REPORT

Tonkin+Taylor

Hazardous Substances Assessment

Diesel storage for back-up generation - Downtown Carpark Site Development

Prepared for
Precinct Properties New Zealand Limited
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Executive summary

This report details the risk assessment and effects of the proposed installation of new diesel tanks at the Downtown Carpark Site Development at 2 Lower Hobson Street.

The Auckland Unitary Plan Operative in Part ("**AUP**") includes standards for the storage and use of hazardous substances in Chapter E31, which applies to diesel as a combustible liquid with chronic toxicity and aquatic ecotoxicity properties. The proposal exceeds the permitted and restricted discretionary quantity for the use and storage of hazardous substances for the Business – City Centre Zone, and therefore a resource consent is required as a Discretionary Activity.

Smaller quantities of hazardous substances such as biocides for cooling water treatment or oils for machinery maintenance may be brought to site by dedicated maintenance contractors at times, but these are not anticipated to exceed the permitted activity thresholds and will be managed in accordance with the building's hazardous substances management plan.

Diesel tanks are proposed to be located in dedicated rooms the basement levels B1 and B4 in addition to level 1 of the building, to supply back-up power generators. These tanks will be 4-hour fire-rated, double skinned for leak prevention and include leak detection systems. They will be refuelled when required at the loading bay of the ground floor by specialist fuel delivery contractors trained in safe unloading procedures and spill response.

The Health and Safety at Work (Hazardous Substances) 2017 regulations stipulate the legal requirements for tank design and operational management measures including for signage, secondary containment, tank specifications, fire extinguishers and independent compliance certification of the stationary container system. These requirements are independent of the AUP but serve as controls that will minimise the impact of diesel storage on people, property and the environment.

The proposed development is adjacent to a flood plain and the building design will incorporate flood and coastal inundation protection measures, as detailed in the Coastal Hazard and Risk Assessment (T+T 2025) and the Flood Hazard and Risk Assessment (T+T 2025). The effects of the diesel storage in a flood plain have also been considered, to account for the residual risk of the barriers failing or future sea level rise scenarios exceeding the barrier height. The tanks are sealed, double skinned and contain vents above the safe fill level, and will not release diesel if flooding occurs.

Given consideration of the location, equipment selection and controls listed above, the risk of fire at the tanks, spills of diesel or flooding at the site have been assessed as low and the effects as less than minor.

1 Introduction

Precinct Properties NZ Limited ("**Precinct**") has engaged Tonkin & Taylor Ltd (T+T) to prepare this hazardous substances assessment to assist in the substantive consent application process for the Downtown Carpark Development project at 2 Lower Hobson Street ("**Project**").

The developed site will include a total diesel storage capacity of up to 20,000 L, across three bulk storage tanks in basement level B4 and five day tanks distributed across B1 and level 1 of the 'podium 3' building. Each tank will be self-bunded, 4-hour fire-rated and isolated from trafficked areas.

The AUP includes standards for the storage and use of hazardous substances, which applies to diesel as a combustible liquid with chronic toxicity and aquatic ecotoxicity properties. This assessment considers the relevant AUP provisions contained in Chapter E31 for Hazardous Substances and specific clauses relating to hazardous substances in Chapter E36 for Natural Hazards and Flooding.

The proposal exceeds the permitted and restricted discretionary quantity for the use and storage of hazardous substances for the Business – City Centre Zone, and therefore a resource consent is required as a Discretionary Activity.

The purpose of this report is to describe the proposed diesel storage and management of associated risks to the environment, and determine the effect of this activity on the environment.

2 Environmental setting

2.1 Site location

The Downtown Carpark Development proposed at 2 Lower Hobson Street ("**Site"**) is located at the current Downtown Carpark in a densely built-up section of Auckland City's CBD at the corner of Lower Hobson Street and Custom Street West. The Site is proposed to be redeveloped to two towers extending multiple storeys above ground, as well as below ground into a basement. The location of the Project is depicted in **Figure 2.1** below.

Figure 2.1: Site location plan *Sourced from: LINZ aerial imagery*

The remainder of the section is occupied by the existing AMP Centre building and HSBC tower building, both of which are also owned by Precinct.

2.2 Built environment

Different land uses and receiving environments have a varying level of sensitivity to the effects associated with hazardous substances. These activities are listed below in order of reducing sensitivity (i.e. starting with the most sensitive):

- School, child-care facilities and aged care facilities
- Residential areas and activities involving places of continuous occupation such as motels
- Sporting complexes and activity open spaces
- Commercial developments including activities such as offices, retail centres and restaurants
- Light and heavy industrial activities

The proposed development is in a dense urban environment surrounded by retail activities, restaurants and commercial offices, including the HSBC Tower and AMP Centre immediately to the east. The existing childcare centre operated by KinderCare on the shared first floor podium will have vacated the site prior to consent implementation.

The Project will be comprised of two separate towers arising from shared lower levels. The taller tower (T1) will be used for a mixture of retail and commercial offices, while T2 will contain retail activities and around 200 hotel accommodation rooms on its lower levels and around 160 apartments on the upper levels. The diesel tanks will be located within the basement and level 1 of the building within areas allocated for carparking and building utilities. The overall sensitivity to effects of hazardous substances on human health and property is low within the basement and utility podium area, and moderate to high for the upper floors where residential activities occur.

2.3 Natural environment

The Site occupies a highly modified environment, dominated by impervious surfaces and man-made structures. The most sensitive environment in the vicinity is the Auckland Waterfront coastal marine environment in the Waitematā Harbour located approximately 80 m to the north and west of the redevelopment, as shown in **Figure 2.2**.

The AUP does not identify any Significant Ecological Areas ("**SEAs**") within the nearby Auckland Waterfront area.

The waterfront coastal environment is characterised by soft tidal muds and experiences a high volume of marine vessel traffic. The area has previously been assessed as having low intrinsic aquatic ecological value[1]. However, this environment is still susceptible to harm in the event of a spill of ecotoxic materials, and is therefore considered sensitive to ecotoxicity effects.

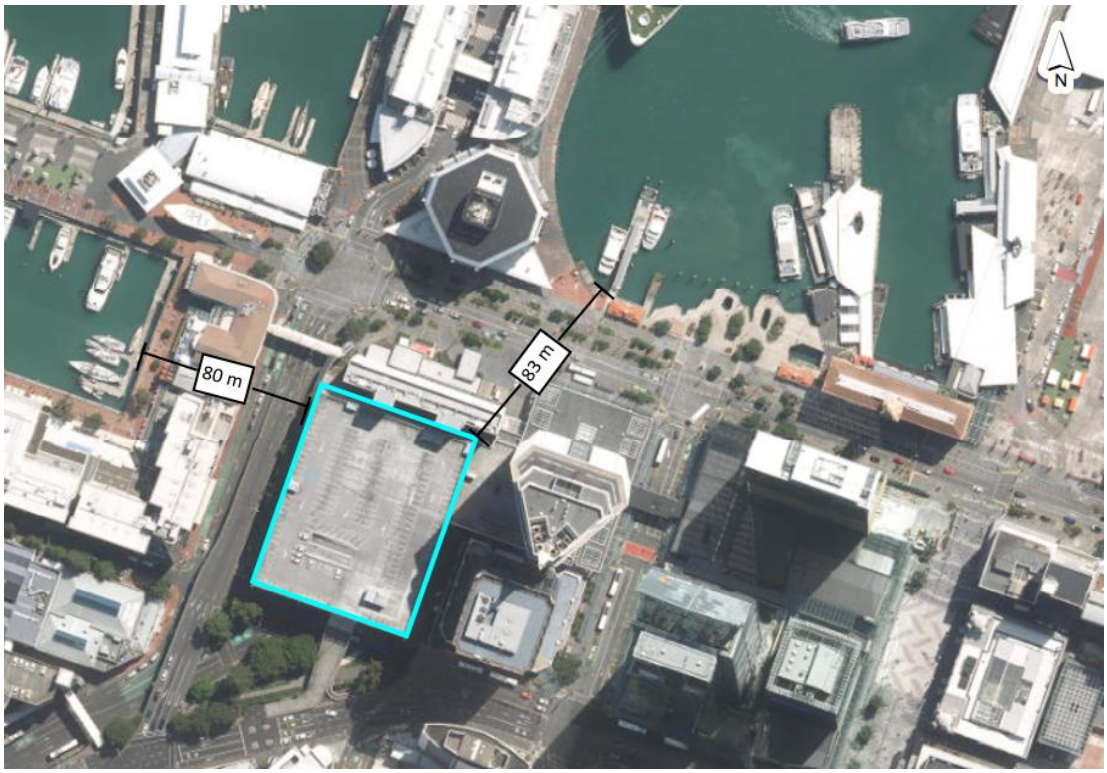

Figure 2.2: Natural environment *Sourced from: Auckland Council LINZ*

[1] As assessed in Quay Street, Ferry Basin Section - Marine Ecological Assessment, Tonkin & Taylor Limited. 2018.

3 Description of proposed hazardous substance storage and use

3.1 Overview

As noted in Section 1, the proposed diesel storage capacity will be provided by three bulk tanks and five day tanks connected to the generator sets. These tanks will supply the main back-up power generation facility servicing the buildings.

The three bulk diesel storage tanks (approximately 4,333 L each) will be located in a dedicated room in basement level B4. The day tanks connected to the generators include one 500 L and one 1,200 L tank located in the 'Generator T2' room in basement level B1, and a final trio of 1,200 L day tanks will be located in the podium 3 Generator Room on level 1. These are shown on the plans attached in **Appendix A**.

The tanks will be 4-hour fire rated, self-bunded (double skinned) and include leak detection sensors.

When required, the bulk fuel tanks will be refilled with diesel gravity fed from a connection point located in the loading bay on the ground floor adjacent to the ramp out to the service lane. Interior fuel lines then allow diesel to be pumped to the day tanks located on level 1 and basement level B1 as required. All deliveries will be supervised by delivery contractors equipped with a spill kit and trained in spill response.

3.2 Hazardous properties of diesel

A new hazard classification system came into force in New Zealand on 30 April 2021 to align with the Globally Harmonised System 7 ("**GHS 7**"). Both the former classifications, as assigned under the Hazardous Substances and New Organisms Act ("**HSNO**"), and the equivalent new classifications are presented for diesel as follows:

- 3.1D – Flammable Liquid Category 4
- 6.3B – Skin irritation Category 3
- 6.7B – Carcinogenicity Category 2
- 6.1E – Aspiration hazard Category 1
- 9.1B – Hazardous to the aquatic environment chronic Category 2

Under GHS 7, larger category numbers correspond to a lower degree of hazard. Therefore, diesel's flammability rating is low, such that diesel is considered 'combustible' but is not easily ignitable. It does not have flammable vapour. The human health hazards require chronic direct exposure to the liquid or inhalation of the aerosolised liquid.

In adopting GHS 7, New Zealand removed the use of Skin irritation Category 3, but it has been included here for completeness.

3.3 Other hazardous substances

Other hazardous substances that may be used on-site are likely to include packaged products for cleaning and disinfection of mechanical water systems in the building, including biocides, scale control, corrosion control, dispersants and antifoams. These are generally expected to have some Class 6 toxicant properties or Class 8 corrosive properties, and some Class 9 ecotoxic classifications[2].

The type and volume of these substances will depend on the specialist certified contractor engaged for the water quality control and building maintenance activities. It is expected that volume of these

[2] Indicative classifications from the Environmental Protection Authority's Water Treatment Chemicals (Acutely Toxic, Corrosive) Group Standard 2020 HSR002686 and Corrosion Inhibitors (Acutely Toxic) Group Standard 2020

products stored on site will be minimal (brought to site as required during compulsory monthly maintenance) and that, if necessary, they will be kept in closed containers within a bunded enclosure in a secure plant area. It is therefore highly unlikely that the quantities of these substances will exceed permitted thresholds described in the AUP discussed further in Section 5.1.

4 Management controls

4.1 General hazardous substances controls

Storage and use of all hazardous substances on-site must comply with the provisions of the Health & Safety at Work (Hazardous Substances) Regulations 2017 ("**HSW-HS**").

Diesel is proposed to be stored in bulk and used in generators at the Site, and therefore it triggers specific requirements in the legislation that are discussed separately in section 4.2.

Any other hazardous substances required at the Site will serve ancillary functions (such as biocides for cooling water treatment) and thus be present in far smaller quantities. While it is not expected that the ancillary hazardous substances will be present on-site in volumes that will trigger specific controls under the HSW-HS, general hazardous substances management requirements will apply. These include:

- Segregation of incompatible materials
  - Substances that may have adverse interactions when mixed (such as acids and alkalis) must be stored separately.
- Signage
  - That communicates the type of hazards present within an area using standardised iconography.
- Labelling
  - All hazardous substances must be clearly labelled to identify the product and the substance hazards.
- Personal Protective Equipment ("**PPE**")
  - PPE must be provided to staff when handling substances that are hazardous on contact, such as toxic or corrosive substances. This extends to providing suitable PPE in spill kits for use in cleaning up spills.
- Contained storage
  - Ensuring that any dedicated storage locations enable spills to be isolated and cleaned up, and are separated from drainage systems that connect to the surrounding environment (in this case the Waitemata Harbour).
- Documentation
  - An inventory of hazardous substances present on site must be maintained and must capture the substances quantity, applicable hazard classifications, storage location, and safety data sheets.

A draft Hazardous Substances Management Plan ("**HSMP**") has been prepared to set out the requirements that will apply on-site and is attached as **Appendix B**. The HSMP is a living document and will be updated following commission of the Site, and regularly reviewed and revised as required. It describes the specific safety measures and procedures for management of hazardous substances at the Site. The HSMP identifies the responsibilities of staff and contractors, including the actions required by each of these roles during regular operations and in the event of spills.

4.2 Diesel tank management

4.2.1 Overview

This section describes restrictions and requirements for the proposed diesel tanks specified under the following:

- HSW-HS (applicable to Class 1 to 8 hazardous substances);
- Health and Safety at Work (Hazardous Substances – Above Ground Stationary Tanks Connected to a Generator Set) Safe Work Instrument 2017 (and amendment 2019), applicable to tanks smaller than 6,000 L connected to generator sets – Section 17.64; and
- Health and Safety at Work (Hazardous Substances—Reduced Secondary Containment for Certain Above Ground Stationary Tanks) Safe Work Instrument 2017, applicable to tanks with integral secondary containment – Section 17.63

Specific controls that will apply to the refuelling of the bulk tanks from the connection in the services lane area also described.

The tanks will be 4-hour fire-rated, double skinned for leak prevention and include leak detection systems.

4.2.2 Health and Safety at Work (Hazardous Substance) Regulations

The storage of hazardous substances at the Site is subject to requirements specified in the HSW-HS.

The restrictions and requirements relevant to the proposed diesel storage activities are described in the following tables:

- **Table 4.1** describes the design and construction requirements relating to the tanks and storage systems; and
- **Table 4.2** describes requirements relating to on-going operations.

The development is required to comply with all applicable regulations and this assessment is carried out on the basis that the controls set in the regulations will be implemented. Information relating to tank selection provided to date as part of the detailed design indicates that these controls will be readily achieved within the development.

Table 4.1: Design and construction requirements

Requirement	Detail
Secondary containment	Secondary containment for at least 110% of the tank capacity is required. However, where integral ("double-skinned") containment is provided, it must comply with the *Health and Safety at Work (Hazardous Substances—Reduced Secondary Containment for Certain Above Ground Stationary Tanks) Safe Work Instrument 2017* which reduces the minimum capacity to 100% of the tank volume.
Tank design	Compliance with Clauses 17.6 to 17.12 of the HSW-HS including requirements for pressure management, lightning and stray current protection, seismic and wind loadings and liquid level indicators (documentation to be provided by the tank supplier). For the small day tank connected to the generator set, adherence to the Health and Safety at Work (Hazardous Substances Above Ground Stationary Tanks Connected to a Generator Set) Safe Work Instrument 2017 (and amendment 2019) is a means of meeting the design standard requirements of 17.6(k) HSW-HS (see section 4.2.3 of this report).
Exhaust and vents	Any vent pipe, relief valve, or overfill pipe that is part of the stationary container system terminates outside the building, except an emergency vent installed on a tank that complies with SwRI 95-03

Requirement	Detail
Tank installation	The tank must be installed on foundations that will prevent subsidence of the ground that endangers safety. The diesel must not discharge or leak from any part of the stationary container system within the building.
Tank delivery system to the generator	The tank and delivery system to the generators must comply the following: • The transfer point used for filling the stationary container system with the hazardous substance is located outside that building • Flow from the tank to the generators must be modulated to match the capacity of the generator engine; • The supply to each generator must be cut off if the temperature of the air above the engine reaches 90°C; • Delivery pumps are to be separate from the secondary containment system; • Non-return valves or other means of preventing the stored hazardous substance from draining from a tank in the event that pipework that is part of the system fails. The device is to be located at the tank. This requirement does not apply to the service tank for the external generator if the diesel storage capacity is less than 500 L; and • Flow from the tank is required to be automatically cut-off in the event of a fire near the system. The cut-off is to be located at the tank.
	Pipework associated with the tank and delivery system is designed, constructed, installed, operated, inspected, tested, and maintained so as to ensure the pipework is suitable for all reasonably foreseeable working pressures, temperatures, and structural stresses. The pipework up to the first connection with the internal combustion engine must be constructed of fire-resistant and corrosion resistant materials, installed securely and tested to ensure the pipework does not leak at a pressure the greater of 350 kPa or 1.5 times the maximum working pressure of the pipework.
	Any transfer point used for filling the tank must be a non-return valve compliant with section 6.3.1(b) of AS 1940:2017. The design, construction and installation of the transfer lines for filling the tanks must comply with Clause 17.72(3)(a) of the HSW-HS regarding the design standard.
Separation from protected places[1] (other buildings and boundaries).	Minimum separation between the tanks (assuming maximum capacity of 4,333 L) is 0.5 m <u>For each bulk tank (assuming max individual capacity of 4,333 L):</u> Minimum separation of 3.0 m from a protected place. <u>For each day tank:</u> Minimum separation of 2 m from a protected place for each 1,200 L day tank. For the 500 L tank, 0 m separation requirement applies. The separation distances to protected places required by HSW-HS must not be calculated beyond the boundary of the property unless the owner, lessee, sub-lessee, occupier, or person in possession of any property beyond that boundary (the adjacent property) agrees in writing that the separation distance may be calculated to include the adjacent property.

Note:

1. A **protected place** includes 'any factory, workshop, office, store, warehouse, shop, or building where persons are regularly employed, whether within or outside the property boundary of a place where a hazardous substance location is situated.' A protected place excludes a small office or other small building associated with a place where storage, handling, use, manufacture, or disposal of a class 3 substance is major function.

Table 4.2: Ongoing operational requirements

Requirement	Detail
Fire extinguishers	2 extinguishers required wherever there is more than 500 L of Class 3.1D flammable liquid in aggregate and is therefore applicable to the proposed tank locations.
Signage	The requirement for signage is triggered by the volume of liquid with Class 3.1D (flammable) and 9.1B (eco-toxic) hazard classifications. The trigger volumes are: • Class 3.1D: 10,000 L and • Class 9.1B: 1,000 L. Signs should be displayed at the building entrance, next to the storage area (or on the tanks), contain the words HAZCHEM, the relevant pictograms and hazard statements, and state the precautions necessary to prevent unintended ignition of the diesel.
Emergency Response Plan	The requirement for an emergency response plan is triggered by the volume of liquid with Class 3.1D (flammable), 6.7B (suspected carcinogenic) and 9.1B (ecotoxic) hazard classifications. The trigger volumes are: • Class 3.1D: 10,000 L; • Class 6.7B: 10,000 L; and • Class 9.1B: 1,000 L. An Emergency Response Plan should describe the emergency procedures for a site and take into account any foreseeable emergency such as a fire, spill or injury. Emergency Response Plans must be regularly tested.
Site plan	A site plan is required that describes the physical position of the stationary container systems in relation to the legal boundary of the Site in which the hazardous substance is located, and: • if any separation distance required by these regulations extends to within 5 m of the legal boundary of the workplace, the location of that legal boundary; and • every building; and • every other stationary tank used to store a hazardous substance at the workplace; and • every storage area for packages containing hazardous substances; and • every storage area for gas cylinders; and • every secondary containment system for any stationary tank that is part of the system; and • all fire-fighting equipment and facilities, including firewalls and vapour barriers; and • every transfer point for a class 2.1.1 or class 3.1 substance.
Segregation of incompatible substances	Segregation of diesel from Class 1, Class 2, Class 3.2, Class 4 and Class 5 substances.

4.2.3 Health and Safety at Work (Hazardous Substances – Above Ground Stationary Tanks Connected to a Generator Set) Safe Work Instrument

The Health and Safety at Work (Hazardous Substances — Above Ground Stationary Tanks Connected to a Generator Set) Safe Work Instrument 2017 (modified 2019[3]) specifies relevant requirements for the day tanks attached to an external diesel generator set, provided the volume does not exceed 6,000 L for double skinned tanks. It applies to above ground stationary tanks which are part of, and integral to, imported diesel fuelled generator set packages.

The requirements of the safe work instrument are detailed in **Table 4.3** below and may be applied to the day tanks attached to the generators on basement level B1 and the level 1 podium as a means of compliance with the requirements for the tank design under r17.6(k) of the HSW-HS.

Table 4.3: H&S at Work (Hazardous Substances – Above Ground Stationary Tanks Connected to a Generator Set) Safe Work Instrument Requirements – day tanks

Requirement
The service tank must be designed and constructed in accordance with one of the following standards: • UL 142 (9th edition, 28 December 2006); • BS 799-5:2010; • OFS T200 (6th issue, 2007); or • NFM 88 940:1981.
The service tank must be designed and constructed in accordance with the following requirements: • all openings to the tank except vent openings must have liquid-tight and gas-tight caps; • the fill point must be marked with a durable symbol identifying the stored hazardous substance; • if a double skin tank all piping connections must enter through the top of the tank; • a double skin tank must not have a capacity that exceeds 6,000 litres; and • the tank must have either: – a nozzle that has an automatic shutdown device in the event of excess liquid/overfill; or – a manually operated pump; or – if a double skin tank, must either have an overfill protection device or the fill point must have secondary containment with a minimum capacity of 15 litres; or – a stationary tank that is designed and constructed in accordance with NFM 88 940:1981 must have a minimum wall thickness of 4 mm.

4.2.4 Hazardous Substances (Hazardous Property Controls) Notice

The HSW-HS exclude class 9 (eco-toxic) substances from the definition of hazardous substances applicable under the regulations. Controls applicable to Class 9 substances are instead specified in the Hazardous Substances (Hazardous Property Controls) Notice 2017. Diesel is classified as Class 9.1B (ecotoxic in the aquatic environment).

The requirements specified under the notice for Class 9.1B substances either refer to or are no more restrictive than corresponding requirements specified under the HSW-HS. Any requirements under the notice therefore fall within those specified in Tables above.

[3] The *Health and Safety at Work (Hazardous Substances – Above Ground Stationary Tanks Connected to a Generator Set) Amendment Safe Work Instrument 2019* added some design and construction requirements based on the 2017 version.

4.2.5 Refuelling in the services lane

The bulk diesel tank fill point will be located in the services lane at ground level as shown in the plans in **Appendix A**. The fill point is approximately 14 m from the nearest existing stormwater catchpit, which will be clearly marked to communicate that it is for stormwater only.

The diesel fill point panel will display the gauge level of each bulk tank and have a light to indicate when the high-level alarm has been activated. Each bulk tank will have an overfill protection valve to automatically shut off delivery once its safe fill level is reached.

The connection to the fill point from the refuelling truck will use 'dry-break' couplings, which have internal valves that prevent fuel from flowing until the coupled connection is secure, and close before being disconnected to prevent spills of residual fuel in the hose. A spill containment tray will be used around the fill point.

Refuelling contractors will be equipped with spill kits and trained in emergency spill response. Transport of diesel is carried out in accordance with the Land Transport Rule: Dangerous Goods 2005, which includes requirements for placarding, equipment (spill kits and extinguishers), documentation and driver training.

5 Resource consent requirement

5.1 Activity status

The Hazardous Substances provisions are set out in Chapter E31 of the AUP.

Activity Table E31.4.3 sets out the Permitted Activity and Restricted Discretionary volumes for hazardous facilities in Auckland. Evaluation of the consent status for the storage of hazardous substances in the Business – City Centre Zone is provided in **Table 5.1** below.

We have considered that each tank will be more than 30 m from a watercourse based on the aerial view of the Site location.

Table 5.1: Comparison against AUP Table E31.4.3 thresholds for the Business – City Centre Zone

Substance and volume	Hazard classification	Table E31.4.3 reference	Permitted activity quantity limit	Restricted Discretionary quantity limit	Consent status
Diesel 18,300 L or 15.6 t	3.1D	(A60)	< 20 t	up to < 40 t	Permitted
	6.1 E	-	Permitted at any quantity		Permitted
	6.3B	(A73)	< 6 t	up to < 12 t	Discretionary
	6.7B	(A73)	< 6 t	up to < 12 t	Discretionary
	9.1B	(A79)	< 10 t	up to < 20 t	Restricted Discretionary

Note: Volume to mass conversion using typical diesel specific gravity of 0.85.

Under Activity Table 31.4.1(A7) of the AUP, hazardous facilities that store or use hazardous substances above the specified thresholds of Table E31.4.3 have discretionary activity status. The Restricted Discretionary thresholds for Class 6.3 - 6.9 chronic human health hazards (A73) are exceeded. The Permitted threshold for Class 9.1B chronic aquatic toxicity (A79) is exceeded, while the proposed volume of diesel remains under the permitted activity quantity threshold for Class 3.1D flammable liquids.

Overall, the proposed storage and use of 18,300 L diesel is a discretionary activity.

As previously mentioned, the other hazardous substances that may be used on-site are expected to be in quantities that have a permitted activity status. Examples of substances that may be required at times include biocides or cleaning products, which can be corrosive (Class 8) or chronically toxic to humans (Class 6) and other organisms (Class 9), or corrosion control agents, which are likely to have ecotoxic classifications (Class 9). Of these classifications, the most restrictive permitted quantity applies to those with acute ecotoxicity classifications 9.1A – 9.4A. The permitted quantity for these classifications under (A77) is less than 0.5 tonnes (approximately 500 L); which is more than expected to be required at any given time or stored on site. Other classifications that may apply to cleaning or maintenance products have higher permitted quantities:

- (A71) permits up to 2 tonnes of acutely toxic substances in Class 6.1B,
- (A73) permits up to 6 tonnes of chronic toxicants Class 6.3-6.9 and acutely toxic Class 6.1C; and
- (A75) permits up to 2 tonnes of highly corrosive substances in Class 8.1, 8.2A or 8.3A.

These volumes are far in excess of what will be required operationally at the development.

The storage and use of these substances at the Site are therefore considered to have permitted activity status under Chapter E31.

Some of the diesel tanks are proposed to be below ground level within a building surrounded by areas subject to the 1% annual exceedance probability ("**AEP**") flood plain[4]. Under Rule E36.4.1(A29) *Storage of hazardous substances in 1% AEP probability floodplain* is a Restricted Discretionary Activity. A comment on the activity standards for hazardous facilities set out in Section E31.6 of the AUP is provided in **Table 5.4**.

The Site is also within an area subject to coastal inundation hazard according to the AUP hazard overlays, as detailed in the Coastal Hazard and Risk Assessment (T+T 2025). Freeboard is provided for a storm surge for a 1-in-200 year event, and further mitigation to manage sea level rise is not required for at least 50 years.

The property design includes freeboard allowances to provide flood protection to the building and interiors. However, this assessment has considered the risk of water ingress into the basement that may arise from the residual risk of the barriers failing, or future sea level rise scenarios exceeding the barrier height.

[4] Downtown West - Downtown Car Park Redevelopment – Flood hazard and risk assessment. Tonkin & Taylor Limited. December 2024.

5.2 Objectives, policies and standards

Chapter E31 of the AUP lays out a series of policies and objectives designed to reduce or eliminate the risks associated with the use, storage, and transport of hazardous goods. Chapter E36 specifies policies designed to protect against and mitigate the effects of natural hazards such as flooding and sea level rise. The policies relevant to the hazardous properties of the proposed diesel tanks have been addressed in **Table 5.2**, and **Table 5.3** while the policies relevant to the interaction between the diesel tanks and natural hazards are addressed in **Table 5.4**.

Table 5.2: E31.2 Objectives and E31.3 Policies

Objective/policy	Comment
E31.2(1) Objective: The risks of hazardous facilities to people, property and the environment are minimised to acceptable levels while recognising the benefits of these facilities.	The Project will follow all applicable standards when installing the proposed diesel storage tanks and will undertake all on-site activities in a manner that minimises the risks associated with the use of diesel, including use of 4-hour fire rated tank design, leak detection and double skinned containment.
E31.3(1) Policy: Manage hazardous substances by: • locating, designing, constructing and managing hazardous facilities to avoid or adequately mitigate adverse effects, including risks, to people, property and the environment; • identifying, assessing and managing cumulative effects of hazardous facilities so they do not increase to unacceptable levels of risk to people, property and the environment; and • locating land use activities so that the adverse effects of the transport of hazardous substances on roading infrastructure and other land use activities are minimised.	The risk to people, property and ecosystems from the installation of the proposed diesel tanks within the Project has been assessed in Section 6 of this report and found to be low, and managed in accordance with the applicable regulations.
E31.3(2) Policy: Require adequate separation distances between hazardous facilities and activities sensitive to hazardous facilities to avoid or adequately mitigate risk to people and property and to avoid reverse sensitivity effects.	Adequate separation distances between flammable substances and from these substances to vulnerable receptors have been adopted based on HSW-HS. The tanks are located either at sub-floor levels or the level 1 floor of the Poduim 3 building within areas used for utilities and car parking. Other substances associated with maintenance tasks or cleaning will be stored in small quantities in dedicated areas isolated from any sensitive activities. Incompatible substances will be segregated.

Table 5.3: E31.6. Standards for hazardous facilities

Permitted activity standard	Comment
E31.6.1 Hazardous facilities site design (1) Any part of a hazardous facility involved in the manufacturing, mixing, packaging, storage, loading, transfer, usage or handling of hazardous substances must be designed, constructed and operated to ensure that: • (a) on-site facilities are set back from the more sensitive uses and watercourses to comply with the distances specified in the activity table above; and • (b) hazardous substances are stored to: – (i) ensure that in the event of an unintended spill or release substances are contained within the intended areas of the site; and – (ii) prevent the accumulation of any solid, liquid, gas or vapour outside of the site area.	The tanks are appropriately located within the sub-floor or podium levels well separated from sensitive uses on site to service the building utilities. All storage tanks are provided with double skinned containment and are kept indoors. All other storage of packaged substances on site will minimised and kept in closed containers in bunded storage areas where required.
E31.6.2 Site drainage systems (1) The site drainage systems (including for wash water) must be designed, constructed, and operated to prevent the entry or discharge of hazardous substances into: • (a) the stormwater or sewerage systems unless authorised by the relevant network utility operator; and • (b) air, land or water, including groundwater and potable water supplies, unless authorised by a resource consent or another rule in the Plan. *Note 11- Compliance can be achieved using precautionary methods, including clearly identified stormwater grates and access holes, roofing, sloped pavements, interceptor drains, containment and diversion valves, oil-water separators, sumps and similar systems.*	There will not be any washwater generated at the Site as part of the diesel storage activity. All storage tanks are provided with double skinned bunding within the building. Drainage plans prepared as part of detailed design will illustrate stormwater grates at the development. There is an existing stormwater catchpit in the services lane within approximately 14 m from the diesel tank fill point as shown on the plans in **Appendix A**. Small quantities of cleaning or maintenance products may be kept in closed containers within dedicated bunded storage areas internal to the building. No pathway is anticipated for ecotoxic substances to escape the site. Any stormwater grates on-site will be clearly identified by markings.

Permitted activity standard	Comment
E31.6.3 Hazardous facilities spill containment system (1) Any part of the hazardous facility site where a hazardous substance spill may occur must be serviced by a suitable spill containment system that is: • (a) constructed from impervious material resistant to all hazardous substances on site; and • (b) for liquid hazardous substances: – (i) able to contain the maximum volume of the largest tank present plus an allowance for stormwater or fire water; – (ii) for drums or other smaller containers, able to contain hold of the maximum volume of substances stored, plus an allowance for stormwater or fire water; – (iii) able to prevent any spill or other unintentional release of hazardous substances, and any stormwater and/ or fire water that has become contaminated, from entering the stormwater drainage system, unless authorised by the relevant network authority; and – (iv) able to prevent any spill or other unintentional release of hazardous substances, and any stormwater and/ or fire water that has become contaminated, from discharging into air, land or water, including groundwater and potable water supplies, unless authorised by a resource consent or another rule in the Plan.	All storage tanks are provided with double skinned containment indoors. Re-loading of diesel is expected to occur infrequently. The connection to the tanks will be within the services lane and supervised by delivery contractors trained in emergency spill response and equipped with spill kits. The refuelling vehicle will use dry break coupling connections and remote fuel level gauges and overfill protection valves for the receiving tanks. Further internal distribution of diesel between bulk storage tanks and day tanks will be conducted via a system fitted with fuel level sensor controls and interlocks to prevent overfilling. Ongoing storage of packages at the site is not anticipated, but in the event that a small package store is established, secondary containment will be provided.
E31.6.1 Hazardous facilities waste management (1) Any hazardous facility generating waste containing hazardous substances must be disposed of these wastes to lawfully operated facilities or be serviced by a Council approved waste disposal contractor.	There are no hazardous wastes associated with the back-up generators. In the event of a spill incident at the Site, the spilled material will be removed from the building or refuelling connection bay for disposal at an authorised facility. This will be a requirement of the spill response plan.
E31.6.4 Temporary storage of fertiliser classed as sub-class 9.3B and 9.3C for rural production activities	This standard does not apply to the storage of hazardous substances associated with the Site.

Table 5.4: E36.8.1. Matters of discretion for hazardous substances in a floodplain

Matter of discretion	Comment
The Council will restrict its discretion to the following matters when assessing a restricted discretionary resource consent application:	

Matter of discretion	Comment
(6) for the storage of hazardous substances in the 1 per cent annual exceedance probability (AEP) floodplain: (a) the location, design and management of facilities where hazardous substances are stored, used or disposed;	Some of the diesel tanks are proposed to be stored within sub-floor areas adjacent to a flood plain. All storage of diesel is in tanks that are double skinned to prevent leaks. All other hazardous substances will be stored in small quantities in closed containers within dedicated bunded storage areas. Building design includes freeboard to prevent floodwater ingress.
(b) the potential risk to public health;	The risk of effects on human or ecosystem health arising from storage of hazardous substances at the site has been assessed as low in Section 6.3 of this report.
(c) and the potential contamination of water	

6 Risk assessment for diesel storage

6.1 Introduction

The following sub-sections set out a risk assessment of the proposed storage and handling of hazardous substances at the Site for the proposed storage volumes. The approach to hazard analysis and risk assessment is based on Ministry for the Environment Guidance for Hazardous Facilities[5].

The risk assessment involves consideration of:

- Identification of potential hazards, failure modes and exposure pathways;
- The sensitivity of the surrounding environment;
- The separation distances from neighbouring activities and the number of people potentially at risk from the facility;
- Cumulative risks of hazardous facilities in the area; and
- Transport of hazardous substances on and off the Site to ensure safe access and appropriate routes for delivery vehicles on-site to minimise risk of spillage.

6.2 Hazard analysis

The hazards associated with hazardous substances are generally classified as follows:

- Fire/Explosion Effects: concerned with damage to property, the built environment and safety of people;
- Human Health Effects: concerned with the well-being, health and safety of people; and
- Environmental Effects: concerned with damage to ecosystems and natural resources.

These hazards are based on the intrinsic characteristics of the substance, for example the flashpoint of a flammable substance. The purpose of the hazard analysis is to undertake a preliminary scaling and ranking of hazards, and to identify risks that should be investigated in greater detail for risk to off-site receptors. **Table 6.1** sets out the hazard analysis for the Site, identifying and rating potential hazards. Substances that, in the absence of controls, could have off-site effects, are evaluated in the qualitative risk analysis in Section 6.3.

Diesel has chronic human health hazards. These chronic hazards require repeated direct exposure in order to have an effect and are therefore not expected to impact any people beyond the Site boundary.

Diesel is also highly hazardous to the aquatic environment. Diesel has a low flammability rating and is considered combustible.

The hazard analysis also accounts for the possibility of limited storage of cleaning or maintenance products, which are conservatively expected to have moderate human health hazards when ingested, inhaled or applied to the skin, and high ecotoxicity classifications.

[5] Ministry for the Environment. Assessment Guide for Hazardous Facilities. 2000.

Table 6.1: Hazard Analysis

Hazardous Substance and quantity stored	Identification of potential hazard properties (HFSP Hazard level[A])	Failure Modes	Exposure pathways/ Affected part of environment	Indicative hazard rating	Potential for off-site effects	
Diesel 18,300 L	Fire/ Explosion (low) Ecotoxicity (medium)	Fire at the storage tank, spill during tank refilling, spill during equipment refuelling, tank failure	People, property, ecosystems	Low fire hazard to people or property due to low flammability rating. Moderate hazard to ecosystems in the event of a spill or failure of secondary containment.	Yes (during refuelling only)	Effects to ecosystems from spills and effects of fire considered further below in the risk assessment.
Packaged cleaning or maintenance products <500 L	Human health (medium) Ecotoxicity (high)	Contamination of floodwater	Ecosystems	Negligible hazard to people due to low storage volume and Low hazard to	Yes (Only during flood or inundation event that exceeds the proposed barriers or failure of flood protections.)	Effects to ecosystems from package leakage during flood events and failure of flood protections

Note: The hazard level is specified according to the hazard classification in Table 1 of the Land Use Planning Guide for Hazardous Facilities, MfE 2000.

6.3 Risk analysis

As outlined **Table 6.1**, the identified events associated with the proposed diesel storage that could result in off-site effects are a fire in the rooms housing the storage tanks, structural failures of these tanks, and spills during either use or refuelling. A qualitative risk assessment for the identified hazards/failure modes associated each of these events is presented below.

The qualitative risk assessment has been carried out in accordance with the method described in MfE (2000), by applying a qualitative rating to the frequency (likelihood) of the failure occurring and the consequence (severity) of impacts if the event were to occur. The likelihood and consequence ratings take into account the controls (mitigation and management measures) that will be in place. The qualitative likelihood and effects ratings are described in **Table 6.2** and **Table 6.3**, respectively.

The overall risk assessment, set out in **Table 6.5**, concludes that the residual risks, after controls have been implemented, are low and can be managed.

Table 6.2: Qualitative rating of likelihood

Frequency rating	Descriptor	Explanation	Industry-wide occurrence rate
A	Almost certain	Event or near miss that has occurred during plant lifetime	Occurs frequently, multiple times a year
B	Likely	Could occur in plant lifetime. Root causes likely to have occurred on plant	Has occurred on occasion, one in five-year occurrence
C	Moderate	Incidents known in industry. Requires at least two failures. Event not expected during lifetime of plant	Might occur at some time, one in 10-year occurrence
D	Unlikely	Foreseeable event, but requires multiple failures. Very remote chance of occurring during lifetime of plant	Not likely to occur, one in 30 years
E	Rare	Theoretically possible, but extremely remote chance of occurrence	Very rare, may occur one in 100 years

Table 6.3: Semi quantitative rating of consequence

Effects rating	Descriptor	Human health/property	Spill to environment
1	Insignificant	No injuries	Negligible environmental damage
2	Minor	First aid treatment required, minor damage to property	On-site release contained
3	Moderate	First aid treatment required, damage to off-site property	Minor environmental damage
4	Major	Extensive injuries, moderate damage to off-site property	Major environmental damage to immediate environment
5	Catastrophic	Fatalities both on and off-site, major and exposure to toxic release by numerous people	Widespread environmental damage

The likelihood and consequence ratings are then combined to qualitatively assess the overall level of risk associated with each hazard. The risk assessment matrix is shown in **Table 6.4.**

Table 6.4: Risk matrix

Consequence / Likelihood	Severity				
	Insignificant	Minor	Moderate	Major	Catastrophic
	(1)	(2)	(3)	(4)	(5)
Almost certain (A)	Significant	Significant	High	High	High
Likely (B)	Moderate	Significant	Significant	High	High
Moderate (C)	Low	Moderate	Significant	High	High
Unlikely (D)	Low	Low	Moderate	Significant	High
Rare (E)	Low	Low	Moderate	Significant	Significant

Table 6.5: Qualitative risk assessment

Event	Controls (Mitigation/ Management Measures)	Residual risk of off-site effects with controls in place		
		Likelihood	Consequence	Risk
Fire at the diesel tank	Restriction of ignition sources near diesel storage tanks and control of un-intended ignition sources through use of intrinsically safe electrical equipment and earthing of equipment. The diesel tank storage locations are secured from unauthorised access. The storage areas segregate diesel storage from other hazardous substances and activities to limit the potential for and impact of a fire. Separation distances provided to public and protected places and between tanks to minimise the impact of fire at the storage locations and potential for fire to spread between locations. Emergency Response Plan in place, including provision of a pair of fire extinguishers for initial response to small fires.	Unlikely	Minor	Low
Tank leak	Tank bunding with a minimum of 100% storage capacity requires any failure mechanism to undermine both layers of the double skinned self-bunded tanks. Separation distances between the tanks and from the tanks to public and protected places reduces the potential severity of a spill.	Unlikely	Minor	Low
Spill during refuelling	Refuelling is only conducted by sufficiently trained individuals. Diesel tanks must possess a liquid level indicator to reduce the likelihood of accidental overfilling.	Unlikely	Minor	Low
Flooding in the area resulting in contamination of water	Building design includes freeboard to prevent floodwater ingress. Refuelling will not occur during flooding. The tanks are double skinned, and all connections are above the safe fill level, the contents will be retained even if partially inundated. Maintenance products will be brought to site by contractors as required, and ongoing storage will be limited. Where required, storage will be in small, closed packages in a bunded area.	Rare	Minor	Low

7 Assessment of effects

7.1 Overview

In accordance with the Objectives and Policies of Chapter E31 of the AUP, the assessment of effects from hazardous substances has particular regard to the following aspects:

- The location, design, construction and management of hazardous facilities to avoid or adequately mitigate adverse effects, including risks, to people, property and the environment;
- Assessment of cumulative effects of hazardous facilities so they do not increase to unacceptable levels of risk to people, property and the environment; and
- The transport of hazardous substances as part of a land use activity so adverse effects associated with the transport of hazardous substances on roading infrastructure and other land use activities along transport routes are minimised.
- Provision of adequate separation between hazardous facilities and activities sensitive to hazardous facilities to avoid or adequately mitigate risk to people and property and to avoid reverse sensitivity effects.

The risks associated with the storage and use of diesel in the basement have been assessed as low for risk to aquatic environments in the event of a spill of diesel during refuelling of the tank or flooding in the area and low for risk to off-site people and property from fire in the diesel storage tanks.

7.2 Effects on people and property

Diesel has a low flammability rating, and the tanks are separated from any sensitive activities on-site and from other hazardous substances. Each of the proposed tanks will comply with the minimum required 4-hour fire rating and the thick concrete construction material surrounding the tanks will further minimise the likelihood of fire spreading within the building. The residual risk to off-site locations is very low.

The effect on people or property from fire at the Site have been assessed as less than minor, taking into consideration the proposed controls to manage the hazards and the isolation of the activity in the basement.

7.2.1 Effects on ecosystems

The Waitematā Harbour is sensitive to the effects of ecotoxic contamination.

The diesel tanks are double-skinned to minimise the risk of a leak and are located indoors in a sealed room to minimise the risk of a leak entering surface water or groundwater if a leak were to occur when the system is unattended. This is further mitigated by the liquid level monitoring and venting controls in place on the tanks to prevent overfilling and over-pressurisation when transfer of diesel is required. The refuelling connections will use dry-break couplings and a back-up spill tray to minimise residual contamination.

In the event of a spill during refuelling of tanks or equipment, the spill response procedures will be initiated to contain and clean up the spilled material.

Provided that the controls are effectively implemented, the effect on ecosystems is assessed as less than minor.

7.2.2 Effects from flooding

Areas adjacent to the Project are identified as subject to the 1% annual exceedance probability flood plain on the Auckland flood plain maps and in flood hazard modelling with allowance for the 3.8 degrees of warming high emission future climate scenario (T+T 2025). The Site is also within an area subject to coastal inundation hazard due to sea level rise according to the AUP hazard overlays, as detailed in the Coastal Hazard and Risk Assessment (T+T 2025).

The diesel tanks are located on basement levels B1 and B4 and Level 01 of Podium 3. Level 01 is not considered at risk of flooding or inundation. The building design includes freeboard and flood barriers as appropriate to prevent flood ingress from the building entrances to the basement levels. In the event of a heavy rainfall event, these areas are not expected to be inundated. However, even if floodwaters did enter the basement areas, the diesel will be contained within the primary tanks and secondary containment systems while the floodwaters subside (or are pumped away).

Each tank must be designed to comply with the HSW-HS requirements for stationary container systems (Part 17), which include requirements for separation distances, signage, material specifications, ancillary equipment, and protections from spills and fires. All of which is detailed in Section 4.2.2. The risk to ecosystems from storage of these tanks within the basement during high rainfall events or storm surges coinciding with sea level rise is assessed as low.

Packages of maintenance products are proposed to be brought to the site on an as-required basis and ongoing storage of packaged hazardous substances is expected to be low. Where required, it will be in closed containers and in areas with spill containment bunding. The risk to ecosystems from a flood barrier failure or weather event exceeding the design criteria of the flood protections is assessed as low.

The effect on the environment from the storage and use of diesel at the Site with respect to the risk during a flood is assessed as less than minor.

7.2.3 Effects from transport

Diesel will occasionally be brought to Site by truck or tanker. This is expected to be required infrequently.

Any transport of hazardous substances must be undertaken in accordance with the Land Transport Rule: Dangerous Goods 2005.

Each truck is stocked with a spill kit and drivers are trained in emergency response. Overall, the effect of transport of hazardous substances associated with the proposed diesel storage and use is less than minor.

7.2.4 Cumulative effects

There are no similar bulk fuel storage activities in the surrounding areas of the Project, though it is expected that the other neighbouring commercial buildings will have their own back-up power generation facilities. However, separation distances to the boundary are such that off-site activities are highly unlikely to have any impact on diesel storage and use at the Site. Cumulative effects from the storage and use of hazardous substances with off-site activities are assessed as negligible.

8 Conclusion

Resource consent is required for the following activities:

- The storage and use of hazardous substances (diesel storage for back up power generation) triggers a discretionary activity consent pursuant to E31.4.1 (A7) for exceeding the permitted and restricted discretionary threshold quantities set out in Table E31.4.3 of the AUP for the Business – City Centre Zone.
- The storage of diesel in the 1 per cent AEP flood plain triggers the requirements for a restricted discretionary consent under Table E36.4.1 (A29).
- The storage of other hazardous substances associated with building maintenance are not proposed to exceed the permitted activity threshold and therefore do not require a consent as set out in Table E31.4.3 of the AUP for the Business – City Centre Zone.

The key risks related to the proposed storage and use of diesel associated with the Site include:

- Fire risk from a fire in the diesel storage tanks.
- Risk of ecotoxic effects from a spill of diesel during tank filling
- Risk of ecotoxic effects from storage of diesel tanks or packaged maintenance products in an area that is identified on Auckland Council Catchment and Hydrology maps as subject to the 1% AEP flood plain.

The overall residual risks from the proposed installation and subsequent use of up to seven new diesel tanks holding approximately 18,300 L in total at the Site are considered low.

The two primary risks are a fire within the diesel storage areas and a spill event in which the ecotoxic material is discharged into the stormwater network (and ultimately the harbour). The proposed controls to manage these risks include selection of self-bunding diesel storage tanks with leak detection sensors and a 4-hour fire resistance rating, provision of fire extinguishers, the segregation of these tanks indoors from external people and property and incompatible substances, use of dry-break couplings and overfill sensors during supervised refuelling and implementation of hazardous substances management plan including measures for spill response. Provided that the controls are implemented effectively, the residual risk of a fire or spill associated with the tanks is low and the effect less than minor.

The effect of flooding in the area has been considered and has likewise been determined to be low risk and less than minor in effect given the proposed controls, which will include flood protections as part of building design and tank selection.

Potential effects associated with transporting hazardous substances to the Site will be minimised by compliance with the Land Transport Rule: Dangerous Goods 2005 and have been assessed as less than minor.

9 Applicability

This report has been prepared for the exclusive use of our client Precinct Properties New Zealand Limited , with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

This report has been prepared in accordance with our proposal[6] dated 14 February 2023 (T+T ref:1016043.0000) and variation orders dated 18 February 2025 and 8 August 2025 (T+T reference 1016043.2000).

We understand and agree that our client will submit this report as part of an application under the Fast-track Approvals Act 2024 and that an Expert Panel as the consenting authority will use this report for the purpose of assessing that application. We understand and agree that this report will be used by the Expert Panel in undertaking its regulatory functions.

Compliance with the Environment Court Practice Note 2023

We confirm that, in our capacity as authors of this report, we have read and abided by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses contained in the Practice Note 2023

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Rob Van de Munckhof: I am the Technical Director of Environmental Engineering at T+T and have worked as a Principal and Senior Environmental Engineer at T+T since 2005. I have undertaken hazardous substances risk assessments for a wide range of industries (including for mining, manufacturing and bulk fuel terminals), as well as providing technical support to Councils associated with District Plan rules for management of hazardous substances risks. I hold the following qualifications –BE (Hons)

Tonkin & Taylor Ltd
Environmental and Engineering Consultants

Report prepared by:	Authorised for Tonkin & Taylor Ltd by:
.....	.....
Rose Turnwald Environmental Engineer	Peter Millar Project Director

[6] T+T LOE, 14 February 2023. *"Downtown Carpark Redevelopment – Geotechnical and Environmental Engineering/Civil and Infrastructure Services"*, Job number 1016043.

Technical review by:

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Rob Van de Munckhof
Technical Director – Environmental Engineering

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Appendix A Downtown Carpark Site Development Plans – tank locations

Appendix B Hazardous Substances Management Plan

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