Jacobs

Brooklyn Data Centre
Preliminary Hazard Assessment

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Revision: A

Stockland
Brooklyn Data Centre

Master Planning and Development Approvals
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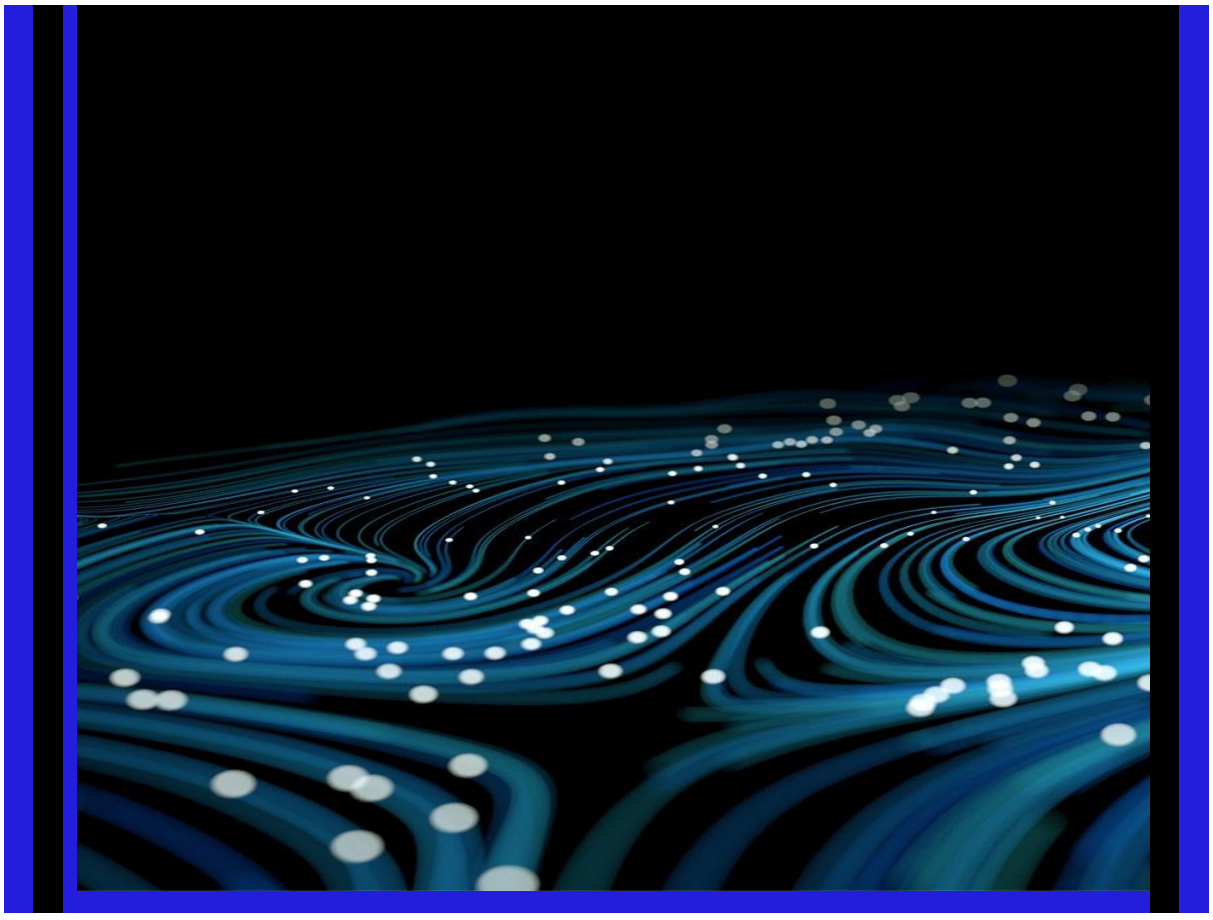

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Executive summary

Jacobs has been engaged by Stockland to undertake a Preliminary Risk Screening (PRS) and Hazard Assessment for a proposed data centre development on the site comprising 413 Francis Street, Brooklyn, Victoria, 3012 (the Project).

The preliminary design involves the construction of two, two-storey Data Centre Buildings, with a 24 hour emergency power backup supply and uninterrupted power system (UPS).

Emergency power will be provided by an estimated 112 x 3 MW diesel fuelled generators. Fuel will be stored in clusters of eight vertical aboveground tanks (approximately 100 kL each) across four separate storage compounds. The total tank capacity across the site will be 3.2 ML of diesel. And additional 1,000 L of diesel is held in the belly tank of each generator, bringing the total onsite diesel volume to 3.312 ML.

The UPS provides power during generator's start-up period and comprises approximately 113,400 lithium ion batteries, housed within 96 individual rooms. Each UPS cabinet accessed through the electrical rooms and protected by 2-hour fire-rated walls.

An application lodged with the Development Facilitation Program (DFP) under *Clause 53.22 Significant Economic Development* must include the following information, as relevant to the Project, in relation to hazards and risks:

- Provide a preliminary risk screening where there are dangerous goods and hazardous materials associated with the Project.
- 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.

Diesel is classified as a C1 Combustible Liquid and treated as a hazardous substance under the Victorian Dangerous Goods (Storage and Handling) Regulations 2022, and Occupational Health and Safety Regulations 2017, while lithium batteries are classified as Class 9 (Miscellaneous) Dangerous Goods under the Australian Dangerous Goods Code.

This assessment has been prepared to address the preliminary design of the Data Centre, including the storage and handling of identified dangerous goods, and will accompany the Development Application for the proposal. Additional risk assessment will be conducted where required, as the detailed design progresses.

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Acronyms and Abbreviations

ALARP	As Low as Reasonably Practicable
AS	Australian Standard
AS/NZS	Australian/New Zealand Standards
CASA	Civil Aviation Safety Authority
CCTV	Closed-Circuit Television
DFP	Development Facilitation Program
EPA	Victorian Environmental Protection Authority
ESD	Environmentally Sustainable Development
E-Waste	Electronic Waste
Hazardous Chemicals	Classified as hazardous in accordance with the Work Health and Safety Regulations (2011)
HAZCHEM	Hazardous Chemicals and Dangerous Goods (collectively)
HAZOP	Hazard and Operability Study
MLRA	Multi-Level Risk Assessment
PHA	Preliminary Hazard Assessment
PRS	Preliminary Risk Screening
SCADA	Supervisory Control and Data Acquisition
SMS	Safety Management Study
UN	United Nations
UPS	Uninterruptible Power Supply
VIC	Victoria (State)

1. Introduction

This report has been prepared by Jacobs on behalf of Stockland Development Pty Ltd in support of the planning permit application relating to land at 413 Francis Street, Brooklyn VIC 3012 (**the Site**). This application seeks approval for the Stage 1 portion of the land use and development (shown in image below) for a data centre (**the Project**) as shown in Figure 1-1.

Under *Clause 53.22 (Significant Economic Development) in the Development Facilitation Program*, a Preliminary Risk Screening (PRS) is required to assess the management of dangerous goods and hazardous materials associated with the Project.

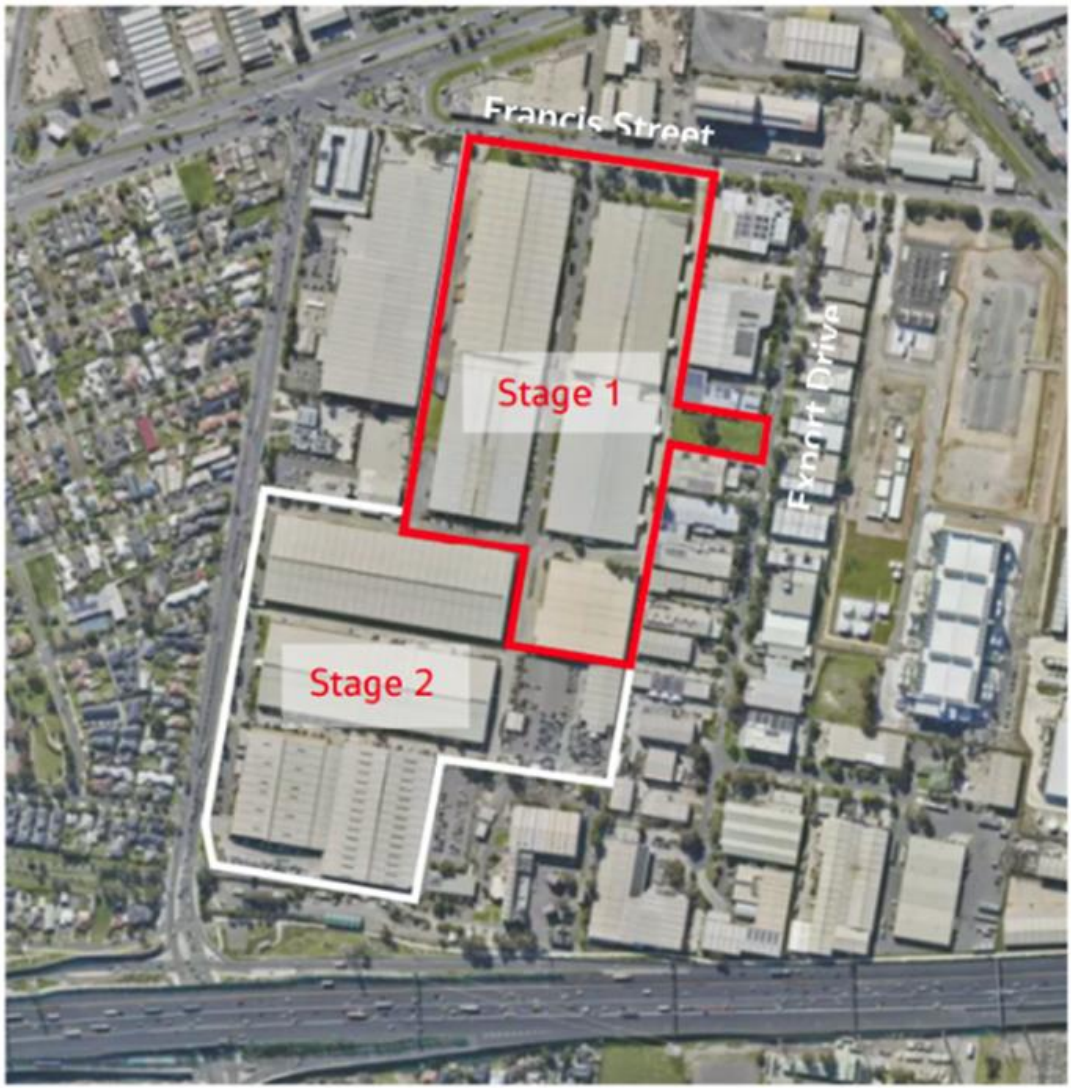

Figure 1-1 Brooklyn Data Centre Location

1.1 Purpose

The purpose of the Preliminary Hazard Analysis (PHA) is to determine whether the proposed development:

- Could affect surrounding land uses

- May generate offensive or hazardous conditions that pose an unacceptable level of risk to nearby communities or
- Could itself be exposed to hazards arising from existing activities in the area.

Given the volume of diesel to be used and stored onsite and the number of lithium-ion batteries for the Project, a PHA has been conducted.

1.2 The Project

The Project will be located on approximately 10-hectare portion of a larger ~22-hectare site at 413 Francis Street, Brooklyn, within an established industrial precinct in Melbourne's west.

The Project seeks the staged use and development of a two-storey data centre (250MVA ultimate power capacity) pursuant to the Industrial 1 & 3 Zones. To facilitate these works, the existing warehouse buildings and associated hard stand/car parking area are to be removed. Early works approval will be sought to undertake bulk earthworks across the Site, including the preparation of leveling of the Site to allow AusNet to deliver the substation (utility installation). It is noted that substation area will be subject to separate planning approvals and the use and development associated with the substation will be subject to a separate approval prepared by AusNet.

This application meets the relevant eligibility criteria to be considered under the Development Facilitation Program where the Minister for Planning will be the Responsible Authority pursuant to Clause 53.22 of the Planning Scheme.

In particular, the Project seeks permission for the staged delivery of two, two-storey data centre buildings, generally comprising the following buildings and works:

- Bulk earthworks for site preparation and leveling (early works approval sought);
- Construction of two-storey data centre buildings with a building height of 18.3 metres, with an additional 7.2 metres of building services for plant and chiller equipment (combined maximum height of circa 25.5 metres);
- The buildings comprise a total gross floor area of circa 75,000 square metres across the two storey data halls and ancillary offices, with additional associated major plant open structures (housing generators and chillers);
- Vehicle ingress and egress is proposed centrally along the Site's frontage to Francis St, with circa 110 car parking spaces provided at the frontage of the two data centre buildings;
- Removal of some vegetation to accommodate the functional parameters of the proposed data centre and substation development;
- Additional landscaping provided in the front setback of the building, scattered throughout the Site and to the office entry of each building, providing an improved landscape response; and
- Provision of required utilities, including diesel generator back up power system, associated fuel storage systems, fire pump and associated water tanks.

The proposed data centre seeks to provide much needed AI integration, data, content and cloud services to address the emerging demand for cloud computing services.

The Project's design has been shaped by technical assessments and stakeholder feedback, ensuring a balanced approach to development. The Project seeks to provide a strategic response to the existing and emerging character through provision of an improved built form and landscape response.

Refer to Figure 1-2.The emergency power supply also includes an Uninterrupted Power System (UPS) to provide power during generator start-up. The UPS system comprises approximately 113,400 lithium iron batteries, housed within 96 individual rooms, each accessed through the electrical rooms and protected by 2 hour fire rated walls.

No processing activities other than the electronic storage of data are to be conducted at the facility. It is expected the site will operate 24 hours per day, 7 days per week.

The redevelopment will accommodate a secure data storage facility with ancillary administration spaces, backup power infrastructure, and associated site upgrades, ensuring compatibility with both current industrial usage patterns and future precinct evolution.

Figure 1-2 Brooklyn Data Centre Layout Plan

The emergency power supply includes an Uninterrupted Power System (UPS) to provide power during generator start-up. The UPS system comprises approximately 113,400 lithium ion batteries, housed within 96 individual fire rated rooms, each accessed through the electrical rooms and protected by 2 hour fire rated walls.

No processing activities other than the electronic storage of data are to be conducted at the facility; however, it will operate continuously 24 hours per day, seven days per week.

The Project will accommodate a secure data storage facility with ancillary administration spaces, backup power infrastructure, and associated site upgrades, ensuring compatibility with both current industrial usage patterns and future precinct evolution.

1.3 Fuel Storage and Handling

The generators will be supplied with diesel from four onsite fuel storage compounds, comprising 3.2 ML of total fuel storage capacity, arranged in four separate storage compounds, with clusters of eight x 100 kL vertical aboveground tanks in each compound. The tanks will be designed and constructed to comply with *AS 1940:2017 – The storage and handling of flammable and combustible liquids* and *AS 1692:2006 – Fabrication and construction of steel tanks*.

The key design features considered when planning the fuel storage and transfer system include:

- Use of above ground storage tanks, which simplifies monitoring, maintenance and replacement when compared with underground tanks
- Vertical orientation of the tanks, which provides a more spatially efficient footprint compared to horizonal tanks
- Use of double-skinned tanks which reduces the need for large physical bunded structures around each tank compound. The tanks' design will comply with AS1940 requirements for self-bunded tanks, including level gauging, interstitial leak detection, high and high-high level alarms and emergency shut-off controls.
- Partitioning of fuel storage across four independent locations to reduce fire load and safely reduce the required separation distances from onsite structures and the offsite high pressure gas pipeline (refer to Section 1.6)
- Redundancy of N+1 tank arrangement provided in each fuel compound
- The tank compounds will meet the requirements for a four-hour fire rating which increases system resilience, and further reduces the potential for impact to / from the offsite high pressure gas pipeline
- Support functions are centralised at each location to provide efficient N+1 redundancy at this scale. This includes the fuel pump stations; electrical, control and monitoring systems; fuel polishing systems; leak detection and spill management; and inventory management
- The fuel piping layout is still being determined but will likely comprise a network of aboveground pipes, compliant with *AS2885 – High Pressure Pipelines* (which includes pipes used to transfer petroleum hydrocarbons)
- The aboveground pipelines will supply fuel to generator banks local to each compound. This avoids large distances of N+1 pipe routes and the risks associated with fuel leaks from underground lines
- The pipework will link each individual tank and associated transfer pumps to the generator banks. Transfer of fuel between the individual storage tanks will not occur in accordance with *AS1940 (5.9.2)*
- Localised secondary containment will be provided around the tank fill point, each fuel transfer pump at any flange or valve along the fuel pipeline
- A dedicated fuel delivery bay will be provided at each tank compound. This includes localised secondary containment discharging though an oily water separator (OWS) to ensure spills are contained and isolated from the stormwater network
- The OWS (SPEL Puraceptor or approved equivalent) has been sized to contain 110% of an 18,000 L fuel tanker, (i.e. 19,800 L).
- Information on the tank volumes and fuel transfer activities will be visible locally at each compound and in a centralised control room.

Each generator will have integral secondary containment (double walled) and will hold around 1,000 L of diesel in a belly tank. This adds an additional 0.112 ML of diesel to the site's 3.2 ML bulk storage capacity (3.3112 ML in total).

1.4 Existing Onsite Infrastructure

The Site is currently operating as the Brooklyn Distribution Centre. The primary built infrastructure includes:

- Warehouse buildings and distribution centres
- Associated hard stand/ car parking area.

It is largely paved with limited landscaping and vegetation. Hardstand areas across the Site are used for internal roads, loading areas, material storage and car parking.

The existing warehouse buildings and associated hard stand/car parking area are to be demolished to allow the construction of the facility and an onsite substation (scope being managed by others). It is noted that this will be subject to separate building approvals prior to demolition works on site.

1.4.1 Stormwater Management

The legal point of discharge (LPOD) for the site is understood to be via the existing open stormwater culvert drainage channel, which ultimately discharges to the existing Council stormwater network within Francis Road (refer to Figure 1-3) indicating the assumed area of LPOD from the stormwater design for the existing site). Topographical survey of the existing site has been undertaken and used to identify the invert level for the adjacent open channel, with a preliminary level of approximately 16.21 mRL adopted for planning-stage design.

The proposed Finished Floor Levels (FFL) for both data centre buildings and associated carparking areas are set well above the 1% AEP flood levels identified by Melbourne Water, ensuring that the development remains resilient to overland flow and broader regional flooding. No flooding impacts are expected within the Site.

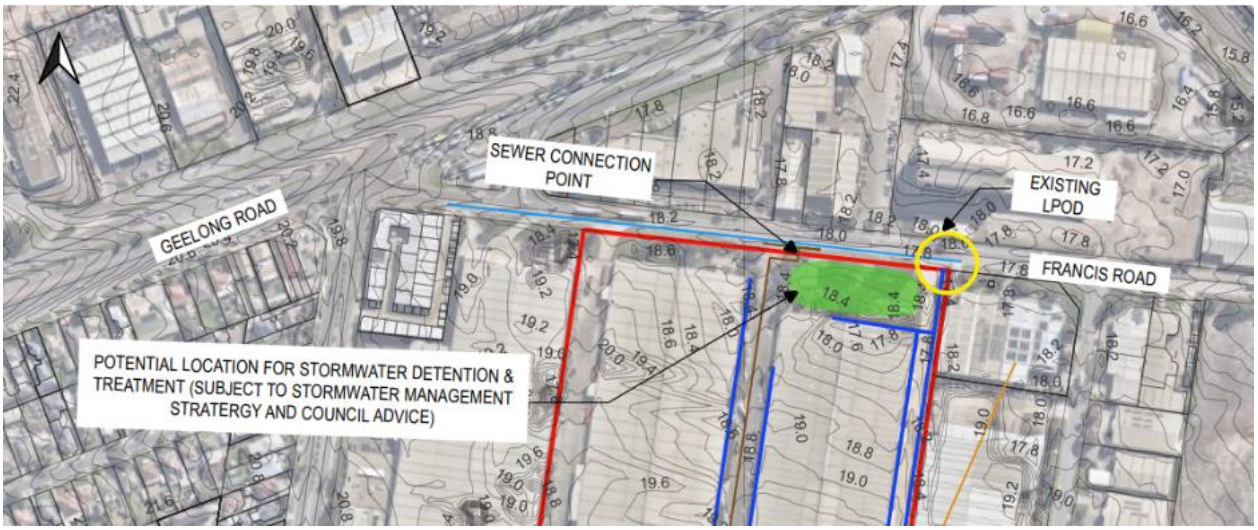

Figure 1-3 Stormwater Discharge Point

To address water quality objectives, the Project implements a Water Sensitive Urban Design (WSUD) treatment train, including bioretention systems, grassed swales, and a total of 30,000 L of rainwater storage across the two buildings. These measures ensure compliance with the Best Practice Environmental Management Guidelines (BPEMG), with MUSIC modelling confirming pollutant reduction targets for Total Suspended Solids, Total Phosphorus, Total Nitrogen, and gross pollutants are all met or exceeded.

Additional risk management measures due to onsite fuel storage and generators include bunding for the fuel areas, double skinned belly tanks for the emergency generators, and oil water separators installed at high-risk locations to prevent any hydrocarbon contamination entering the stormwater network.

1.5 Surrounding Land Use

The Site is located within an established industrial precinct in Brooklyn, surrounded by industrial land to the north, east, and south. To the west, beyond Millers Road, the land is zoned for residential use. The Site is identified as existing state significant industrial land and is split across two industrial zones and an overlay:

- Industrial 1 Zone (IN1Z) – Eastern portion of the Site
- Industrial 3 Zone (IN3Z) – Western portion of the Site
- Special Building Overlay (SBO) – Northern boundary.

The nearest sensitive receivers are located 170m to the west of the site, 675 m to the east on Francis Street, as shown in **Figure 1-4**.

Figure 1-4 Surrounding Land Use and Potentially Sensitive Receptors

1.6 High-Pressure Gas Line Adjacent the Site

A high-pressure gas transmission pipeline is present within the vicinity of the site, along the northern site boundary, as shown in **Figure 1-5**. This introduces a potential interaction between a hazardous facility (the Project) and existing pipeline infrastructure. Operations around such infrastructure must comply with *AS/NZS 2885 – Pipelines – Gas and liquid petroleum.*

The shortest distance between the existing high pressure gas pipeline and the proposed diesel storage compounds is approximately 120 metres, which occurs between the high-pressure natural gas pipeline located along the northern site boundary (Francis Street) and the proposed storage in building 1.

The pipeline presents a potential offsite hazard that may impact the facility, and operations around such infrastructure must comply with *AS/NZS 2885 – Pipelines – Gas and liquid petroleum*.

The Project's risk-mitigation strategy is to avoid storing fuel in bulk in proximity to the gas pipeline. The design intent is to distribute the fuel across four separate locations throughout the site, using five fire-rated fuel tanks, to reduce the potential for a major incident.

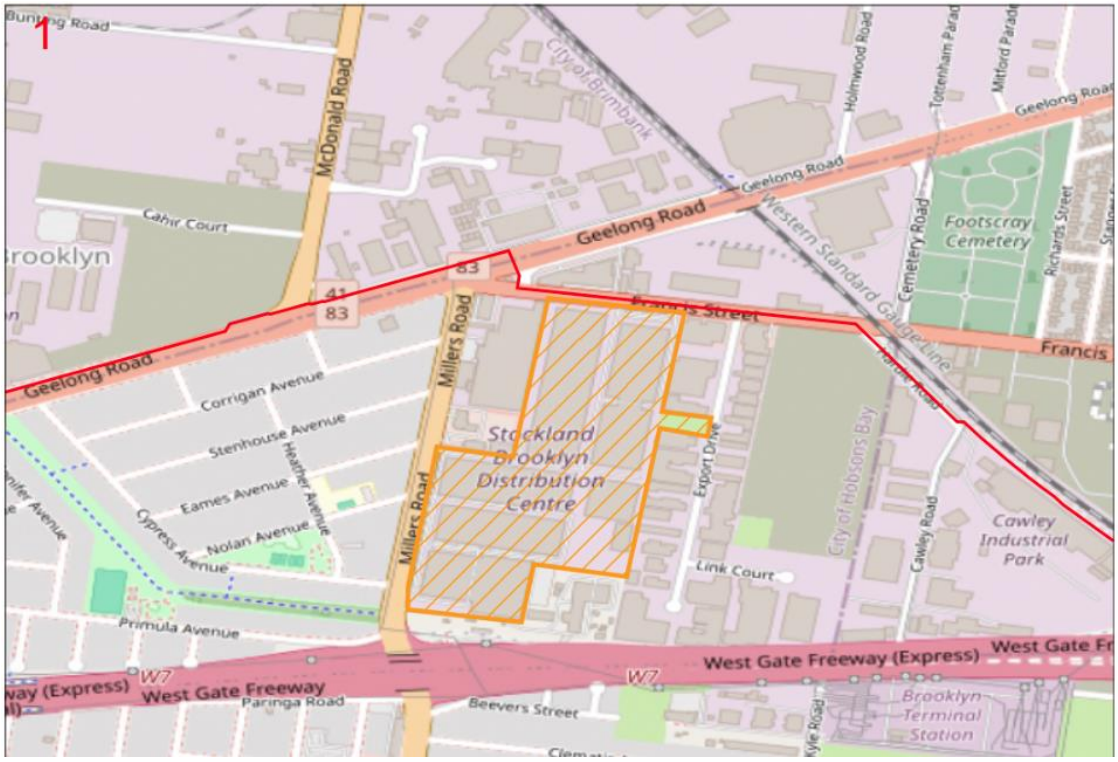

Figure 1-5. APA high pressure gas transmission pipeline (red) in relation to the Project (orange hashing).

2. Methodology

2.1 Overview

The PRS assesses the potential human health and environmental risks associated with the site, based on available proposal documentation and specialist technical reports relevant to the development. The screening considered the following aspects:

- Air Quality
- Groundwater and Soil Contamination
- Noise
- Water Management
- Waste Generation and Handling
- Visual Amenity and Landscape Character
- Bushfire
- Security
- Traffic
- Human Health.

The objective of the screening process is to identify potential risks and confirm that appropriate mitigation measures and controls have been identified.

2.2 Legislation and Standards

The PRS has been undertaken based on the types and quantities of dangerous goods proposed to be stored or used on site and the potential impact the site may have towards human health and the environment. This screening process is guided by the applicable Victorian legislative and regulatory framework governing dangerous goods and the environment, including the:

- *AS 1692:2006 – Fabrication and construction of steel tanks*
- *AS 1940:2017 – The storage and handling of flammable and combustible liquids*
- *AS/NZS 2885 – Pipelines – Gas and liquid petroleum*
- Australian Dangerous Goods Code (for Transport by Road or Rail)
- *Dangerous Goods Act 1985, Part IV Information on dangerous goods at licensed premises*
- Dangerous Goods (Storage and Handling) Regulations 2022, Schedule 2 – Quantities of Dangerous Goods
- *Environmental Protection Act 2017, Section 25 – General Environmental Duty*
- EPA Guidelines for the Storage and Handling of Liquids, 2025 (Pub1698)
- NSW Department of Planning and Environment (DPE) Hazardous Industry Planning Advisory Paper (HIPAP) documents
- *Occupational Health and Safety Act 2004*
- Occupational Health and Safety Regulations 2017
- Victorian Planning and Environment Regulations, 2015
- Victorian Fire Rescue Victoria (FRV) Fire Safety Guideline GL-55.

2.3 Preliminary Risk Screening

The types and volumes of dangerous goods / hazardous substances (HazChem) anticipated to be stored / used on the Site were identified based on the concept design documents. The only bulk HazChem items were determined to be:

- Diesel fuel stored in 32 aboveground vertical tanks (100 kL each) located in four bunded compounds, as well as minor amounts in genset belly tanks and supply pipelines

- Approximately 113,400 lithium iron batteries, housed within 96 individual rooms, protected by 2-hour fire rated walls

Other HazChem identified include:

- 1,000 L diesel in the belly tank of each generator (0.112 ML total)
- Minor quantities of diesel for the back-up generators supporting the fire water pumps (sufficient to provide a minimum of 60 L/min water for 60 min across 18 sprinklers)
- Minor quantities of compressed nitrogen gas present in the firewater sprinkler pipelines to prime the sprinkler heads
- Minor quantities of maintenance and housekeeping chemicals (oils, cleaning materials etc).

The proposed chillers are air cooled and will not require liquid or gaseous refrigerants, and the water-cooling system is designed to be an enclosed loop with limited treatment (e.g. anti corrosion) required.

2.4 Preliminary Hazard Assessment

A Preliminary Hazard Assessment (PHA) was also completed for the development application to provide an early, systematic appraisal of the hazards associated with the Project, and to determine the level of risk posed to surrounding land uses.

The assessment is made up of two complimentary components:

- **Hazard Analysis**, which identifies credible hazard sources associated with site activities and
- **Multi-Level Risk Assessment** (MLRA), which determines the depth of risk evaluation required.

2.4.1 Hazard Identification

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.

Key considerations 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 use
- the interactions of these factors.

2.4.2 Multi-Level Risk Assessment

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.

The three assessment levels are:

Level 1: A 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: A full quantitative analysis.

The following three stages are used in the assessment process:

- Preliminary screening
- Risk classification and prioritisation
- Risk analysis and assessment.

The PHA estimates the cumulative risks from the existing and proposed development to determine the level of risk to people, property and the environment surrounding the site and in the presence of controls.

This report addresses the Level 1 and Level 2 assessments and makes recommendations for Level 3 assessments where appropriate.

3. Preliminary Risk Screening

3.1 Dangerous Goods Inventory

The types and volumes of dangerous goods / hazardous substances (HazChem) anticipated to be stored / used on the Site were identified based on the concept design documents. The only bulk HazChem items were determined to be:

- Diesel which is classified as a C1 combustible liquids and is not classified as a dangerous good under the Australian Dangerous Goods Code. However, diesel is considered a dangerous good under Victorian Dangerous Goods (Storage and Handling) Regulations 2022, when stored in bulk
- Lithium-ion batteries are a Class 9 Miscellaneous dangerous substances and articles under the Australian Dangerous Goods Code. However, they are not considered to be dangerous goods while in use under the Victorian Dangerous Goods (Storage and Handling) Regulations 2022. Any spare batteries held onsite would be classified and managed as Class 9 Dangerous Goods.

The HazChem quantities are provided in Table 3-1 and were assessed against the relevant regulatory thresholds listed in Schedule 2 of the Dangerous Goods (Storage and Handling) Regulations 2022 including:

- Placard Quantities (Column 4)
- Manifest Quantities (Column 5)
- Fire Protection Quantities (Column 6)

The dangerous goods proposed for the Project are presented in Table 3-1.

Table 3-1 Dangerous Goods

Substance	Hazardous Class	Total Storage on Site	Placard Quantity	Manifest Quantity	Fire Protection Quantity
Diesel	C 1	3,312,000 L (tanks and generator storage)	10,000 L	100,000 L	100,000 L
Lithium Batteries	UN Class 9 Packing Group II	Dependent on battery type. Expected to exceed 20,000 kg	1,000 kg	10,000 kg	20,000 kg

Both the proposed diesel storage volume and quantity of lithium-ion batteries are expected to exceed the Schedule 2 trigger for Placard Quantities, Manifest Quantities and Fire Protection Quantities.

Where Placard quantities are exceeded "*the occupier of those premisses must ensure that a "HAZCHEM" outer warning placard as specified in Schedule 4 is displayed—*"

Where Manifest Quantities are exceeded, a manifest must be maintained that complies with section 30(1) of the Act.

Where Fire Protection Quantities are exceeded, the occupier must:

> (a) request the written advice of the emergency services authority, in relation to the design of the fire protection system for the premises; and

(b) in establishing the fire protection system for the premises, have regard to that written advice.

A Preliminary Hazard Assessment (PHA) has been conducted for the diesel and lithium-ion battery storage to identify and minimise associated hazards. A comprehensive assessment (HAZOP) will be conducted during detailed design to ensure the recommendations from the PHA are addressed.

3.2 Dangerous Goods Transport

During operation, diesel transport and tank refuelling will be infrequent, with significant quantities only required in the event of an extended electrical power outage.

Generators will be periodically run for planned and/or corrective maintenance. This will include three-monthly maintenance checks in accordance with *AS/NZS 3010 Electrical installations - Generating sets*. Refuelling would occur after such events to ensure stocks remain at the required level.

The drainage from each fuel tanker delivery bay will be discharged through an oil water separator (SPEL Puraceptor or approved equivalent) to ensure any spills are contained and isolated from the stormwater network. Each OWS has been sized to contain 110% of an 18,000 L fuel tanker, (i.e. 19,800 L).

Only appropriately licensed drivers and registered vehicles will be engaged to delivery diesel to the site. Procedures regarding the safe delivery and handling of diesel fuel for the Project will be established and followed.

3.3 High-Pressure Natural Gas Pipeline

Under *AS/NZS 2885 – Pipelines – Gas and liquid petroleum,* new hazardous facilities (including bulk fuel storage) are prohibited from being developed within a pipeline's safety management zone, unless a formal safety assessment can demonstrate the risk is managed to a tolerable level.

Separation distances between high-pressure gas transmission pipelines and new hazardous facilities are not fixed and are determined by:

- pipeline diameter
- maximum operating pressure
- wall thickness
- population density
- type of nearby facility (fuel tanks are considered high consequence facilities).

Additionally, *Clause 4* (General Siting) and *Clause 5* (Tank Installation) of *AS 1940:2017* requires that tanks are not to be located where a credible external event (e.g. pipeline rupture) could escalate the consequences.

Additional rules and restrictions are expected to apply within the pipeline easement during the construction phase of the project, including requirements to maintain safe separation distances from heavy machinery and other construction activities.

The design and location of the bulk fuel storage compounds has been aligned with the pipeline owner's (APA) *Site Planning and Landscape National Guideline*s. APA will be consulted during the detailed design stage to confirm that the proposed design, construction and operational risk mitigation measures associated with the bulk fuel storage compounds are acceptable.

Additional rules and restrictions are expected to apply within the pipeline easement during the construction phase of the project, including requirements to maintain safe separation distances from heavy machinery and other construction activities.

3.4 Human Health and Environment

The screening assessment of human health and environmental aspects informs the PHA, ensuring that relevant risks and required controls are appropriately addressed.

Table 3-2 Summary of PRS

Risk	Source	Proposed Mitigation	Risk Rating
Air emissions (particulate matter (PM2.5, PM10), nitrogen oxides, and other pollutants)	Diesel fuelled emergency generators	▪ Use modern, low-emission generators compliant with Australian air standards ▪ Limit test runs to scheduled low-impact periods ▪ Install high-efficiency exhaust treatment (e.g. diesel particulate filtration) ▪ Provide redundancy in power systems to reduce generator use	Low
Air Plume Rise	Vertical velocity of diesel exhaust	▪ Use of emergency generators used in the plume rise screening assessment ▪ Submission of CASA Form 1247, including all required meteorological data, to an independent aviation safety assessment and verification.	Low
Soil contamination	Accidental spills or releases of hydrocarbons, oils and coolants from construction plant and equipment	▪ Use double-walled aboveground storage tanks with bunding sized to 110% of tank capacity-walled above-ground storage tanks with bunding sized to 110% of tank capacity ▪ Install SCADA-based leak detection and monitoring-based leak detection and monitoring ▪ Implement an Emergency Management Plan ▪ Confirm receiving facilities for off-site soil disposal are lawful for Category D waste	Low
Groundwater contamination	Existing groundwater with concentrations above screening levels from background sources, off-site inputs (PFAS, chlorinated hydrocarbons) or historical USTs	▪ Given groundwater depth and nature of the Project, impacts are unlikely ▪ Undertake intrusive investigation during UST removal to confirm whether contamination management is required	Low
Noise	Rooftop chillers and emergency generators	▪ Evaluate low-noise chiller units ▪ Assess relocation of chiller plant to ground level with building shielding ▪ Implement engineered generator noise controls achieving ≥5 dB reduction	Low

Risk	Source	Proposed Mitigation	Risk Rating
		▪ Provide hearing protection for workers near generators ▪ Assess feasibility of 30–35 dB attenuation for any non-emergency generator operation.	
Odour	None	None	Nil
Water	Cooling systems, potable water use, stormwater runoff	▪ Install high-efficiency fixtures, metering and monitoring ▪ Use closed-loop cooling systems ▪ Incorporate rainwater harvesting and non-potable water reuse (subject to assessment) ▪ Implement WSUD features and permeable surfaces to manage stormwater ▪ Use native, low-maintenance landscaping to reduce irrigation	Low
Waste generation and handling	Construction activities, data centre operations, regulated materials, and e-waste	▪ Implement Waste Management Plan and ESD report requirements ▪ Segregate waste streams using compliant containers and colour-coded systems ▪ Provide secure indoor storage for e-waste and batteries ▪ Use licensed contractors for removal of regulated waste and disposal at lawful EPA-approved facilities ▪ Maintain waste registers, inspections and monitoring ▪ Manage construction waste under a CEMP ▪ Target 85% diversion of construction and demolition waste from landfill	Low
Amenity and Landscape Character	Visual prominence of built form and changes to surrounding landscape character	▪ Retain existing vegetation where practicable ▪ Use native, low-maintenance landscaping ▪ Apply WSUD features to enhance visual integration ▪ Position plantings to soften built form and maintain sightlines	Low

Risk	Source	Proposed Mitigation	Risk Rating
		▪ Enhance street-facing edges with additional vegetation	
Bushfire	Regional context and site location (not within Bushfire Management Overlay/not within designated Bushfire Prone Area)	▪ Maintain vegetation and structure separation in accordance with standard commercial/industrial requirements	Low
Security	Construction and operational activities introducing potential unauthorised access or interference with critical infrastructure	▪ Implement Masterplan security framework ▪ Apply layered perimeter and building security controls ▪ Use access control, CCTV and monitoring systems ▪ Apply security zoning (Zones 1–5) to restrict access to sensitive areas ▪ Provide reinforced building envelope protections and vehicle barriers	Low
Traffic	Construction vehicle movements, operational staff movements, occasional heavy vehicle deliveries/waste management/ diesel fuel delivery	▪ Implement traffic management measures during construction ▪ Conduct updated traffic surveys and inspections ▪ Manage deliveries outside peak periods where practicable ▪ Confirm adequate road network capacity ▪ Prepare construction traffic management plan	Low

A Fire Safety Study will be completed as part of the detailed design.

3.5 Preliminary Risk Screening Conclusions

The volume of diesel stored onsite and the presence of lithium ion batteries exceed outlined in the Dangerous Goods (Storage and Handling) Regulations 2022, Schedule 2 – Quantities of Dangerous Goods. Additional detailed assessment in the form of a PHA was completed for these materials, as summarised in Section 4.

The risk associated with the location of the high-pressure gas pipeline is also addressed in the PHA. The current design seeks to mitigate hazards by distributing the diesel storage across four engineering designed tank compounds, rather than utilising a single large tank in close proximity to the pipeline. This also reduces the extent of fuel distribution piping required to transfer fuel from a centralised storage system across the facility.

As detailed design progresses and additional fuel-tank specifications become available, further risk-mitigation measures will be examined. This will include a HAZOP assessment providing an opportunity to more precisely define site tolerances and design parameters.

The pipeline operator (APA) will be involved in the process to determine whether the current controls reduce risk to ALARP or if further mitigation measures are required, with consultation outcomes to be reported accordingly.

Based on the findings contained with the relevant proposal documents and specialist reports, potential human health and environmental risks associated with the site were assessed as **Low**.

4. Preliminary Hazard Analysis

The hazards identified in the PRS that warrant further assessment in the form of a PHA were the following:

- diesel storage and use on site
- lithium-ion Batteries

Hazards relating to the separation distance between the high-pressure gas transmission pipeline and the proposed onsite diesel storage will be assessed separately if required, following consultation with APA.

Although human health and environmental risks were assessed as Low, they have been included in the PHA for completeness and to ensure a comprehensive evaluation of the proposed development.

4.1 Methodology

The process adopted for assessing hazardous impacts involved the following steps:

Step 1: Hazard identification (i.e. PRS)

Step 2: Hazard analysis (consequence and probability estimations)

Step 3: Risk evaluation and assessment against specific criteria.

The following sections of the report discuss the hazard identification and analysis process.

4.2 Hazard Identification

Hazard identification was the first step in the risk assessment (Section 3). It involved the identification of the theoretically possible hazardous events as the basis for further quantification and analysis. Identification did not imply that the hazard or the theoretically possible impact, would occur. Essentially, it identified the characteristics and nature of hazards to be further evaluated in order to quantify potential risks.

4.2.1 Hazard Analysis

After a review of the events identified and the prevention/protection measures incorporated into the design of the Project, events which are considered to have the potential to result in impacts off-site or which have the potential to escalate to larger incidents will be addressed in the detailed design.

4.2.2 Consequence Estimation

Consequence estimation involves the analysis and modelling (where appropriate) of credible events from the hazard identification process 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.

4.2.3 Probability / Likelihood Estimation

Where necessary, the likelihood of an incident is determined by adopting probability and likelihood factors derived from Jacobs' experience in similar projects and publicly available data.

4.2.4 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 together with the likelihood's estimated are then compared

against the accepted criteria. Whether it is considered necessary to conduct the predictions would depend on the likelihood estimated and if the risk criteria are exceeded.

4.2.5 Risk Criteria

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.

Residual risk should be "as low as reasonably practical" (ALARP). This principal involves weighing the costs of extra safety measures 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 risk criteria reflect three bands as shown in Figure 4-1:

- Negligible: provided other individual criteria are met, societal risk is not considered significant.
- Intolerable: the activity is considered undesirable, even if individual risk criteria are met.
- ALARP: the emphasis is on reducing risks as far as possible towards the negligible boundary. Provided other quantitative and qualitative criteria are met, the risks from the activity would be considered tolerable in the ALARP region.

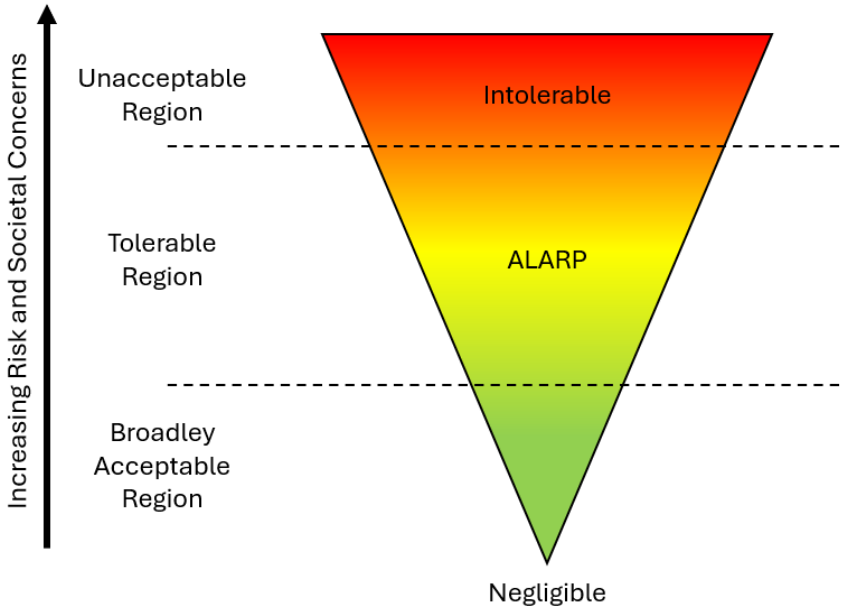

Figure 4-1 ALARP Triangle

The risk assessment 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 4-1 and Table 4-2.

Table 4-1 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

Table 4-2 Qualitative Consequence Rating

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

The overall risk rating and ALARP criteria are shown in Table 4-3.

Table 4-3 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 are:

- avoidance of risk
- reduction of high consequence events wherever practicable, even where the likelihood is low
- containment of the effects of significant events, wherever possible, within the site boundary
- development should not pose any incremental risk

The siting of an installation must also consider the potential for propagation of an accident causing a "domino" effect on adjoining premises. This risk may occur in an industrial estate where the siting of hazardous materials on one site may potentially cause hazardous materials on an adjoining premises to intensify the overall impact of the event.

4.2.6 Incident Scenarios and Control Measures

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 assessed in Table 4-4.

The control measures recommended are designed to maintain and contain the risks within the site boundaries and reduce the risk to receptors outside the boundary.

The proposed technical and management safeguards reflect industry good practice and are readily implemented as part of the Safety in Design process.

Table 4-4 Summary of Potential Major incident Scenarios & Residual Risk after Implementation of Controls

Hazard / Incident	Scenario	Likely Consequences	Controls	Likelihood	Consequence	Residual Risk
Site Initiated Fire	Fire starts in lithium battery storage. Failure of lithium ion battery protection systems leading to thermal runaway, fire and spread to other batteries.	Potential for fire to spread and for diesel to act as accelerant. Potential for downwind irritation from smoke plume. Localised radiant heat effects.	**A fire safety study will be completed as part of the detailed design** Lithium battery storage is installed and maintained as per manufacturers requirements and follows relevant regulatory requirements. Facility has appropriate fire control systems in place. Emergency evacuation plans in place.	Unlikely	Major	ALARP
Site Initiated Fire	Fire starts in a generator	Potential for fire to spread and for diesel to act as accelerant. Potential for downwind irritation from smoke plume. Localised radiant heat effects.	**A fire safety study will be completed as part of the detailed design** Generators installed and maintained as per manufacturers requirements and follows relevant regulatory requirements. Facility has appropriate fire control systems in place. Emergency evacuation plans in place.	Unlikely	Major	ALARP
Site Initiated Fire	Electrical systems, arching, over-heating, short circuiting, etc	Potential for fire to spread and for diesel to act as accelerant. Potential for downwind irritation from smoke plume. Localised radiant heat effects.	**A fire safety study will be completed as part of the detailed design** Electrical systems installed and maintained as per manufacturers requirements and follows relevant regulatory requirements. Facility has appropriate fire control systems in place. Emergency evacuation plans in place.	Unlikely	Major	ALARP

Hazard / Incident	Scenario	Likely Consequences	Controls	Likelihood	Consequence	Residual Risk
Site Initiated Fire	Fire starts in another section of the site and impinges on diesel storage and lithium batteries.	Potential for fire to spread and for diesel to act as accelerant. Potential for downwind irritation from smoke plume. Localised radiant heat effects.	**A fire safety study will be completed as part of the detailed design** Facility has appropriate fire control systems in place. Emergency evacuation plans in place.	Unlikely	Major	ALARP
Offsite initiated Fire	Fire starts off site, moves on site and impinges on diesel storage and lithium batteries.	Potential for fire to spread within the site and for diesel to act as accelerant. Potential for downwind irritation from smoke plume. Localised radiant heat effects.	**A fire safety study will be completed as part of the detailed design** Facility has appropriate fire control systems in pace. Emergency evacuation plans in place.	Unlikely	Major	ALARP
Dangerous Goods Transport (Soil & GW Impact)	Transportation accident releases diesel on route to site	Traffic accident resulting in spillage and possible environmental pollution.	Only appropriately licenced contractors and vehicles will be used to transport dangerous goods Driver Code of Conduct implemented. UN number and Dangerous Goods Class information clearly displayed on trucks. Material Safety Data Sheet (MSDS) and other relevant information retained by driver and relevant Project Site personnel. Effective communication between driver and site personnel established. Emergency Management Plan implemented. The Plan will include the following. • Advise emergency services of the spill. • Isolate the spill area (if possible).	Rare	Moderate	Tolerable

Hazard / Incident	Scenario	Likely Consequences	Controls	Likelihood	Consequence	Residual Risk
Release of Dangerous Goods (Soil & GW Impact)	Mechanical failure leads to the accidental release of diesel on site.	Possible environmental pollution	UN number and Dangerous Goods Class information clearly displayed on Storage tanks. Material Safety Data Sheet (MSDS) and other relevant information retained by relevant Project Site personnel. Emergency Management Plan implemented. The Plan will include the following. • Advise emergency services of the spill. • Isolate the spill area (if safe to do so). Bunding of fuel storage area with 110% minimum capacity.	Rare	Moderate	Tolerable
Running of Gensets (Emergency)	Loss of mains power results in the extended use of onsite gensets until power is restored.	Potential for downwind irritation from generator exhaust. Potential for elevated noise levels.	Modern low-emission generators compliant with AU standards. High-efficiency exhaust treatment systems. Integrating multiple redundancy power systems to reduce generator reliance. Acoustic treatment for generators.	Possible	Minor	Tolerable
Running of Gensets (Maintenance)	Scheduled maintenance activities require short term operation of gensets.	Potential for downwind irritation from generator exhaust. Potential for elevated noise levels during maintenance activities.	Modern low-emission generators compliant with AU standards. High-efficiency exhaust treatment systems. Acoustic treatment for generators. Maintenance activities restricted to daytime hours.	Unlikely	Insignificant	Tolerable
Cooling Tower operation	Continuous use of on-site cooling towers.	Potential for elevated noise levels.	Acoustic treatment for cooling towers.	Unlikely	Minor	Tolerable

Hazard / Incident	Scenario	Likely Consequences	Controls	Likelihood	Consequence	Residual Risk
		Potential for unsustainable water use.	Adoption of high efficiency air-cooled systems and a closed-loop water system.			
Waste Generation	Generation of operational, construction, hazardous (E-waste) waste.	Potential that improper handling and disposal could lead to contamination and/or data loss. Potential for unsustainable or unnecessary waste generation.	Waste management plan. Segregation and colour-coded system for waste. Secure storage for hazardous waste such as e-waste and batteries. Licenced contractors who use EPA approved facilities to dispose of waste. Collection and review of waste generation metrics.	Unlikely	Minor	Tolerable
Visual Amenity and Landscape Character Impact from Site	Site development negatively altering community visual amenity and character.	Potential reduced visual quality from public viewpoints. Potential decrease in surrounding property sale value.	Native, low-maintenance landscaping. Strategic placement of planting to soften building form. Retention of vegetation where possible. Project siting within an area of similar character (industrial area).	Unlikely	Insignificant	Tolerable
Bushfire Impact (External)	Exposure of site to bushfire (including direct smoke plume).	Potential restrictions to regular operations (example refuelling). Potential for bushfire to spread within the site and for diesel to act as accelerant. Potential for downwind irritation from smoke plume. Localised radiant heat effects.	The Site is not subject to a Bushfire Management Overlay, or located within a designated Bushfire Prone Area, or near dense vegetation (industrial area). Facility has appropriate fire control systems in place. Emergency evacuation plans in place.	Rare	Major	Tolerable
Security Incident	Unauthorised access, intrusion, tampering,	Potential safety impact to personal and disruption to regular operations.	Layered security zones in place. Security fencing and barriers in place.	Possible	Minor	Tolerable

Hazard / Incident	Scenario	Likely Consequences	Controls	Likelihood	Consequence	Residual Risk
	or harm to critical infrastructure.	Potential for critical infrastructure damage. Potential for data exposure.	CCTV, alarms, access controls in place. Reinforced secure construction. Integrated monitoring systems in place.			
Site Traffic Impact	Increased vehicle movements during operation and construction affecting road capacity.	Potential increased congestion to localised traffic conditions. Potential degradation of road surface conditions.	Heavy vehicle deliveries will be scheduled to take place outside of peak periods. Contractor's using heavy vehicles will be required to demonstrate compliance with the National Heavy Vehicle Regulations prior to engagement.	Unlikely	Minor	Tolerable
High pressure gas line	Proximity of the development to the high pressure gas line impacts the design, construction and / or use of the bulk diesel storage compound	Increased costs to redesign concept layout Restrictions applied to construction activities (e.g. traffic movement) An incident involving the gas line (e.g. gas leak, fire, explosion) impacts the bulk diesel storage compound	The pipeline presents a potential offsite hazard that may impact the facility, and operations around such infrastructure must comply with *AS/NZS 2885 – Pipelines – Gas and liquid petroleum.* Fuel will be distributed from four separate locations, in clusters of eight 100 kL fire-rated tanks, reducing the potential for a major incident. The design and location of the bulk fuel storage compounds is aligned with the pipeline owner's (APA) *Site Planning and Landscape National Guidelines*. APA will be consulted during the detailed design stage to confirm that the proposed design, construction and operational risk mitigation measures associated with the bulk fuel storage compounds are acceptable.	Unlikely	Moderate	Tolerable

5. Preliminary Hazard Assessment Conclusions

The main hazards of concern identified in the PHA related to bulk diesel storage and the presence of a significant quantity of lithium-ion batteries.

Both diesel storage and lithium-ion batteries are estimated to exceed the Schedule 2 Fire Protection Quantities. Therefore, regulatory requirements are triggered for placards, a dangerous good manifest and requiring written advice of the emergency services authority in relation to the design of the fire protection system for the premises.

The technical and management safeguards required for both diesel and lithium-ion batteries are based on good practice industry standards and are readily implemented as part of the Safety in Design process.

The requirement for additional studies has been identified to confirm the risks are appropriately managed. This includes:

- Fire Safety Study
- Conduct of a formal land use change Safety Management Study and HAZOP to assess the potential impact of the high pressure gas pipeline, including consultation with the pipeline operator, APA
- Construction Traffic Impact Assessment.

This assessment addresses the DFP requirement under *Clause 53.22 Significant Economic Development* where dangerous goods and hazardous materials associated with the Project.

Appendix A. References

- Air Quality and Plume Rise Assessment Report, Jacobs, 2026
- Brooklyn Data Centre Stockland Landscape Concept Design, Jacobs, 2026.
- Brooklyn Data Centre Town Planning Acoustic Assessment, Marshall Day, 2026
- Environmental Site Assessment, Stage 1 Redevelopment Area, Brooklyn Distribution Centre 413 Francis Street, Brooklyn, VIC, Golder Associates Pty Ltd, 2022.
- ESD Report – Planning Application, Jacobs, 2026.
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- Preliminary Traffic Assessment – 413 Francis Street Brooklyn, Jacobs, 2025.
- Report on Environmental Investigation, Proposed Substation, Douglas Partners Pty Ltd, 2025
- Stormwater Management Plan, Jacobs, Feb 2026
- Waste Management Plan - Brooklyn Data Centre, Jacobs, 2026