPP requires a Preliminary Hazard Analysis (PHA) to be undertaken. The PHA determines the level of risk to people, property, the environment and surrounds, taking into account the implementation of controls.

The Preliminary Risk Screening (PRS) for storage of dangerous goods indicate that the development may be classified as a hazardous or offensive industry.

Therefore a more detailed assessment of the hazards listed below must be undertaken in a Preliminary Hazard Analysis.

The Preliminary Hazard Analysis has found that the main dangerous goods potential hazard associated with the proposed development of Rouse Hill Hospital was the following:

- Bulk oxygen storage
- Storage of gas cylinders
- Diesel storage

The main engineering controls, operational controls and management controls required to be put in place are from the following Australian Standards:

- Oxygen handling and storage to conform with *AS 1894 The storage and handling of non-flammable cryogenic and refrigerated liquids*
- Gas cylinder handling and storage to conform with *AS 4332 The storage and handling of gases in cylinders*.
- Diesel pipework and storage to conform with *AS 1940 The storage and handling of flammable and combustible liquids.*
- Pipework to also conform with *AS 4041 Pressure Piping*

The residual risks associated with these hazards once controls are implemented were rated as Tolerable (i.e. the risk is acceptably low).

The risk of biophysical damage outside the Site is considered unlikely based on the engineering and design controls that will be in place.

It is the conclusion of this Preliminary Hazard Analysis that the proposed development would be identified as a suitable development for the area, with suitable engineering controls, operational controls and management controls in place. These controls are standard industry practice and readily implemented as part of safety engineering.

2.0 Introduction

SLR Consulting Australia Pty Ltd (SLR Consulting) has been engaged by Health Infrastructure to assess the potential impacts of the proposed State Significant Development Application (SSDA) for the Rouse Hill Hospital (RHH) at the corner of Windsor Road and Commercial Road, Rouse Hill, New South Wales (NSW) 2155.

This Preliminary Hazard Analysis Report has been prepared by SLR to support a SSDA for the construction and operation of a new hospital campus at the Corner of Commercial Road and Windsor Road, Rouse Hill (SSD-96248991).

The proposed development comprises:

Site preparation including earthworks and tree removal;

Construction of internal roads with access from Commercial Road;

Incoming electrical and communications services

Construction of hospital buildings up to eleven storeys;

Construction of a ten storey above-ground car park;

Pedestrian and cycle pathway connections; and

Landscaping; and

Ancillary works to Commercial Road, comprising:

- minor works (including realignment of existing median strip, kerb and gutter, footpath and lane marking) to provide access from Commercial Road into Hospital Road; and
- associated tree removal along Commercial Road.

The scope of the proposed works includes:

An emergency department and primary access clinic

Comprehensive birthing services including birthing rooms and a maternity inpatient unit

Inpatient beds and day surgery services

Short stay medical assessment services

Pathology, pharmacy, and medical imaging services

Outpatient and ambulatory care services including paediatrics and renal dialysis and antenatal and postnatal services

Virtual care and hospital in the home services

Prehabilitation, rehabilitation and lifestyle medicine.

Administration, staff support, loading dock and back-of-house services; and

Ancillary commercial uses to support the hospital, including retail.

This report has addressed the following matters within the Secretary's Environmental Assessment Requirements (SEARs) issued for the SSDA on 16 October 2025 (see Table 1).

Table 1 Relevant SEARs items

SEARs item	Response
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 and Multi-Level Risk Assessment. • 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.	This Hazards and Risks assessment prepared in accordance with the relevant NSW Environment Protect Authority (EPA) guidelines. Preliminary Risk Screenings are assessed at Sections 5.0 and 6.0 of this report. The Preliminary Hazard Analysis are assessed at Section 7.0 and 8.0 of this report. The development is not adjacent to or on land in a pipeline corridor. Therefore there was no need to consult with pipeline operators as outlined at Section 7.2.6 of this report.

This report addresses the Project in relation to Hazards & Risk in accordance with State Environmental Planning Policy (Resilience and Hazards) 2021 (the SEPP).

This involves a two-stage process:

Stage 1 – Preliminary Risk Screening (PRS)

Under the SEPP, the Preliminary Risk Screening (PRS) stage assesses the storage and transport of specific dangerous goods classes that have the potential for significant, off-site effects. Specifically, this stage involves the identification of classes and quantities of all dangerous goods to be used, stored or produced on site with respect to storage depot locations as well as transported to and from the site.

Stage 2 – Preliminary Hazard Analysis (PHA)

If screening thresholds for the identified dangerous goods are exceeded, the SEPP requires a Preliminary Hazard Analysis (PHA) to be undertaken.

The PHA determines the level of risk to people, property, the environment and surrounds, taking into account the implementation of controls.

If the risk levels exceed the criteria of acceptability and/or if the controls are assessed as inadequate, or unable to be readily controlled, then the development is classified as “hazardous industry”.

Where it is unable to prevent offensive impacts on the surrounding land users, the development is classified as “offensive industry”.

PHAs are prepared in accordance with Hazardous Industry Planning Advisory Paper No.6 – “Guidelines for Hazard Analysis (DoP,2011)” and “Multi-Level Risk Assessment (DoP,2011)”.

HIPAP 6 provides guidance on the general approach recommended for hazard analysis. The objective of hazard analysis is to develop a comprehensive understanding of the hazards and risks associated with an operation or facility and of the adequacy of safeguards. The hazard analysis process may include qualitative and quantitative methods. Consideration should include:

- the nature and quantities of hazardous materials stored and processed on the site;
- the type of plant and equipment in use;
- the adequacy of proposed technical, operational and organisational safeguards;
- the surrounding land uses or likely future land uses; and
- the interactions of these factors.

The MLRA provides guidance on the criteria for using the results of the screening, classification and prioritisation steps to determine which of three levels of further analysis is appropriate.

Level 1 is an essentially qualitative approach based on comprehensive hazard identification to demonstrate that the activity does not pose a significant off-site risk.

Level 2 supplements the qualitative analysis by sufficiently quantifying the main risk contributors to show that risk criteria will not be exceeded.

Level 3 is a full quantitative analysis.

The MLRA guidance states a Level 1 qualitative assessment may suffice provided all or most of the following conditions are met:

- screening and risk classification and prioritisation indicate there are no major off-site consequences and societal risk is negligible;
- the necessary technical and management safeguards are well understood and readily implemented; and
- there are no sensitive surrounding land uses.

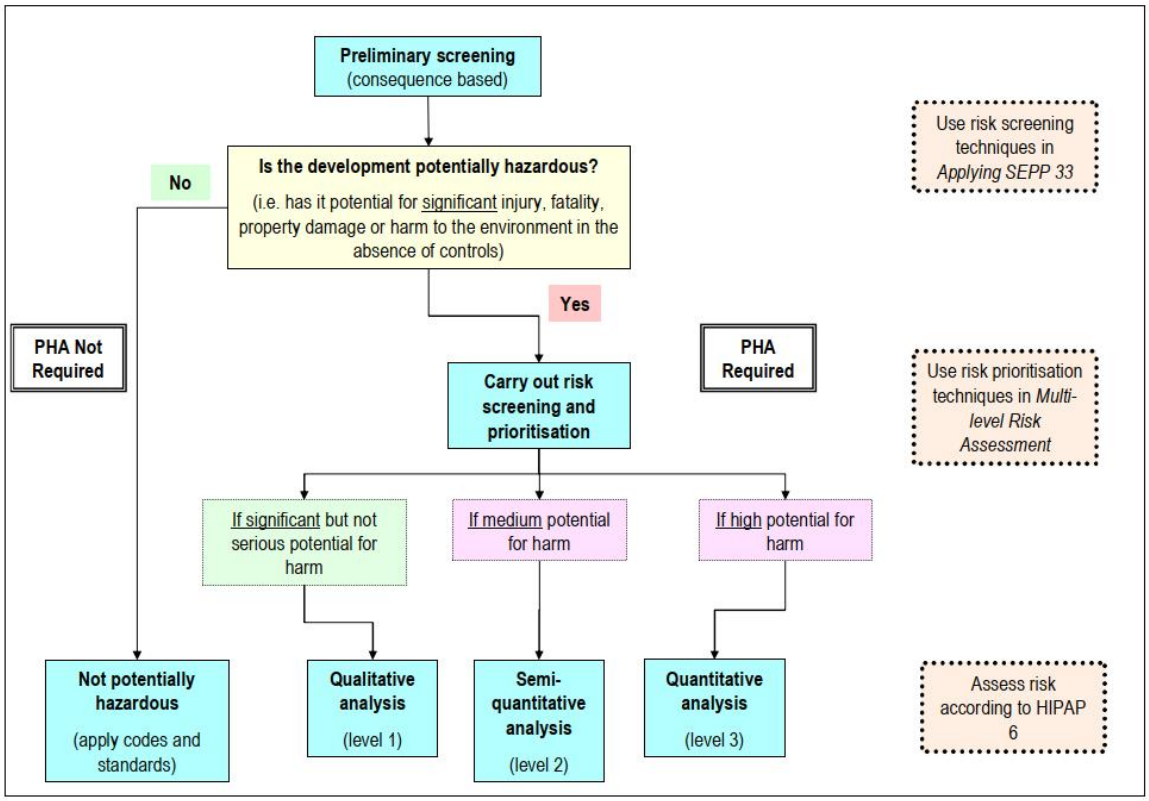
The current Preliminary Hazard Analysis study for the Project met the MLRA criteria for a Level 1 assessment as the activity does not pose a significant off-site risk and the necessary technical and management safeguards are well understood and readily implemented.

It further states the following three stages are used in the assessment process:

- preliminary screening
- risk classification and prioritisation
- risk analysis and assessment.

The overall MLRA approach can be seen in Figure 1.

Figure 1 The Multi-Level Risk Assessment Approach[1]



The Preliminary Hazard Analysis should estimate the cumulative risks from the existing and proposed development. To determine the level of risk to people, property and the environment at the proposed location and in the presence of controls.

If the risk levels exceed the criteria of acceptability and/or if the controls are assessed as inadequate, or unable to be readily controlled, then the development is classified as 'hazardous industry'. Where it is unable to prevent offensive impacts on the surrounding land users, the development is classified as 'offensive industry'.

A development may also be considered potentially hazardous with respect to the transport of dangerous goods.

This report presents information pertaining to the Preliminary Hazard Analysis for the Project.

3.0 Methodology of this Study

The present Hazard and Risk Study forms part of the SSDA for the Proposal, undertaken in accordance with the NSW Department of Planning and Environment's (DPEs) Secretary's Environmental Assessment Requirements (SEARs).

The purpose of this report is to provide a screening assessment of the hazards associated with the storage of dangerous goods on the site in accordance with the SEPP. The purpose of the initial SEPP risk screening is to exclude from more detailed studies those developments which do not pose significant risk.

[1] Source Planning NSW, 2011a Multi-Level Risk Assessment, New South Wales Government, figure 3)

Where the SEPP identifies a development as potentially hazardous and/or offensive, developments are required to undertake a Preliminary Hazard Analysis (PHA) to determine the level of risk to people, property and the environment at the proposed location and in the presence of controls.

If the risk levels exceed the criteria of acceptability and/or if the controls are assessed as inadequate, or unable to be readily controlled, then the development is classified as 'hazardous industry'. Where it is unable to prevent offensive impacts on the surrounding land users, the development is classified as 'offensive industry'.

A development may also be considered potentially hazardous with respect to the transport of dangerous goods. A proposed development may be potentially hazardous if the number of generated traffic movements (for significant quantities of hazardous materials entering or leaving the site) is above the cumulative annual or peak weekly vehicle movements. Table 4 in the document Applying SEPP 33: Hazardous and Offensive Development Application Guidelines (NSW Department of Planning, 2011), outlines the screening thresholds for transportation.

This report presents information pertaining to the presence of any hazardous materials, flammable substances, and compressed or liquefied gases proposed to be stored or handled in relation to the Development Site, including on site storage, or transported to or from the site.

3.1 Proposed Development

The site is located near Rouse Hill Town Centre, at the corner of Windsor Road and Commercial Road, Rouse Hill within The Hills Shire Local Government Area (LGA). The Rouse Hill Metro Station is located approximately 300m south of the site.

The site comprises the property title Lot 311 DP 1274392; and Lot 312 DP 1274392 (the site). The SSDA site will extend to the full extent of works including the hospital site, footpath connection (Part Lot 229), construction compounds (Part Lot 229) and works to Commercial Rd (Lot 2011, DP 1131519 and Lot 101, DP1060353). (See **Figure 2**).

Figure 2 SSDA – Site Plan Proposed (over page)

LEGEND

1. MAIN HOSPITAL BUILDING
2. MULTI-DECK CAR PARK
3. AMBULANCE BAYS
4. PUBLIC VEHICULAR DROP OFF
5. LOADING
6. FIRE TRUCK BAY
7. FIRE HYDRANTS & BOOSTER
8. OXYGEN VIE PLANT
9. HOSPITAL ROAD ENTRY
10. ON GRADE CAR PARKING
11. WESTERN SERVICE ROAD
12. ON SITE DETENTION TANK
13. MAIN HOSPITAL BUILDING ENTRY NORTH
14. MAIN HOSPITAL BUILDING ENTRY SOUTH
15. OXYGEN VIE FILL UP LAYBY HARDSTAND
16. INDICATIVE PV PANEL ZONE
17. TOTEM SIGNAGE
18. COVERED WALKWAY
19. ANCILLARY WORKS TO COMMERCIAL ROAD
20. TEMPORARY SITE SHEDS AT DPHI SITE
21. METRO FOOTPATH UPGRADE WORKS

A. EXISTING ENDEAVOUR ENERGY SUBSTATION
B. EXISTING TINSW INTERCHANGE BUS DEPOT

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NORTH POINT

0 3750 15000 30000
1:750mm

REV	DESCRIPTION OF CHANGE	DATE	CHECKED	ISSUED
A	SSDA - FOR REVIEW	09/09/24	HDR	
B	SSDA - DRAFT	18/10/24	HDR	
C	SSDA - RECORD SET	08/11/24	HDR	
D	SSDA - DRAFT	17/06/25	HDR	
E	SSDA	27/06/25	HDR	
F	SSDA	23/07/25	HDR	

DRAWING LEGEND

- SITE BOUNDARY
- LOT BOUNDARY
- EXTENT OF WORKS
- INDICATIVE HV EASEMENT
- INDICATIVE EMF CONSTRAINT
- EXISTING TREES ON ADJACENT SITES
- PUBLIC PEDESTRIAN ENTRY
- BIKE ENTRY
- PUBLIC VEHICLE ENTRY
- EMERGENCY ENTRY
- LOGISTIC VEHICLE ENTRY

NOTE :

- HV CABLE EASEMENT BASED ON SURVEY - *5254-Detail-RevL*

CLIENT

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PROJECT

ROUSE HILL HOSPITAL CORNER OF COMMERCIAL AND WINDSOR RD, ROUSE HILL, NSW, 2155, AUSTRALIA

DRAWING TITLE

SSDA - SITE PLAN PROPOSED

SCALE: 1 : 750 @ A1
PROJECT NUMBER: 130486
DRAWING NUMBER: **130486-HDR-AR-DWG-000014**
ISSUE:

PROJECT STATUS: **FOR SSDA**

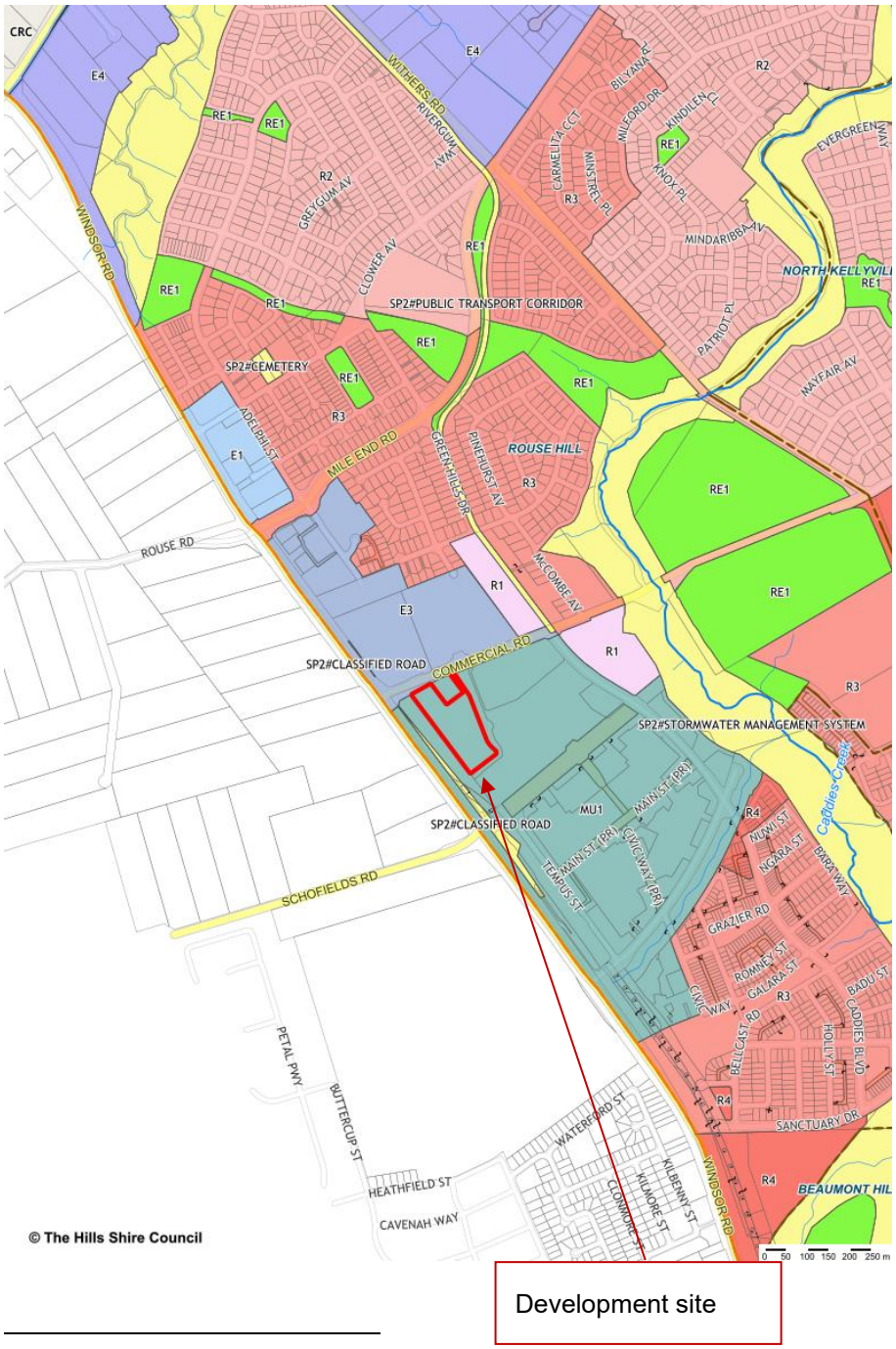
5/08/2025 1:20:34 PM

Autodesk Docs://130541_Rouse Hill Hospital_2024/130486_HDR_AR_MDL_SITE.rvt

The Development Site is zoned MU1 Mixed Use in The Hills Local Environmental Plan 2019, as are the Lots surrounding the site. To the north, across Commercial Road, the land is zoned E3 Productivity Support. (See **Figure 3**).

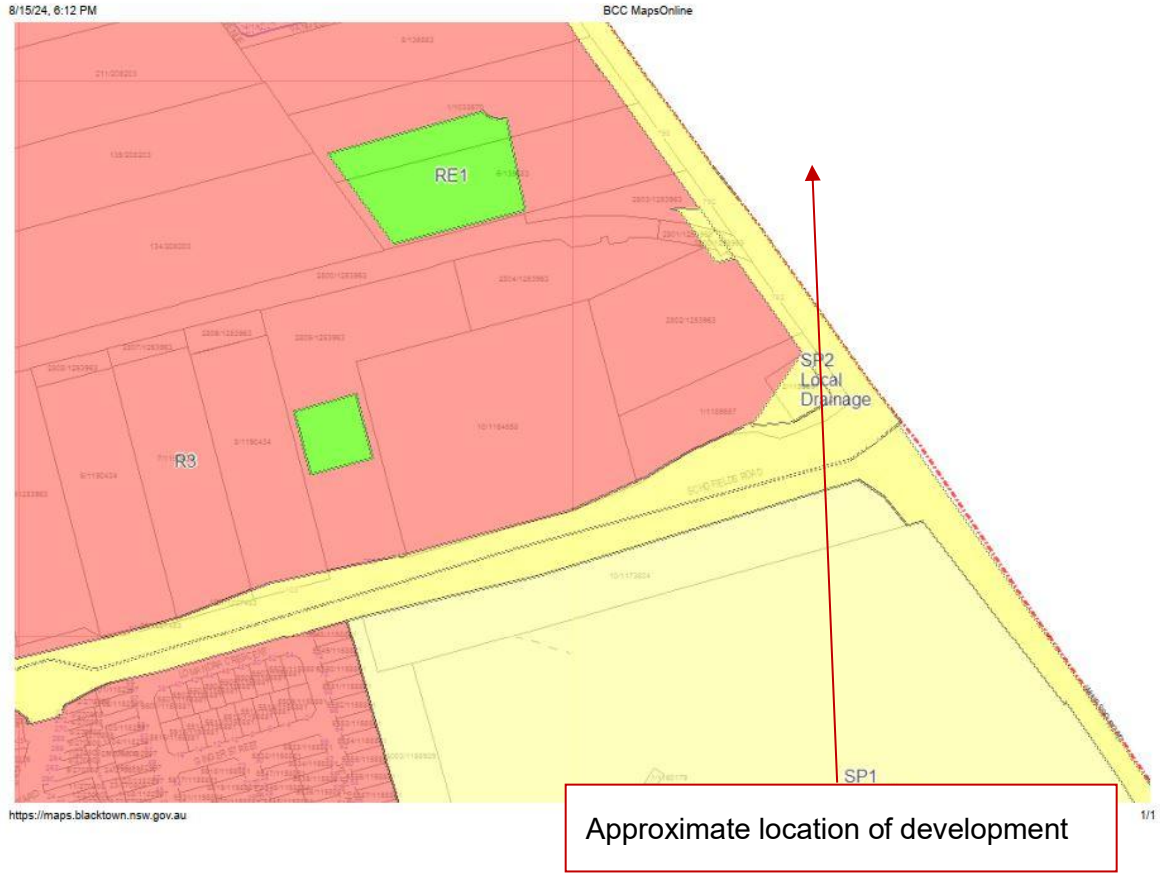
The dividing line between The Hills Shire LGA and Blacktown City Council runs along Windsor Road, near the development site. The Lots across Windsor Road from the development site, are subject to the Blacktown Local Environmental Plan 2015. These Lots are zoned R3 Medium Density Residential and SP1 Special Purpose 1 which consists of Castlereagh Memorial Park. (See **Figure 4**).

Figure 3 The Hills Shire Council Land Zoning Map (development site outlined in red)[2]



[2] Source The Hills Shire Council Interactive Map accessed 15/8/24

Figure 4 Blacktown City Council Land Zoning Map- Opposite Windsor Road



3.2 Project Description

Development consent is sought for the construction and operation of a new hospital campus comprising buildings ranging 9 to 11 storeys. The Rouse Hill Hospital is planned to include the following:

- An emergency department and primary access clinic
- Comprehensive birthing services including birthing rooms and a maternity inpatient unit
- Inpatient beds and day surgery services
- Short stay medical assessment services
- Pathology, pharmacy, and medical imaging services
- Outpatient and ambulatory care services including paediatrics and renal dialysis and antenatal and postnatal services
- Virtual care and hospital in the home services
- Prehabilitation, rehabilitation and lifestyle medicine.
- Administration, staff support, loading dock and back-of-house services; and
- Ancillary commercial uses to support the hospital, including retail.

3.3 Processes Undertaken on Site

The processes undertaken on site will be that of operational hospital working as a full hospital campus model. This will include processes undertaken as part of ancillary commercial services to support the hospital.

3.4 Hours of Operation

The proposed development will operate twenty four hours per day, seven days per week.

3.5 Vehicular Access and Parking

Access to the Development Site will be via Commercial Road (refer **Figure 3**).

4.0 Surrounding Land Uses and Zoning

As previously stated, under the provision of The Hills Local Environmental Plan 2019, the Development Site is zoned MU1 Mixed Use.

In accordance with the LEP, within land zoned MU1 Mixed Use those land uses permissible with consent in the MU1 zone are:

Amusement centres; Bee keeping; Boarding houses; Car parks; Centre-based child care facilities; Commercial premises; Community facilities; Entertainment facilities; Function centres; Heliports; Information and education facilities; Light industries; Local distribution premises; Medical centres; Oyster aquaculture; Passenger transport facilities; Places of public worship; Recreation areas; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Shop top housing; Tank-based aquaculture; Tourist and visitor accommodation; Vehicle repair stations; Water reticulation systems; Any other development not specified in item 2 or 4

Those land uses prohibited in the MU1 zone are:

Agriculture; Air transport facilities; Airstrips; Animal boarding or training establishments; Biosolids treatment facilities; Boat building and repair facilities; Boat launching ramps; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Environmental facilities; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Heavy industrial storage establishments; Highway service centres; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Industries; Jetties; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Recreation facilities (major); Residential accommodation; Resource recovery facilities; Rural industries; Sewage treatment plants; Sex services premises; Storage premises; Transport depots; Truck depots; Vehicle body repair workshops; Warehouse or distribution centres; Waste disposal facilities; Water recreation structures; Water recycling facilities; Water supply systems; Wharf or boating facilities; Wholesale supplies

The Development Site is approximately equidistant from residential areas to the North, North West and North East, located approximately 260 metres to from the site.

5.0 Preliminary Risk Screening

Preliminary risk screening of the proposed development is required under Resilience and Hazards SEPP to determine the need for a Preliminary Hazard Analysis (PHA). The preliminary screening assesses the storage of specific Dangerous Goods classes that have the potential for significant, off-site effects. Specifically, the assessment involves the

identification of classes and quantities of all dangerous goods to be used, stored or produced on site with respect to storage depot locations as well as transported to and from the site.

5.1 Dangerous Goods Storage

The information contained in the tables compares the total storage quantity of the required dangerous goods classes against the storage screening threshold in Table 3 of Applying SEPP 33 (NSW Department of Planning, 2011).

Where dangerous goods are used or stored in volumes greater than the manifest quantities specified in schedule 11 of the Work Health and Safety Regulation 2017, Safework NSW must be notified, which will include manifests and lodgement an emergency plan to Fire and Rescue NSW. Further advice on these requirements can be sort from Safework NSW.

5.1.1 Bulk Oxygen Storage

Bulk oxygen storage on site consists of a 30,000 litres primary/secondary supply vessel with a 3,000 litres emergency vessel.

Bulk oxygen has a Dangerous Goods classification of 2.2, with a Subsidiary Hazard of 5.1. Under the relevant storage screening thresholds, there is no threshold for Dangerous Goods class 2.2 but there is a threshold for class 5.1. Therefore the threshold for class 5.1 will be used in this Hazard Analysis.

Bulk oxygen storage exceeds the Resilience and Hazards SEPP threshold for sub hazard 5.1. Accordingly the development may be classified as a hazardous or offensive industry.

5.1.2 Diesel Storage

Diesel storage will consist of one bulk diesel tank of 15,000 litres and two day tanks of 1,000 litres each. The bulk tank will be an underground tank near the Generator Room. The two day tanks will be situated in the Generator Room. The location of the underground tank and Generator room day tanks will require further hazard analysis as part of a Preliminary Hazard Analysis.

Diesel fuel to be stored on the site, is not classed as a Dangerous Goods, but is classed as a C1 Combustible Liquid provided no flammable liquids are stored with the diesel.

SLR has been advised that no flammable liquids will be stored with the diesel. Therefore, in the Project diesel will be classed as a C1 Combustible Liquid.

Note that C1 combustible liquids are not a dangerous good under UN (United Nations) classification. However, they are defined as dangerous goods under NSW workplace legislation.

It should be noted that the Protection of the Environment Operations Act 1997, Schedule 1, Clause 9(1) indicates that ‘petroleum products storage’, which would include diesel fuel storage, is a Scheduled Activity. Capacity to store greater than 2,000 tonnes requires an environment protection licence under the Protection of the Environment Operations Act 1997 (POEO Act), from the NSW Environmental Protection Authority (EPA).

The information contained in the tables compares the total storage quantity of the required dangerous goods classes against the storage screening threshold in Table 3, and Figure 9 of Applying SEPP 33 (NSW Department of Planning, 2011).

5.1.3 Dangerous Goods Inventory

The dangerous goods to be stored on the site were grouped into their respective ADG classes. If more than one packaging group was present in an ADG class it was assumed that the total amount for that class was the more hazardous packing group.

The proposed inventory of dangerous goods and other hazardous materials at the is set out below in **Table 2**.

Table 2 Dangerous Goods in Storage[3]

Substance	Hazardous Class	Packing Group	Total Storage on Site	SEPP 33 Threshold Quantity	SEPP 33 Threshold Level Findings
Oxygen (bulk tank, liquid)	2.2 Subsidiary Hazard 5.1	n/a	33,000L Equivalent to 29 tonnes[4]	5 tonnes Sub Hazard 5.1	Exceeds the SEPP 33 threshold for sub hazard 5.1. Further hazard analysis required.
Nitrous oxide	2.2 Subsidiary Hazard 5.1	n/a	400kg 8 x G Size cylinders (water capacity of 50L)	5 tonnes Sub Hazard 5.1	Included in total below
Total Dangerous Good Subsidiary Hazard 5.1 (oxygen + nitrous oxide)	Subsidiary Hazard 5.1	n/a	29.14 tonnes	5 tonnes Sub Hazard 5.1	Exceeds the SEPP 33 threshold for sub hazard 5.1. Further hazard analysis required.
Carbon dioxide	2.2	n/a	100L 2 x G Size cylinders (water capacity of 50L)	n/a	No threshold under SEPP 33
Medical air	2.2	n/a	2,000 L	n/a	No threshold under SEPP 33
Refrigerants A2L	2.1	n/a	No information	n/a	No threshold under SEPP 33
Diesel	C1	n/a	17,000L	100,000 kg or litres	Safework NSW notification not required
			Equivalent to 15 tonnes[5]	2,000 tonnes	Environmental Protection Licence under (POEO Act) not required from NSW EPA

It is noted that where dangerous goods are used or stored in volumes greater than the manifest quantities specified in schedule 11 of the Work Health and Safety Regulation 2017, Safework NSW must be notified, which will include manifests and lodgement of an

[3] Information provided by TSA Riley

[4] Conversion based on 1,141 L per tonne for liquid oxygen

[5] Conversion based on 1,135 L per tonne for industrial diesel, source: Department of the Environment and Energy (2017)

emergency plan to Fire and Rescue NSW. Further advice on these requirements should be sought from Safework NSW.

Schedule 11 sets a manifest quantity for class 2.2 dangerous goods at 10,000 L Therefore in the current development if the proposed storage of exceeds 10,000 L, Safework NSW must be notified.

5.2 Dangerous Goods Transport

In applying Resilience and Hazards SEPP, a proposed development may be deemed potentially hazardous if the numbers of generated traffic movements for significant quantities of dangerous goods entering and leaving the site, are above the cumulative vehicle movements shown in the SEPP 33 guideline (Table 2).

The levels of maximum proposed movements at the site per week are provided below in **Table 3**. Note that the annual levels directly reflect the weekly vehicle movements.

The actual site needs are substantially below the SEPP 33 Thresholds on both load quantity and weekly movement thresholds.

Therefore each of the listed dangerous goods classes that will require transportation to the facility, including to and from, are not classified as potentially hazardous with respect to the transport of dangerous goods. Therefore, the facility is not considered potentially hazardous with regards to transport of Dangerous Goods.

Table 3 Dangerous Goods Vehicle Movements

ADG Class	Maximum Proposed DGs Vehicle Movements (per week)	SEPP 33 Threshold Vehicle Movements (per week)	SEPP 33 Threshold Minimum Quantity (per load)	Load Type (relevant to the facility)	SEPP 33 Threshold Level Findings
Subsidiary Hazard 5.1	< 1	>30	2 tonnes	Bulk	**Below**

6.0 Preliminary Risk Screening Conclusions

This report has reviewed and applied the requirements of Hazards & Risk in accordance with State Environmental Planning Policy (Resilience and Hazards) 2021 (the SEPP) in order to determine whether the policy applies to the Project.

The Resilience and Hazards SEPP screenings for storage of dangerous goods indicate that the development may be classified as a hazardous or offensive industry.

Therefore a more detailed assessment of the hazards listed below must be undertaken in a Preliminary Hazard Analysis.

The following dangerous goods storage are considered potentially hazardous at the site as set out below:

- Oxygen storage
- Gas cylinder storage
- Diesel storage.

It is the conclusion that the proposed development requires further hazard analysis be undertaken in the form of a Preliminary Hazard Analysis.

7.0 PRELIMARY HAZARD ANALYSIS

A Preliminary Hazard Analysis must be prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 - Guidelines for Hazard Analysis (DoP, 2011). The Preliminary Hazard Analysis should estimate the cumulative risks from the existing and proposed development.

Where Resilience and Hazards SEPP identifies a development as potentially hazardous and/or offensive, developments are required to undertake a Preliminary Hazard Analysis to determine the level of risk to people, property and the environment at the proposed location and in the presence of controls.

The purpose of the Preliminary Hazard Analysis is to assess whether the proposed development impacts on the current surrounding land uses and/or if the development is offensive or hazardous, thereby posing an unacceptable risk to the surrounding community or if the proposed development may be potentially subject to hazards or risks from existing development in the surrounding area.

7.1 Hazard Identification

The hazard analysis and quantified risk assessment approach developed and recommended in HIPAP relies on a systematic and analytical approach to the identification and analysis of hazards and the quantification of off-site risks to assess risk tolerability and land use safety implications. HIPAP advocates a merit-based approach, the level and extent of analysis must be appropriate to the hazards present and therefore, need only progress to the extent necessary for the particular case.

7.1.1 Methodology

The procedures adopted by this study for assessing hazardous impacts involve the following steps:

Step 1: Hazard identification;

Step 2: Hazard analysis (consequence and probability estimations); and

Step 3: Risk evaluation and assessment against specific criteria.

The following sections of the report discuss the hazard identification and analysis process as prescribed in HIPAP.

7.1.2 Hazard Identification

This is the first step in the risk assessment. It involves the identification of all theoretically possible hazardous events as the basis for further quantification and analysis. This does not in any way imply that the hazard identified or the theoretically possible impact will occur in practice. Essentially, it identifies the particular characteristics and nature of hazards to be further evaluated in order to quantify potential risks.

To identify hazards, a survey of operations was carried out to isolate the events which are outside normal operating conditions and which have the potential to impact outside the boundaries of the site. These events do not include occurrences that are a normal part of the operation cycles of the site but rather the atypical and abnormal.

7.1.3 Hazard analysis

After a review of the events identified in the hazard identification stage and the prevention/protection measures incorporated into the design of the site, any events which are considered to have the potential to result in impacts off-site or which have the potential to escalate to larger incidents are carried to the next stage of analysis.

7.1.4 Consequence Estimation

This aspect involves the analysis and modelling of the credible events carried forward from the hazard identification process in order to quantify their impacts outside the boundaries of the site. These events typically include explosion, fire fume, dispersion/propagation and stormwater contamination and their potential effects on people and/or damage to property.

7.1.5 Probability Likelihood Estimation

Where necessary, the likelihood of incidents quantified as a result of Section 7.1.4 are determined by adopting probability and likelihood factors derived from published data.

7.1.6 Risk Evaluation and Assessment

The risk analysis includes the consequences of each hazardous event and the frequencies of each initiating failure. The results of consequence calculations (radiation and overpressure contours, and toxic exposure levels) together with the probabilities and likelihood's estimated are then compared against the accepted criteria, as specified by the HIPAP series applicable for the site. Whether it is considered necessary to conduct the predictions would depend on the probabilities and likelihood estimated and if the risk criteria are exceeded.

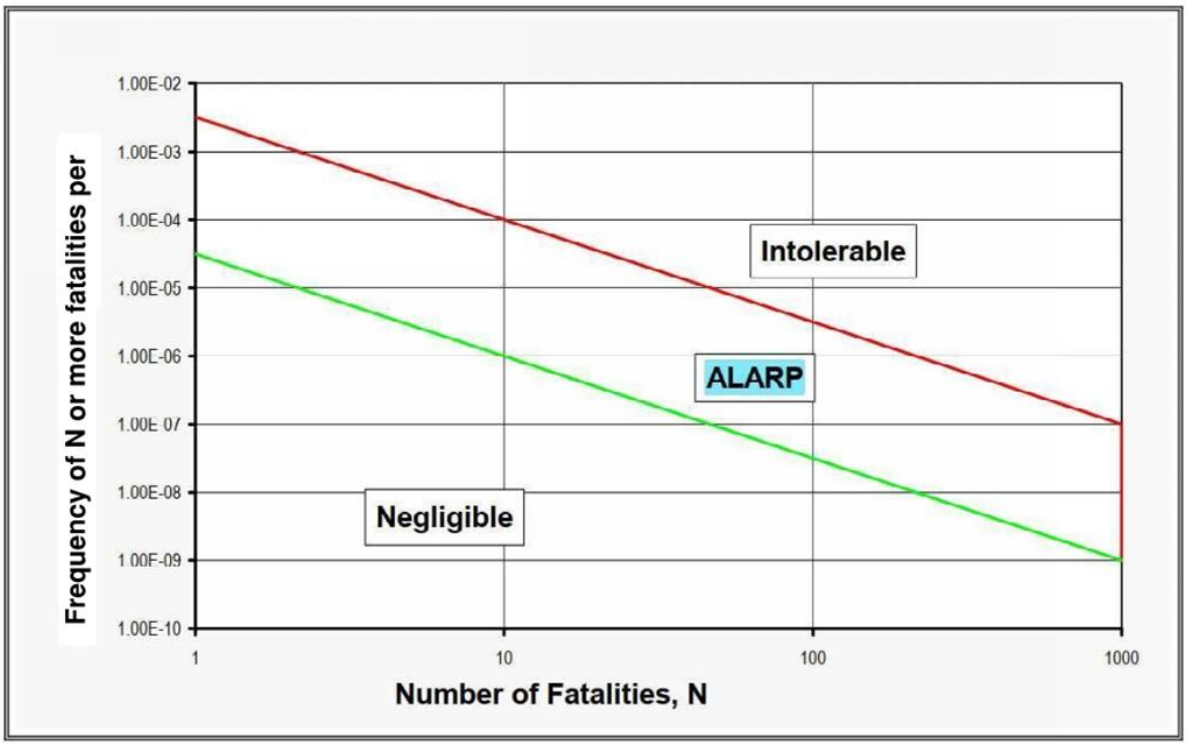
7.1.7 Risk Criteria

As part of the MLRA, hazards are identified and the risk from the hazards estimated. Risk criteria take into consideration surrounding land uses, and the category of risk. They encompass such elements as injury/ irritation, individual and societal risk of fatality, property damage and harm to the biophysical environment. Criteria may be expressed in qualitative or quantitative terms. (Planning NSW, 2011a) A key concept in the risk criteria is that societal risks should be "as low as reasonably practical", known as the ALARP principle.

ALARP is a principle that may be applied in relation to the degree of risk reduction that may be sought from a particular activity. It has been described by the UK Health and Safety Executive (HSE) in the following terms: 'In weighing the costs of extra safety measures the principle of reasonable practicability (ALARP) applies in such a way that the higher or more unacceptable a risk is, the more, proportionately, an employer is expected to spend to reduce it'.

The indicative societal risk criteria reflect these regions as three societal risk bands: negligible, ALARP and intolerable, as shown in the example below in **Figure 5**.

Figure 5 Indicative Societal Risk Criteria[6]



Below the negligible line, provided other individual criteria are met, societal risk is not considered significant. Above the intolerable level, an activity is considered undesirable, even if individual risk criteria are met. Within the ALARP region, the emphasis is on reducing risks as far as possible towards the negligible line. Provided other quantitative and qualitative criteria are met, the risks from the activity would be considered tolerable in the ALARP region.

The risk assessment in the current study was based on hazard identification, consequence assessment and likelihood assessment, to create an overall risk assessment. Descriptors for the qualitative risk assessment at the various levels of consequence of a particular event, and the likelihood (or probability) of such an event occurring are presented in **Table 4** and **Table 5**.

Table 4 Qualitative Likelihood Rating

Level	Descriptor	Description
A	Almost certain	Is expected to occur in most circumstances
B	Likely	Will probably occur in most circumstances
C	Possible	Could occur
D	Unlikely	Could occur but not expected
E	Rare	Conceivable, but only in exceptional circumstances

[6] Source Planning NSW, HIPAP 4, New South Wales Government, figure 3)

Table 5 Qualitative Consequence Rating

Level	Descriptor	People	Environment	Asset / Production
5	Catastrophic	Multiple fatality	Extreme environmental harm, eg. widespread catastrophic impact	More than $5M ($5 million) loss or production delay
4	Major	Permanent total disabilities, single fatality	Major environmental harm, eg. Widespread substantial impact	$1M to $5M loss or production delay
3	Moderate	Major injury or health effects, eg. major lost workday case/permanent disability	Serious environmental harm, eg. widespread and significant impact	$500k ($500k thousand) to $1M loss or production delay
2	Minor	Minor injury or health effects, eg. restricted work or minor lost workday case	Material environmental harm, eg. localised and significant impact	$50k to $500k loss or production delay
1	Insignificant	Slight injury or health effects, eg. first aid/minor medical treatment level	Minimal environmental harm, eg. interference or likely interference to an environmental value	Less than $50k loss or production delay

The risk ratings are defined as the following:

- Tolerable – The risk is acceptably low
- ALARP – As Low As Reasonably Practical, the risk has been reduced to as low a level as possible and all feasible controls and mitigation strategies are implemented.
- Intolerable - The risk cannot be reduced to an acceptable level with residual impacts likely to have significant impact on the local environment or stakeholders. Intolerable risk would preclude the development of the Project.

The risk rating matrix has been set out below in **Table 8**.

Table 6 Risk Rating Matrix

			Risk Rating		
Likelihood			**Consequence**		
	Insignificant	**Minor**	**Moderate**	**Major**	**Catastrophic**
Almost certain	ALARP	ALARP	Intolerable	Intolerable	Intolerable
Likely	Tolerable	ALARP	ALARP	Intolerable	Intolerable
Possible	Tolerable	Tolerable	ALARP	ALARP	Intolerable
Unlikely	Tolerable	Tolerable	Tolerable	ALARP	ALARP
Rare	Tolerable	Tolerable	Tolerable	Tolerable	ALARP

In assessing the tolerability of risk from potentially hazardous development, the relevant general principles set out in HIPAP 6 are:

- the avoidance of all avoidable risks;

- the risk from a major hazard should be reduced wherever practicable, even where the likelihood of exposure is low;
- the effects of significant events should, wherever possible be contained within the site boundary; and
- where the risk from an existing installation is already high, further development should not pose any incremental risk.

7.1.8 Risk of Property Damage and Accident Propagation

The siting of an installation must account for the potential for propagation of an accident causing a “domino” effect on adjoining premises. This risk would be expected within an industrial estate where siting of hazardous materials on one site may potentially cause hazardous materials on an adjoining premises to further develop the size of the accident.

7.1.9 Criteria for Risk Assessment to the Biophysical Environment

The siting of potentially hazardous developments also needs to consider the risk from accidental releases into the biophysical environment.

The suggested criteria for sensitive environmental areas relate to the potential effects of an accidental release or emission on the long-term viability of the ecosystem or any species within it and are expressed as follows:

- Industrial developments should not be sited in proximity to sensitive natural environmental areas where the effects or consequences of the more likely accidental emissions may threaten the long-term viability of the ecosystem or any species within it; and
- Industrial developments should not be sited in proximity to sensitive natural environmental areas where the likelihood or probability of impacts that may threaten the long-term viability of the ecosystem or any species within it is not substantially lower than the existing background level threat to the ecosystem.

In the current study, the risk of biophysical damage outside the Site is considered unlikely based on the engineering and design controls that will be in place.

7.2 Potential Hazardous Incidents Identified for Further Discussion

Following a review of surrounding land use a series of potentially hazardous events or scenarios were considered to identify if further comprehensive qualitative analysis is required. Each event or scenario shall be discussed in detail.

The following dangerous goods storage listed below exceeded Resilience and Hazards SEPP Preliminary Risk Screening as such required more comprehensive analysis:

- Bulk oxygen storage
- Storage of gas cylinders
- Diesel storage.

As set out in the SEARs, a further aspect to be considered in this report will be whether the development is in the vicinity of a pipeline corridor.

7.2.1 Incident Scenarios and Control Measures

The control measures, provided below, are designed to maintain and contain the risks within the boundaries of the site and reduce the risk to areas outside the boundaries. The technical and management safeguards required are self-evident and readily implemented as part of plant safety engineering. Following these safeguards, including codes and standards will ensure the risk level is ALARP and that the Project design meets the principles of:

- the avoidance of all avoidable risks;
- the risk from a major hazard should be reduced wherever practicable, even where the likelihood of exposure is low;
- the effects of significant events should, wherever possible be contained within the site boundary; and
- where the risk from an existing installation is already high, further development should not pose any incremental risk.

7.2.2 Dangerous Goods Storage - Bulk Oxygen, Diesel Storage & Gas Cylinder Storage

The locations of various storages have been set out in the following section.

Bulk oxygen storage, diesel storage and medical gas storages on the ground level have been set out in Figure 6.

Figure 6 Level 00 –Site Plan with bulk oxygen storage, diesel storage & medical gas storage annotated (over page)

130486-HDR-AR-DWG-010007 SSDA - HOSPITAL ZONE 03 LEVEL 00 GA PLAN

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NORTH POINT

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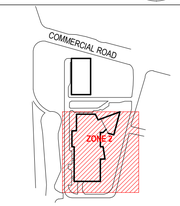
KEY PLAN



REV	DESCRIPTION OF CHANGE	DATE	CHECKED	ISSUED
A	SSDA - FOR REVIEW	09/09/24	HDR	
B	SSDA - DRAFT	18/10/24	HDR	
C	SSDA - RECORD SET	08/11/24	HDR	
D	SSDA - DRAFT	17/06/25	HDR	
E	SSDA	27/06/25	HDR	

LEGEND

SITE BOUNDARY / LOT BOUNDARY

EASEMENT ZONE FOR HV CABLES

NOTE :

- HV CABLE EASEMENT BASED ON SURVEY - *5254-Detail-RevK*

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PROJECT

ROUSE HILL HOSPITAL
CORNER OF COMMERCIAL AND WINDSOR RD, ROUSE HILL, NSW 2155 AUSTRALIA

DRAWING TITLE

SSDA - HOSPITAL LEVEL 00 GENERAL ARRANGEMENT PLAN

SCALE
1 : 250 @ A1

PROJECT NUMBER
130486

DRAWING NUMBER
130486-HDR-AR-DWG-010007

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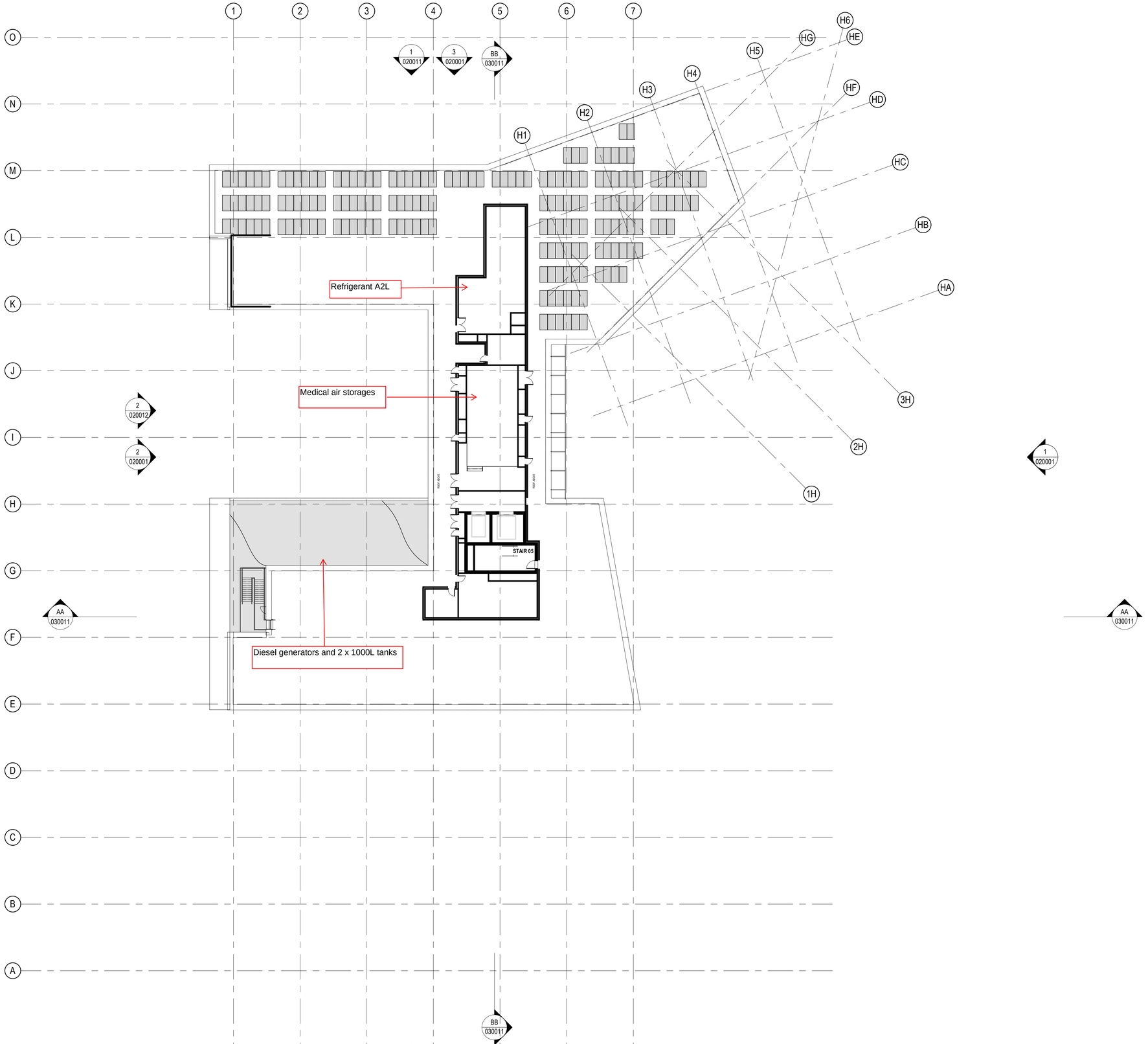
Level 10 storage locations of medical air, refrigerant A2L and diesel tanks have been set out in Figure 7.

Figure 7 Level 10 Plan with storages of medical air, refrigerant A2L & diesel annotated (over page)



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NORTH POINT

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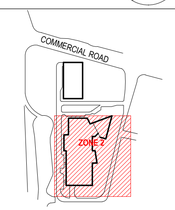
KEY PLAN



REV	DESCRIPTION OF CHANGE	DATE	CHECKED	ISSUED
A	SSDA - DRAFT	17/06/25	HDR	
B	SSDA	27/06/25	HDR	

LEGEND

SITE BOUNDARY / LOT BOUNDARY

EASEMENT ZONE FOR HV CABLES

NOTE :

- HV CABLE EASEMENT BASED ON SURVEY - *5254-Detail-RevK*

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DRAWING TITLE

SSDA - HOSPITAL LEVEL 10 GENERAL ARRANGEMENT PLAN

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130486-HDR-AR-DWG-010017

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7.2.3 Bulk Oxygen Storage

Bulk oxygen storage on site consists of a 30,000 litres primary/secondary supply vessel with a 3,000 litres emergency vessel.

The bulk oxygen storage must follow the guidance set out in AS 1894-1997 The Storage and Handling of Non-Flammable cryogenic and refrigerated liquids. Including the specific requirements for liquid oxygen as set out in section 4 of AS 1894. The storage design requirements are in part based on separation distances from other areas near the storage. Such as the safety distances outlined in Figure 4, minimum separation distances set out in Tables 4.1 and 4.2, Figures 4.2 and 4.3. The final design will need to show these separation details. It should be noted that the separation distances apply to all components to the bulk oxygen system. This can be seen in the extract from AS 1894 Figure 4.1 set out in **Figure 8** of the current report.

Figure 8 From AS 1894 - Figure 4.1 (in part)

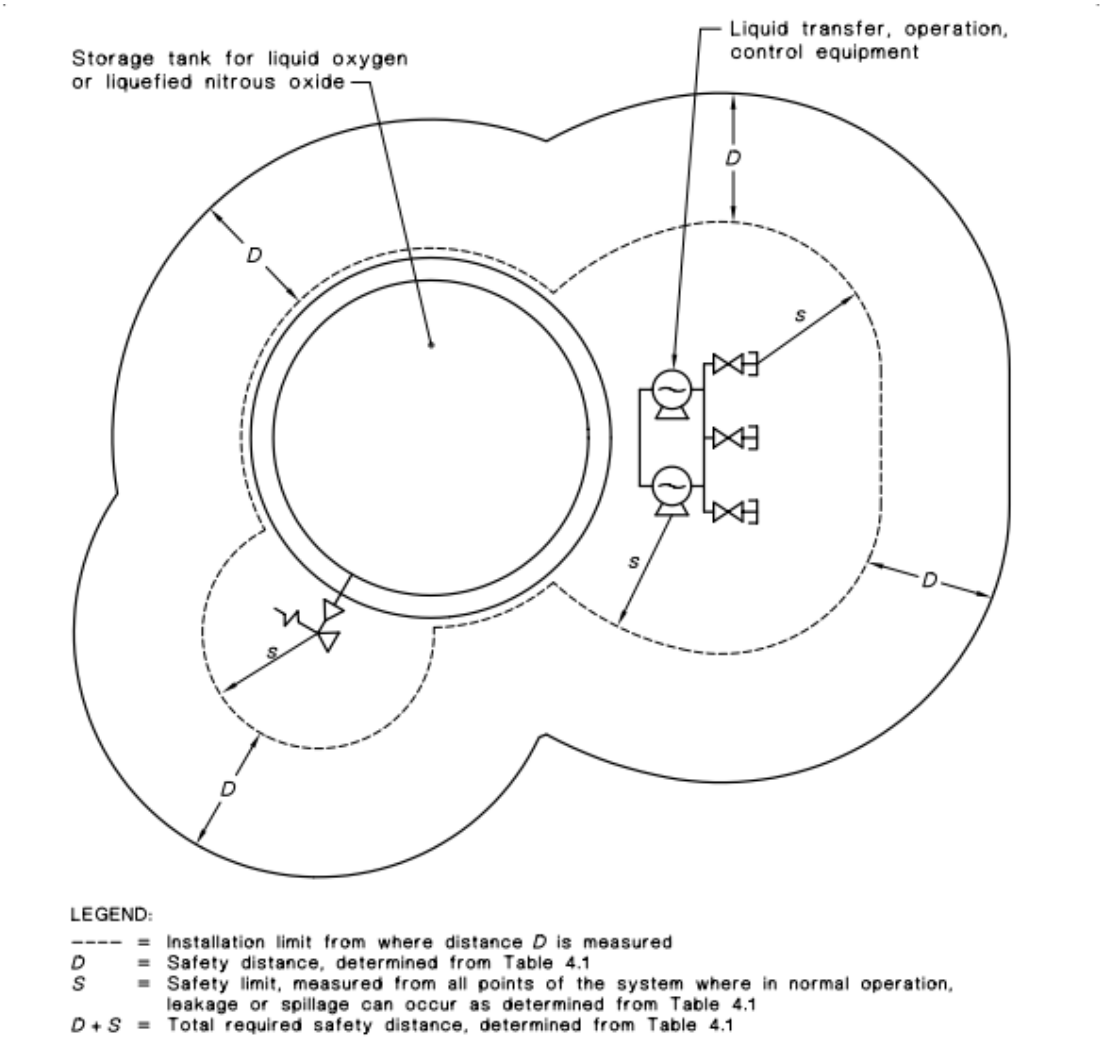


FIGURE 4.1 (in part) SAFETY DISTANCES DEFINITION
FOR LIQUID OXYGEN AND LIQUEFIED NITROUS OXIDE VESSELS

The separation distances likely required for the site will be from 4m to 12m dependent on the bulk storage final design and areas from which separation is required, as set out in AS 1894 Table 4.1. If fire rated screen walls (FRL 240/240/240) are put in places between the bulk

oxygen system and the areas then separation distances may be measured around the wall as set out in AS1894.

The separation distance required between the bulk oxygen tank including associated structure and the diesel below ground storage tank (i.e combustible liquid) will be a minimum of 3m from the below ground tank and 10m from the filling, dip and vent connections or other openings to the tank. The minimum separation distance from the above ground tanks in the generator room will be 10m. These separation distances are set out in AS 1894, table 4.2.

In the current design of Rouse Hill Hospital, the location of the bulk oxygen tanks can be seen above in Figure 6.

The Hazard Identification Word Diagram listing hazards considered can be found in **Table 8**.

It should be noted that the technical and management safeguards required are standard industry practice and readily implemented as part of safety engineering.

7.2.4 Storage of Gas Cylinders

Australian Standard AS 4332-2004 The Storage and Handling of Gases in Cylinders sets out the requirements and recommendations for safely storing and handling compressed gases in cylinders. The storage requirements are set out in section 4 of AS 4332.

All the gases are Dangerous goods class 2.2. However the oxygen cylinders and nitrous oxide cylinders do have a subsidiary hazard class of 5.1. Therefore the separation distances from the store to “protected places” may need to be 5m and for “on site protected places” the separation distance should be 3m. As set out in AS 4332, Table 4.1 and Figure 4.2.

The gas cylinder storage is next to the bulk oxygen storage. As previously stated, the separation distances requirements from the bulk oxygen componentry to the adjoining gas cylinder cage is expected to be 4m – 6m dependent on the bulk storage final design. This distance maybe reduced with the installation of a protective screen wall (fire resistance level (FRL) 240/240/240) board / wall between the two storages. Any protective board / wall or enclosure will need to comply with design details set out in AS 1894.

The separation distance required between the gas cylinder storage and the diesel fill points (i.e combustible liquid) should be a minimum of 3m. These separation distances are set out in AS 4332, table 4.1.

In the current design of Rouse Hill Hospital, the location of the gas cylinder storage (labelled “medical gas”) can be seen above in Figure 6 and Figure 7**.**

Major incidents possible at the site along with potential outcomes, consequences and control measures and residual risk after the implementation of control measures have been outlined in the Hazard Identification Word Diagram can be found in **Table 8**.

7.2.5 Storage of Diesel

Diesel storage will consist of one bulk diesel tank of 15,000 litres and two day tanks of 1,000 litres each. The bulk tank will be an underground tank near the Generator Room. The location of the bulk diesel underground tank can be seen in Figure 6. The two day tanks will be situated in the Generator Compound on Level 10. A diesel riser inside the building will allow the transfer of diesel from the underground tanks to the day tanks on Level 10. The location of the diesel riser on the ground floor, can be seen in Figure 6 and Generator Compound with diesel day tank storage can be seen in Figure 7**.**

Australian Standard AS 1940:2017 The Storage and Handling of Flammable and Combustible Liquids, sets out the requirements for safely storing and handling combustible liquids such as diesel.

The storage design requirements are in part based on separation distances from other areas near the storage. Such as the minimum separation distances set out in AS 1940:2017 Tables 5.3 and 5.4, Figures 4.2 and 4.3. The final design will need to show these separation details.

The fill point for the underground diesel tanks will require a separation distance from on site protected places of at least 3m and at least 10m from the bulk oxygen tank and associated structures. The final separation distance requirements will be dependent on the final design of the storage.

The underground tanks will need to be located with respect to the building foundations and supports so that the building load cannot be transmitted to the tank.

The diesel risers will need to comply with Australian Standard AS 1940:2017, section 6 and other relevant standards such as Australian Standard AS 4041:2006 Pressure Piping.

Major incidents possible at the site along with potential outcomes, consequences and control measures and residual risk after the implementation of control measures have been outlined in the Hazard Identification Word Diagram can be found in **Table 8**.

In the current design of Rouse Hill Hospital, the location of the diesel storage can be seen above in Figure 6 **and** Figure 7**.**

7.2.6 Gas Pipeline Corridor & Other Assets

The State Environmental Planning Policy (Infrastructure) 2007 states the following:

Subdivision 2 Development in gas pipeline corridors

55 Development adjacent to corridor

(1) Before determining an application (or any application for modification of a consent) for development adjacent to a gas pipeline corridor, the consent authority must:

(a) be satisfied that the potential safety risks or risks to the integrity of the pipeline that are associated with the development or modification to which the application relates have been identified, and

(b) take those risks into consideration.

(2) In this clause, gas pipeline corridor means any land:

(a) within the licence area of a gas pipeline licensed under the Pipelines Act 1967, or

(b) within 20m (measured radially) of the centreline of any of the following gas pipelines:

(i) Central West Pipeline System and Central Ranges Pipeline System,

(ii) Eastern Gas Pipeline,

(iii) Moomba to Sydney Pipeline System,

(iv) Wilton to Newcastle Pipeline,

(v) Wilton to Wollongong Pipeline,

(vi) Culcairn to Victoria Interconnect Pipeline,

(vii) Hoskinstown to Australian Capital Territory Pipeline.

Regarding the current development, SLR made a Before You Dig enquiry to ascertain the presence of pipeline and other assets in proximity to the development site. It should be noted that the information provided to SLR by the various parties is indicative only. More

detailed information will be required from the relevant parties during the design phase of the development. This detail is beyond the scope of a preliminary hazard analysis.

The development is not adjacent to a gas pipeline corridor for pipelines listed above in Subdivision 2 Development in gas pipeline corridors. Furthermore no high pressure gas pipelines have been identified in the area. There is a medium pressure gas distribution pipeline running adjacent to the development and surrounding properties.

A Before You Dig enquiry also provides responses from other interested parties. Accordingly, to provide a complete picture, SLR has included those other responses into the current report.

The responses from the Before You Dig enquiry have been summarised below in **Table 7**

Table 7 Before You Dig enquiry response summary

Party	Asset	Comment
Jemena Gas North	Gas pipelines	Gas mains or services in the vicinity of the site
Endeavour Energy	Electrical assets	Underground assets present
Sydney Water	Water pipelines	Underground assets present
NBN Co NSWACT	NBN cables	Assets present
Transport for NSW	Transport areas	Assets present
The Hills Shire Council	Council assets	No assets
Telstra	Telecommunications	Assets adjacent to the site
Optus	Telecommunications	Fibre optic telecommunications assets in vicinity of the site

The assets listed above are common features found adjacent to many suburban developments. The design and engineering requirements to build and work near these assets are well understood. Liaising with the relevant parties involved will be critical to get up to date advice relating to their individual assets and the development design. Based on this, the Rouse Hill Hospital development should not create undue hazards and risks to these assets should be minimal.

Please note the developer must check again with Before You Dig again nearer to the construction date to ensure latest information on inground services.

Table 8 Summary of Potential Major Incident Scenarios & Residual Risk after Implementation of Controls

Hazard / Incident	Scenario	Likely Consequences	Controls	Likelihood	Consequence	Residual Risk
Bulk Oxygen						
Oxygen release – storage tank failure	Sudden release of oxygen	Potential for moderate, short term impacts downwind from a release. Some medical treatment may be required in a worst case scenario Localised evacuation of site may be required	Oxygen storage to conform with AS 1894. Periodic vessel inspection and system maintenance Emergency response plan in place	Rare	Moderate	Tolerable
Oxygen release – pipe leak (corrosion)	Small oxygen leak	Minor leak/plant shutdown and isolation Minor irritation/injury to staff in close proximity. No off site impacts expected	Oxygen storage to conform with AS 1894. Periodic vessel inspection and system maintenance.	Rare	Minor	Tolerable
Oxygen Release – Pipework Flange/weld failure	Small oxygen leak	Minor leak/plant shutdown and isolation Minor irritation/injury to staff in close proximity. No off site impacts expected	Oxygen storage to conform with AS 1894. Periodic vessel inspection and system maintenance.	Rare	Minor	Tolerable

Hazard / Incident	Scenario	Likely Consequences	Controls	Likelihood	Consequence	Residual Risk
Oxygen Release - Maintenance Operations	Maintenance error or accident	Minor leak/plant shutdown and isolation Minor irritation/injury to staff in close proximity. No off site impacts expected	All maintenance work on equipment carried out by competent personnel	Unlikely	Minor	Tolerable
Oxygen Release – car / mechanical impact on pipe/vessel	Impact causes pipe rupture or leak	Minor leak/plant shutdown and isolation Minor irritation/injury to staff in close proximity. No off site impacts expected	Protection of oxygen storage to conform with AS 1894. Pipe work separated from normal operations or protected where possible. For example with bollards and exclusion zones.	Unlikely	Minor	Tolerable
Oxygen Release – during bulk delivery	Problems with bulk delivery of oxygen. Range from minor leak and isolation to major leak.	Some potential for minor, short term off site impacts downwind from a release. Some medical treatment may be required in a worst case scenario Localised evacuation of site may be required	Oxygen storage to conform with AS 1894. Industry standard delivery procedures followed. Regular condition inspections of fill point. Use of established industry procedures minimize likelihood of oxygen leak during delivery.	Unlikely	Minor to Moderate	Tolerable

Hazard / Incident	Scenario	Likely Consequences	Controls	Likelihood	Consequence	Residual Risk
			Emergency response plan in place			
Site Fire	Fire starts in another section of the site and impinges on oxygen storage tank	Potential for fire to spread, oxygen may be released and act as accelerant. Potential for downwind irritation from smoke plume. Localised radiant heat effects	Facility has appropriate fire control systems in pace. Emergency response plan in place Emergency evacuation plans in place.	Rare	Major	Tolerable
Fire Impact (external)	Fire starts off site, moves on site and impinges on oxygen tank.	Potential for fire to spread, oxygen may be released and act as accelerant. Potential for downwind irritation from smoke plume. Localised radiant heat effects	Facility has appropriate fire control systems in pace. Emergency response plan in place Emergency evacuation plans in place.	Rare	Major	Tolerable
Gas Cylinder Storage						
Gas release – gas cylinder failure	Sudden release of gas Torpedoing of damaged gas cylinder	Potential for moderate, short term impacts in close proximity downwind from a release. Physical damage from torpedoing cylinder.	Gas cylinder handling and storage to conform with AS 4332. Periodic storage inspection, Emergency response plan in place	Rare	Moderate	Tolerable

Hazard / Incident	Scenario	Likely Consequences	Controls	Likelihood	Consequence	Residual Risk
		Some medical treatment may be required in a worst case scenario Localised evacuation of site may be required. No off site impacts expected				
Gas release – pipe leak (corrosion)	Small gas leak	Minor leak/plant shutdown and isolation Minor irritation/injury to staff in close proximity. No off site impacts expected	Gas cylinder handling and storage to conform with AS 4332. Periodic cylinder inspection and system maintenance.	Rare	Minor	Tolerable
Gas release – Pipework Flange/weld failure	Small gas leak	Minor leak/plant shutdown and isolation Minor irritation/injury to staff in close proximity. No off site impacts expected	Gas cylinder handling and storage to conform with AS 4332. Periodic cylinder inspection and system maintenance.	Rare	Minor	Tolerable

Hazard / Incident	Scenario	Likely Consequences	Controls	Likelihood	Consequence	Residual Risk
Gas Release - Maintenance Operations	Maintenance error or accident	Potential for moderate, short term impacts in close proximity downwind from a release. Physical damage from torpedoing cylinder. Some medical treatment may be required in a worst case scenario Localised evacuation of site may be required No off site impacts expected	All maintenance work on equipment carried out by competent personnel	Unlikely	Moderate	Tolerable
Gas Release – car / mechanical impact on gas cylinder storage	Impact causes gas cylinder rupture or leak. Torpedoing of damaged gas cylinder	Minor leak/plant shutdown and isolation Minor irritation/injury to staff in close proximity. Physical damage from torpedoing cylinder. Some medical treatment may be required in a worst case scenario No off site impacts expected	Protection of gas cylinder storage to conform with AS 4332. Gas cylinder storage separated from normal operations or protected where possible. For example with bollards and exclusion zones.	Unlikely	Moderate	Tolerable

Hazard / Incident	Scenario	Likely Consequences	Controls	Likelihood	Consequence	Residual Risk
Gas release – during gas cylinder delivery	Problems with delivery of gas cylinders. Range from minor leak and isolation to gas cylinder rupture or leak. Torpedoing of damaged gas cylinder	Some potential for minor, short term impacts downwind from a release. Physical damage from torpedoing cylinder. Some medical treatment may be required in a worst case scenario Localised evacuation of site may be required No off site impacts expected	Protection of gas cylinder storage to conform with AS 4332. Industry standard delivery procedures followed. Regular condition inspections of gas cylinder storage and transport pathway for cylinders into storage. Use of established industry procedures minimize likelihood of gas cylinder damage during delivery. Emergency response plan in place	Unlikely	Moderate	Tolerable
Site Fire	Fire starts in another section of the site and impinges on gas cylinder storage tank	Potential for fire to spread, damage to gas cylinders. Potential for downwind irritation from smoke plume. Localised radiant heat effects	Facility has appropriate fire control systems in pace. Emergency response plan in place Emergency evacuation plans in place.	Rare	Major	Tolerable

Hazard / Incident	Scenario	Likely Consequences	Controls	Likelihood	Consequence	Residual Risk
Fire Impact (external)	Fire starts off site, moves on site and impinges on oxygen tank.	Potential for fire to spread, oxygen may be released and act as accelerant. Potential for downwind irritation from smoke plume. Localised radiant heat effects	Facility has appropriate fire control systems in pace. Emergency response plan in place Emergency evacuation plans in place.	Rare	Major	Tolerable
Diesel Storage						
Diesel release – tank failure	Underground tanks degrades and fails	Release on diesel into the surrounding ground Minor irritation/injury to staff in close proximity. No off site impacts expected	Underground storage to conform with AS 1940. Periodic storage inspection, Emergency response plan in place	Rare	Minor	Tolerable
Diesel release – pipe leak (corrosion)	Small diesel leak	Minor leak/plant shutdown and isolation Minor irritation/injury to staff in close proximity. No off site impacts expected	Diesel pipework and storage to conform with AS 1940 and AS 4041. Periodic inspection of pipework and system maintenance.	Rare	Minor	Tolerable

Hazard / Incident	Scenario	Likely Consequences	Controls	Likelihood	Consequence	Residual Risk
Diesel release – Pipework Flange/weld failure	Small diesel leak	Minor leak/plant shutdown and isolation Minor irritation/injury to staff in close proximity. No off site impacts expected	Diesel pipework and storage to conform with AS 1940 and AS 4041. Periodic inspection of pipework and system maintenance.	Rare	Minor	Tolerable
Diesel Release - Maintenance Operations	Maintenance error or accident	Potential for minor to moderate, short term impacts in close proximity from a release. Some medical treatment may be required in a worst case scenario Localised evacuation of site may be required No off site impacts expected	All maintenance work on equipment carried out by competent personnel	Unlikely	Moderate	Tolerable
Diesel Release – car / mechanical impact on diesel fill point	Impact causes rupture of fill point.	Minor leak/plant shutdown and isolation Minor irritation/injury to staff in close proximity. No off site impacts expected	Protection of diesel fill point to conform with AS 1940. Diesel fill point separated from normal operations or protected where possible. For example with bollards and exclusion zones.	Unlikely	Minor	Tolerable

Hazard / Incident	Scenario	Likely Consequences	Controls	Likelihood	Consequence	Residual Risk
Diesel release – during bulk diesel delivery	Problems with delivery of diesel. Range from minor leak and isolation to large scale release of diesel.	Some potential for minor, short term impacts downwind from a release. Some medical treatment may be required in a worst case scenario Localised evacuation of site may be required No off site impacts expected	Industry standard delivery procedures followed. Regular condition inspections of diesel fill point and transport pathway to access diesel fill point. Emergency response plan in place	Unlikely	Minor to Moderate	Tolerable
Site Fire	Fire starts in another section of the site and impinges on diesel storage tanks in Generator Room and diesel fill point	Potential for fire to spread, diesel may be released and act as accelerant. Potential for downwind irritation from smoke plume. Localised radiant heat effects	Facility has appropriate fire control systems in pace. Emergency response plan in place Emergency evacuation plans in place.	Rare	Major	Tolerable
Fire Impact (external)	Fire starts off site, moves on site and impinges on diesel fill point and Generator Room.	Potential for fire to spread, diesel may be released and act as accelerant. Potential for downwind irritation from smoke plume. Localised radiant heat effects	Facility has appropriate fire control systems in pace. Emergency response plan in place Emergency evacuation plans in place.	Rare	Major	Tolerable

8.0 Conclusion

The Preliminary Hazard Analysis has found that the main dangerous goods potential hazard associated with the proposed development of Rouse Hill Hospital was the following:

- Bulk oxygen storage
- Storage of gas cylinders
- Diesel storage

The residual risks associated with this hazard once controls are implemented were rated as Tolerable (i.e. the risk is acceptably low).

The risk of biophysical damage outside the Site is considered unlikely based on the engineering and design controls that will be in place.

The development is not in the vicinity of a pipeline corridor.

It is the conclusion of this Preliminary Hazard Analysis that the proposed development would be identified as a suitable development for the area, with suitable engineering controls, operational controls and management controls in place. These controls are standard industry practice and readily implemented as part of safety engineering.

9.0 References

Commonwealth Government, 2014, *Australian Code for the Transport of Dangerous Goods by Road and Rail* (ADG Number 7.3).

Department of the Environment and Energy (2017), *Guide to the Australian Energy Statistics 2017*, Canberra, August.

Department of Planning NSW, 2011, *Applying SEPP 33 - Hazardous and Offensive Development Application Guidelines*.

NSW Government *Code of Practice Managing Risks of Hazardous Chemicals in the Workplace,* August 2019

NSW Government *Notifications of Schedule 11 Hazardous Chemicals and Abandoned Tanks – Guidance Material*. Safework NSW

Planning NSW, 2011 *Rick Criteria for Land Use Safety Planning – Hazardous Industry Planning Advisory Paper No 4*, New South Wales Government

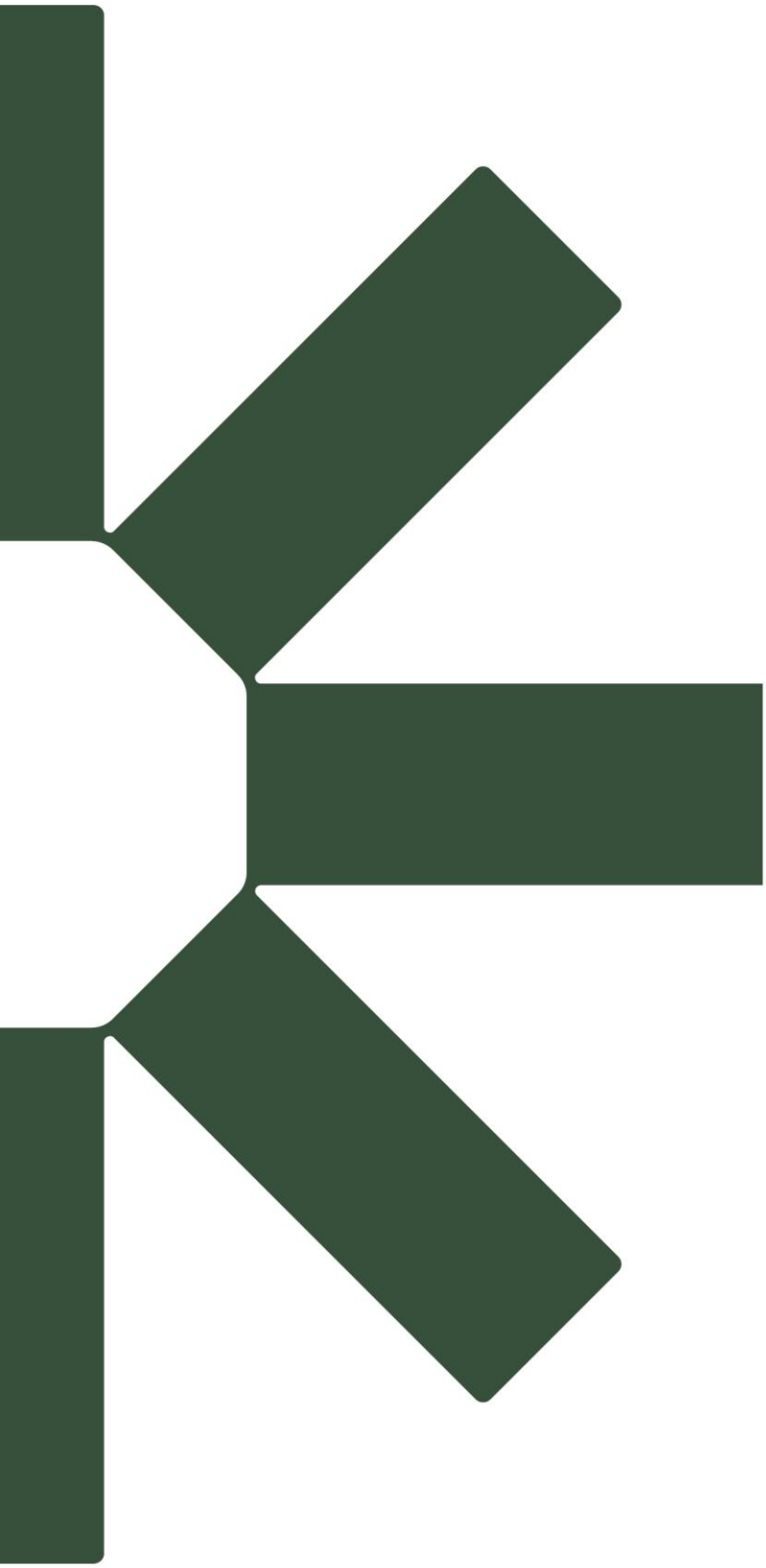
Planning NSW, 2011 *Hazard Analysis – Hazardous Industry Planning Advisory Paper No 6*, New South Wales Government

State Environmental Planning Policy (Resilience and Hazards) 2021

10.0 Feedback

At SLR, we are committed to delivering professional quality service to our clients. We are constantly looking for ways to improve the quality of our deliverables and our service to our clients. Client feedback is a valuable tool in helping us prioritise services and resources according to our client needs.

To achieve this, your feedback on the team's performance, deliverables and service are valuable and SLR welcome all feedback via https://www.slrconsulting.com/en/feedback. We recognise the value of your time and we will make a $10 donation to our Charity Partner - Lifeline, for every completed form.



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