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Kemps Creek Data Centre

Hazards and Risk

SYD05-06-07_Y-R-0009

Revision 2 | 16 April 2021

Job number 277863-00

Arup Australia Pty Ltd ABN 76 625 912 665

Arup
Level 5
151 Clarence Street
Sydney NSW 2000
Australia
www.arup.com

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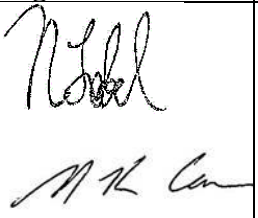
		Signature			
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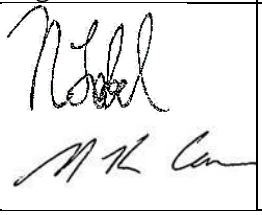
		Signature			
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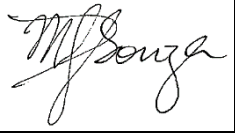
		Signature			

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Executive summary

Background

The Site will form part of the new Kemps Creek Warehouse, Logistics and Industrial Facilities Hub being developed as a joint venture between Frasers Property and Altis Property Partner under the recently approved State Significant Development (SSD) 9522 as of 21 December 2020.

The purpose of this report is to address the relevant Secretary's Environmental Assessment Requirements (SEARs) and development control plan (DCP) requirements for Hazards and Risk. Specifically, this report contains a preliminary risk screening in accordance with the *State Environmental Planning Policy No. 33 Hazardous and Offensive Development* (SEPP 33) and if required, a preliminary hazard analysis (PHA). This report also details the location and quantity of potentially hazardous materials used onsite.

Methodology

The following legislation, regulations and policies form the basis of this assessment:

- *Applying SEPP 33* Guidelines
- Section 7.1 of the *Work Health and Safety Regulations 2011*
- *Protection of Environment Operations Act 1997*
- Australian Standard (AS) 1940-2017: *The storage and handling of flammable and combustible liquids*
- *Building Code of Australia*[1]

As part of the SEPP 33 process, a preliminary risk screening to assess whether the development would be considered potentially hazardous has been undertaken. Additionally, the storage locations and quantities of hazardous materials such as back-up generators, diesel fuel storage tanks, and lithium-ion batteries have been detailed in this report. The potential risks that may arise as a result of the storage of these hazardous materials have also been addressed to mitigate these risks So Far as is Reasonably Practicable (SFAIRP).

Findings

The outcomes of this assessment are as follows:

- The site was found to be below the threshold for classification as potentially hazardous in terms of both storage and transportation and so a PHA is not required.

[1] The project fire engineers shall be provided with this report and are to incorporate any unique fire hazards into the overall fire strategy as part of the Building Code of Australia compliance process.

- The manifest quantity thresholds for diesel as set out by Schedule 11 of the Work Health and Safety (WHS) Regulations are exceeded.
- The placard quantity thresholds for diesel as set out by Schedule 11 of the WHS Regulations are exceeded.
- The criteria for a licence for chemical storage under the Protection of the Environment Operations Act 1997 (PoEO) has not been met.

Recommendations

Arup makes the following recommendations regarding the site:

- Each room within the data centres storing battery cabinets is to be installed with the following measures:
  - A fire resistance level (FRL) of 120/120/120.
  - Adequate ventilation to relieve the off gassing of combustible gases from thermal runaway or a gas detection system.
  - Smoke detection.
  - Double knock pre-action sprinkler system.
  - The inclusion of lithium-ion batteries is to be incorporated into the overall fire safety strategy by the project fire engineer.
- The following recommendations apply to the storage of diesel fuel outside data centres:
  - The belly tanks shall comply with AS 1940-2017: *The storage and handling of flammable and combustible liquids* (AS 1940).
  - Specifically, the tanks shall comply with Section 5.9 of AS 1940 - Requirements for above-ground tanks with integral secondary containment.
  - There shall be at least 600 mm between fuel tanks placed side by side.
  - There shall be at least 4.5 m between generators and the data centre building.
  - There shall be at least 4.5 m between sets (pairs) of generators.
- The transformers shall be designed in accordance with AS 2067-2016: *Substations and high voltage installations exceeding 1 kV a.c.*.
- The regulator should be notified of diesel storage exceeding manifest quantities in accordance with Regulation 348 of the WHS Regulations.
- Outer warning placards regarding quantities of diesel stored should be displayed at any entrance where emergency services may enter the workplace in accordance with Regulation 349 and Schedule 13 of the WHS Regulations
- Placards should be displayed on or near the containers of diesel in accordance with Regulation 350 and Schedule 13 of the WHS Regulations.
- An emergency plan should be prepared for the site and provided to the NSW Fire and Rescue as per the requirements of Regulation 361 of the WHS Regulations.

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Glossary

Abbreviations	
ADGC	Australian Code for the Transport of Dangerous Goods by Road & Rail
AS	Australian Standard
DCP	Development Control Plan
DG	Dangerous Good
FRL	Fire Resistance Level
PHA	Preliminary Hazard Analysis
PoEO	Protection of the Environment Operations Act 1997
SEARs	Secretary's Environmental Application Requirements
SEPP	State Environmental Planning Policy
SFAIRP	So Far as is Reasonably Practicable
SSD	State Significant Development
WHS	Work Health and Safety Regulations 2011

1 Introduction

1.1 Purpose of this report

The purpose of this report is to address the relevant Secretary's Environmental Assessment Requirements (SEARs) and development control plan (DCP) requirements for Hazards and Risk. Specifically, this report contains a preliminary risk screening in accordance with the *State Environmental Planning Policy No. 33 Hazardous and Offensive Development* (SEPP 33) and if required, a preliminary hazard analysis (PHA). This report also details the location and quantity of potentially hazardous materials used onsite.

1.2 Proposal overview

1.2.1 Site context

The identified site address that is the subject of this technical report is legally defined as 757-769 Mamre Road, Kemps Creek. The entire Site comprises a total area of approximately 17.38 hectares (ha) and is subject to the applicable provisions outlined within SEPP (WSEA) 2009. Access to the Site is currently obtained via the proposed Estate Access Roads (SSD 9522), which are accessed from Mamre Road. Access into the Site is made possible via Mamre Road, which is subject to future road widening as part of the Mamre Road Widening Project (Transport for NSW).

The Site is situated approximately 40.26 km west of the Sydney CBD, 22.11 km west of Parramatta and 11.97 km southeast of Penrith. It is within close proximity to transport infrastructure routes (predominantly the bus network), as well as sharing direct links with the wider regional road network, including Mamre Road and both the M4 & M7 Motorways. All of which provide enhanced connectivity to the Subject Site and immediate vicinity, as well as the wider locality.

Additionally, the Subject Site is located within close proximity to active transport links, such as bicycle routes, providing an additional mode of accessible transport available to the Subject Site. In its existing state, the Subject Site comprises an undeveloped land portion; however, is subject to bulk earthworks and infrastructure works under a concurrent State Significant Development (SSD) Application – SSD 9522.

The Proponent is proposing to construct and operate a Data Centre on the Subject Site. The Site is located within the Penrith Local Government Area (LGA) and is zoned IN1 General Industrial under the provisions of State Environmental Planning Policy (Western Sydney Employment Area) 2009 (SEPP (WSEA) 2009). Development for the purpose of a Data Centre is permissible with consent within the IN1 General Industrial zone pursuant to the provisions outlined with Part 3, Division 3, Clause 27 of State Environmental Planning Policy (Infrastructure) 2007 (ISEPP).

The site and surrounding context are illustrated below in Figure 1.

Lot 34
DP1118173

Lot 1
DP1018318

Lot X
DP421633

Lot Y
DP421633

Lot 22
DP258414

Subject Site

COMMERCIAL IN CONFIDENCE

Legend

- Proposed Site
- Lot
- SSDA 9522

Client

Job Title
Kemps Creek Data Centre

Figure Title
Site Context and Surrounding Area

Meters
0 100 200 300 400

Issue	Date	By	Chkd	Appd
D2	2021-03-03	ICD	LS	

ARUP
Level 5, Barrack Place,
151 Clarence St,
PO Box 76 Millers Point,
Sydney NSW 2000
Tel +61 (2)9320 9320
www.arup.com

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Coordinate System
GDA 1994 MGA Zone 56

Job No	Figure No
277863-00	Figure 01

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Aerial Imagery: DFSI, 2020

1.2.2 Description of the proposed development

The Site will form part of the new Kemps Creek Warehouse, Logistics and Industrial Facilities Hub being developed as a joint venture between Frasers Property and Altis Property Partner under the recently approved SSD 9522 as of 21 December 2020.

The site layout has been developed for three data centres for a total of (3 x 48MW) 144MW capacity. Full detailed design is currently underway for two 48MW centres, with the third data centre being designated as a future build. The design of these which are based on the end-client's reference design as well as applicable Australian standards.

Each data hall will be supplied with lithium-ion batteries and back-up generators that will work in tandem to ensure uninterrupted power supply in the event of a loss of power. The lithium-ion batteries will be within fire separated rooms in accordance with the Building Code of Australia and reviewed by the project fire engineer. The generators and associated diesel fuel tanks will be outdoors adjacent to the buildings. SEARs and DCP requirements relevant to this report in Table 1 identifies the SEARs and DCP requirements which are relevant to this technical assessment.

Table 1: SEARs and DCP requirements for Hazards and Risk

SEARs relevant to this technical report	Where addressed in this technical report
A preliminary risk screening completed in accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development and Applying SEPP 33 with clear indication of class (and any subsidiary hazard), quantity and location of all dangerous goods and hazardous materials associated with the development. Should the preliminary risk screening indicate that the development is "potentially hazardous" a Preliminary Hazard Analysis (PHA) must be prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6, 'Hazard Analysis' and Multi-Level Risk Assessment	This report forms the preliminary risk screening Section 4 shows that the development is not potentially hazardous.
Details regarding the location and number of back-up generators, diesel fuel storage tanks and lithium-ion batteries to be installed to service the development.	Section 5
Agency comments	
N/A	N/A
DCP Requirements	
N/A	N/A

2 Policy and planning context

The following legislation, regulations and policies form the basis of this assessment:

- *Applying SEPP 33* Guidelines
- Section 7.1 of the *Work Health and Safety Regulations 2011*
- *Protection of Environment Operations Act 1997*
- Australian Standard (AS) 1940-2017: *The storage and handling of flammable and combustible liquids*
- *Building Code of Australia*[2]

[2] The project fire engineers shall be provided with this report and are to incorporate any unique fire hazards into the overall fire strategy as part of the Building Code of Australia compliance process.

3 Methodology

This Chapter outlines the methodology used to carry out the preliminary risk screening, including definition of the study area used as the basis of the assessment.

3.1 Study area

The preliminary risk screening covers the area defined by the fenced in boundary line of the site. Figure 1 above shows this area that is considered to be onsite. The area outside of this boundary is considered offsite for the purposes of this assessment.

3.2 SEPP 33

State Environmental Planning Policy No. 33 Hazardous and Offensive Development (SEPP 33) is used in New South Wales to regulate the planning approval process for developments in hazardous and offensive industries, and potentially hazardous and potentially offensive industries. The SEPP 33 process is shown in Figure 2.

A key part of the SEPP 33 process is the Preliminary Hazard Analysis (PHA). If the development application includes dangerous goods (DGs) with quantities or transport frequencies above defined thresholds, a PHA must be produced as part of the SEPP 33 process.

Section 4 below assesses the site against the SEPP 33 guidelines to determine whether a PHA must be undertaken.

Figure 1: The SEPP 33 Process

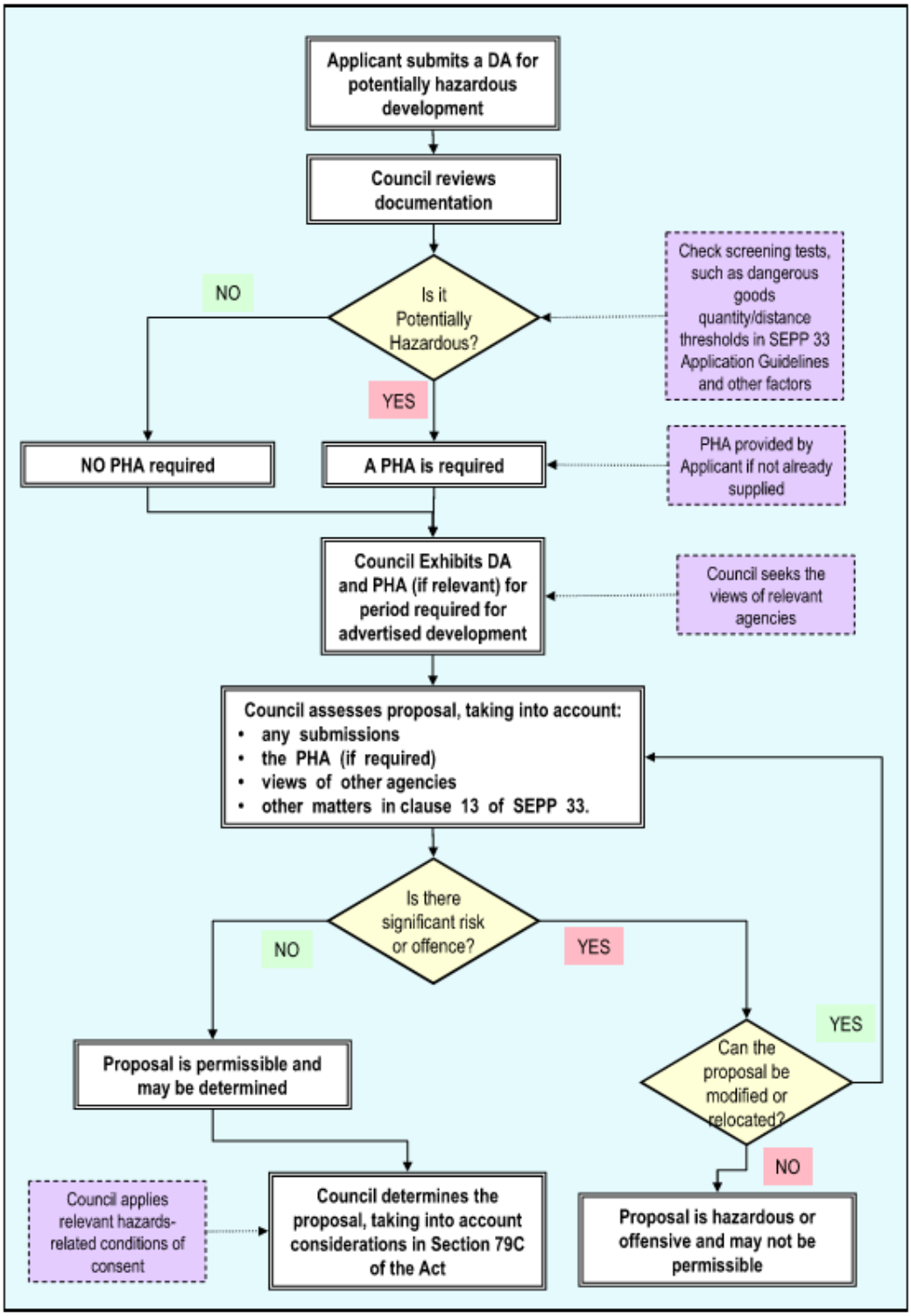

Figure 2: The SEPP 33 Process

3.3 Storage of hazardous goods

The storage locations and quantities of hazardous materials such as back-up generators, diesel fuel storage tanks, and lithium-ion batteries have been detailed in Section 5 below. The potential risks that may arise as a result of the storage of these hazardous materials have also been addressed to mitigate these risks So Far as is Reasonably Practicable (SFAIRP).

3.4 Section 7.1 of the WHS Regulations

Section 7.1 of the *Work Health and Safety Regulations 2011* (WHS) is applicable to the use, handling and storage of hazardous chemicals at a workplace. Section 6 below sets out the WHS requirements for workplaces that exceed the manifest and placard quantities of hazardous chemicals.

3.5 Protection of the Environment Operations Act

The *Protection of the Environment Operations Act 1997* (PoEO) sets out the conditions that would necessitate the issuance of an environment protection licence. Section 7 below assesses whether any of these conditions are met and therefore if the site would require an environment protection licence.

4 Applicability of SEPP 33

In order to carry out the SEPP 33 screening, each substance stored onsite has been classified in accordance with the National Transport Commission's *Australian Code for the Transport of Dangerous Goods by Road & Rail* (ADGC). This process includes substances not classified as DGs by the ADGC.

4.1 Hazardous Substances onsite

The substances to be stored onsite are listed in Table 2 below. This table shows the UN number (if relevant), DG class, subsidiary risk, packing group and approximate quantities.

Table 2: Hazardous substances stored onsite

Substance	UN Number	DG Class	Quantity
Lithium-ion batteries[3]	3480/3481	9	250 t
Diesel	1202	N/A – not a DG but it is a C1 combustible liquid	1650 t
Transformer oil (mineral oil or ester oil)	N/A – not a DG but it is usually a C2 combustible liquid		120 kL

It should be noted that Class 9 DGs are excluded from the risk screening. Since no thresholds set out by Table 1 of *Applying SEPP 33* are exceeded, the development is not considered to be potentially hazardous and SEPP 33 does not apply in terms of storage.

Quantities of hazardous substances

The details of the storage of diesel fuel for these generators can be found in Table 5 below. As the final generator supplier has not been finalised, a range of capacities has been provided. There will also be a small volume of diesel in a separate tank for fire pumps, but this will not impact the conclusions of this assessment.

Table 3: Diesel stored in back-up generators

Location	Number of generators	Generator capacity (kL)	Total Fuel (kL)
Data Hall	60	31	1860
Administration Building	2	6.5 - 7.5	15
Total	62	N/A	1875

Each of the three data centres will have 20 data halls, and each data hall will have its own battery storage room. Each battery storage room will contain approximately 14 battery cabinets. This totals approximately 840 cabinets for the site. The following calculation shows there are approximately 250 t of lithium-ion

[3] Note that this is the total quantity. The batteries will be stored across the site in multiple fire separated rooms.

batteries to be stored onsite. As the final supplier has not been chosen yet, these calculations are approximate only:

$$1\ battery\ cabinet = 17\ battery\ modules^{4}$$
$$1\ battery\ module = 17\ kg^{5}$$
$$1\ battery\ cabinet = 17\ kg\ \times 17\ modules$$
$$= 289\ kg$$
$$840\ battery\ cabinets = 289\ kg \times 840\ cabinets$$
$$\cong 250\ t$$

Initially there will be two transformers, but this will ultimately be increased to four. Each transformer will hold approximately 30 kL totalling 120 kL for all four transformers.

4.2 Transportation of Dangerous Goods

As the only Dangerous Good as classified by the ADGC is the lithium-ion battery, the transportation screening has been carried out only for lithium-ion batteries. It has been assumed that batteries are delivered once at the commissioning of the site and typically require replacement once every 5 to 15 years.

Table 4: Transportation of dangerous goods

DG Class	Cumulative Annual Movements Expected	Annual Movements Threshold	Peak Weekly Movements Expected	Weekly Movements Threshold	Threshold Exceeded
9	5	>1000	1	>60	No

As can be seen by the table above, transportation thresholds are not exceeded and so the development is not considered to be potentially hazardous and SEPP 33 does not apply in terms of transportation.

Further, while diesel has not been screened as it is not classified as a DG by the ADGC, it is not expected that there is a noticeable risk of diesel transportation. This is due to the low annual and weekly movements expected as diesel will only be used in generators when back-up power is required, and testing undertaken.

[4] Schneider Electric, 2018. *Product Specification Lithium Ion Battery Rack Type G*. https://www.se.com/ww/en/download/document/SPD_ACOS-B27UL8_EN/, accessed 18 February 2021.
[5] Schneider Electric, 2018. *Product Specification Lithium Ion Battery Rack Type G*. https://www.se.com/ww/en/download/document/SPD_ACOS-B27UL8_EN/, accessed 18 February 2021.

5 Storage of hazardous goods

This section details the storage quantities and locations of hazardous goods used at the site. If a potential risk of loss of control exists with the storage of a hazardous good, measures required to mitigate the risk SFAIRP are also detailed.

5.1 Lithium-ion Batteries

Lithium-ion batteries will be stored within battery rooms in each data hall of the three main buildings. Figure 3 below shows the likely location of the battery rooms within each data hall.

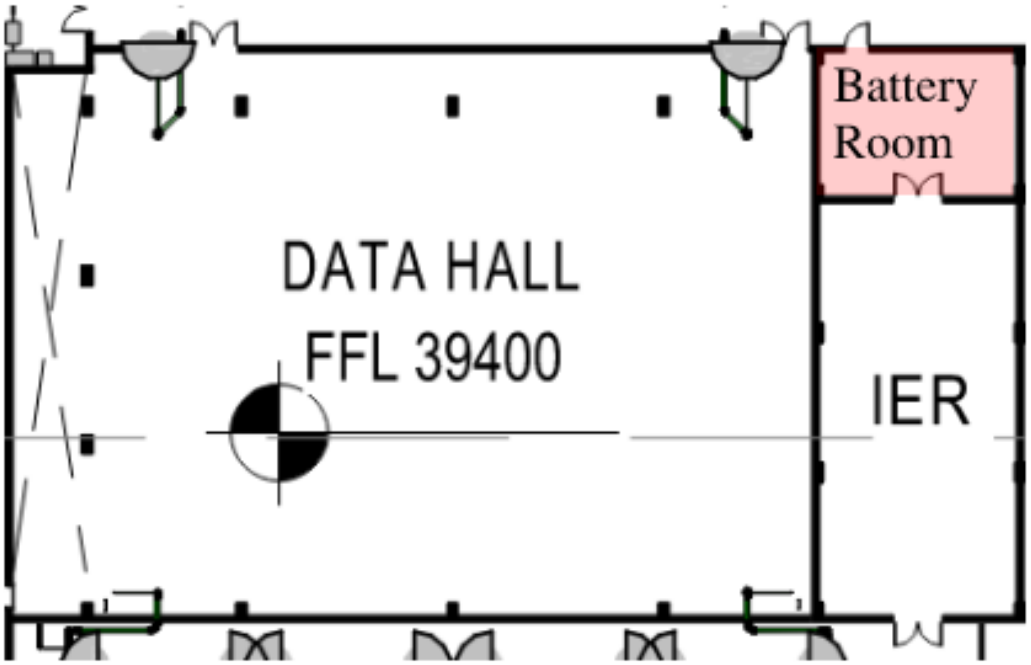

Figure 3: Indicative battery room location

Additionally, there will be a small number of battery racks in the administration building. These battery racks are likely to be below the threshold for fire rating and so do not require the mitigations below. There will be approximately 840 battery cabinets in multiple fire separated rooms within data halls onsite.

Lithium-ion batteries do have the potential for thermal runaway and the following controls are considered sufficient to mitigate this risk SFAIRP. Each room in the data halls storing battery cabinets is to be installed with the following measures:

- A fire resistance level (FRL) of 120/120/120.
- Adequate ventilation to relieve the off gassing of combustible gases from thermal runaway or a gas detection system.
- Smoke detection.
- Double knock pre-action sprinkler system.
- The inclusion of lithium-ion batteries is to be incorporated into the overall fire safety strategy by the project fire engineer.

5.2 Back-up generators and diesel storage

Back-up generators will be located outside and adjacent to each data hall and the administration building. Diesel will be stored in belly tanks underneath each generator as shown in Figure 4.

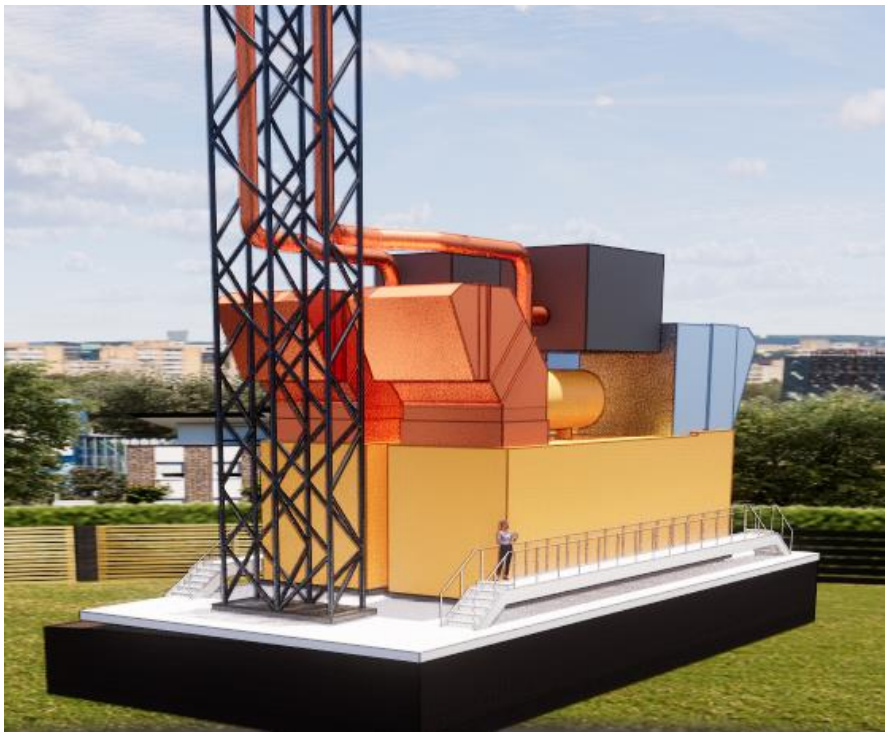

Figure 4: Indicative render of generator and belly tank

Figure 5 below shows the arrangement of generators and likely location of generators outside each data hall.

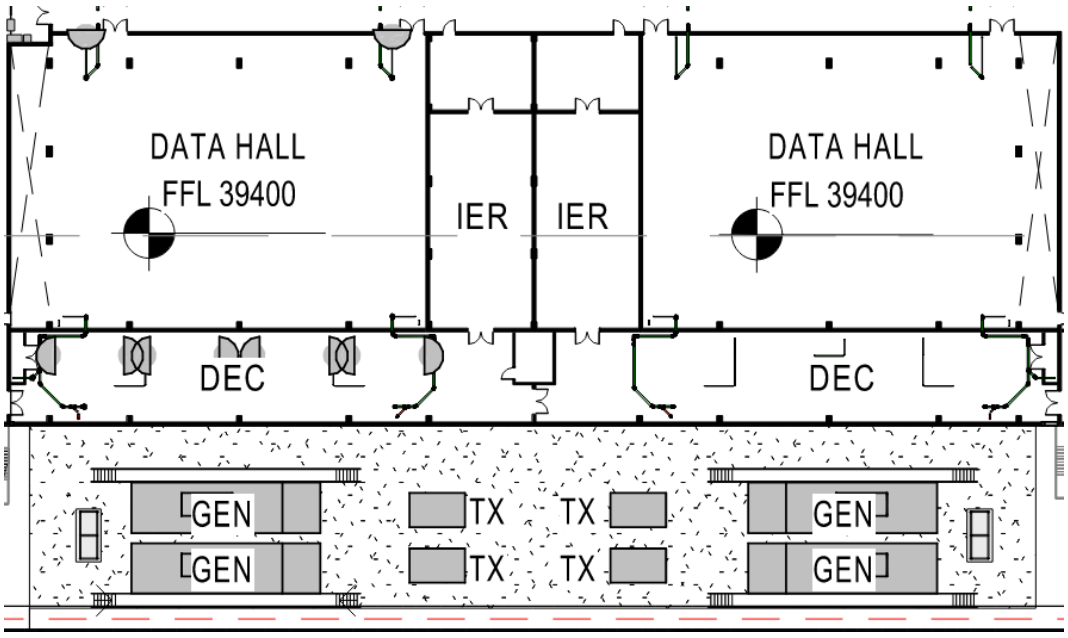

Figure 5: Indicative generator location

The details of the storage of diesel fuel for these generators can be found in Table 5 below. As the final generator supplier has not been finalised, a range of capacities has been provided.

Table 5: Diesel stored in back-up generators

Location	Number of generators	Generator capacity (kL)	Total Fuel (kL)
Data Hall	60	31	1860
Administration Building	2	6.5 - 7.5	15
Total	62	N/A	1875

While diesel is not classified as a dangerous good by the ADGC, it is a C1 combustible liquid. As such, there exists a risk of loss of control of the diesel stored in each belly tank.

This loss of control has the potential to create a cascading event with each of the generators. AS 1940 defines onsite protected places as including "…other dangerous goods stores where quantities exceed minor storage". The distance for tanks to onsite protected places is defined by Table 5.3 and 5.4 of AS 1940.

As shown in Figure 5, two generators will be placed side by side outside each data hall. As per Tables 5.3 and 5.4 of AS 1940, for stores of capacity approximately 30 kL of a C1 combustible liquid, the minimum separation distance between tanks and the building is to be at least 4.5 m. The layout shown in Figure 5 has generators with a separation distance of at least 4.5 m between generators and the building and 15 m between sets of generators. This is expected to be sufficient to prevent a cascading fire event from the diesel stored in generators.

Further, as per Section 5.9 of AS 1940, each tank storing diesel is to be separated by at least 600 mm. The sets of generators side by side in Figure 5 are separated by 800 mm in the current design. These separation requirements are summarised in Figure 6 below.

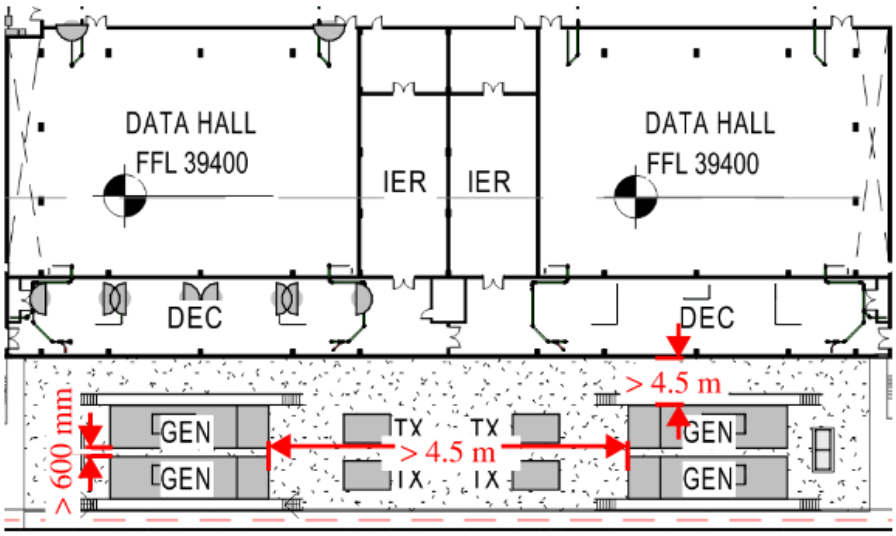

Figure 6: AS 1940 separation requirements

For generators servicing the administration building, the 6.5 - 7.5 kL of diesel in these fuel tanks is below the 10 kL threshold for separation from protected places.

In order to mitigate the risks discussed above SFAIRP, the following recommendations apply:

- The belly tanks shall comply with AS 1940.
- Specifically, the tanks shall comply with Section 5.9 of AS 1940 – Requirements for above-ground tanks with integral secondary containment.
- There shall be at least 600 mm between fuel tanks placed side by side.
- There shall be at least 4.5 m between generators and data centres.
- There shall be at least 4.5 m between sets (pairs) of generators.

Given its classification as a C1 combustible liquid (rather than a Dangerous Good) and the common place use of diesel in buildings, compliance with AS 1940 is considered sufficient to mitigate this risk.

5.3 Transformer oil

Each transformer will be designed to AS 2067-2016: *Substations and high voltage installations exceeding 1 kV a.c.* (AS 2067) and specifically, adhere to Table 6.1 of AS 2067 reproduced below. It should be noted that currently, a less combustible liquid is being considered for the transformer oil and the relevant row has been highlighted in Table 6 below.

Table 6: Clearances for outdoor transformers

Transformer type	**Liquid volume**	**Clearances to other transformers or equipment**	**Clearances to buildings**		
		Horizontal separation G_1 to other transformer or non-combustible surfaces	Horizontal clearance G_2 to combustible surfaces	Horizontal clearance G_3 to 2 hour fire resistant surfaces of buildings	Vertical extent G_4 for 2 hour fire resistant surfaces of buildings
	L	m	m	m	m
Oil-insulated transformers	100 ≤1000	1	6	1	4.5
	>1000 ≤2000	3	7.5	1.5	7.5
	>2000 ≤20 000	5	10	4.5	15
	>20 000 ≤45 000	10	20	7.5	30
	>45 000 ≤60 000	15	30	7.5	30
	>60 000	23	30	7.5	30

Less combustible liquid-insulated transformers without enhanced protection	100 ≤1000	1	6	1	4.5
	>1000 ≤38 000	1.5	7.5	1.5	7.5
	>38 000	4.5	15	4.5	15
Less combustible liquid with enhanced protection	Clearance G_1 to other transformers or building surfaces				Vertical extent G_4 for 2 hour fire resistant surfaces of buildings
	Horizontal m				Vertical m
	0.9				1.5
Dry-type transformers Fire behaviour class F_0	1.5				3.0

Adherence to AS 2067 is considered sufficient to mitigate the risks associated with transformers.

6 WHS Regulations

Section 7.1 of the WHS Regulations sets out the requirements for the use, handling, and storage of hazardous chemicals at a workplace. Specifically, this report assesses requirements for exceeding manifest and placard quantities found in Division 3 and 4 of Section 7.1, respectively.

Regulation 328(4) sets out the exclusions from Section 7.1 for hazardous chemicals in certain circumstances. Regulation 328(4)(a) excludes "hazardous chemicals in batteries when incorporated in plant". As such, the use of lithium-ion batteries at the facility is considered to be excluded from the requirements of Section 7.1.

It should be noted that Regulation 328(4)(b) excludes "fuel, oils or coolants in a container fitted to a vehicle, vessel, aircraft, mobile plant, appliance or other device, if the fuel, oil or coolant is intended for use in the operation of the device". This would also exclude diesel stored in the belly tanks of generators from the requirements of Section 7.1. However, due to the large total quantity of diesel present at the facility, it is considered best practice to follow the requirements of Section 7.1. Recommendations have therefore been made for the storage of diesel in line with Section 7.1 of the WHS Regulations.

6.1 Manifest Quantities

Regulation 348 states that the "Regulator must be notified if manifest quantities to be exceeded". The maximum allowable manifest quantity of diesel (category 4 flammable liquid) as per Schedule 11 of the WHS Regulations is 100 000 L or 100 kL. This is exceeded by approximately 1875 kL of diesel proposed to be stored onsite and therefore the regulator should be notified in accordance with Regulation 348 of the WHS Regulations.

An emergency plan should be prepared for the site and provided to the NSW Fire and Rescue as per the requirements of Regulation 361 of the WHS Regulations.

6.2 Placard Quantities

Division 4 states that outer warning placards and placards are to be displayed if placard quantities are exceeded. The maximum allowable placard quantity of diesel as per Schedule 11 of the WHS Regulations is 10 000 L or 10 kL. This is exceeded by approximately 1875 kL of diesel proposed to be stored onsite and therefore:

- Outer warning placards should be displayed at any entrance where emergency services may enter the workplace in accordance with Regulation 349 and Schedule 13 of the WHS Regulations.
- Placards should be displayed on or near the containers of diesel in accordance with Regulation 350 and Schedule 13 of the WHS Regulations.

7 Protection of the Environment Operations Act

The PoEO sets out the scheduled activities for which a licence is required. Table 7 below shows the criteria required for chemical storage to be classified as a scheduled activity and therefore requiring a licence.

Table 7: Criteria for chemical storage under the PoEO

Activity	Criteria
General chemicals storage	Capacity to store more than 20 t (pressurised gases), 200 t (liquefied gases) or 2000 t (chemicals in any other form)
Onsite generated chemical waste storage	Involves storing onsite at any time more than 5 tonnes of any chemical substance produced onsite that is prescribed waste, not including excluded material
Petroleum products storage	Capacity to store more than 200 t (liquefied gases) or 2000 t (chemicals in any other form)

General chemical storage is defined to include all chemical substances classified as dangerous goods by the ADGC. As lithium-ion batteries are classified as Class 9 DGs by the ADGC, a licence would be required if more than 2000 t of lithium-ion batteries are to be stored at the facility.

There are approximately 250 t of batteries stored onsite. This is below the 2000 t limit and so lithium-ion battery storage is not classified as a scheduled activity and a licence is not required.

There are approximately 1650 t of diesel proposed to be stored onsite. This is below the 2000 t limit and so diesel storage is not classified as a scheduled activity and a licence is not required.

As none of the criteria for chemical storage under the scheduled activities of the PoEO have been met, a licence is not required for chemical storage. A licence may be required by the PoEO for other scheduled activities such as electricity generation, but this is out of the scope of this report. More information on electricity generation as a scheduled activity can be found in Section 5.1 of the Infrastructure Requirements Report.

8 Findings and recommendations

A preliminary risk screening in accordance with SEPP 33 has been undertaken. The outcomes of this assessment are as follows:

- The site was found to be below the threshold for classification as potentially hazardous in terms of both storage and transportation and so a PHA is not required.
- The manifest quantity thresholds for diesel as set out by Schedule 11 of the WHS Regulations are exceeded.
- The placard quantity thresholds for diesel as set out by Schedule 11 of the WHS Regulations are exceeded.
- The criteria for a licence for chemical storage under the PoEO has not been met.

Arup makes the following recommendations regarding the site:

- Each room within the data centres storing battery cabinets is to be installed with the following measures:
    - A fire resistance level (FRL) of 120/120/120.
    - Adequate ventilation to relieve the off gassing of combustible gases from thermal runaway or a gas detection system.
    - Smoke detection.
    - Double knock pre-action sprinkler system.
    - The inclusion of lithium-ion batteries is to be incorporated into the overall fire safety strategy by the project fire engineer.
- The following recommendations apply to the storage of diesel fuel outside data centres:
    - The belly tanks shall comply with AS 1940.
    - Specifically, the tanks shall comply with Section 5.9 of AS 1940 - Requirements for above-ground tanks with integral secondary containment.
    - There shall be at least 600 mm between fuel tanks placed side by side.
    - There shall be at least 4.5 m between generators and data centres.
    - There shall be at least 4.5 m between sets of generators.
- The regulator should be notified of diesel storage exceeding manifest quantities in accordance with Regulation 348 of the WHS Regulations.
- The transformers shall be designed in accordance with AS 2067.
- Outer warning placards regarding quantities of diesel stored should be displayed at any entrance where emergency services may enter the workplace in accordance with Regulation 349 and Schedule 13 of the WHS Regulations
- Placards should be displayed on or near the containers of diesel in accordance with Regulation 350 and Schedule 13 of the WHS Regulations.

- An emergency plan should be prepared for the site and provided to the NSW Fire and Rescue as per the requirements of Regulation 361 of the WHS Regulations.

References

[1] Schneider Electric, “Product Specification Lithium-Ion Battery Rack Type G,” 2018. [Online]. Available: https://www.se.com/ww/en/download/document/SPD_ACOS-B27UL8_EN/. [Accessed 18 February 2021].

[2] *Work Health and Safety Regulations,* 2011.

[3] *Protection of the Environment Operations Act*, 1997.

[4] NSW Department of Planning, Industry and Environment (DPIE), *Applying SEPP 33,* : , 2011.

[5] Australian Standards, *AS 1940-2017: The storage and handling of flammable and combustible liquids,* : , .

[6] National Transport Commission Australia, *Australian Code for the Transport of Dangerous Goods by Road & Rail, Edition 7.6,* : , 2018.

[7] Australian Standards, *AS 2067-2016: Substations and high volate installations exceeding 1 kV a.c.*.