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EDGEROI SERVICE STATION REDEVELOPMENT

STATEMENT OF ENVIRONMENTAL EFECTS

Edgeroi Energy Pty Ltd.
14456 Newell Highway, Edgeroi, NSW 2390

January 2023

This document has been prepared by SMK Consultants Pty Ltd.

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DOCUMENT CONTROL

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Executive Summary

This report has been prepared by SMK Consultants on behalf of Benzina group for Edgeroi Energy Pty Ltd. (the Applicant) to support a development application to the Narrabri Shire Council for the upgrade of an existing service station at 14456 Newell Highway, Edgeroi NSW 2390. Following completion, the development will include a service station, kitchen, dining area and truck driver rest rooms with ancillary vehicle parking and landscaping.

Applicant: Edgeroi Energy Pty Ltd
4 Waxflower Street
Denham Court NSW 2565

Land involved:

Lot Number	Deposited Plan
59	753952
60	753952
61	753952
62	665543
1	311343

Zoning: 'RU5' under the Narrabri LEP

Local Government Authority: Narrabri Shire Council

Proposed Development: Redevelopment of Edgeroi Service Station

Type of Development: Local and Integrated Development

Permissibility: The proposed development is permissible with the consent of the Narrabri Shire Council.

Approvals and Licences

A development approval is required from the Narrabri Shire Council under the Narrabri *Local Environmental Plan 2012.* No other approvals or licences are required for the development proposal.

The Description of Proposal

The applicant for the project is Edgeroi Energy Pty Ltd. It is proposed to redevelop the existing service station and ancillary facilities at 14456 Newell Highway in Edgeroi, NSW 2390. The proposed new service station facility and ancillary infrastructure will extend over Lots 59, 60, 61 DP 753952, Lot 62 DP 665543, and Lot 1 DP 311343.

The proposal involves the demolition of the existing service station and the construction of a new service station facility. The proposal is considered Local Development under the *Environmental Planning and Assessment Act 1979.* The proposed development is considered permissible with the consent of the Narrabri Shire Council under the *Narrabri Local Environmental Plan 2012.*

This environmental assessment of the proposed development has determined that if appropriate safeguards and environmental management practices are adopted on the site, the facilities could be operated with minimal harm to the environment or the amenity of residents within the local area.

TABLE OF CONTENTS

1 Introduction

SMK Consultants has been engaged by the proponent's representative, Benzina Group, to prepare this Statement of Environmental Effects (SoEE). This report will accompany a Development Application (DA) to the Narrabri Shire Council. The application seeks consent for the demolition of an existing service station and construction of a new service station on the same site, being 14456 Newell Highway, Edgeroi, NSW 2390. The new development would entail a service station, restaurant and trucker's facilities with associated car parking and landscaping. The land to be developed includes Lots 59, 60, 61 DP 753952, Lot 62 DP 665543 and Lot 1 DP 311343. This proposal will create employment and new business opportunities within the village of Edgeroi and its surrounds during the construction and operational phases.

This SoEE has been prepared to address the proposed development in accordance with the *Narrabri Local Environment Plan 2012* (Narrabri LEP) and the Narrabri Shire Council development control plans. The SoEE addresses the matters for consideration outlined in Section 4.15 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). It focuses on the key assessment requirements and recommends mitigation measures, where possible, to reduce potential environmental impacts.

1.1 Proponent Details

The Proponent is Edgeroi Energy Pty Ltd. The contact person for the proposed development is Mr. Hewa Husain.

Table 1: Proponent Details

Proponent	**Edgeroi Energy Pty Ltd**
Contact Name	Mr. Hewa Husain
Address	PO Box 365
	Penrith NSW 2751
Email	hewa@thebenzinagroup.com
Phone	+61 414 858 858

2 Site Analysis

2.1 Authors and Guidelines

SMK Consultants have over 30-years of experience in preparing planning applications, layouts, and construction of development sites in the Narrabri area. This experience is incorporated in the design and assessment of the proposed development. The persons involved in the preparation of this Statement of Environmental Effects and its appendices are:

- **Bruno Nwokolo** B.Sc. M.Sc.
- **Peter Taylor** B.Sc. MEIANZ CIAg

2.2 Title Description and Land Tenure

The land titles and their descriptions are set out in the following table.

Table 2: Site Details and Title Description

Parameter	Value
Address	14456 Newell Highway, Edgeroi, NSW 2390
Lot and DP	Lots 59, 60, 61 DP 753952 Lot 62 DP 665543 Lot 1 DP 311343
Owners	Edgeroi Energy Pty Ltd
Area of Property	1.321 Hectares
Local Government Area	Narrabri
Current Land Use	Service Station
Land Use Zoning	RU5 – Village

2.3 Development Details

The Applicant seek to demolish an existing service station and construct a new Service Station with improved facilities on the site. The subject land extends across Lots 59, 60, 61 DP 753952, Lot 62 DP 665543 and Lot 1 DP 311343.

2.4 Site Location

The development proposal is located in the centre of Edgeroi village, approximately 25 kilometres north of Narrabri. The site has historically provided fuel to the local community and travellers. The old facility also included a shop, food sales and a post office site. Traditionally, the site would have provided a fuel depot and point of receival for a range of packages for local farmers. The site had a liquor licence which allowed the sale of alcohol to the surrounding community and was the point of community focus for this local area.

The site adjoins the Newell Highway and has been utilised by travellers as a rest stop as it included an external toilet facility and covered picnic table.

Edgeroi consists of a small village which has traditionally been a service point for the surrounding farming land. There are seven houses in the village in addition to the residence associated with the service station.

Edgeroi also supports a grain receival facility utilised to store grain from surrounding farms. This facility was first constructed in the 1960's but has since been expanded with larger open grain bunkers. The shop and food sales in Edgeroi supported this grain operation.

Edgeroi once had a railway station but this has been closed for some time. The rail upgrade has not redeveloped the railway station.

2.5 Development Site

The property address is 14,456 Newell Highway, Edgeroi, NSW 2390, and this will be referred to as 'the site' therein.

The site operated as a service station and shop up until about 2018 when it was the subject of an investigation for redevelopment. While the existing facilities on the site closed down at that time, the redevelopment did not proceed. The residences on the site remain occupied, however, Figure 1 shows the old service station while it was in operation.

The existing shop and sales building consists of a single storey building located to the east of the Newell Highway. The service station facility originally included two unleaded petrol bowsers at the front of the shop and additional bowsers were installed to the immediate south, including a premium, unleaded and diesel bowser. The premium and unleaded fuel tanks remain below ground. The diesel tank was an above-ground tank which was removed when the site closed down in about 2017 / 2018.

Additional infrastructure on the site includes several open sheds and a residence that was constructed separate to the main shop facility. The original facilities for the residence included a tennis court on the southern side, and an extensive area of mown lawn along Queen Street on the eastern boundary of the site. The site also comprised an external public toilet and shelter area used as a traveller's rest area. The shelter was demolished when it came under disrepair in about 2020.

There are three vehicle access points onto the site from the Newell Highway. The entry/exit points are located on the edge of the highway. A bitumen sealed road, which is located within the road reserve of the Newell Highway, provides the forecourt of the service station and access to the rest area.

Figure 1: Older photo of service station while it was in operation

As a result of the closure of the service station, the site has been used for various purposes, other than a fuel station and shop. The site is currently being utilised for storage of a range of products for upgrade work on the Newell Highway. It was also used for storage of materials for the Inland Rail project. The following image shows the site as of 17th January 2023.

Figure 2: Current use of the site looking southeast from Newell Highway

2.6 Surrounding Land Uses

The site is bordered by similarly zoned properties (RU5 – Village) to the east (Lots 73, 72, 71, & 70 in DP 753952). Newell Highway adjoins the site to the west and the Narrabri-Moree railway line is present directly west of the Newell highway. The property to the west of the railway line comprises the Edgeroi Grain Receival facility (Lot 10 in DP819396) and is zoned RU1 – Primary Production.

The southern adjoining Lot is zoned RU5 – Village and supports a residential dwelling (Lot 63 DP753952).
Land surrounding the village of Edgeroi is zoned RU1 - Primary Production and supports farmland and rural residences.

3 The Development Proposal

3.1 Proposed Development

This Development Application seeks approval for the construction of a service station at 14,456 Newell Highway in the village of Edgeroi. The development involves the replacement of an existing service station, which will require demolition works prior to construction commencing. The proposed development includes the following components:

- Demolition of existing service station site including removal of below ground fuel tanks and remediation activities in the event of contamination;
- Removal of main house and sheds at rear of site;
- Civil works to construct foundation and pavement areas;
- Construction of updated highway intersection/s;
- Construction of service station building and associated external covered areas;
- Installation of fuel bowsers and fuel storages;
- Installation of wastewater management system;
- Construction of onsite stormwater management system;
- Regeneration of existing bore or replacement and installation of appropriate water tanks for potable water supplies and fire-fighting water storage;
- Erection of signage for advertising and traffic flow within the site.
- Provision of onsite car and truck parking spaces for customers and staff;
- Landscaping.

The land is not bushfire prone and therefore only limited asset protection zones are required. It is noted that there is an existing perimeter road surrounding the site to the north, west and east. The bitumen sealed Queen Street borders the site to the east and north, while the Newell Highway runs along the western boundary.

Stormwater plans have been prepared by Civil & Stormwater Engineering Services Pty Ltd. The plans document the methodology involved in determining stormwater flows, water cycle management to reuse stormwater and provide recommendations regarding detention and erosion and sediment control. Stormwater calculations are in accordance with Council requirements and accepted water sensitive urban design principles. The plans are attached as Appendix 2.

Where required, relevant service authorities will be contacted to make the necessary arrangements for the provision of the upgrade and ancillary works. This may include provision of better communication connections to the site from the existing telecommunication lines running parallel with the Newell Highway.

The following figures provide a locality and overall site plan of the proposed development.

Figure 3: Aerial Photo and street view of development site

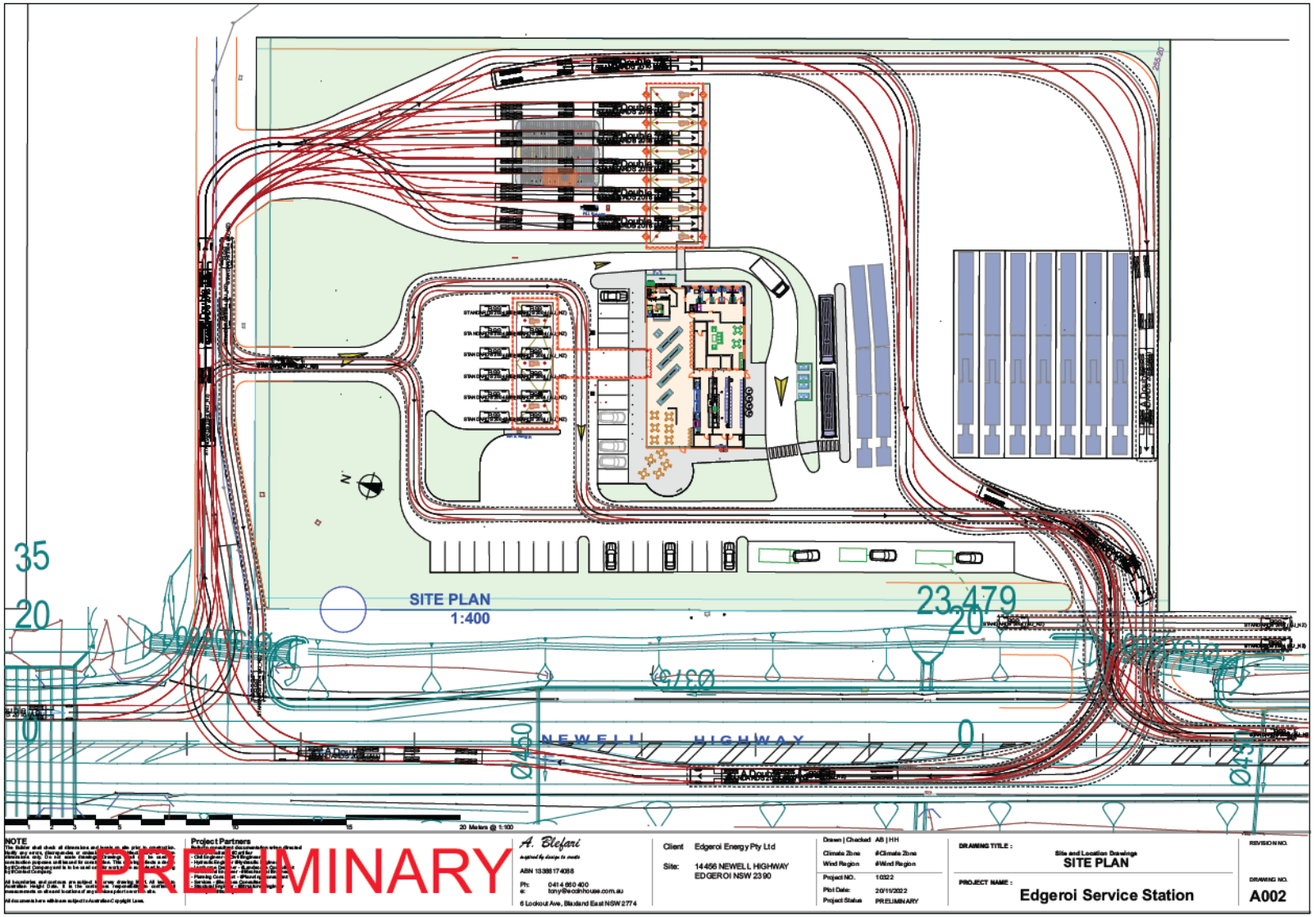


Figure 4: Preliminary Layout of Proposed Edgeroi Service Station site

3.1.1 Proposed Service Station

The site aims to provide service station facilities for both light and heavy vehicles. A large part of the site will be developed to provide fuelling facilities for mainly south-bound trucks, parking areas to enable the drivers to rest and utilise the separate truckers rest rooms and lounge facility.

The proposed service station will include an underground tank system in preference to above ground tanks and fuel bowser. This will be required to include a monitoring bore network in accordance with NSW EPA recommendations.

The service station will also include a convenience store, café and dining area. The old service station provided these services and therefore no change of use is occurring.

The intention is to operate the site on a 24/7 basis. This will provide for truck operators using the Newell Highway as well as drivers during grain harvest periods, with somewhere to obtain food and rest. This is necessary on the basis of requirements for mainly interstate truck drivers to maintain their rest periods.

No accommodation will be provided on this site.

The service station is expected to require between 2 and 3 people to staff the site. This will potentially require between 2 or 3 shifts per day. It is therefore expected that the site will require the equivalent of 10 or more full time staff to operate.

The following table presents the estimation of service vehicles required to operate the site.

Table 3: Service Station Deliveries

Delivery Type	Frequency	Vehicle Type	Number per week
Fuel	Weekly / Bi-Weekly	Triaxle / B-Double	3
Gas (Swap Bottles)	Quarterly	Medium Rigid Truck	1
Grocery	Monthly	Medium Rigid Truck	2
Drink	Fortnightly	Medium Rigid Truck	2
Garbage	Weekly	Medium Rigid Truck	1
Confectionary	Fortnightly	Van	1
Milk	Weekly	Small Truck / Ute	5
News Papers	Daily	Ute	1

Figure 5 presents a floor plan of the proposed service station.

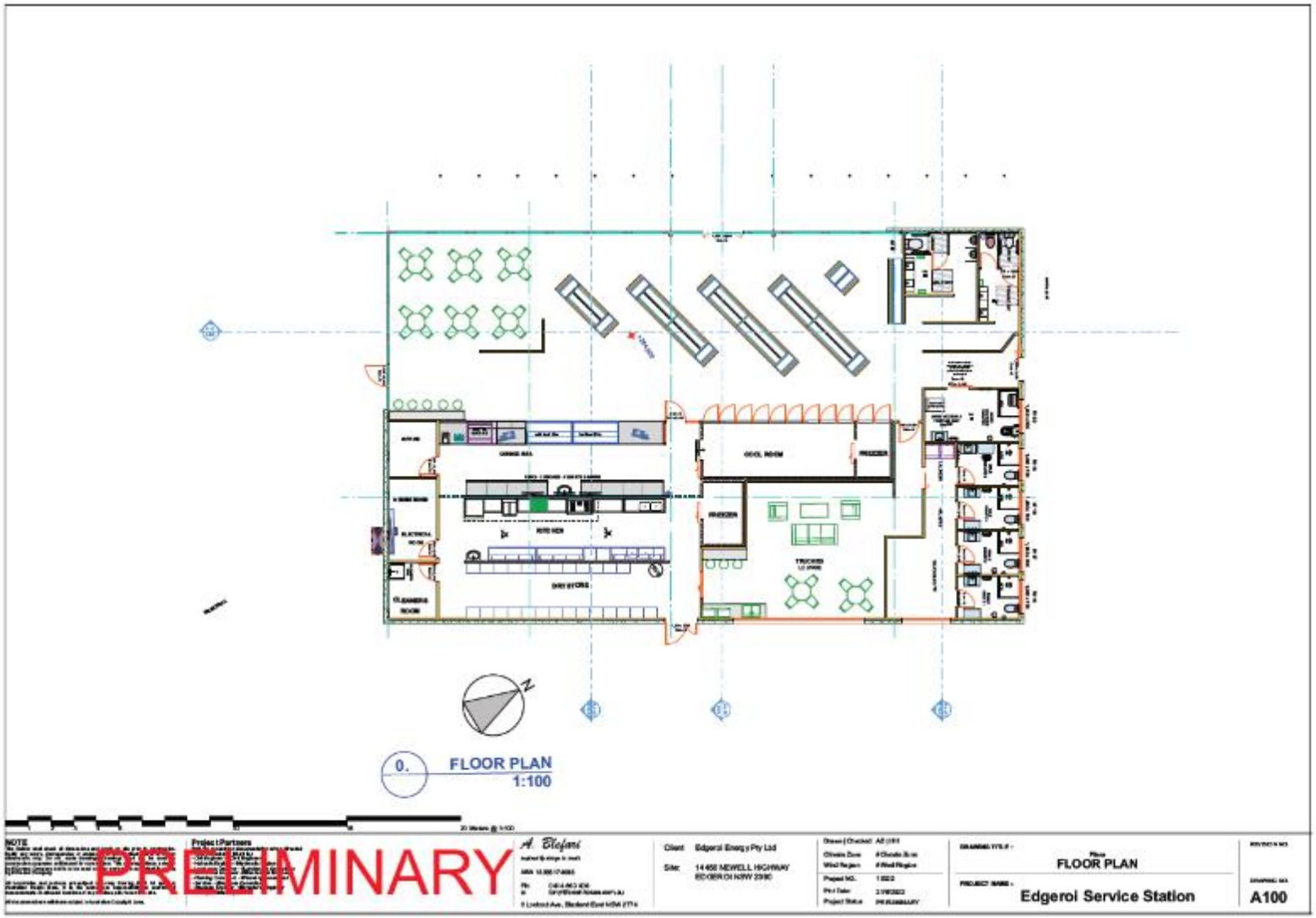


Figure 5: Preliminary floor plan of service station building

3.1.2 Proposed Convenience Store, Cafe and Trucker's Facilities

The convenience store will provide basic groceries for travellers and local residents. The proposed food and drink premises will include 48 seats. There will also be a dedicated trucker's area which will include a lounge, shower facilities and ablution facilities.

Kitchen hours of operation will be from 6am until 10pm Monday to Sunday, with pre-prepared meals available outside of these hours.

3.1.3 Lighting

The service station site will require lighting for safety purposes and night operations. Lighting will be provided in two forms. Directional downward facing lights will be installed within the covered fuel bowser areas, illuminating refuelling areas for safety purposes. This lighting will be directed downward and will not aim to illuminate the immediate surrounds.

Softer directional lighting will be provided to mark out car parks and footpaths. This will be in the form of short post-mounted lights to illuminate areas for pedestrian use.

The proposal does not include large overhead lighting within the truck parking areas. This would have the potential to impact adjoining residences and will therefore be avoided.

3.1.4 Wastewater Management

Edgeroi does not have a sewage scheme and all existing houses and facilities dispose of wastewater via septic disposal systems. The site currently has several old septic tanks and absorption trenches in place which were sufficient for onsite wastewater disposal for the existing site. They will not be suitable for the larger service station facility that is proposed.

The applicant is proposing to utilise a packaged sewage treatment system which can be partially buried onsite. The intent is to dispose of the treated wastewater onsite. This water can be applied to part of the surrounding landscaping as a sustainable reuse of this water.

3.1.5 Intersection onto Newell Highway

Benzina Group engaged Stantec to complete a transport impact assessment for the proposed development. The transport impact assessment (TIA) is included as Appendix 5. The report recommends that in order to facilitate the safe movement of vehicles, the intersection of the Newell Highway and Queen Street North (the intersection leading to the site entry driveways on the northern boundary) and the site exit driveway directly on the Newell Highway close to the southern boundary should both be modified. Modifications would be minor, including road widening and alignment changes to ensure two-way traffic flows on Queen Street, and changes to painted mediants to accommodate A-Double/B-Triple vehicles.

The TIAS included discussions with Transport for NSW. The final layout of the entrance and exits have been submitted to Transport for NSW for their review. At present, an agreement in principle was reached for the entry and exit for this development proposal. The Newell highway has an 80 km/h speed limit and channelised left and right turning lanes which were developed for the old service station site.

It is also noted that widening of the Queen Street North road reserve is recommended along the sites northern boundary to better align the intersection works and Queen Street North, with logical paths of travel, and two-way independent movements maintained. The TIA includes plans showing vehicle swept paths, including 36.5m A-Doubles to ensure appropriate access is possible for all design vehicles that are permitted on the Newell Highway.

3.1.6 Proposed Car Parking

The proposed car parking for the development will need to include separate areas for trucks and light vehicles. The largest vehicle that may access the site at present would be an AB-Triple or a 13- axle rigid truck and two dog trailers, with a length of approximately 37m.

The proposed development includes a total of 63 on-site parking spaces, including 11 heavy vehicle parking spaces (nine for heavy vehicles and two for coaches). The proposal also includes six light vehicle refuelling spaces, five spaces at the high flow heavy vehicle fuel pumps and two accessible spaces. Parking areas also allow for car and trailers as well as single vehicles. 20-car parks are included. Three spaces are available for car and caravan combinations. This complies with TfNSW guidelines and the Narrabri Shire DCP.

3.1.7 Proposed Landscaping

A final landscaping plan has not been prepared to date. This will be dependent on the overall site layout and land remaining once the internal turning pathways are established.

The objective of the landscaping proposal will be to soften the impact of the proposed development on the streetscape and to present a tidy and aesthetically pleasing final development. This will be most significant in minimising the visual impact of the proposal on houses to the east and south of the site. Additionally, the landscaping will provide a more pleasing visual amenity, encouraging clients to stop at the site and limit the area of bitumen sealed surfaces to reduce overall heat emissions from the paved area.

As per Figure 3 (Drawing A002) presented as the overall preliminary site plan, landscaping will be carried out along the majority of the perimeter of the site. The western area between the building and the highway corridor will be landscaped with mainly short shrubs and grass to ensure that sight distances are not impeded by plant growth. Internal areas associated with the car parking area and entrance to the trucker's lounge will also be landscaped with shrubs

and grass to soften these areas and limit the area of exposed pavement during hot summer periods.

3.1.8 Proposed Signage

The proposal seeks approval for advertising signage on the premises as part of the overall development. The proposed signage will reflect the service station's corporate branding. The preliminary proposal will involve:

- 9m Prime Sign -internally illuminated;
- Directional Signage for entry and exit points - not illuminated;
- Air and Water Signage - not illuminated;
- Canopy / Building Fascia Sign to show fuelling facilities - not illuminated.

The final layout of signs will be presented at the construction certificate phase of the development.

3.2 Infrastructure Requirements

3.2.1 Telecommunications and Electricity

Telephone and power services are available to the site and will continue to service the proposed upgrade. Service authorities will be contacted to obtain specific requirements once the Development Application has been lodged with and approved by Council.

3.2.2 Water Supply

Water supply needs have been calculated from guidelines utilised to determine typical wastewater design flows for various developments.

The current Australian Standard AS/NZS 1547:2012 does not provide any planning values for non-domestic wastewater flows in Australia. In view of absence of suitable planning data at a state level, the '*Code of practice – onsite wastewater management'*, issued by the EPA Victoria (2016), was utilised to determine typical wastewater design flows generated by the proposed service station.

Table 4 includes the predicted wastewater design flow calculations for the facility on a daily basis. It is noted that wastewater associated with staff is included in two categories. This has been carried out with the intent of providing conservative design flow estimates for the proposed development.

Table 4: Predicted Commercial Wastewater Flow Allowances

Facility	Source	Peak Day Usage People	Design Flow Per Person (L/day)	Total Design Flow (L/day)
Restaurant	Prepared Food / Meals	132	15	1,980
Shop	Staff	15	15	225
Staff room	Staff	15	60	900
Laundry	-	11	115	1,265
Shower Facility	-	45	40	1,800
Toilets	-	132	10	1,320
Total				**7,490**

Based on the above calculations, **the maximum daily design flow for the proposed development is 7,490 L per day.** This is equivalent to 2.7 ML per annum.

While rainwater harvesting could be used to supplement supply, the primary source of water would need to be groundwater. As this facility would be referred to as a business, the use of groundwater under the provision of domestic and stock use is not permissible. The option for a water source would be to purchase a water entitlement and obtain work approval for a new bore on the site.

There is currently one bore (GW007252) on site however no data is available for this bore. There are an additional 4 bores in the vicinity, as shown in Figure 6. Yield data is only available for bore GW969838; this has a yield of 3.8 L/s. While it is impossible to exactly predict a new bore's yield, or an existing one without the appropriate data, the fact that a nearby bore has a yield potential of 328,320L/day implies another bore in the same vicinity would easily achieve the required 7,490L/day.

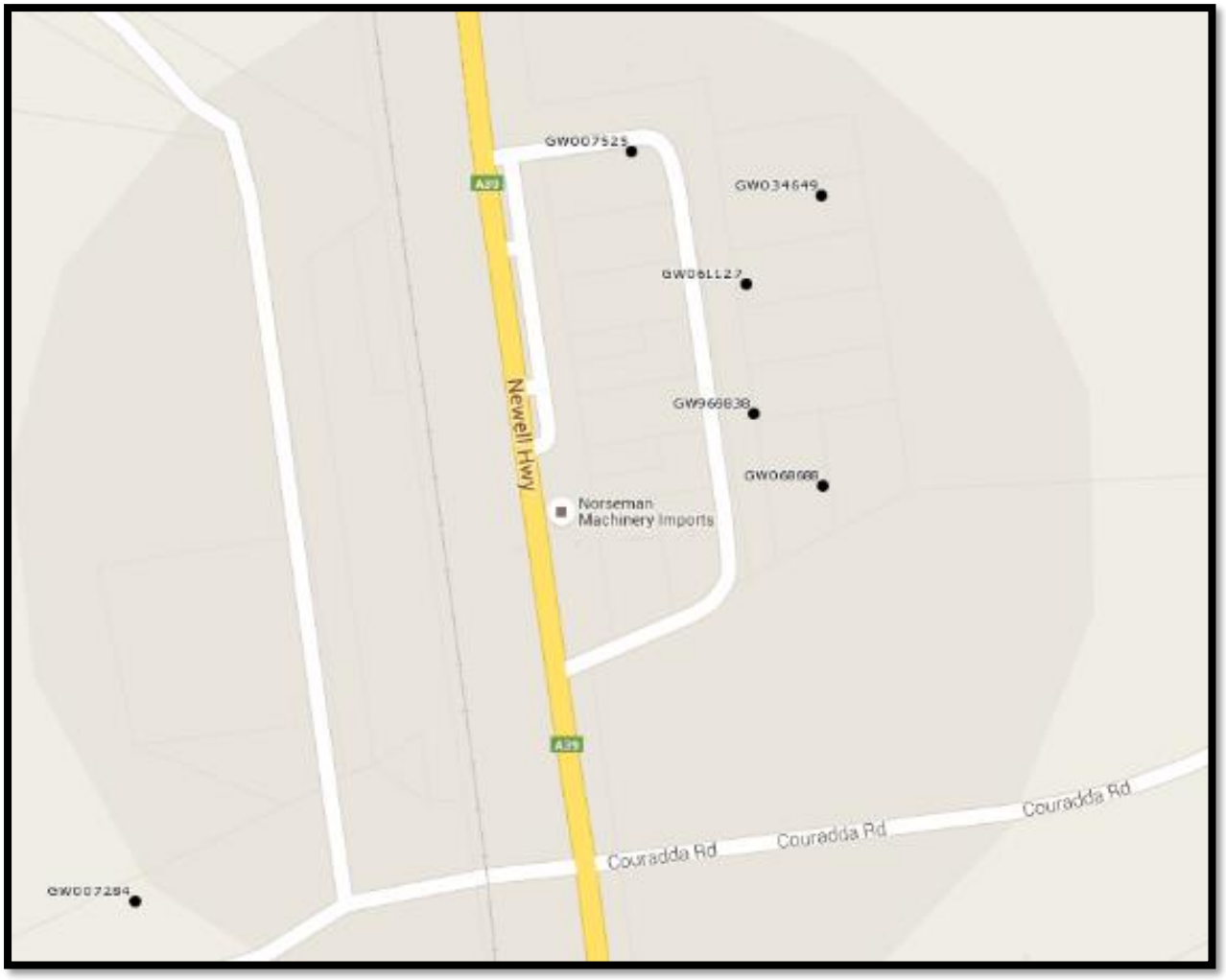


Figure 6: Bores in the Vicinity of the Development Site

4 Statutory Matters

This application seeks to upgrade the facilities and does not include any change in land use.

The development proposal is considered Local Development under Part 4 of the *Environmental Planning and Assessment Act, 1979* as it does not exceed local development thresholds. The proposal therefore requires development consent from the Narrabri Shire Council without a requirement for the application to be assessed by a Joint Regional Planning Panel.

The development is also classified as 'Integrated Development' pursuant to Section 4.46 of the EP&A Act, as approvals from other government agencies are required, specifically TfNSW.

4.1 Commonwealth Legislation and Regulations

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) is the Australian Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities, and heritage places defined in the EPBC Act as Matters of National Environmental Significance (MNES). The EPBC Act provides guidelines for an assessment process to determine whether a development needs referral to the Federal Department of Environment, Water, Heritage and the Arts (DEWHA) in Canberra.

The proposed development was considered in accordance with the EPBC Act. The proposal is not considered to have the potential to significantly impact on any Matters of National Environmental Significance, as the site has already been cleared of native vegetation and no additional clearing of native vegetation is proposed. Hence, this proposal is consistent with the objectives of the EPBC Act.

4.2 State Legislation, Regulations and Policies

4.2.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* provides the framework for NSW Planning Legislation. Under this Act, local Councils prepare Local Environmental Plans (LEPs) that specify planning controls for specific parcels of land. The Act also provides for State Environmental Planning Policies (SEPPs). The applicable SEPPs have been discussed in detail within this report. This SoEE has been prepared in accordance with the requirements of this Act. It provides an environmental assessment and details of how development will be constructed and operated to protect the environment, the community and provide for ecologically sustainable development.

4.2.2 Environmental Planning and Assessment Regulation 2000

The NSW *Environmental Planning and Assessment Regulation 2000* requires that certain documents must accompany a development application. This Statement of Environmental Effects and its attachments satisfy these requirements.

Under Part 1 Clause 4, Designated Development is described as:

1) *Development described in Part 1 of Schedule 3 is declared to be designated development*
2) *for the purposes of the Act unless it is declared not to be designated development by a provision of Part 2 or 3 of that Schedule.*
3) *Part 4 of Schedule 3 defines certain words and expressions used in that Schedule.*
4) *Part 5 of Schedule 3 prescribes how certain distances are to be measured for the purposes of that Schedule.*

   Schedule 3, as in force when a development application is made, continues to apply to and in respect of the development application regardless of any subsequent substitution or amendment of that Schedule, and the application is unaffected by any such substitution or amendment.
5) *References in subclause (4) to Schedule 3 include references to Schedule 3 to the Environmental Planning and Assessment Regulation 1994.*

Schedule 3 Designated Development Part 27 states that petroleum works are designated if;

Petroleum works:

a) *that produce crude petroleum or shale oil, or*
b) *that produce more than 5 petajoules per year of natural gas or methane, or*
c) *that refine crude petroleum, shale oil or natural gas, or*
d) *that manufacture more than 100 tonnes per year of petroleum products (including aviation fuel, petrol, kerosene, mineral turpentine, fuel oils, lubricants, wax, bitumen, liquefied gas and the precursors to petrochemicals, such as acetylene, ethylene, toluene and xylene), or*
e) *that store petroleum and natural gas products with an intended storage capacity in excess of:*
   i. *200 tonnes for liquefied gases, or*
   ii. *2,000 tonnes of any petroleum products, or*
f) *that dispose of oil or petroleum waste or process or recover more than 20 tonnes of oil or petroleum waste per year, or*
g) *that are located:*
   i. *within 40 metres of a natural waterbody or wetland, or*

ii. in an area of high water table or highly permeable soils, or

iii. within a drinking water catchment, or

iv. on a floodplain.

The proposed service station development will store a maximum of 330 kL of flammable liquids in three underground storage tanks, divided into the components displayed below.

Table 5: Summary of Fuel storage

Fuel Type	**Volume (L)**	**Density (kg/m^3)**	**Weight (Tonne)**
Diesel	70,000	836	58.520
Diesel	40,000	836	33.440
Diesel	90,000	836	75.240
AdBlue	20,000	1093	21.860
UPL	80,000	735	58.800
E10	30,000	743	22.290
		Total	**270.150**

Total storage capacity on site is therefore approximately 270 tonnes, well below the designated development criteria (2,000 tonne) stated in the Regulations.

In addition to the above information, the proposed development does not pose an additional significant environmental impact relative to the existing development, and as such is not Designated, as stated in Clause 35 of Schedule 3 included below:

> *Part 2: Are alterations or additions designated development?*
> *35: Is there a significant increase in the environmental impacts of the total development?*
> *Development involving alterations or additions to development (whether existing or approved) is not designated development if, in the opinion of the consent authority, the alterations or additions do not significantly increase the environmental impacts of the total development (that is the development together with the additions or alterations) compared with the existing or approved development.*
> *Note. Development referred to in this clause is not designated development for the purposes of section 77A of the Act. This means that section 98 of the Act (Appeal by an objector) will not extend to any such development even if it is State significant development.*

4.2.3 Biodiversity Conservation Act 2016

The BC Act outlines requirements in relation to the listing of threatened species, biodiversity impact assessment, offsetting and related offences. The assessment of biodiversity values on land and the impacts of activities on those biodiversity values are to be carried out in accordance with the Biodiversity Assessment Method (BAM). The objective of the BAM is to adopt a standard approach that will result in no net loss of biodiversity in NSW.

The Act also outlined the Biodiversity Offset Scheme (BOS). Development that is subject to the BOS scheme includes development needing consent under Part 4 of the EP&A Act (excluding complying development), activities under Part 5 of the EP&A Act, State significant development and State significant infrastructure.

Where development or an activity is, "likely to significantly affect threatened species", a Biodiversity Development Assessment Report (BDAR) must be prepared and consent authorities are required to consider the likely impact of the proposed development on biodiversity values before granting approval.

Section 7.2. of the BC Act states that an activity is "likely to significantly affect threatened species" (and therefore whether a BDAR is required) is reached if:

- The test in section 7.3 of the BC Act identifies matters that may significantly impact threatened species, populations or endangered communities;
- The Biodiversity Offset Scheme (BOS) Threshold is exceeded; and
- The development is carried out in a declared area of outstanding biodiversity value.

The subject land was assessed using the online Biodiversity Offsets Scheme Entry Tool, which determines whether any proposed clearing would be above or below the area thresholds or lies within an area mapped as having high biodiversity value. According to the BOS Entry Tool, the area clearing threshold for the subject site is 2,500 sq.m (0.25 Ha) of native vegetation. The majority of the proposed development site has already been cleared of native vegetation and developed as sealed or gravelled areas in association with the previous development. While additional vegetation will be removed as part of the proposal, the remaining vegetation is dominated by non-native species and is thus not considered to constitute a native vegetation community. Several Bimble Box trees will be retained on this site if the vehicle movement paths can be designed around the trees. A large proportion of the site is presently covered in gravel and is being used for storage of materials to be used for a Newell Highway upgrade within Edgeroi. The allowance of clearing up to 0.25 Ha of native vegetation can ensure that the development that would not exceed the BOS Threshold.

The proposed development site is not located within a declared area of outstanding biodiversity value. The adjoining Tarlee Creek is mapped as an area that has high Biodiversity Value but the mapped area does not extend onto the development site. A copy of this map is presented in Appendix 6.

Proponents are also required to carry out a 'test of significance' for all development proposals that do not exceed the Biodiversity Offset Scheme Threshold. A test of significance was not deemed to be required for this proposal given that the vegetation within the proposed development site is limited in area and has been actively managed as part of the original service station for a period of more than 30-years (Pre-1990). Disturbance of the remaining native vegetation will be limited.

4.2.4 National Parks and Wildlife Act 1974

The proposal has been prepared in accordance with the requirements of this Act. There are no national parks, nature reserves, regional parks, state conservation areas, historic sites, karst conservation areas or Aboriginal areas within the subject area.

A preliminary assessment of cultural heritage was undertaken and included elsewhere in this report. An inspection of the subject site was conducted in accordance with Due Diligence methodologies to assess the potential impact of the proposed development on any items or sites of cultural significance. No sites of cultural significance were observed within the footprint of the proposed development site.

These considerations protect the objectives of the Act.

4.2.5 The Heritage Act 1977

There are no known non-indigenous heritage items identified within or near the development site.

4.2.6 Water Management Act 2000

The objects of the *Water Management Act 2000* are to provide for the sustainable and integrated management of the water sources of the State for the benefit of both present and future generations.

The site is not flood-prone and therefore a flood work application is not required. A small contour bank is located within the boundary of the northern section of Queens Street. This reduces or prevents the overland flow in the adjoining Tarlee Creek from entering the village area.

The site will require a work approval for an onsite bore. This will be subject to an application to Water NSW. The process may involve utilising the existing bore however it will require approval. The option will involve decommissioning this bore and replacing it with a new one. Once this is completed, a Water Access Licence should be obtained and linked to the approved bore to provide a legal source of potable water to the site. Some water will be obtained from rainwater capture and storage.

4.2.7 Environmental Planning and Assessment Amendment (Siding Spring Observatory) Regulation 2016

The aim of the *Environmental Planning and Assessment Amendment (Siding Spring Observatory) Regulation 2016* is to ensure that development in the vicinity of the Siding Spring Observatory does not impact the effectiveness of the observatory, around which the Dark Sky Region in NSW is centered.

Clause 92 of the *Environmental Planning and Assessment Amendment (Siding Spring Observatory) Regulation 2016*, under the *Environmental Planning and Assessment Act 1979*, requires consent authorities to take into consideration the Dark Sky Planning Guideline when determining a development application for Regional development, State significant development or designated development on land within 200km of the observatory.

The proposed development is 146km from the Observatory; however, it is classed as Local Development and does not constitute Regional development, State significant development or designated development. The *Environmental Planning and Assessment Amendment (Siding Spring Observatory) Regulation 2016* is therefore not applicable to the proposed development.

4.3 State Environmental Planning Policies and Development Codes

The following table presents a summary and comment on State Environmental Planning Policies and development code relevance to the proposed development.

Table 6: State Environmental Planning Policies and Development Codes

SEPP Title	Relevance
State Environmental Planning Policy (Planning Systems) 2021	Not Relevant
State Environmental Planning Policy (Biodiversity and Conservation) 2021	Review provided below
State Environmental Planning Policy (Resilience and Hazards) 2021	Review provided below

SEPP Title	Relevance
State Environmental Planning Policy (Transport and Infrastructure) 2021	Review provided below
State Environmental Planning Policy (Industry and Employment) 2021	Review provided below
State Environmental Planning Policy (Resources and Energy) 2021	Not Relevant
State Environmental Planning Policy (Primary Production) 2021	Review provided below
State Environmental Planning Policy (Precincts – Eastern Harbour City) 2021	Not Relevant
State Environmental Planning Policy (Precincts – Central River City) 2021	Not Relevant
State Environmental Planning Policy (Precincts – Western Parkland City) 2021	Not Relevant
State Environmental Planning Policy (Precincts – Regional) 2021	Not Relevant

4.3.1 State Environmental Planning Policy (Resilience and Hazards) 2021

4.3.1.1 Hazardous and Offensive Development

Chapter 3 of the SEPP applies to proposals falling under the definition of *'potentially hazardous industry'* or '*potentially offensive industry'*. Under the SEPP, the permissibility of industrial proposals is linked to safety and pollution control performance. The SEPP aims to ensure the merit of proposals are properly assessed before being determined. It aims to ensure that developments can only proceed if they are suitably sited and can demonstrate that they will be built and operated with an adequate level of safety.

In a potentially hazardous industry, any development proposing the storage and handling of goods considered hazardous goods needs to be screened and have a risk assessment completed.

A screening process was undertaken by Fuel System Designers for the proposed development. The screening process included applying a rigorous analysis considering the hazardous materials to be stored, boundary setbacks, transportation services, external consequences and the probability of a hazardous event. Calculations were undertaken in keeping with the Department of Planning's – Applying SEPP 33 and the Planning & Infrastructure's Assessment Guideline – Multi-level Risk Assessment.

The assessment is included in full in Appendix 4 of this report. In summary, the results of the screening process undertaken for the proposed service station development in Edgeroi

indicates that it is not a potentially hazardous development. As such, no further analysis (i.e. Preliminary Hazard Analysis) is necessary.

4.3.1.2 Remediation of Land

Chapter 4 of the *Resilience and Hazards SEPP 2021* covers remediation of land and aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or other aspects of the environment. Where it is proposed to rezone the land or to carry out a development that would change the use of the land a consent authority must consider whether the land is contaminated and if it is, whether the land is suitable for the proposed development in its present state or whether remediation is required. Even where no change of use is proposed a consent authority must consider whether the land is suitable for the proposed development if the land has been used for a purpose listed in Table 1 of Appendix 1 in Contaminated Land Planning Guidelines (NSW Government, 2018 (Draft)).

There is an existing service station on the development site. NEO Consulting Pty Ltd conducted a targeted Environmental Site Assessment report (included as Appendix 8) for the development site in 2021 to identify if hydrocarbon, BTEX, TRH and Metals 8 Contamination existed across the site.

On the 4th November 2021 NEO Consulting Pty Ltd took representative soil samples from various locations and depths across the site with the intent of identifying hydrocarbon discharge from the UPSS, pipes and dispensing units. Whilst onsite NEO Consulting Pty Ltd inspected the site for water monitoring wells, no monitoring wells were located onsite at the time of the inspection.

No soil sample taken whilst doing the field work had any indication of contamination visually or aromatically. Laboratory analysis of each soil sample indicates the site is well within the acceptable contamination and had no evidence of reaching any health-based investigation levels. The site was deemed suitable for continued use as determined in accordance with the NSW EPA Guidelines for assessing Service Station Sites 2003 and Schedule NEPM 2013 B5c 5a.

Contamination from the primary source of hydrocarbons outside of the tank pit area at the site was not evident. No soil sample extracted from across the site was noted as failing against the assessment criteria.

The report concludes that the site is suitable for use provided the following recommendations are implemented:

- Considering the site has been closed, the UPSS onsite should be decommissioned in accordance with NSW SafeWork, or re-commissioned for use.

- Any soils requiring excavation, on-site reuse and/or removal must be classified in accordance with "Waste Classification Guidelines Part 1: Classifying Waste" NSW EPA (2014);
- All on site structures should be assessed within a Hazardous Materials Survey prior to demolition.

4.3.2 State Environmental Planning Policy (Transport and Infrastructure) 2021

The site is located on the Newell Highway which is classified as a state road (A41) under Section 138 of the Roads Act 1993. As the proposed development has frontage to a classified road, the provisions of State Environmental Planning Policy (SEPP) (Transport and Infrastructure) 2021 apply to the site.

Part 2.3 Division 17 refers specifically to road infrastructure and is relevant to the proposed site redevelopment. Clause 2.119 states:

"The consent authority must not grant consent to development on land that has a frontage to a classified road unless it is satisfied that:

a) where practicable, vehicular access to the land is provided by a road other than the classified road, and

b) the safety, efficiency and ongoing operation of the classified road will not be adversely affected by the development as a result of:

i. the design of the vehicular access to the land, or

ii. the emission of smoke or dust from the development, or

iii. the nature, volume or frequency of vehicles using the classified road to gain access to the land, and

c) The development is of a type that is not sensitive to traffic noise or vehicle emissions, or is appropriately located and designed, or includes measures, to ameliorate potential traffic noise or vehicle emissions within the site of the development arising from the adjacent classified road".

The SEPP further specifies that a consent authority must consult with the road authority and have regard for its feedback in relation to traffic safety, road congestion and other matters as specified under Clause 3.58:

"(2) Before determining a development application for development to which this clause applies, the consent authority must:

a) give written notice of the application to Transport for NSW (TfNSW) within 7 days after the application is made, and b)

b) take into consideration the matters referred to in subsection (3).

(3) The consent authority must take into consideration—

a) any submission that TfNSW provides in response to that notice within 21 days after the notice was given (unless, before the 21 days have passed, TfNSW advises that it will not be making a submission), and

b) the accessibility of the site concerned, including—

i. the efficiency of movement of people and freight to and from the site and the extent of multi-purpose trips, and

ii. the potential to minimise the need for travel by car, and

c) any potential traffic safety, road congestion or parking implications of the development.

The subject site enjoys current safe access directly from the Newell Highway and its redevelopment will incorporate the provision of improved ingress and egress arrangements, suited to heavy vehicles.

A Transport Impact Assessment has been prepared by Stantec. The Report has considered existing traffic conditions, proposed access arrangements for the site and its on-site parking provisions and has concluded that the project is capable of operating without adverse impact on traffic conditions.

The traffic assessment report for proposed development is included in full in Appendix 5, and findings are summarised in Sections 3.1.5, 3.1.6 and 6.10 of this SoEE.

4.3.3 State Environmental Planning Policy (Industry and Employment) 2021

The proposed signage is consistent with the objectives of the Policy and satisfies the assessment criteria specified in Schedule 5 of the Policy. The proposed signage:

- is compatible with the character of the area and locality of the Newell Highway;
- does not detract from the amenity or visual quality of any environmentally sensitive areas, heritage areas, natural or other conservation areas, open space areas, waterways, rural landscapes or residential areas;
- does not obscure or compromise important views, dominate the skyline or reduce the quality of vistas;
- respects the viewing rights of other advertisers;
- contributes to the visual interest of the streetscape, setting and landscape;
- does not protrude above buildings, structures or tree canopies in the area;
- is compatible with the scale, proportion and other characteristics of the site and buildings;
- respects important features of the site and buildings and;

- does not reduce the safety for any public road, pedestrians, bicyclists or children by obscuring sightlines from public areas.

Furthermore, illumination will not result in unacceptable glare, affect safety for pedestrians, vehicles or aircraft or detract from the amenity of any residence or other form of accommodation. The proposed scale, proportion and form of the proposed signage is appropriate for the streetscape, setting and landscape.

Advertisements and signage to which this Part applies
The proposed signage is business identification signage and it is not located within an area that prohibits advertisements. The proposed development application requires approval for the proposed signage from the Consent Authority – Narrabri Shire Council.

The proposed signage is not located on transport corridor land. The application will be advertised in accordance with section 79A of the Act. As this advertisement is within 250m of a classified road, clause 18 of the act applies, accordingly, the application will be provided to the RTA (now TfNSW) at the same time that it is advertised in accordance with section 79A of the Act. While the proposed advertisements protrude above the dominant skyline, buildings, structures or tree canopies, the consent authority may grant consent to the display under Chapter 3 of the SEPP.

4.3.4 State Environmental Planning Policy – Primary Production and Rural Development 2021

The subject site is located within the state of New South Wales and zoned RU5 Village under the *Narrabri Local Environmental Plan 2012*. Therefore, the proposed development is consistent with the rural development planning Policy. The site has an existing use as a service station.

4.3.5 State Environmental Planning Policy (Biodiversity and Conservation) 2021

Chapter 4 of the *SEPP (Biodiversity and Conservation) 2021* applies to land within each local government area listed in Schedule 2 of the SEPP, with certain exceptions such as land zoned RU1 – Primary Production or land dedicated or reserved under the *National Parks and Wildlife Act 1974*, for example. The Narrabri LGA is included in this schedule, and none of the exceptions listed apply to the site. The proposal is therefore to be assessed pursuant to Chapter 4 of the SEPP.

Clause 4.9 of the SEPP sets out the development assessment process where the proposal has an area of more than 1 Hectare and no approved Koala plan of management has been prepared for the land. These conditions apply to the current proposal.

An excerpt is provided below:

3) *If the council is satisfied that the development is likely to have low or no impact on koalas or koala habitat, the council may grant consent to the development application*
4) *If the council is satisfied that the development is likely to have a higher level of impact on koalas or koala habitat, the council must, in deciding whether to grant consent to the development application, take into account a koala assessment report for the development.*
5) *However, despite subsections (3) and (4), the council may grant development consent if the applicant provides to the council—*

(a) information, prepared by a suitably qualified and experienced person, the council is satisfied demonstrates that the land subject of the development application—

(i) does not include any trees belonging to the koala use tree species listed in Schedule 3 for the relevant koala management area, or

(ii) is not core koala habitat, or

(b) information the council is satisfied demonstrates that the land subject of the development application—

(i) does not include any trees with a diameter at breast height over bark of more than 10 centimetres, or

(ii) includes only horticultural or agricultural plantations.

The SEPP provides the following definitions:

- ***Core Koala Habitat*** *means*:
  a) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas are recorded as being present at the time of assessment of the land as highly suitable koala habitat, or
  b) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years.
- ***Koala Habitat*** means koala habitat however described in a plan of management under this Chapter or a former Koala SEPP and includes core koala habitat

Site Assessment

The assessment requires that the land is assessed for the presence of potential Koala habitat or core Koala Habitat.

The proposed development footprint contained three Koala feed tree species, mainly Bimble Box. The majority of the site has been cleared of native vegetation and has been developed or disturbed in association with the previous development. As such the subject area is not considered to be suitable for Koala and does not constitute potential koala habitat.

Figure 7 includes a map of all the recorded koala sightings within the site. The red triangles indicate recorded sightings. There are no known record within 5-kilometres of the proposed development site. No historical records of a “resident population” exist for the project area.

Given that there is no evidence of a resident population of Koalas in the local area. Koala records show some sightings in the Bobbiwaa Conservation area located 7.5 km to the east of Edgeroi. No Koala sighting records are noted for Edgeroi.

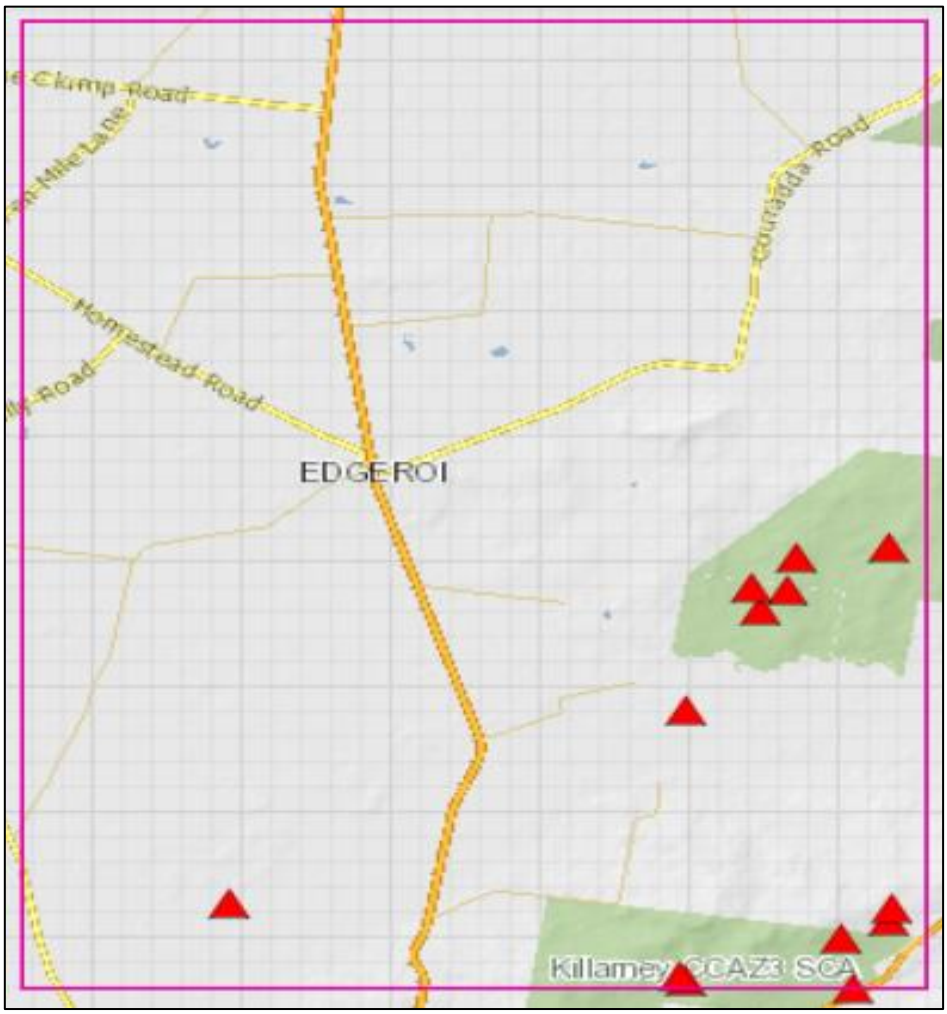


Figure 7: Koala Records in a 10km x 10km area centred around the subject site

The lack of Koala habitat in Edgeroi and the lack of sightings in the town area indicate that Koala do not use the village area. On this basis, no further investigation is required for this SEPP.

4.4 Regional Plan

4.4.1 New England North West Regional Plan 2036

The New England North West is one of the State's largest agricultural and food producers. To ensure that the region makes the most of our productive agricultural land and associated business opportunities, investment is required in infrastructure, including construction and manufacturing materials to provide the foundations for a strong and prosperous future.

The Plan outlines the following regionally focused goals:

- A strong and dynamic regional economy
- A healthy environment with pristine waterways
- Strong infrastructure and transport networks for a connected future
- Attractive and thriving communities

The key priorities for the Narrabri LGA of relevance to this proposal include:

- better understand housing needs and help to make life more affordable for residents
- increase the number of local jobs
- advocate for better infrastructure and services
- support the growth of agricultural businesses and tourism across the Shire.

The proposed development will provide jobs to support rural development and infrastructure. The development is therefore considered to align with the key priorities for the Narrabri shire.

4.5 Environmental Planning and Assessment Regulation 2000

The *Environmental Planning and Assessment Regulation 2000* requires that certain documents must accompany a development application. This Statement of Environmental Effects and its attachments satisfy these requirements.

4.5.1 Local Environmental Plan

The *Narrabri Local Environment Plan 2012* (NLEP 2012) is the current local government planning policy for the Shire. The framework of the LEP is derived from *the Environmental Planning and Assessment Act 1979*.

4.5.2 Land Use Definition

The proposed development can be defined as a 'service station' or 'highway service station'. These development types are defined in the LEP in the following manner.

> ***"service station** means a building or place used for the sale by retail of fuels and lubricants for motor vehicles, whether or not the building or place is also used for any one or more of the following:*
>
> *(a) the ancillary sale by retail of spare parts and accessories for motor vehicles,*
> *(b) the cleaning of motor vehicles,*
> *(c) installation of accessories,*
> *(d) inspecting, repairing and servicing of motor vehicles (other than body building, panel beating, spray painting, or chassis restoration),*
> *(e) the ancillary retail selling or hiring of general merchandise or services or both.*
>
> ***highway service centre** means a building or place used to provide refreshments and vehicle services to highway users. It may include any one or more of the following:*
>
> *(a) a restaurant or cafe,*
> *(b) take away food and drink premises,*
> *(c) service stations and facilities for emergency vehicle towing and repairs,*
> *(d) parking for vehicles,*
> *(e) rest areas and public amenities*."

Under the *Narrabri Local Environmental Plan* 2012 (NLEP), service stations and highway service centres are not explicitly mentioned as permitted in Zone RU5 - Village, however they are 'permitted with consent', subject to approval from the Narrabri Shire Council. The site has an existing use right on the basis that it has been operating as a service station and convenience store for a period of more than 30-years.

The subject land is zoned as RU5 – Village under the *Narrabri Local Environment Plan 2012* (NLEP). The proposal meets all objectives as prescribed by the *Narrabri Local Environmental Plan 2012* for zone RU5 – Village. These are listed below:

- ***To provide for a range of land uses, services and facilities that are associated with a rural village***.

Comment: The land use will not change as there is an existing service station on the site. This type of development is vital to rural villages.

- ***To enable development of a scale compatible with the general residential character of village areas and which will not prejudice the viability of established shopping and commercial centres.***

Comment: The development will be of an appropriate size for the village and will not prejudice the viability of established shopping and commercial operations.

The proposal is therefore considered to align with the overall objectives of the zone and is permissible with consent from the Narrabri Shire Council.

4.5.3 Heritage Conservation

Part 5, Clause 5.10 of the LEP deals with heritage items and heritage conservation areas. The objectives of this clause are as follows:

a) To conserve the environmental heritage of Narrabri,
b) To conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views,
c) To conserve archaeological sites,
d) To conserve Aboriginal objects and Aboriginal places of heritage significance.

The proposal is not in the immediate vicinity of any heritage items in accordance with Council's Local Environmental Plan or under State or Federal legislation.

4.5.4 Bushfire Hazard Reduction

Section 5.11 of the LEP deals with land that is considered bushfire prone and may require bushfire hazard reduction work. Bushfire hazard reduction work authorised by the *Rural Fires Act 1997* may be carried out on any land without development consent.

Bushfire hazard reduction work includes the following:

a) the establishment or maintenance of firebreak on land, and
b) the controlled application of appropriate fire regimes or other means for the reduction or modification of available fuels within a predetermined area to mitigate against the spread of a bushfire,

But does not include construction of a track, trail or road.

The site and its surrounds are not identified as Bush Fire Prone Land on the ePlanning Spatial Viewer, as shown in Figure 8. The risk of bushfire within the subject site is therefore considered relatively low.

It is noted that there is an existing perimeter road surrounding the site to the north, west and east. The bitumen sealed Queen Street borders the site to the east and north, while the Newell Highway runs along the western boundary. The proposal involves the storage and handling of flammable and combustible liquids (e.g. diesel) on-site. A suitably qualified consultant will be engaged to prepare further details for the Construction Certificate outlining a fire protection plan for the site. These are standard procedures for new service station operations.

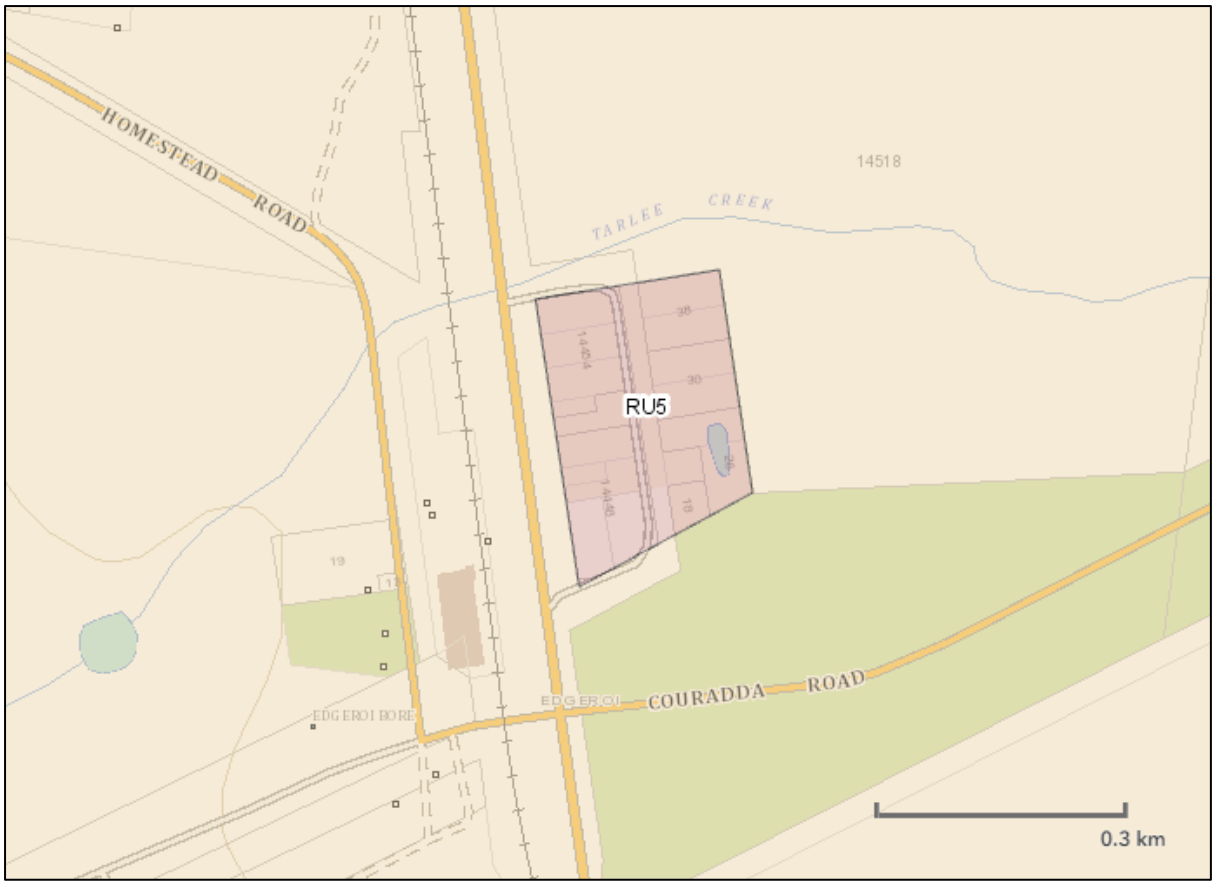


Figure 8: No Bush Fire Prone Land in the Vicinity of the Proposal (Source: ePlanning Spatial Viewer)

4.5.5 Earthworks

Part 6, Clause 6.1 of the LEP deals with development requiring earthworks. The objective of this clause is to ensure that earthworks for which development consent is required will not have a detrimental impact on environmental functions and processes, neighboring uses, cultural or heritage items or features of the surrounding land. Development consent is required for earthworks unless:

a) the earthworks are exempt development under this Plan or another applicable environmental planning instrument, or
b) the earthworks are ancillary to development that is permitted without consent under this Plan or to development for which development consent has been given.

Before granting development consent for earthworks (or for development involving ancillary earthworks), the consent authority must consider the following matters:

a) the likely disruption of, or any detrimental effect on, drainage patterns and soil stability in the locality of the development,

b) the effect of the proposed development on the likely future use or redevelopment of the land,
c) the quality of the fill or the soil to be excavated, or both,
d) the effect of the proposed development on the existing and likely amenity of adjoining properties,
e) the source of any fill material and the destination of any excavated material,
f) the likelihood of disturbing relics,
g) the proximity to, and potential for adverse impacts on any watercourse drinking water catchment or environmentally sensitive area,
h) Any appropriate measures proposed to avoid, minimise or mitigate of the development.

Ancillary earthworks will be required for construction of the proposed development to achieve appropriate design standards. Adequate erosion and sediment control devices will be established on site prior to and during the construction works in accordance with standard sediment and erosion control requirements. An erosion and sediment control plan has been prepared for the proposal and is included in Appendix 2. Earthworks will therefore not have a detrimental impact on environmental functions and processes, neighboring uses, cultural or heritage items or features of the surrounding land.

4.5.6 Development Contribution Plan

The Narrabri Shire Section 7.11 Contributions Plan 2016 allows Narrabri Shire Council to impose the payment of a levy as part of certain development consents where developments would result in heavy vehicular use on public roads and the existing road maintenance schedule is inadequate to carry the additional load. This contribution plan is not applicable to the proposed development, as it is not listed as a development type which may be levied a contribution, and it is not located on land shown in the Schedule of the Contributions Plan.

4.6 Development Control Plan

Narrabri Shire has 13-Development Control Plans. These are addressed below.

DCP - Exempt and Complying Development

A service station is not classified as exempt development. Additionally, according to section 2.3.d, a service station does not constitute complying development. Therefore, this DCP is not applicable.

DCP - Landfill Development

The development is not a landfill therefore this DCP is not applicable.

DCP - Medium Density Development

This DCP relates to residential development and there for is not applicable to this development.

DCP - Notification Policy

The development will undergo a notification process in accordance with this DCP. This will be overseen by Narrabri Shire Council.

DCP - Outdoor Advertising

This DCP specifies that all activities with and being part of an Outdoor Advertising structure/message will comply with the requirements of the:

- Department of Urban Affairs and Planning
- Best Practice Guidelines
- Outdoor Advertising Policy

The development and associated outdoor advertising shall comply with these requirements.

DCP - Parking Code

This DCP aims to provide a consistent guide for Council and developers for the provision of adequate parking for people using, and employed by, developments within the Shire and ensure an acceptable quality of parking areas within the Shire. This DCP relates to all proposed traffic generating developments.

A Transport Impact Assessment report has been prepared for the proposed development. This report is included in full in Appendix 5 and Section 4.1 demonstrates compliance with the DCP.

In summary, the DCP parking rates are consistent with the TfNSW Guide to Traffic Generating Developments (2002) and the specific parking requirements for the proposed development included below:

Convenience Stores:	5 spaces per 100m^2 GFA of convenience store
Restaurant greater of:	15 spaces per 100m^2 GFA, or 1 space per 3 seats

The proposed convenience store has a GFA of 180m^2. It therefore requires up to 10 car park spaces. The restaurant has a GFA of 195m^2, and therefore requires up to 30 spaces. The total requirement for the proposed development is therefore 40 spaces.

The proposed development includes a total of 63 on-site parking spaces, including 11 heavy vehicle parking spaces (nine for heavy vehicles and two for coaches), and therefore exceeds the minimum requirement laid out in the DCP.

DCP - Subdivision Code

The development does not include a subdivision therefore this DCP is not applicable.

DCP - Transportable Homes

The development does not include a transportable home therefore this DCP in not applicable**.**

DCP - Water Supply to Buildings

This DCP is applicable as town water is not available in Edgeroi. In accordance with DCP Water Supply to Buildings, any fitting or appliance identified as a possible source of contamination in Table 4.2 of Part 1 – AS 3500 that is connected to Council's water supply or a private supply used for human consumption, shall be fitted with a back flow prevention device as specified in AS 3500 National Plumbing and Drainage Code.

The development is not a residential building, therefore water storage requirements for domestic use do not apply.

DCP - Drainage to Buildings

In accordance with this DCP, all buildings:

- shall be fitted with roof guttering, downpipes and a drainage system;
- all soil and waste fixtures shall be connected to a sewage system;
- Effluent will be disposed of in accordance with written directions given by Council's Environmental Services Department to suit the particular conditions of the site and;
- Liquid wastes, other than from dwellings or human sanitary facilities, will receive any required pre-treatment before being discharged into the sewer.

DCP - Building Line

In accordance with this DCP all buildings will be erected a minimum of 6m from the front of boundary allotments.

DCP - Encroachment into public roads

In accordance with this DCP no building associated with this development will encroach onto a road reserve.

DCP - Building near sewer and stormwater mains

In accordance with this DCP, all structures associated with this development will be located clear of the main by a distance of minimum one (1) meter.

DCP - Industrial Development Code

This code applies to development for an industrial purpose within the Narrabri Shire and it sets out several development guidelines. The proposal is for a commercial development and the industrial development code is therefore not applicable.

4.7 Narrabri Shire Council Growth Management Strategy

The 2009 Narrabri Shire Council Growth Management Strategy supports and promotes regional and rural development in the Narrabri Shire. The proposed development aligns with this strategy.

4.8 Licence Requirements

The proposed development does not require any statutory Licences or Permits to proceed, other than Council consent.

The Service Station will require:

- A Works Licence for a Groundwater Bore to be issued under the Water Management Act 2000;
- Registration of the fuel tanks.

5 Description of Site

5.1 Meteorological and Climatic Data

The proposed location is situated in northern NSW at an elevation of approximately 178m AHD. The climate is best described at temperate.

The closest weather station to provide more comprehensive climate data is the Narrabri Airport AWS (Site: 054149). The Narrabri Airport AWS recording station is located approximately 21.8 kilometre south of the proposed development site. Table 7 provides a summary of the average monthly and annual climate conditions.

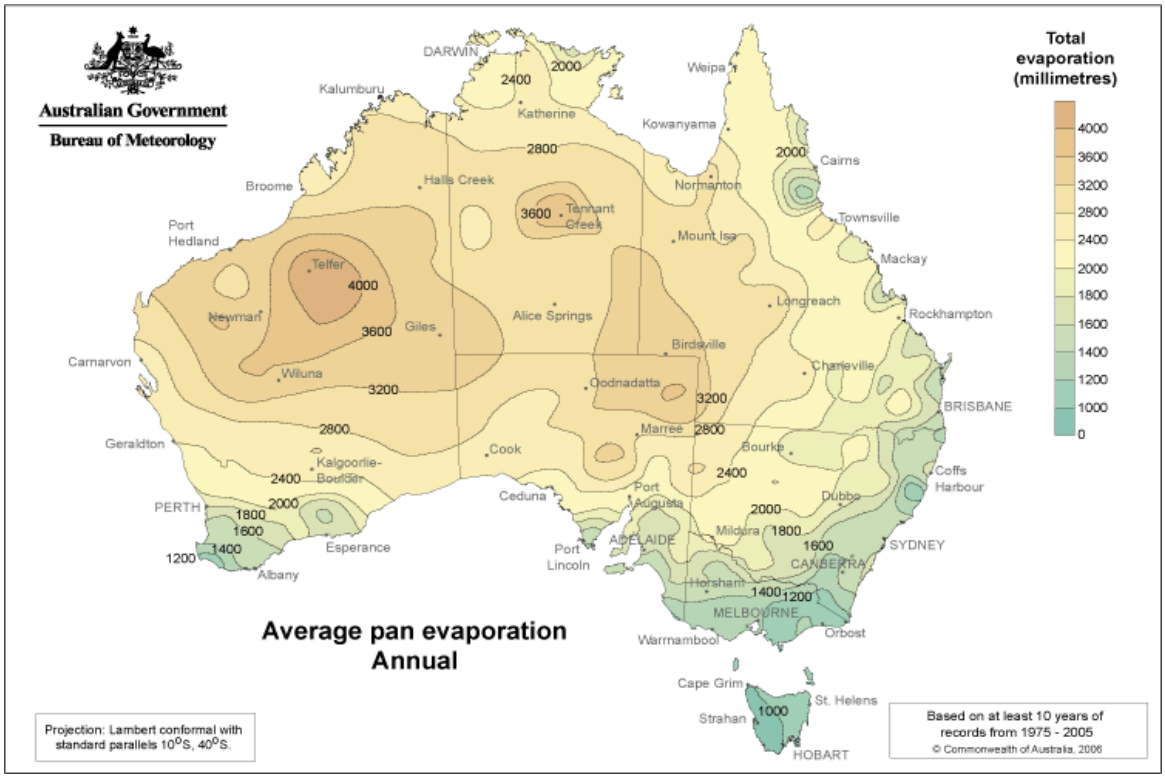


Figure 9: Average Annual Pan Evaporation across Australia

Table 4: Climatic Information – Narrabri Airport AWS 054038 (1997-2022)

Monthly	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Av. Max Temp (°C)	34.9	33.5	30.8	26.9	22.3	18.4	18.1	20.1	24.2	28.3	31.1	33.1	26.9
Av. Min Temp (°C)	20.5	19.4	16.7	12.3	7.6	5.7	4.1	4.6	8.1	12.2	16.1	18.6	12.2
Av. Rad. (MJ/m^2)	26.4	23.5	20.6	16.5	12.9	10.8	11.8	15.0	19.1	22.6	24.5	26.6	19.2

The long-term temperature figures show an average mid-summer highest temperature of approximately 34.9°C and a mid-winter lowest temperature of approximately 4.1°C. Relative humidity is generally low.

The average wind speed and direction for the area varies according to the season and time of day. The wind roses depicting the average wind speed and direction for each month at 9am and 3pm were procured from the Bureau of Meteorology. This is shown in Figure 10.

The *New England North West Climate Change Snapshot* (2014) projections indicate a warmer climate will result in altered rainfall patterns and more intense bushfires, droughts and floods.

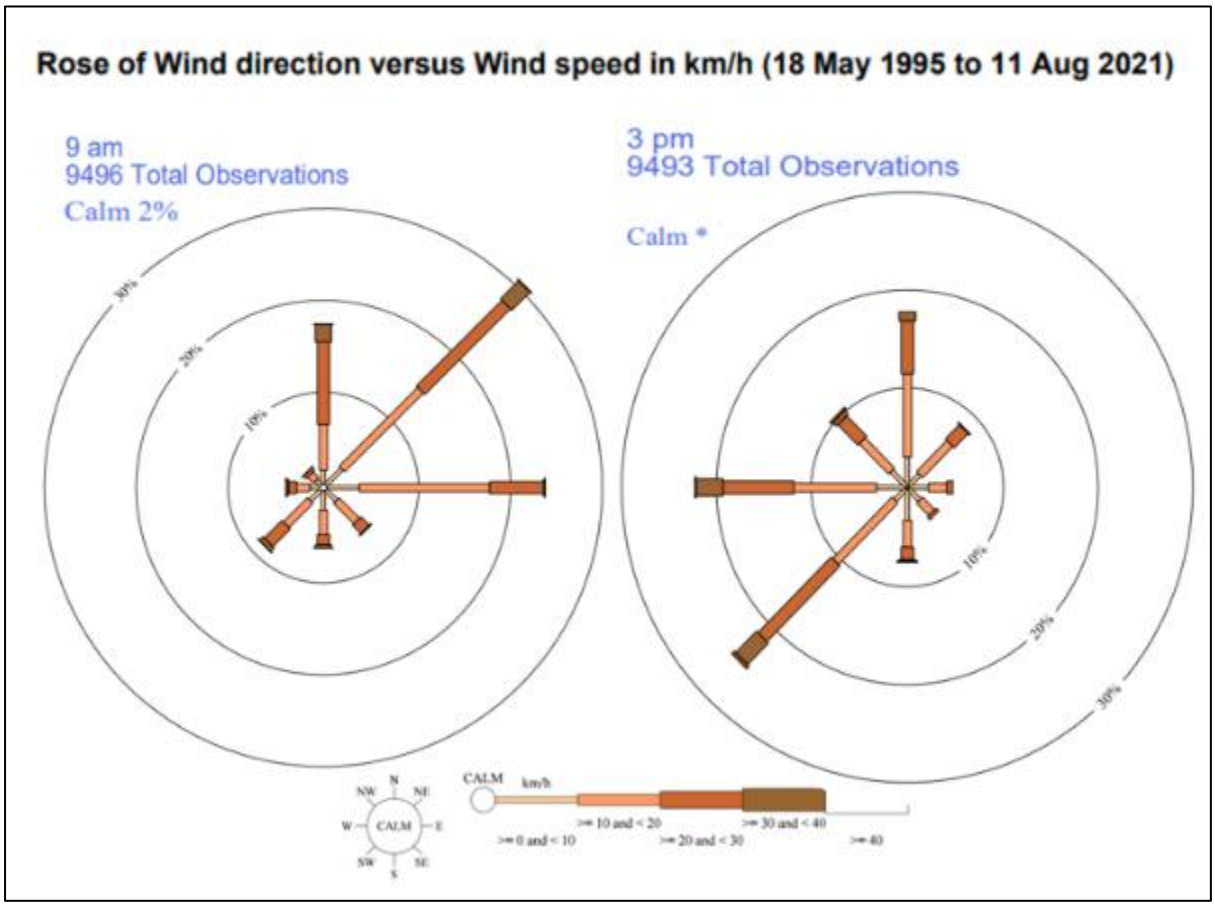


Figure 10: Wind Roses for Moree Aero (Source: BoM Data 1995-2021)

5.1.1 Design Storm IFD Data

The Bureau of Meteorology website provided Rainfall Intensity-Frequency-Duration (IFD) data for storm events at the proposed development site. A 1 in 20-year storm event with a 24-hour duration produces 126mm of rainfall in total. A 1 in 100-year storm event with a 1-hour storm duration produces 66.8mm of rainfall.

5.2 Topography, Soils and Geology

The development lies atop of undifferentiated colluvial and residual deposits. This sedimentary deposit composed of surface mantle that has accumulated toward the base of a slope as a result of transport by gravity and non-channelized flow. An in-depth knowledge of the foundation and geology below the development is important since the development will have foundations, although the area in and around Edgeroi is tectonically stable. The site is a clay field texture or 35% or more clay throughout the solum except for thin, surface crusty horizons 30 mm or less thick. When dry, open cracks occur at some time in most years, these are at least 5 mm wide and extend upward to the surface or to the base of any plough layer, peaty horizon, self-mulching horizon, or thin, surface crusty horizon and Slickensides and/or lenticular peds occur at some depth in the solum.

The subject site is not considered to have any existing salinity issues and the development proposal, as designed, will not increase the risk of salinity on the property. There are no acid sulphate soils present within the region.

Land slope on the property varies across the site but is essentially flat. Erosion is not considered a risk. However, given the nature of the proposed development, best practice drainage and sediment controls will be implemented on site. An erosion and sediment control plan is included in Appendix 2.

There is minimal physical alteration as result of this proposal and hence there is no chance of subsidence, slip or mass movement of the soil on site.

5.3 Water

5.3.1 Surface Water

The site is located within the Gwydir River catchment and the closest surface waterbody to the proposed development is Tarlee Creek, an ephemeral first order stream located approximately 27m north of the site boundary at its closest point. There are no other surface watercourses in the vicinity of the proposal.

5.3.2 Groundwater

The site is located over porous rock aquifers, within the Gunnedah Oxley Basin within the Gwydir Water Management Area.

The Gunnedah-Oxley Basin MDB Groundwater Source extends over an outcrop area of 1,128,000 Ha and a sub-crop area of 2,860,000 Ha. It is covered by the *Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources* (*2011*). The NSW Murray Darling Basin (MDB) porous rock groundwater sources are located within the NSW portion of

the MDB. In general, the plan area includes all porous rock groundwater sources that are not included in other water sharing plans. Total average annual recharge within the Gunnedah-Oxley Basin MDB Groundwater Source is estimated at 414,558 ML with 214,665 ML (just over 50%) protected for environmental use and 199,893 ML defined as the long-term average annual extraction limit. The level of connection between surface and groundwater is considered to be low to moderate in the Gunnedah-Oxley MDB and the travel time between surface and groundwater is estimated to be years to decades.

Publicly available bore data was examined for groundwater bores in the vicinity of the proposed development. Bore logs indicate spatial variation depth to water bearing zones, with a minimum depth of 35m below ground level. Water bearing zones were encountered within fractured bedrock.

Groundwater dependent ecosystems (GDE's) are defined as ecosystems which have their species composition and their natural ecological processes determined by groundwater (ARMCANZ & ANZECC, 1996). The Bureau of Meteorology's Atlas of Groundwater Dependent Ecosystems was also searched to identify ecosystems near the proposed development with potential for groundwater interaction. The Atlas did not identify any surface watercourses with potential for groundwater interaction in the vicinity of Edgeroi (based on national assessment) (Figure 11). The Belah woodland to the north of the proposal is assessed as having moderate potential for groundwater connectivity (based on regional assessment) (Figure 12).

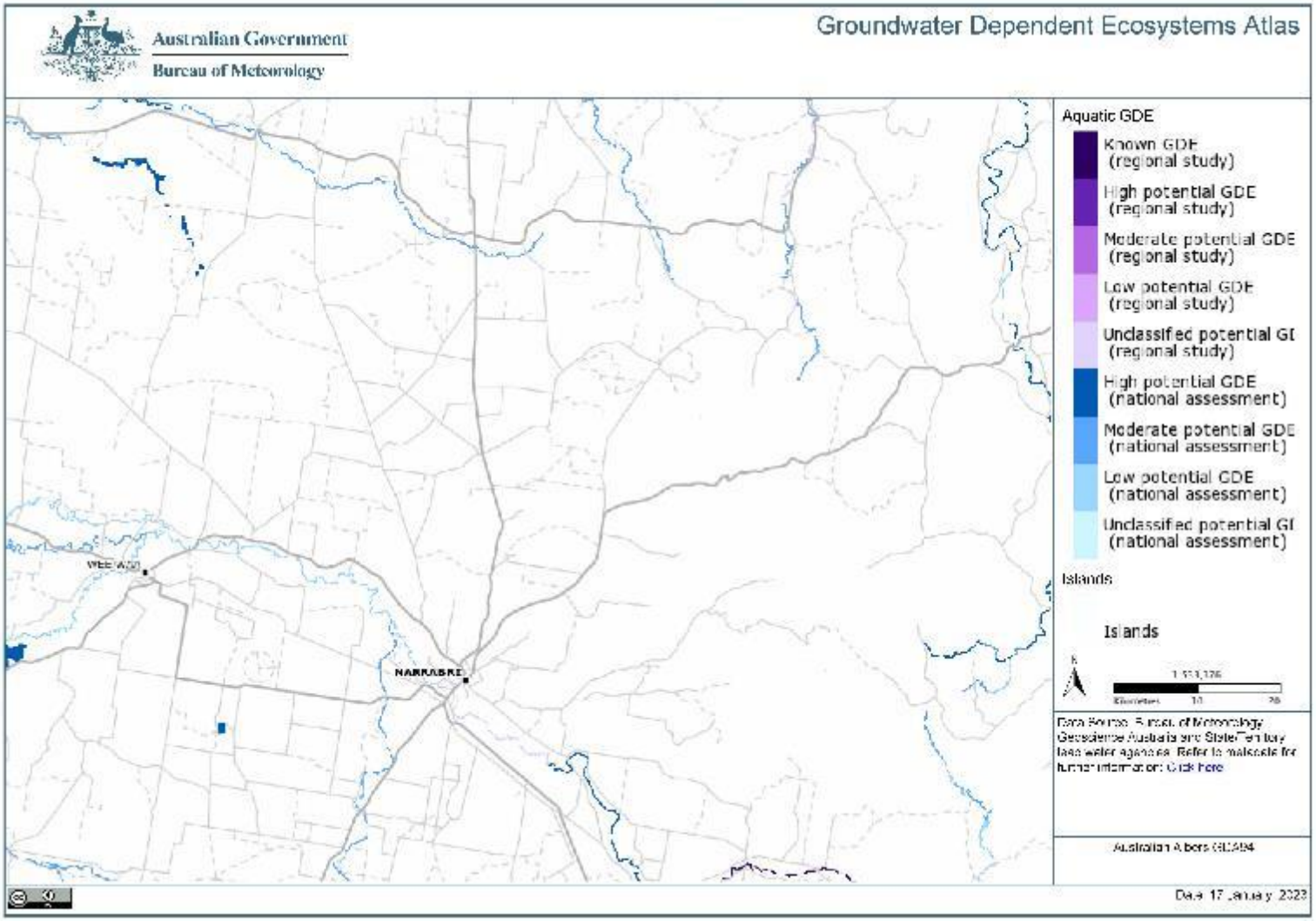


Figure 11: Aquatic Groundwater Dependent Ecosystems Near Edgeroi

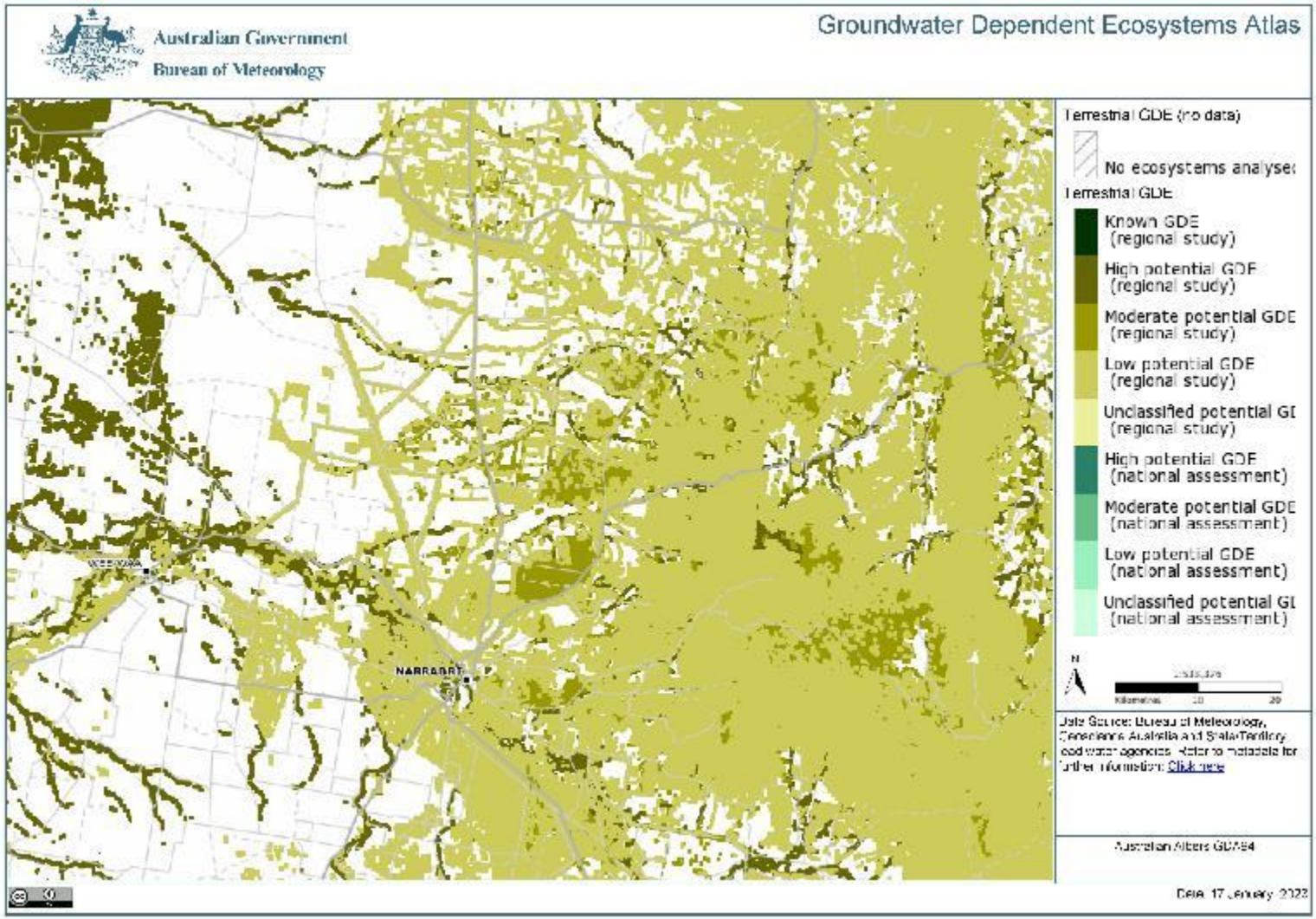


Figure 12: Terrestrial Groundwater Dependent Ecosystems Near Edgeroi

5.4 Cultural Heritage

5.4.1 Indigenous Heritage

The Aboriginal Heritage Information Management System (AHIMS) is a database operated by OEH and regulated under section 90Q of the *National Parks and Wildlife Act 1974*. AHIMS contains information and records related to registered Aboriginal archaeological sites (Aboriginal objects, as defined under the Act) and declared Aboriginal places (as defined under the Act) in NSW.

A search of AHIMS was conducted on the 16th January 2023 to identify registered (known) Aboriginal sites or declared Aboriginal places within or in the vicinity of the subject area (i.e. Lots 59, 60 & 61 DP753952, Lot 62 DP665543 and Lot 1 DP311343) with a buffer of 200 metres. The search revealed zero (0) recorded Aboriginal sites within or adjacent to the boundaries of the constituent lots. The search results are included as Appendix 3.

The following presents a summary of the site investigation:

- There are no known/registered archaeological sites within the subject site
- The subject site has been modified in the past as a result of agricultural activities and the construction of the old service station and other buildings on the site.
- The potential for this site to contain sites of significance may involve rock shelters, campsites, and scarred trees. No such artefacts were identified during a site walkover.

The result of this investigation has therefore determined that the likelihood of disturbing sites or objects of aboriginal cultural significance are extremely low on the area identified for the proposed development. On this basis, it can be concluded that there is no specific requirement to engage with the local Aboriginal community through an Archaeologist to undertake a more detailed investigation of the area. However, appropriate protocols should be adopted on the site. This involves an ***unanticipated finds protocol*** as outlined below:

> *If any Aboriginal object is discovered and/or harmed in, or under the land, while undertaking the proposed development activities, the proponent must:*
>
> - *Not further harm the object*
> - *Immediately cease all work at the particular location*
> - *Secure the area so as to avoid further harm to the Aboriginal object*
> - *Notify OEH as soon as possible on 131555, providing any detailed of the Aboriginal object and its location*
> - *Not recommence any work at the particular location unless authorised in writing by OEH.*

If any aboriginal object is found through development of the site all work will cease and NSW National Parks and Wildlife Services – Heritage Section will be notified. If human remains are found, work on the site will cease, the area will be secured and both the NSW Police will need to be notified.

5.4.2 Non-indigenous Heritage

A search of the NSW State Heritage Register found no heritage listed sites on the property or surrounding properties. The *Narrabri Local Environmental Plan 2012* showed no heritage sites on the property or surrounding properties.

5.5 Fauna and Flora

The proposed development site is currently occupied by the old service station, a residential dwelling and extensive gravel pavement storage area for Newell Highway upgrade materials. The adjoining land to the north, south and west include areas of open woodland and grassland contained within crown reserves and freehold grazing land.

Figure 13 shows the modelled plant community types (PCTs) predicted to occur within the area based on desktop information available on the SEED portal.

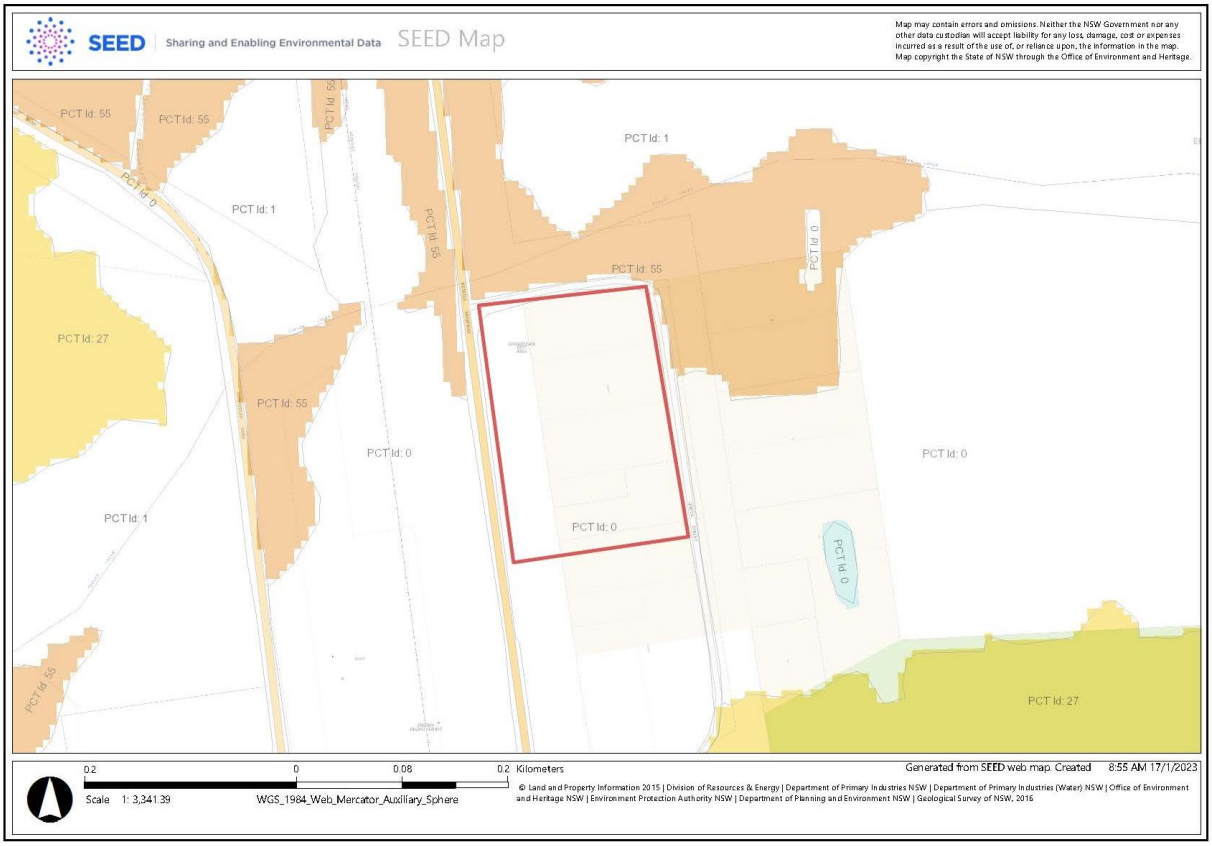


Figure 13: SEED Plant Community Types.

The mapping shows that the site footprint and surrounding areas to the west, east and south are predicted to consist of 'PCT 0 – Non-native vegetation'. Areas adjoining the site to the north are predicted to support 'PCT 55 - Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions.

A site inspection carried out by SMK Consultants confirmed the SEED mapping results. The majority of the site was historically cleared and developed for the construction and operation of the existing service station and rest area. These areas support areas of mown lawns, and include gravel and bitumen surfaces. The remainder of the subject site is dominated by weed species, and is therefore consistent with PCT 0 – Non-native vegetation.

Figures 14-16 show the habitat present within and around the proposed development at the time of the site inspection.

Figure 14: Open woodland south-east and upslope of the proposed pen area

Figure 15: Open woodland south-east and upslope of the proposed pen area

Figure 16: Open woodland south-east and upslope of the proposed pen area

5.6 Natural Hazards

The land is geologically stable and not subject to volcanism, earthquake or soil instability such as subsidence, slip or mass movement. Also, the land is not classified as bushfire prone land according to mapping provided by the Narrabri Shire Council. The proposed development is flood free.

5.6.1 Bushfire

The subject lot is not identified as bush fire prone land on the ePlanning Spatial viewer and Narrabri Shire Council mapping. The site is cleared of native vegetation and has been cultivated in recent times. Accordingly, no 'Bushfire Attack Level Risk Assessment' is required.

5.6.2 Flooding

The subject lot is identified as flood free land on the ePlanning Spatial viewer.

Some local drainage issues are present during large rainfall events. The Edgeroi village area is located on the eastern upslope side of the Newell Highway. The highway is a raised structure and therefore obstructs the natural overland flow of local water. Several culverts have been installed beneath the highway to drain the village area. Based on the large number of culverts stored on the service station site at present, TfNSW's Newell Highway upgrade project will include additional culverts to improve the drainage within the village area.

6 Environmental considerations

Items considered include matters set out under Section 79C of the *Environmental Planning and Assessment Act 1979.* A summary of the major points of that consideration follows.

6.1 Land Use Conflict

The development poses no potential land use conflict as it is permissible within the current zoning and the land use will not change significantly from existing/historical uses. The visual amenity of the site will improve with the construction of the proposed service station and landscaping measures.

The potential for land conflict typical occurs as a result adverse dust, noise, or aesthetic impacts. There are four (4) identified sensitive receptors (rural or residential dwellings) within a 200m radius of the proposed development site. The closest sensitive receptors are outlined in Table 8 and shown in Figure 17. The closest sensitive receptor is a rural dwelling located approximately 22 metres south of the proposed development site.

Table 8: Separation distances from sensitive receptors to the site boundary

Receptor	Receptor Type	Address	Direction from subject Site	Approximate Distance (m)
1	Rural Dwelling	14448 Newell Highway Edgeroi	South	30
2	Rural Dwelling	38 Queen Street Edgeroi	East	26
3	Rural Dwelling	30 Queen Street Edgeroi	East	50
4	Rural Dwelling	26 Queen Street Edgeroi	South-East	80
5	Rural Dwelling	18 Queen Street Edgeroi	South-East	120

Figure 17: Nearby Sensitive Receptors

The proposal is in relatively close proximity to a number of residential dwellings; however the new service station is not predicted to result in land use conflict due to the fact that the site was operated as a service station and convenience store for a period of more than 30-years prior to closing down in 2018.

The following management and mitigation measures would be implemented to avoid or reduce impacts on surrounding land uses;

- The development as proposed would manage stormwater within the site and ensure that the rate of discharge of stormwater is similar or the same as current peak discharges to avoid overloading of the local stormwater system;
- A sediment detention basin and drainage controls would be implemented to minimise the potential for impacts associated with siltation of waterways or dust deposition;
- Operations would be undertaken in a manner which minimises noise and dust emissions.

Overall, the proposed development site is considered unlikely to result in any significant adverse impacts to sensitive receptors which would have the potential result in land use conflict in the locality. Acoustic amenity is addressed in section 6.7 of this report.

6.2 Erosion and Sediment Control

Demolition and construction works associated with the proposed service station upgrade will employ erosion and sediment controls which adhere to Council's Erosion and Sedimentation Control Policy. In summary, the keys to achieving satisfactory Erosion Sedimentation Control which will be followed are listed below:

- Minimising the amount of site disturbance to the greatest possible extent.
- Isolate the site by diverting clean upstream overland flow around or separately through the development where possible.
- Provide water quality controls by the use of approved silt fencing and run-off diversion bunds.
- Retain topsoil for effective revegetation works.
- Control run-off and sediment movement at its point source rather than only at one final point.
- Progressive revegetation of the site where possible during on-going construction to reduce the area contributing sediment. This in turn increases the efficiency and effectiveness of the entire sediment control system.

- Filtering of the sediment from site runoff via sediment traps and grated drains prior to its release to the adjoining stormwater system.
- Construction of a washdown area with provisions to restrict all silt and trafficked debris from entering the stormwater system.
- No work of stockpiling of materials to be placed outside of the site work boundary.

Details of proposed erosion and sedimentation controls have been prepared for the proposal and are included as part of the stormwater plans included as Appendix 2.

6.3 Air Quality

Air pollution can result from increased dust and/or exhaust emissions from machinery used as part of the operation of the service station. Dust from grain, roads and trucks is a pollutant and can adversely affect amenity in the area. These emissions must be controlled so there are no significant emissions from the facility.

The main potential sources of dust at the site consist of road dust as well as earthmoving equipment during the construction phase of the works.

The proposal will include the following management and mitigation measures to minimise the potential adverse impacts of dust, both on and offsite:

- Vehicle speed restrictions are limited at 10 km/h;
- Regularly inspect and maintain all machinery to reduce potential for excessive emissions;
- Keep pavements and surfaces clean of bull-dust from trucks entering the site;
- During extreme conditions, such as hot, dry, windy conditions, dust generating work should be suspended as necessary to prevent undue dust impacts; and
- Regularly apply water or dust suppression methods to un-sealed roads during the construction phase;
- Utilise a water truck to suppress dust during the construction phase;
- Construction management will include visual monitoring of dust emissions and appropriate actions to mitigate potential issues. Internal dust management is a key construction measure to maintain good health of workers and maintenance of equipment and therefore dust emission control through watering or other means of suppression will form a key component in daily operations.

Implementation of the above-mentioned control measures are considered sufficient to minimise dust emissions to ensure that there is no significant adverse impact on amenity as a result of the proposed development.

6.4 Waste

6.4.1 General waste

A waste storage area and loading are proposed at the rear of the main structure and adjacent to the drive-thru facility. The area would ensure access by all rigid trucks including 12.5m heavy rigid vehicles. Waste trucks and service vehicles would use this area as necessary, with access via a dedicated road with the area adequately separated from other on-site facilities. Pedestrian connection to the main structure ensures practical use with marked crossings where necessary.

The facility would mainly utilise skip bins for waste separation and storage onsite. These would be managed by a local waste collection contractor who would empty the bins on an as required basis and haul the waste to the Narrabri Landfill facility.

A pedestrian path connects the coach and heavy vehicle parking areas with the main building adjacent to the loading area. A dedicated service lane at the rear of the building will allow for waste collection and loading/ unloading to occur in an area adequately separated from the general public.

General waste generated from the premises will either be recycled or disposed of via Council waste collection services.

6.4.2 Wastewater

The proponent has prepared a detailed On-site Wastewater Management Plan (OWMP) and will lodge a separate Section 68 application for the proposal. The main points of the OWMP are summarised below.

Table 9 includes the predicted wastewater design flow and BOD loading rate calculations for the facility on a daily basis. The estimates were provided by the wastewater treatment system supplier. It is noted that wastewater associated with staff is included in two categories. This has been carried out with the intent of providing conservative design flow and BOD loading rate estimates for the proposed development.

Table 9: Predicted Commercial Wastewater Flow/BOD Allowances

Facility	Source	Peak Day Usage	Design Flow Per Person (L/day)	Design BOD Per Person (g/day)	Total Design Flow (L/day)	Total Design BOD Loading (g/day)
Restaurant	Prepared Food / Meals	132	15	15	1,980	1,980
Shop	Staff	15	15	15	225	225
Staff room	Staff	15	60	30	900	450
Laundry	-	11	115	55	1,265	605
Shower Facility	-	45	40	6	1,800	270
Toilets	-	132	10	12	1,320	1,584
Total					**7,490**	**5,114**

Based on the above calculations, **the maximum daily design flow for the proposed development is 7,490 L per day and the maximum daily design BOD loading rate is 5,115 g (5.12 Kg) per day.** The proposed septic system must therefore be able to support both this hydraulic and BOD loading at a minimum.

The proponent will install an on-site aerated wastewater treatment system (AWTS) which will treat the wastewater for re-use onto green areas of the site. The system selected is the Kelair-Blivet BL 2000 NR model. The model has a footprint of 7.5m x 2.27m and has a capacity to accept approximately 46,000 L / day effluent and 11 kg BOD/day. It therefore exceeds the minimum requirements for the proposal.

The Kelair-Blivet comprises of primary settlement chamber, aerobic zone, final settlement (humus tank) and sludge storage. A nutrient removal module, chlorine disinfection module and irrigation chamber with suitable filter will be added to the Kelair-Blivet to be installed at this site. The treated effluent will therefore have characteristics consistent with secondary treated wastewater at a minimum. The system can also provide tertiary treatment depending on configuration of chlorine dosing for disinfection.

Based on calculations presented for nutrient and hydraulic loads the minimum land application area for the proposed septic waste treatment system is **2,140 m^2**. Treated wastewater will be applied via a sub-surface drip irrigation system on landscaped areas of the development.

6.5 Pollution Prevention – Construction Phase

Impacts on receiving waters and surrounding areas will be minimised during the construction phase with measures outlined in the attached erosion and sediment control plan (Appendix 2).

6.5.1 Pollutants

Typical pollutants generated during the construction phase of the proposed development are shown below in Table 510.

Table 5: Pollutants Typically Generated During Construction

Pollutant	Sources
Litter	Paper, construction packaging, food packaging, cement bags, off-cuts
Sediment	Unprotected exposure soils and stockpiles during earthworks and building
Hydrocarbons	Fuel and oil spills, leaks from construction equipment
Toxic Materials	Cement slurry, asphalt prime, solvents, cleaning agents, wash-waters (e.g. from tile works)
pH altering substances	Acid sulphate soils, cement slurry and wash waters

6.5.2 Performance objectives

The objectives of the site's pollution prevention measures are:

- Minimise the amount of sediment entering the region's waterways and stormwater drains;
- Minimise or prevent environmental harm to the region's waterways and associated ecosystems;
- Minimise localised flooding caused by sediment runoff.

6.5.3 Monitoring and Maintenance

The general requirement of monitoring during the construction phase will be:

- Work activities are restricted to designated construction areas;
- Earthworks and site clearing are undertaken in accordance with the Erosion and Sediment Control Plan;
- Erosion and sediment control devices are to be constructed/installed in accordance with the Erosion and Sediment Control Plan;

- Inspection of sediment fences, erosion and sediment control structures/devices on a weekly basis as well as after any rain event exceeding 25mm in 24hrs (major storm event);
- Stormwater discharges from the site are not having any adverse effect on the downstream environment;
- Monitoring and recording of the performance of the drainage control devices including water quality testing where required;
- Any failure in the stormwater system shall be immediately rectified to prevent uncontrolled discharge from the site;
- Any failure to the stormwater system causing damage to surroundings should be rectified immediately by remedial works to the damaged area.

6.5.4 Responsibility and Reporting

- The contractor shall be responsible for monitoring the performance of all drainage control and erosion and sediment control devices;
- Records of any failures to devices should be kept and reported to the Construction Manager;
- Regular inspections of the devices shall be reported to the Construction Manager;
- Inspections of the devices after heavy rainfall shall be reported to the Construction Manager.

6.6 Pollution Prevention – Operational Phase

The identified pollution sources on this site include general waste such as litter and waste from food packaging, in addition to hydrocarbons spilt during refuelling. The general waste will be dealt with via skip bins as discuss above. The site will have a stormwater runoff collection system to process stormwater runoff from the service station forecourt area which will contain any spills of fuel. The processing system will include an oil/water separate.

There is no Australian Standard for oil/water separators. There are only guidelines for hydrocarbon discharge limits for stormwater discharge. All State and territory regulating environmental authorities (or EPA) have guidelines with varying terminology stating that hydrocarbons are not to be visual (10ppm) in stormwater receiving waters.

6.6.1 Pollutants

The key pollutants typically generated during the operational phase of service stations are shown in Table 611.

Table 6: Pollutants Typically Generated During Operation

Pollutant	Sources
Litter/Gross Pollutants	Waste materials, food, food packaging etc.
Sediments	Aggregates bins, wind deposits and car trails
Hydrocarbons	Fuel and oil spills, leaks from dispensing areas, car park
Surfactants	Detergents, cleaning agents
Nutrients	Nitrogen, Phosphorus

6.6.2 Proposed Stormwater Treatment

6.6.2.1 Stormwater Treatment Philosophy

Waterways and other aquatic environments are valued by the community for their social, cultural, economic and environmental benefits. Urban runoff, contaminated with nutrients, sediment and other pollutants adversely impact these valued resources. Water Sensitive Urban Design (WSUD) is a holistic approach to the planning and design of urban landscapes that minimises theses negative impacts. This approach is used on this project to select the treatment options that considers the civil, landscape and ecological aspects of the site.

6.6.2.2 Source control

Rubbish bins can be an effective source control for litter and are appropriate for most developments. Bins will be placed in appropriate areas (such as buildings and staff amenity) to encourage thoughtful waste disposal.

6.6.2.3 In ground proprietary treatment device

In ground, proprietary stormwater treatment devices are useful for treatment of stormwater on sites that are constrained by available area for stormwater treatment. These devices are installed underground and can remove a full range of pollutants from stormwater, including TSS, soluble heavy metals, oil, grease, and nutrients.

6.6.2.4 Fuel Related Stormwater Treatment

Key features of the fuel related stormwater treatment process are detailed in Figure 18.

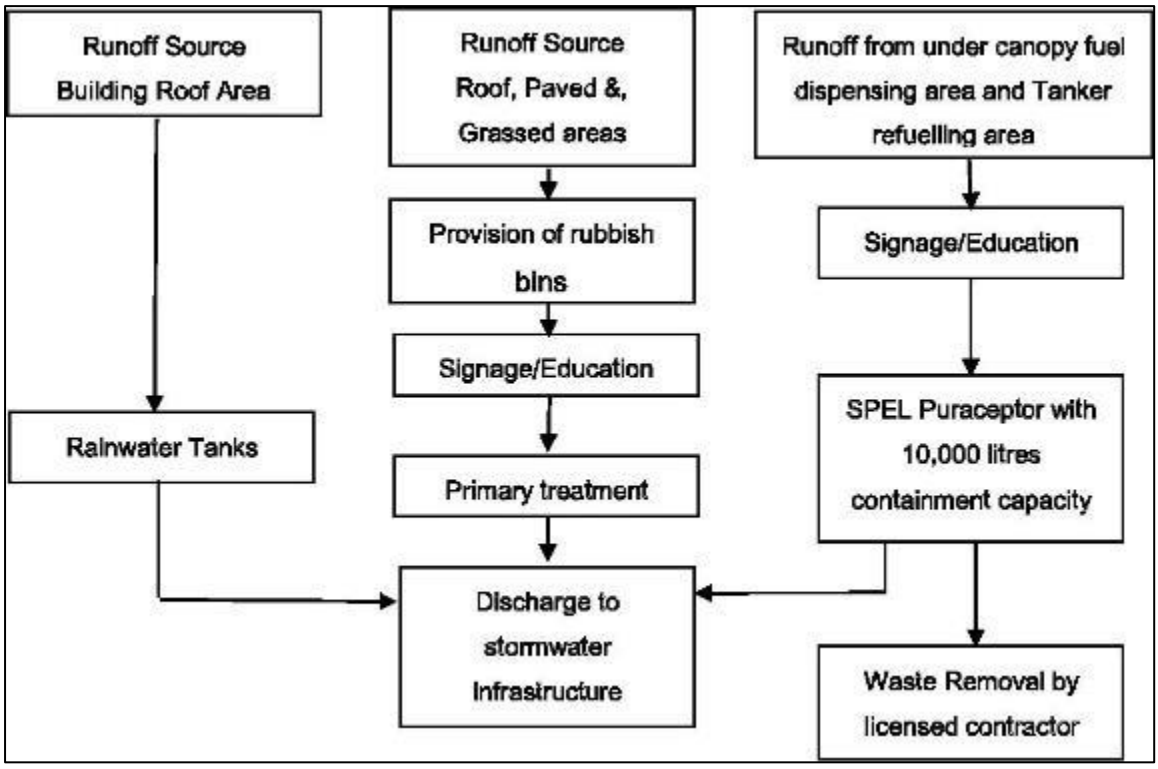


Figure 18: Fuel Related Stormwater Treatment Philosophy

6.6.2.5 Fuel Dispensing Areas

The fuel dispensing areas will be concrete surfaced and covered by a canopy. The perimeter of the canopy will overhang the dispensing containment areas by 10 degrees to reduce windblown rain into the area. The containment areas will drain to sumps that will discharge to an appropriately sized Spel® Puraceptor.

Bulk fuel transfers from a road tanker to underground tanks will take place under the canopy; any flows from the dispensing area will be directed to a Spel® Puraceptor. A spill containment box at the fill points will be used for minor fuel spills that might occur during unloading. The spilt fuel will drain from the containment box into the fuel storage tanks.

6.6.2.6 Spel® Puraceptor

The Puraceptor, illustrated in Figure 19, will have a minimum containment volume of 10,000 litres, which allows for containment of spill from an 8,000-litre tanker compartment plus allowances for wind-blown rain. The Puraceptor will remove hydrocarbons, gross pollutants and total suspended solids.

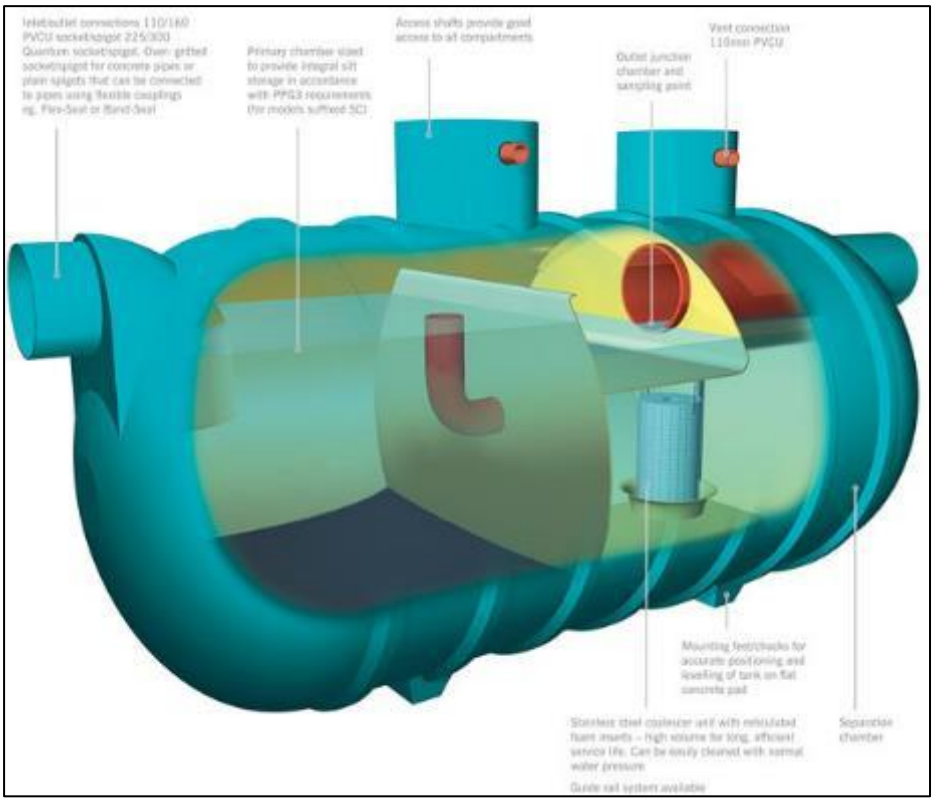


Figure 19: Spel® Puraceptor

6.6.2.7 Underground Fuel Storage Tanks

Underground fuel storage tanks, piping and fuel dispensers will be installed in accordance with Australian Institute of Petroleum (AIP) standards.

6.6.2.8 Areas outside canopy

All driveways and concrete car parking areas will drain via gully inlet pits and trench drains. The stormwater will then flow to a detention tank for removal of pollutants, such as sediment, before discharging to the road stormwater drainage network via legal points of discharge.

Details of the proposed stormwater detention tank are included in the stormwater plans included as Appendix 2. The tank has a total capacity of 21,000L and comprises the following components:

- An oil retention chamber with an approximate capacity of 10,000L;
- A silt retention chamber with an approximate capacity of 5,000L; and
- A secondary chamber with an approximate capacity of 6,000L.

6.7 Acoustic Amenity

The site has operated as a service station for a period of more than 30-years. This had established an acoustic footprint in the village. The new facility will operate 24-hours per day

and therefore additional noise will be generated. This will mainly result of trucks manoeuvring on the site to fuel up and then park for extended periods.

During the construction phase, additional noise sources are expected from the operation of earthmoving machinery.

Potential construction noise sources at the site will include trucks and construction plant. Construction plant will include graders, rollers, excavators and water trucks for the construction of pavements and foundations. Once foundations are completed, builders' equipment such as nail guns and a range of electrical tools will be required. Other equipment such as small cranes and scissor lifts will be required for construction of the site.

Typical construction equipment noise levels, displayed in

Table 712, have been obtained from:

- *AS 2436 – 2010, Guide to noise and vibration control on construction, demolition, and maintenance sites.*
- *BS 5228-1, Code of practice for noise and vibration control on construction and open sites. Noise.*
- *DEFRA—Department for Environment Food and Rural Affairs (United Kingdom), Update of noise database for prediction of noise on construction and open sites-Phase 3: Noise measurement data for construction plant used on quarries, July 2006.*

Table 7: Typical Sound Levels of Construction Plant and Equipment

Plant Description	A-weighted sound power levels L_{wA} dB ref: 10^{-12} W		A-weighted sound pressure levels L_{pA} (mid-point) dB at 10m
	Typical Range	Typical (midpoint)	
Asphalt paver	103-112	108	80
Backhoe	100-108	104	76
Compactor	110-115	113	85
Compressor (silenced)	93-110	101	73
Concrete agitator truck	107-111	109	76
Concrete pencil vibrator	101-105	103	75
Concrete pump truck	103-113	108	80
Concrete vibratory screed	115	115	87
Crane (mobile)	95-113	104	76
Excavator	97-117	107	79

Plant Description	A-weighted sound power levels L_{wA} dB ref: 10^{-12} W		A-weighted sound pressure levels L_{pA} (mid-point) dB at 10m
	Typical Range	Typical (midpoint)	
Forklift	106	106	78
Front end loader	110-115	113	85
Generator (diesel)	84-=113	99	71
Grader	105-115	110	82
Hand tools (electric)	95-110	102	74
Hand tools (pneumatic)	114-117	116	88
Jack hammers	121	121	93
Truck (>20 tonne)	107	107	79
Truck (water cart)	106-108	107	79
Vehicle (light commercial e.g. 4WD)	100-111	106	78

The magnitude of off-site noise impact associated with construction would be dependent upon a number of factors:

- The intensity and location of construction activities;
- The type of equipment used;
- Existing local noise sources;
- Intervening terrain;
- The prevailing weather conditions;

During any given period, the machinery items to be used in the study area would operate at maximum sound power levels for only brief stages. At other times, the machinery may produce lower sound levels while carrying out activities not requiring full power. It is highly unlikely that all construction equipment would be operating at their maximum sound power levels at any one time and certain types of construction machinery would be present in the study area for only brief periods during construction.

Furthermore, all construction and operation of machinery would take place during limited work hours and not during the evening or night periods, where sound can be increased due to various factors such as inversion layers and sensitive receptors may include sleeping residents. Accordingly, the predictions should be considered as conservative estimates.

During operation of the service station, noise sources will predominantly be from trucks accessing the facility.

The NSW Noise Policy for Industry 2017 (NPI) presents a methodology for determining Project Noise Trigger Levels (PNTL) for industrial development. Ambient and background noise measurements are used to determine PNTL relevant to the proposed development. Table 13 provides the NPI minimum Rating Background Level (RBL) for each period of the day, which were adopted for the site.

Table 13: Rating Background Noise Levels

Period	RBL dB(A)
Day	35
Evening	30
Night	30

Note: Day is defined as the period from 7am to 6pm (Monday to Saturday) and 8am to 6pm (Sundays and public holidays). Evening is defined as the period from 6pm to 10pm. Night is defined as the period from 10pm to 7am (Monday to Saturday), and 10pm to 8am (Sundays and public holidays).

Table 14 provides an analysis of both the intrusiveness and amenity noise levels for the purposes of establishing a PNTL for the proposed development.

Table 14: Assessment of PNTL in adjacent receiving environment

Metric	Day dB(A)	Evening dB(A)	Night dB(A)
Rating Background Level	35	30	30
Project Intrusiveness Criteria	40	35	35
Recommended Amenity Level	50	45	40
Project Amenity Level	45	40	35
Project Trigger Noise Level	**40**	**35**	**35**

These levels are considered acceptable ambient noise levels that can received by sensitive receptors whilst being considered to protect environmental values, including health and well-being, for outside a dwelling.

The noise assessment procedure for industrial noise must consider two separate components, mainly the intrusiveness and the amenity criteria. The lower of the two criterion is applied as the project specific noise levels.

Construction noise impacts associated with the project were estimated using the distance attenuation relationship described in the following equation:

$$L_2 = L_1 - 20\text{Log}(d_1/d_2)$$

(source: Noise Guide for Local Government - epa.nsw.gov.au)

Where d_1 = *distance (m) between source and receiver*

d_2 = *distance (m) at which Sound Pressure (L_{pa}) measured*

L_2 = *sound pressure level at the distance d_1 from the source*

L_1 = *sound pressure level at distance d_2 from the source*

Propagation calculations consider sound intensity losses due to hemispherical spreading, with additional losses such as atmospheric absorption, directivity, ground absorption and shielding ignored in the calculations.

6.7.1 Predicted Noise Level at Closest Receptor

During construction, only the day (7am – 6pm) requirements are relevant due to construction not occurring during the evening nor the night.

The Closest receptor is 22m south of the project site. At this distance, the loudest activity (jack hammer) is predicted to be:

L_2 = *93 - 20log(22/10)*

= *86.2db*

During operation, noise will be experienced 24-hours per day. Accordingly, the proposal is required to meet all, including night-time, noise requirements. The primary source of significant noise will be from trucks. The sound pressure at the closest receptor is expected to be in the order of:

L_2 = *79 - 20log(22/10)*

= *72.2db*

Accordingly, sound pressure generated at the project, intrusive noise, is considered to be above 50 dB noise limit during the construction phase and 45dB during operation.

It should be noted that the receptors in the area were already exposed to the noises typical of a service station and at present, heavy machinery associated with the Newell Highway project. Additional local noise includes traffic noise from the Newell Highway and occasional train noise from the adjoining railway line.

The closest receptor to the proposed service station borders the Newell Highway. This receptor would therefore already be accustomed to a relatively high level of background noise throughout the day and night.

Receptors along the eastern side of Queen Street are located at a distance of approximately 150m from the Newell Highway. Truck or heavy machinery noise at the front of these residences would be in the order of between 55 dB and 65 dB, depending on whether the

direct noise travel is impacted by buildings between the highway and the receptor. This is traffic noise. The flow of traffic is not continuous. Traffic counts suggest a low of 8-vehicles per hour during the night and a peak of 124-vehicle per hour around 9am. The night vehicles would mainly be trucks. The daytime traffic involves up to 80-trucks per hour which is a relatively continuous noise source.

Truck movements onsite during operations will involve a truck entering the site for either fuel or resting. They will be manoeuvring between the fuel bowsers and parking area. Their engines will be turned off when the trucks are not moving.

Noise exceedances will occur for short periods during the manoeuvring. Truck engines will be idling when this occurs and therefore noise levels are reduced. The prime noise impact will occur when trucks start as the truck revs slightly when starting. The trucks will generally idle for a period to warm up and then leave. Once leaving the site, the trucks will rev but this will occur within the Newell Highway corridor.

The noise source will be generated at a level of approximately 1.5m above ground level from the trucks. To limit the noise exceedances, a noise reduction structure can be installed. This could be in various forms, including a fence structure made from colorbond fence materials. The colorbond would need to be thicker than the standard material to deflect the noise. Preliminary calculations indicate that a 2m high noise barrier will reduce an 80 dB noise emission on the site to below 35 dB at the eastern properties. A similar barrier would be suitable for the house to the south of the site. The noise barrier would need to be designed by a suitable acoustic engineer to ensure that the material properties provide the required attenuation.

Not all noise would be eliminated as noise from the highway would be intermixed with noise from the service station.

6.7.2 Mitigation Measures

During construction, it is recommended that the proponent shall implement the following noise control measures:

- Establish a construction noise and vibration control plan;
- Select plant and equipment where practical on acoustic performance;
- Use plant and equipment in a manner which minimises noise impacts;
- Implement a noise monitoring program to ensure that noise levels are being controlled and that best possible practices are being implemented; and
- Initiate an information program to inform local residents of the construction program and time periods when noise levels could exceed the recommended assessment guidelines.

During operation the proponent shall aid in minimising noise by implementing the following measures:

- All delivery vehicle companies and their respective drivers are to be instructed to operate delivery vehicles in as quiet a manner as possible whilst on site through such measures as:
    - Travel at low speeds;
    - Minimise use of excessive engine revving and no rapid acceleration;
    - Do not use exhaust breaks whilst on site;
    - Do not park external to a loading dock with engines running for extended periods of time.
- The operator shall erect appropriate on-site signage in the service vehicle roadways and loading dock areas advising of the necessity to minimise noise so as to protect neighbouring residents' amenity.
- Staff will be instructed to minimise noise by careful work practices (i.e. placing garbage in containers using low noise methods).
- Institute a complaint response procedure to be used in the instance of complaints regarding noise from site activities.

Truck and other drivers on the site need to be made aware of noise emissions. This is considered to be difficult as many once only users will enter the site and therefore their consideration of adjoining landowners will be limited.

For truck drivers, a system of standard signs will be placed onsite. These will include but not limited to:

- Engines to be turned off when refuelling;
- No revving of engines during manoeuvring;
- Engines to be turned off when parked;
- Vehicles to idle to highway exit.
- No exhaust brakes to be used onsite.

6.8 Site Maintenance and Management Procedures

The service station operator will have a Petrol Handling Manual, which will set out all requirements for the safe handling of combustible and flammable materials. This manual will dictate weekly, monthly and annual checking procedures with checklists to be completed and records stored.

The manual will also set out dry cleaning methods to be employed within the fuel dispensing area in lieu of washing down to reduce possible contaminated runoff. Emergency procedures will be also clearly set out, detailing actions to be taken by site personnel in the case of varying possible emergencies such as spills, fire or risk of fire, vehicle accidents, etc.

In addition, a regular cleaning/maintenance program/contract is to be established for emptying of rubbish bins located around the site, removal of general litter from the site, inspection of stormwater gully pits and removal of any sediment or captured litter from the Spel® Puraceptor. The Spel® Puraceptor will be inspected and maintained in accordance with the manufacturer's instructions.

The maintenance plan will address the following:

- Inspection frequency;
- Maintenance frequency;
- Data collection/storage requirements;

The plan will also contain detailed cleanout and inspection procedures covering aspects such as equipment needs, maintenance techniques, occupational health and safety, public safety, environmental management considerations, disposal requirements of pollutants collected and access issues.

6.9 Maintenance Plans for Stormwater Treatment Devices

All stormwater quality improvement systems require maintenance in order to function efficiently and effectively. Table 15 details the basic maintenance requirements for each type of stormwater quality improvements system. A detailed maintenance schedule will be developed as part of the detailed design of the site.

Table 15: Maintenance Requirements

Control	Maintenance Requirement	Maintenance Period
Onsite Detention Pond	Removal of accumulated sediment	As required by inspection and monitoring
Spel® Puraceptor	Replacement of oil separators and coalescer units, removal of oil, sediment & gross pollutants (skimmers and vacuum truck)	6 Months (inspect after major spill)

6.10 Access and Transport

A detailed transport impact assessment report has been prepared for the proposed development and is included in full in Appendix 5 of this report. The main points of the report are summarised in this section.

The proposed development includes two separated entry driveways along Queen Street North and an exit driveway to the south directly to the Newell Highway. The Newell Highway is a national highway in New South Wales which provides the major road link between Queensland and Victoria via central NSW and as such carry's large amounts of freight. Near the site, the Newell Highway is aligned in a north-south direction and includes four traffic lanes (two in each direction) within a 16.4 metre wide carriageway. Near the site, it has a posted speed limit of 80 kilometres per hour, increasing to 110 kilometres per hour about 100 metres north of the site.

Heavy vehicle parking and refuelling areas will be accessed by the eastern entry only. The access is appropriately dimensioned to ensure access by all vehicles up to 36.5-metre-long A-Doubles and B-Triples. All vehicles will enter and exit in a forward direction.

The proposed development is expected to generate up to 85 vehicle movements during peak periods. This is based on a 20% 'draw-in' rate of passing traffic on the Newell Highway to the site. This is considered appropriate for the proposed development.

The intersection of the Newell Highway and Queen Street North (the intersection leading to the site entry driveways on the northern boundary) and the site exit driveway directly on the Newell Highway close to the southern boundary would need to be modified to facilitate the safe movement of vehicles in and out of the site (refer Section 3.1.5 of this report and Appendix A of the Transport Impact Assessment report for details of the proposed modifications). It is also noted that TfNSW works are being commissioned along the Newell Highway through Edgeroi, including drainage/ culvert works and intersection modifications.

Preliminary traffic movement pathways have been submitted to TfNSW for review and discussion purposes. Based on this preliminary review, minor modifications to the highway intersections would be necessary should the proposal be approved. These modifications would largely be limited to modifications to linemarkings.

It is also noted that widening of the Queen Street North road reserve is recommended along the site's northern boundary to better align the intersection works and Queen Street North, with logical paths of travel, and two-way independent movements maintained. The Queen Street Road reserve is approximately 40m in width and therefore such widening is possible

without the need to alter the reserve boundary. This is Council land as they are the road authority. Council will need to consider this as part of this development application.

The proposed development will involve an upgrade of the access between the service station and the Newell Highway. In part, this is a result of the larger size of trucks using the highway and potentially accessing the service station when compared to the original development. The proposed intersections and site drawings as presented in the TIA are based on the largest truck size that may utilise the site. Appropriate access sweep paths can be constructed.

The anticipated traffic volumes are manageable with turning movements appropriate having regard to the through traffic volumes, vehicle type, posted speed limit and available sightlines. The traffic safety impact for this development can be managed.

6.10.1 Parking Arrangements

The proposed development includes 63 on-site spaces, including:

- 41 car parking spaces, including air and water fill point spaces, three car with caravan spaces and two accessible spaces
- six spaces for light vehicles at the fuel pumps
- five heavy vehicle spaces at the high flow fuel pumps
- two bus parking spaces
- nine heavy vehicle parking spaces including four spaces for 36.5m A-Doubles and five spaces for 20m semi-trailers.

The car park layout has been reviewed against and is considered compliant with the requirements of Narrabri DCP 2011 and the Australian Standard for Off Street Car Parking (AS/NZS2890.1:2004, AS/NZS2890.2:2018 and AS/NZS2890.6:2009).

6.11 Visual Impacts

The proposed development site is directly adjacent to the Newell Highway. A service station and other buildings have been present in this area for more than 30-years. On this basis, the proposal is considered to be similar as existing development of the site. While the proposed development will be more extensive, it includes landscaping to soften the visual impact of the development on the surrounding area. It is considered that the proposal will have positive impacts on visual amenity, given that the existing service station has been abandoned for several years and is in a state of disrepair.

Adjoining landowners will have their visual landscape changed as a result of the service station building. As a result of potential noise exceedances, the site will require some form of

noise barrier. This may consist of a fence to a height of 2m or more. The result of this will include a reduction in the visual impact of the new service station site.

For many years, the adjoining landowners have been viewing abandoned or semi-abandoned buildings, dumped cars, a camp site, which has become overgrown by grass and weeds. At present, the adjoining landowners are viewing a material storage site which is actively used for the current Newell Highway project which is anticipated to continue for a period of up to 2-years. The site is currently being accessed by heavy machinery and trucks. The adjoining landowners are viewing stacks of box culverts and other structures to be utilised in the highway project. The historical and current views cannot be considered as proving a pristine environment or landscape view to adjoining landowners when the Newell Highway is added in to the landscape features. It is suggested that most of the adjoining houses would utilise view of the surrounding farm land and east to Mount Kaputar National Park in preference to looking at the Newell Highway and an abandoned service station site.

The proposed development will modify this view to provide a modern building, landscaping and a tidy site, subject to good management practices. This would be considered more visually pleasing than the historical and current view of the site.

6.12 Social and Economic Impacts

The Narrabri Shire suffers from some economic and population segment decline and population ageing. The Shire's major employer is agriculture although even this sector has shown decline in worker availability. This project is expected to provide social and economic benefit at the local levels in terms of job creation. In addition, the proposal has the potential to increase economic activity in the related supply sector, transport sector, fuel supplies and associated construction, maintenance, and service industries. The facility will also provide local with a shop and service facility which was lost when the original service station and shop was closed down.

6.12.1 Social Impact

The proposed development will provide additional services to the residential community of Edgeroi which is currently provided with limited services and facilities. The existing service station was well utilised by people residing in Edgeroi on trips into or out of the town or trips to other destinations. The service station is ideally located along a major highway allowing people easy access to the facility. It also allows residents a convenience shop for purchasing milk, newspapers, ice creams etc. Overall, positive social benefits will result from the proposed service station expansion.

6.12.2 Economic Impact

Economic benefits for the community will result from employment opportunities generated during the construction phase of the new buildings and also additional employment opportunities once the revamped service station facility is operational. The service station will also provide a local source of fuel for residents, farmers, grain trucks and other surrounding locals. This has been absent for an extended period and the closest sources of fuel are either Narrabri or Bellata.

The proposal will have positive economic benefits in that it will contribute to the local economy and will provide the community with additional services.

6.12.3 Scenic Values

The proposed development will improve the appearance of the site through the use of modern and current building materials and building design. The visual amenity of the area will be improved by the proposed development.

Given the nature of the proposed development, it was determined that a detailed Landscape and Visual Impact Assessment is not required. Nonetheless, the proposed development will incorporate landscaping along the front boundary of the site conducive to the proposed development. The proposed service station will also improve the aesthetics of the site when compared to the current and historical condition of the site.

6.13 Cumulative Impacts

Cumulative impacts are those that result from the successive, incremental, and/or combined effects of an action, project, or activity (collectively referred to as “developments”) when added to other existing, planned, and/or reasonably anticipated future ones.

Development in Edgeroi of recent periods consisted of one new house, the Inland Rail Project and currently upgrades to the Newell Highway. No other development in the form of buildings, industry or changes to farming intensity in the adjoining rural land is anticipated. Villages such as Edgeroi remain subject to decline as a result of isolation and a reduction in the number of people living on farms that the town services. Issues identified in Edgeroi include the lack of use and decline of the local town hall. This suggests a decline in population that utilise the immediate town area.

On this basis, there are limited cumulative impacts identified as a result of the redevelopment of this service station site, resulting from changes or development in the village area or surrounds.

7 Suitability of the Site for the Development and Report Summary

- The proposed development involves the construction of a new service station, food and drink premises and trucker's facilities with ancillary facilities. The proposal would extend over Lots 59, 60, 61DP 753952, Lot 62 DP665543 and Lot 1 DP 311343 at 14456 Newell Highway, Edgeroi, NSW 2390;
- The site is zoned RU5 Village under the provisions of Narrabri Shire Council's Local Environmental Plan 2012;
- The subject site currently supports a service station which is in disrepair and has been closed since 2018. The proposed development will result in a positive impact on the aesthetics and appearance of the site;
- The total area under proposed development is approximately 16,178m^2 with a 157.5m frontage on the Newell Highway and access from Queen Street on the northern boundary;
- Utility services are currently available and are capable of supporting upgrades to service the proposed service station, if required;
- The proposed development will have no significant adverse impacts on the native flora and fauna in the surrounds.
- The proposal will require minor upgrades to existing site entrances; however the proposal is overall not expected to present a significant impact to the operation and safety of the Newell Highway and can be supported from a traffic and transport perspective;
- The land is not identified as bushfire or flood prone based on available online mapping provided on the ePlanning Spatial Viewer and Narrabri LEP maps;
- The contamination levels identified by the preliminary site inspection are considered to be minimal, in relation to the site's history of commercial use. All analytical results for soil were below the relevant NEPM Assessment Criteria for Commercial and Industrial site. Potential contaminants of concern appear to be limited to the topsoil, having little opportunity to permeate down into the underlying clay soils.
- A Transport Impact Assessment report concluded that the proposed service station upgrade is a suitable development for the site; and
- The development as proposed is considered to address the requirements of sustainable development being a key consideration under the provisions of the *Environmental Planning & Assessment Act 1979*.

7.1 Any submissions made in accordance with this Act or the Regulations

Public participation is addressed under Section 79A of the *Environmental Planning and Assessment Act 1979* for advertised development and other notifiable development.

The development was subject to a development application for similar redevelopment of the site in 2016. Adjoining landowners provided comment on the proposal. These comments were considered in the preparation of this report.

The consent authority must ensure a development application is advertised/notified in accordance with this clause and any relevant environmental planning instrument and/or development control plan.

7.2 Public and Public Authority Submissions

Where necessary for Integrated Development, Council must notify the appropriate authorities of the proposal, under the EP&A Act. General Terms of Approval from notified government authorities should be included in the conditions of consent issued by the Council.

The proposed development is classed as Integrated Development as the proposal should be referred to TfNSW.

The development will also require an application to Water NSW to establish appropriate approvals for use of groundwater as the primary water supply for the service station. This will require separate applications made under the Water Management Act 2000.

7.3 The Public Interest

The public's interest will not be compromised by the proposed development, and it is understood the application will be notified/advertised in accordance with Schedule 1 of the *Environmental Planning and Assessment Act 1979* and any relevant environmental planning instrument and development control plan to ensure the public are notified accordingly and given their right to be heard.

Do any policy statements from Federal or State Governments have relevance?

All levels of government support economic development in rural and regional centres. The proposal is generally in accordance with the following directions as outlined in the NSW Government New England North West Regional Plan 2036, mainly:

- Direction 14 "Enhance transport and infrastructure networks"
- Direction 15 "Facilitate air and public transport infrastructure"
- Direction 16 "Coordinate infrastructure delivery"
- Direction 20 "Deliver greater housing diversity to suit changing needs"
- Direction 21 "Deliver well planned rural residential housing".

Are there any relevant planning studies or strategies?

The *Narrabri Shire Growth Management Strategy 2020* encourages the provision of services to the community to encourage economic development within the region. The proposal contributes to this goal through the provision of suitable amenity, employment opportunities and economic development to the area.

How will the health and safety of the public be affected?

The premises will be visited by members of the public as part of the ongoing commercial operations of the business. A number of standard safety measures will be in place to ensure the public is protected from any potential hazards of the development operations.

7.4 Justification for Approving the Proposal

The concept of sustainable development recognises the link and importance of social, economic, and ecological consequences of a proposal.

The proposal has been planned in a manner to recognise and reduce any possible adverse environmental effects as clearly outlined and demonstrated under the relevant sections of this SoEE.

The proposed service station would improve local amenity, preserve the essential character of the locality and maintain the principles for the protection of the environment and environmental sustainability.

In conclusion, the proposed development will result in minimal environmental or amenity impacts and accordingly justifies a favourable determination by Council.

7.5 Context and Setting

The subject site is located at 14456 Newell Highway, Edgeroi, NSW 2390, along the Newell Highway. The site is located approximately 25 kilometres south of the centre of the township of Narrabri, within land zoned RU5-Village under the Narrabri Shire LEP. Adjoining lands consist of both residential buildings and agricultural lands.

The proposed site meets the recommended buffer distances from the property boundary and sensitive receptors. No shallow groundwater sources have been identified within the site's vicinity. The proposed access will ensure safe access to and from public roads. The proposal's demand on resources will be minimal as the development will only require minimal physical works for during the construction phase of the project. No additional services are required.

Overall, the proposed site is considered suitable for the construction of a service station, food and drink premises and trucker's facilities.

8 Conclusion

This Statement of Environmental Effects provided an investigation into the proposed construction of a service station, food and drink premises and truckers facilities with ancillary car parking and landscaping at 14456 Newell Hwy, Edgeroi NSW 2390. The findings of this Statement of Environmental Effects include the following:

- The proposal is considered to comply with local planning guidelines and meets the objectives of the *Narrabri Local Environmental Plan 2012*;
- The proposal is consistent with the surrounding land uses and meets all applicable setback distances; and
- The proposal is not considered to have any significant environmental impact and does not pose any significant conflict with the amenity of the area if appropriate mitigation measures are adopted, specifically to reduce noise impacts on adjoining land in the village.

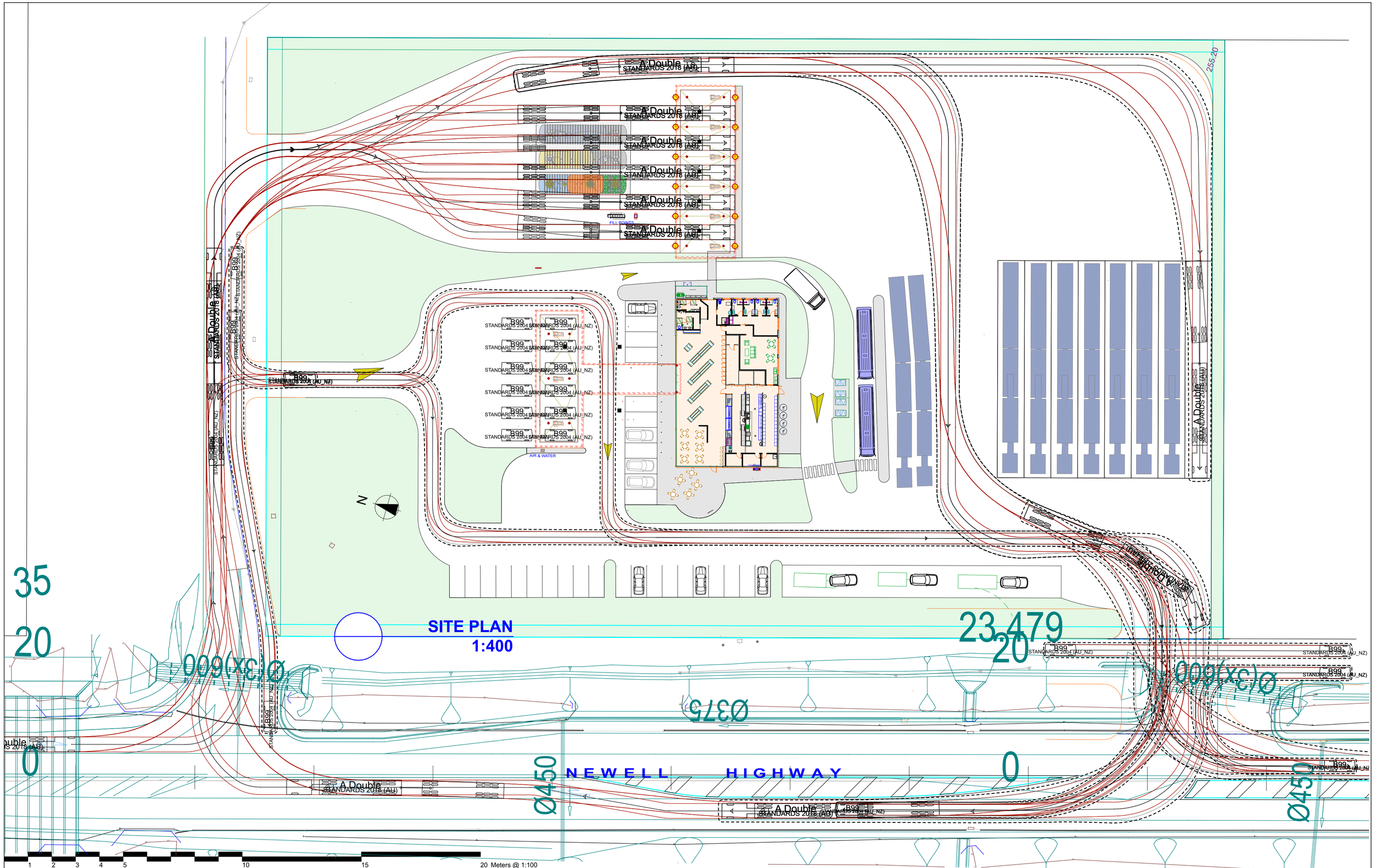
The proposal is considered to provide positive benefits by redevelopment of an abandoned fuel facility, remediation of the site and replacement of aging abandoned buildings with modern buildings. In relation to community benefit, the site will provide a shop and fuel station for the Edgeroi region and surrounding farm land.

In the event that the proposal creates social unrest, the Proponent has developed several management procedures which would be used to address the situation and implement corrective actions as required. This would occur through a complaints procedure. As the village is relatively small, the few residents that live in the village would have easy direct access to site management.

It is anticipated that the project will provide an economic stimulus for the village and, consistent with highway strategies, encourage drivers to stop and recuperate at the site, helping to mark Edgeroi as a suitable and welcoming place for highway users to rest.

Overall, this assessment finds that the proposal is well suited to the subject site and should be a welcomed addition to Edgeroi.

Appendix 1: Site Plan & Roof Plan



PRELIMINARY

NOTE

The Builder shall check all dimensions and levels on site prior to construction. Notify any errors, discrepancies or omissions detected to the Architect. Figured dimensions only. Do not scale drawings. Drawings shall not be used for construction purposes until issued for construction. This drawing reflects a design by #Contact Company and is to be used only for work shown as issued in writing by #Contact Company.

All boundaries and contours are subject to survey drawing **V.1**. All levels to Australian Height Data. It is the contractors responsibility to confirm all measurements on site and locations of any services prior to work on site.

Project Partners

Refer to consultant documentation when directed

- Certifier - #Certifier Consulta - **#Certifier**
- Civil Engineer - #Civil Enginee - **#Civil Engineer**
- Hydraulic Engineer - #Hydraulic Enginee - **#Hydraulic Engineer**
- Landscape Designer - #Landsca - **#Landscape Consultant**
- Mechanical Engineer - #Mechani - **#Mechanical Engineer**
- Planning Consultant - #Planning Consultant
- Services - #Services Consultan - **#Services Consultant**
- Structural Engineer - #Structura - **#Structural Engineer**

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6 Lookout Ave, Blaxland East NSW 2774

Client Edgeroi Energy Pty Ltd

Site: 14456 NEWELL HIGHWAY
EDGEROI NSW 2390

Drawn | Checked	AB | HH
Climate Zone	#Climate Zone
Wind Region	#Wind Region
Project NO.	10322
Plot Date:	20/11/2022
Project Status	PRELIMINARY

DRAWING TITLE :

Site and Location Drawings
SITE PLAN

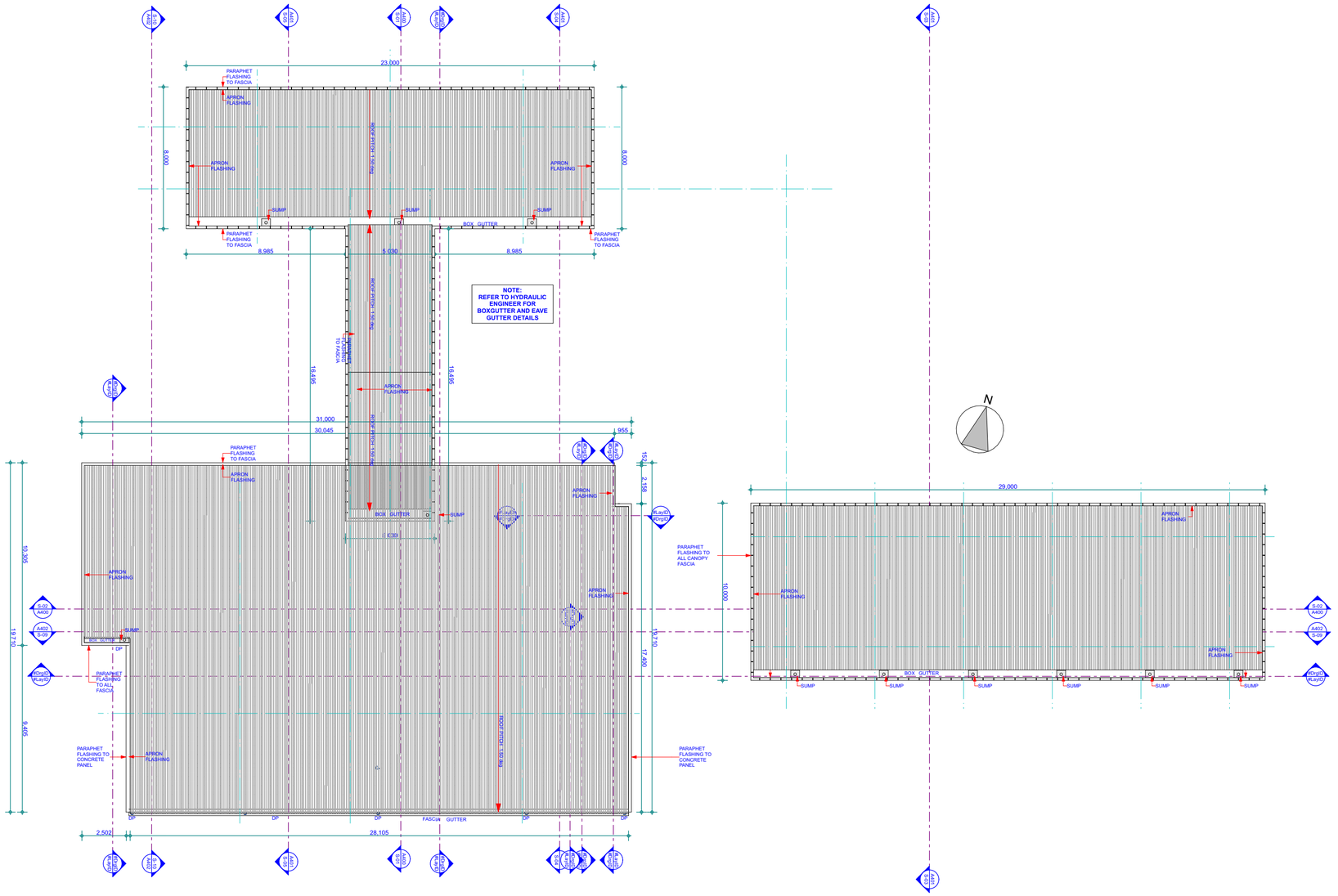
PROJECT NAME :

Edgeroi Service Station

REVISION NO.

DRAWING NO.

A002



2. ROOF PLAN
1:200

1 2 3 4 5 10 15 20 Meters @ 1:100

NOTE
The Builder shall check all dimensions and levels on site prior to construction. Notify any errors, discrepancies or omissions to the architect. Refer to written dimensions only. Do not scale drawings. Drawings shall not be used for construction purposes until issued for construction. This drawing reflects a design by #Contact Company and is to be used only for work when authorised in writing by #Contact Company.

All boundaries and contours are subject to survey drawing **W-01**. All levels to Australian Height Data. It is the contractors responsibility to confirm all measurements on site and locations of any services prior to work on site.

Project Partners
Refer to consultant documentation when directed
- NCC Consultant - **#Certifier**
- Civil Engineer - **#Civil Engineer**
- Hydraulic Engineer **#Hydraulic Engineer**
- Landscape Designer - **#Landscape Consultant**
- Mechanical Engineer - **#Mechanical Engineer**
- Planning Consultant - **#Planning Consultant**
- Services - **#Services Consultant**
- Structural Engineer - **#Structural Engineer**
- Surveyor - **#Surveyor**

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Client Edgeroi Energy Pty Ltd

Site: 14456 NEWELL HIGHWAY EDGEROI NSW 2390

Drawn | Checked	AB | HH
Climate Zone	#Climate Zone
Wind Region	#Wind Region
Project NO.	10322
Plot Date:	14/12/2022
Project Status	PRELIMINARY

DRAWING TITLE : Plans **ROOF PLAN**

PROJECT NAME : **Edgeroi Service Station**

REVISION NO.

DRAWING NO. **A102**

Appendix 2: Stormwater Plans

14456 NEWELL HIGHWAY EDGEROI
PROPOSED EDGEROI SERVICE STATION

STORMWATER CONCEPT PLANS

LEGEND

- PROPOSED STORMWATER DRAINAGE PIPE
- PROPOSED STORMWATER DRAINING TO OSD
- PROPOSED STORMWATER BYPASSING OSD
- PROPOSED WASTEMWATER HDPE DRAINAGE PIPE
- Ø100 HDPE OR PVC WRAPPED IN 20mm ABLEFLEX STORMWATER DRAINAGE PIPE CAST IN SLAB
- 65 — Ø65 HDPE OR PVC WRAPPED IN 20mm ABLEFLEX STORMWATER DRAINAGE PIPE CAST IN SLAB
- SS — Ø100mm SUBSOIL DRAINAGE TO BE WRAPPED IN GEOTEXTILE BIDIMA34
- IO — INSPECTION OPENING
- DP — DOWNPIPE Ø150
- RL 47.00 — DESIGN SURFACE LEVEL
- NS 26.45 — EXISTING SURFACE LEVEL
- IL 47.00 — INVERT LEVEL
- EXISTING STORMWATER
- ExW — EXISTING WATER MAIN
- ExS — EXISTING SEWER MAIN
- ExT — EXISTING TELSTRA
- ExE — EXISTING ELECTRICAL
- ExG — EXISTING GAS
- ExOP — EXISTING OPTIC FIBER
- MASONRY RETAINING WALL TO STRUCTURAL ENGINEER'S DETAILS
- SWALE DRAIN

LOCALITY PLAN
N.T.S

DRAWING INDEX

Drawing No.	DESCRIPTION
000	COVER SHEET PLAN
101	STORMWATER CONCEPT PLAN SITE PLAN
102	STORMWATER CONCEPT PLAN ROOF LEVEL
103	CATCHEMENT PLAN
104	ON-SITE DETENTION DETAILS AND CALCULATION SHEET
105	MAINTENANCE SCHEDULE & AQUATOR TANK DETAILS SHEET
106	SEDIMENT & EROSION CONTROL PLAN & MISCELLANEOUS DETAILS SHEET

GENERAL NOTES

1. ALL LINES ARE TO BE Ø90 uPVC 1.0% GRADE UNLESS NOTED OTHERWISE. CHARGED LINES TO BE SEWERGRADE & SEALED.
2. EXISTING SERVICES LOCATIONS SHOWN INDICATIVE ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE & LEVEL ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY EARTHWORKS.
3. ALL PIPES TO HAVE MIN 150mm COVER IF LOCATED WITHIN PROPERTY.
4. ALL PITS IN DRIVEWAYS TO BE 450x450 CONCRETE AND ALL PITS IN LANDSCAPED AREAS TO BE 450x450 PLASTIC.
5. PITS LESS THAN 600mm DEEP MAY BE BRICK, PRECAST OR CONCRETE.
6. ALL BALCONIES AND ROOFS TO BE DRAINED AND TO HAVE SAFETY OVERFLOWS IN ACCORDANCE WITH RELEVANT AUSTRALIAN STANDARDS.
7. ALL EXTERNAL SLABS TO BE WATERPROOFED.
8. ALL GRATES TO HAVE CHILD PROOF LOCKS.
9. ALL DRAINAGE WORKS TO AVOID TREE ROOTS.
10. ALL DPs TO HAVE LEAF GUARDS.
11. ALL EXISTING LEVELS TO BE CONFIRMED BY BUILDER PRIOR TO CONSTRUCTION.
12. ALL WORK WITHIN COUNCIL RESERVE TO BE INSPECTED BY COUNCIL PRIOR TO CONSTRUCTION.
13. COUNCIL'S ISSUED FOOTWAY DESIGN LEVELS TO BE INCORPORATED INTO THE FINISHED LEVELS ONCE ISSUED BY COUNCIL.
14. ALL WORK SHALL BE IN ACCORDANCE WITH B.C.A. AND A.S.3500.3.
15. REFER TO LANDSCAPE ARCHITECT'S DRAWINGS FOR LANDSCAPING.
16. CARE TO BE TAKEN AROUND EXISTING SEWER. STRUCTURAL ADVIICE IS REQUIRED FOR SEWER PROTECTION AGAINST ADDITIONAL LOADING FROM NEW PITS, PIPES, RETAINING WALLS AND OSD BASIN WATER LEVELS.
17. ALL PIPES IN BALCONIES TO BE Ø50mm HDPE OR PVC WRAPPED IN 20mm ABLEFLEX CAST IN SLAB AT MIN 1.0% SLOPE. CONTRACTOR TO PROVIDE A BREAK / OPEN VOID IN RAIL / BALLUSTRADE FOR STORMWATER EMERGENCY OVERFLOW. ALL ENCLOSED AREAS/PLANTER BOXES TO BE FITTED WITH FLOOR WASTES & DRAINED TO OSD DOWNPIPES TO BE CHECKED BY ARCHITECT & . PLUMBER PRIOR TO CONSTRUCTION
18. THE OSD BASIN / TANK IS TO BE BUILT TO THE CORRECT LEVELS & SIZE AS PER THIS DESIGN. ANY VARIATIONS ARE TO BE DONE UNDER CONSULTATION FROM OUR OFFICE ONLY. ANY AMENDMENTS WITHOUT OUR APPROVAL WOULD RESULT IN ADDITIONAL FEES FOR REDESIGN AT OC STAGE OR IF A SOLUTION CANNOT BE FOUND, RECONSTRUCTION IS REQUIRED UNDER THE CONTRACTOR'S EXPENSES.

NOTE:
ALL GRATES WITHIN FOOTWAY AREAS TO BE HEEL GUARD & BIKE SAFE.

NOTE:
ALL REDUNDANT PIPELINES WITHIN FOOTPATH AREA MUST BE REMOVED AND FOOTPATH/KERB REINSTATED.

NOTE:
REFER ARCHITECTURAL DRAWINGS FOR FINAL SET-OUT LEVELS.

NOTES:
1- CONTRACTOR IS TO PROVIDE OVERFLOW OUTLETS & EMERGENCY OVERFLOW SPITTERS TO ALL TRAPPED AREAS.
2- DP/VD ARE Ø150mm PIPES U.N.O.
3- ALL TRANSFERRING PIPES ARE SUSPENDED U.N.O.
4- BALCONIES PIPES ARE Ø50mm HDPE OR PVC WRAPPED IN 20mm ABLEFLEX CAST IN SLAB AT MIN 1.0% SLOPE.

NOTE:
ALL PIPES ARE Ø100 PVC U.N.O.

NOTE:
PITS DEEPER THAN 1.0m TO BE FITTED WITH STEP IRONS.

PIPES NOTE:
Ø65 PVC @ MIN 1.0%
Ø90 PVC @ MIN 1.0%
Ø100 PVC @ MIN 1.0%
Ø150 PVC @ MIN 1.0%
Ø225 PVC @ MIN 0.5%
Ø300 PVC @ MIN 0.4%
UNLESS NOTED OTHERWISE

NOT FOR CONSTRUCTION

Issue	Description	Date	Designed	Engineer	Checked
A	ISSUE FOR DEVELOPMENT APPLICATION	16/12/2022	MD	EH	OC

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Scale

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Project
14456 NEWELL HIGHWAY, EDGEROI
PROPOSED EDGEROI SERVICE STATION
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title
COVER SHEET PLAN

Scale	Project No.	Dwg. No.	Issue
N.T.S. A1	220139	000	A

PROPOSED RCP CULVERTS DRAINING UNDER QUEEN STREET & DISCHARGING TO TARLEE CREEK. RAISE QUEEN ROAD/LOWER CREEK BED AS REQUIRED TO FACILITATE DRAINAGE.

PROPOSED HEADWALL

IL 252.87

900mm (W) x 300mm (H) BOX CULVERT @ MIN 1.0%

EX. RL 253.05

A 104

TOW 254.10

EX. RL 253.10

RL 253.80

RL 253.75

STREET

QUEEN

ABOVEGROUND OSD BASIN	
VOLUME PROVIDED	160.50m³
BASIN AREA	642.0m²
MAX. DEPTH	0.30m
Av. DEPTH	0.25m
ORIFICE CL	253.15
BASIN IL	253.70
TWL	254.00

PIT 4
GRATED DRAIN
250mm (W) x 150mm (D)
SL 254.15
IL 254.00

PROPOSED CULVERT PIPE BELOW DRIVEWAY

PIT 6
450 x 450
SL 253.70
IL 253.36

PROPOSED CULVERT PIPE BELOW DRIVEWAY

PIT 8
GRATED DRAIN
250mm (W) x 150mm (D)
SL 254.15
IL 254.00

EX. RL 253.12

EX. RL 253.10

RL 253.80

RL 253.75

TOW 254.10

RL 254.15

RL 253.80

RL 253.80

RL 253.80

EX. RL 253.10

MIN TOW 254.15

RL 254.20

OVERFLOW PIT 1
1200 x 1200
SL 254.00
IL 253.00

DISCHARGE CONTROL PIT 2
1200 x 1200
SL 253.90
IL 253.15

PIT 3
450 x 450
SL 253.70
IL 253.17

PIT 41
450 x 450
SL 253.70
IL 253.27

Ø450mm RCP @ 0.5%

PIT 40
450 x 450
SL 253.70
IL 253.35

MIN TOW 254.15

EX. RL 253.45

RL 253.75

RL 254.20

RL 253.80

RL 253.80

RL 253.75

RL 253.75

IL 253.36

IL 253.35

Ø225mm PVC @ 0.5%

Ø300mm PVC @ 0.5%

TOW 254.15

Ø450mm RCP @ 0.5%

PIT 38
900 x 900
SL 254.00
IL 253.29

Ø225mm PVC @ 0.5%

RL 254.20

Ø300mm PVC @ 0.5%

Ø375mm PVC @ 0.5%

PIT 36
900 x 900
SL 254.05
IL 253.55

Ø225mm PVC

PIT 5
450 x 450
SL 253.70
IL 253.30

Ø225mm PVC @ 0.5%

PIT 7
900 x 900
SL 254.10
IL 253.70

HATCH DENOTES PROPOSED BATTER

PIT 35
900 x 900
SL 254.05
IL 253.50

Ø150mm PVC

RL 254.20

RL 254.15

Ø225mm PVC @ 0.5%

EX. RL 253.12

PIT 33
450 x 450
SL 254.05
IL 253.64

RL 254.15

RL 254.15

PIT 9
900 x 900
SL 254.05
IL 253.57

PIT 10
900 x 900
SL 254.05
IL 253.55

PROVIDE 150mm HIGH KERB

PIT 11
900 x 900
SL 254.10
IL 253.70

RL 254.25

RL 254.25

EX. RL 253.20

PIT12
900 x 900
SL 254.13
IL 253.63

EX. RL 253.30

RL 254.25

RL 254.13

Ø225mm PVC @ 0.5%

Ø300mm PVC @ 0.5%

RL 254.25

RL 254.25

RL 254.25

RL 254.25

RL 254.25

RL 254.14

Ø225mm PVC @ 0.5%

RL 254.35

RL 254.25

RL 254.35

RL 254.35

RL 254.35

RL 254.90

RL 255.00

RL 255.00

EX. RL 253.30

EX. RL 253.40

EX. RL 253.50

EX. RL 253.60

EX. RL 253.70

EX. RL 253.80

EX. RL 253.90

EX. RL 254.00

EX. RL 254.10

EX. RL 254.20

EX. RL 254.30

EX. RL 254.40

EX. RL 254.45

EX. RL 254.50

EX. RL 254.52

QUEEN STREET

EX. RL 253.82

RL 254.57

HATCH DENOTES PROPOSED BATTER

EX. RL 254.22

RL 254.80

RL 255.02

RL 255.20

EX. RL 254.52

DENOTES SWALE DRAIN

IL 253.42

PIT 39
900 x 900
SL 254.00
IL 253.55

Ø300mm PVC @ 0.5%

IL 253.54

Ø150mm PVC @ MIN 1.0%

RL 254.40

RL 254.40

MINIMUM 55mm HIGH ROLLOVER BUNDING AT 10° FROM CANOPY TO MANUFACTURER'S SPECS

PIT 37
900 x 900
SL 254.00
IL 253.37

T20 AQUATOR TANK OR APPROVED EQUIVALENT. REFER 105 FOR DETAILS

RL 254.40

PIT 29
450 x 450
SL 254.20
IL 253.80

Ø225mm PVC @ 0.5%

IL 253.37

IL 253.47

IL 253.72

IL 253.38

IL 254.00

RL 254.10

RL 254.30

RL 254.30

RL 254.25

RL 254.40

MINIMUM 55mm HIGH ROLLOVER BUNDING AT 10° FROM CANOPY TO MANUFACTURER'S SPECS

Ø225mm PVC @ 0.5%

Ø300mm PVC @ 0.5%

RL 254.40

PIT 34.1
450 x 450
SL 254.05
IL 253.65

RL 254.30

RL 254.20

Ø375mm PVC @ 0.5%

RL 254.15

RL 254.15

RL 254.15

RL 254.15

DP

PIT 34
450 x 450
SL 254.05
IL 253.65

PIT 32
450 x 450
SL 254.05
IL 253.65

DP

DP

IL 253.49

FFL 254.40

RL 254.30

RL 254.40

RL 254.90

RL 254.15

RL 254.20

PIT 31
450 x 450
SL 254.05
IL 253.65

Ø225mm PVC @ 0.5%

Ø225mm PVC @ 0.5%

PIT 33.1
450 x 450
SL 254.05
IL 253.69

RL 254.15

IL 253.75

RL 254.15

RL 254.15

RL 254.20

PIT 30
450 x 450
SL 254.10
IL 253.70

Ø225mm PVC @ 0.5%

DP

DP

DP

PIT 13
900 x 900
SL 254.14
IL 253.74

Ø150mm PVC @ 1.0%

Ø300mm PVC @ 0.5%

RL 254.35

PIT 14
900 x 900
SL 254.25
IL 253.85

RL 254.25

RL 254.80

PIT 20
900 x 900
SL 254.20
IL 253.70

PIT 15
900 x 900
SL 254.20
IL 253.80

Ø225mm PVC @ 0.5%

Ø150mm PVC @ MIN 1.0%

Ø450mm RCP @ 0.5%

IL 253.75

Ø225mm PVC @ 0.5%

PIT 28
450 x 450
SL 254.32
IL 253.92

PIT 27
450 x 450
SL 254.30
IL 253.90

PIT 26
450 x 450
SL 254.30
IL 253.90

PIT 25
450 x 450
SL 254.30
IL 253.90

PIT 24
450 x 450
SL 254.30
IL 253.90

PIT 23
900 x 900
SL 254.10
IL 253.69

RL 254.10

Ø225mm PVC @ 0.7%

RL 254.25

RL 254.50

PIT 22
900 x 900
SL 254.25
IL 253.85

PIT 21
900 x 900
SL 254.50
IL 254.05

DENOTES SWALE DRAIN

RL 254.75

RL 254.75

RL 254.80

Ø375mm PVC @ 0.5%

PIT 18
900 x 900
SL 254.55
IL 254.15

RL 254.55

RL 254.55

PIT 19
900 x 900
SL 254.55
IL 253.99

Ø225mm PVC @ 0.5%

Ø300mm PVC @ 0.5%

RL 254.90

RL 254.90

PIT 16
900 x 900
SL 254.65
IL 254.15

PIT 17
900 x 900
SL 254.80
IL 254.35

RL 254.65

RL 254.90

RL 254.80

Ø225mm PVC @ 0.5%

CONTINUES BELOW

PROPOSED PIPES & HEADWALLS. DETAILS BY OTHERS/AT CC STAGE.

NI

PROPOSED PIPES & HEADWALLS. DETAILS BY OTHERS/AT CC STAGE.

CONTINUES ABOVE

CATCHMENT AREA TO BYPASS OSD = 2847.21m² (19.05% IMPERVIOUS)

NOTE:
EXISTING SWALE DRAIN TO STREET FRONTAGE TO BE UPDATED AS REQUIRED WITH NEW RCP PIPE CULVERTS UNDER CROSSOVERS.

HATCH DENOTES PROPOSED BATTER

PROPOSED PIPES & HEADWALLS. DETAILS BY OTHERS/AT CC STAGE.

NEWELL HIGHWAY

SITE PLAN

SCALE 1:250

NOT FOR CONSTRUCTION

Issue	Description	Date	Designed	Engineer	Checked
A	ISSUE FOR DEVELOPMENT APPLICATION	16/12/2022	MD	EH	OC

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Scale
0 2 4 6 8 10 12 m
SCALE 1:250 @ A1

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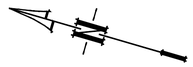
Project
14456 NEWELL HIGHWAY, EDGEROI
PROPOSED EDGEROI SERVICE STATION
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title
STORMWATER CONCEPT PLAN
SITE PLAN

Scale	Project No.	Dwg. No.	Issue
1:250 A1	220139	101	A

LEGEND

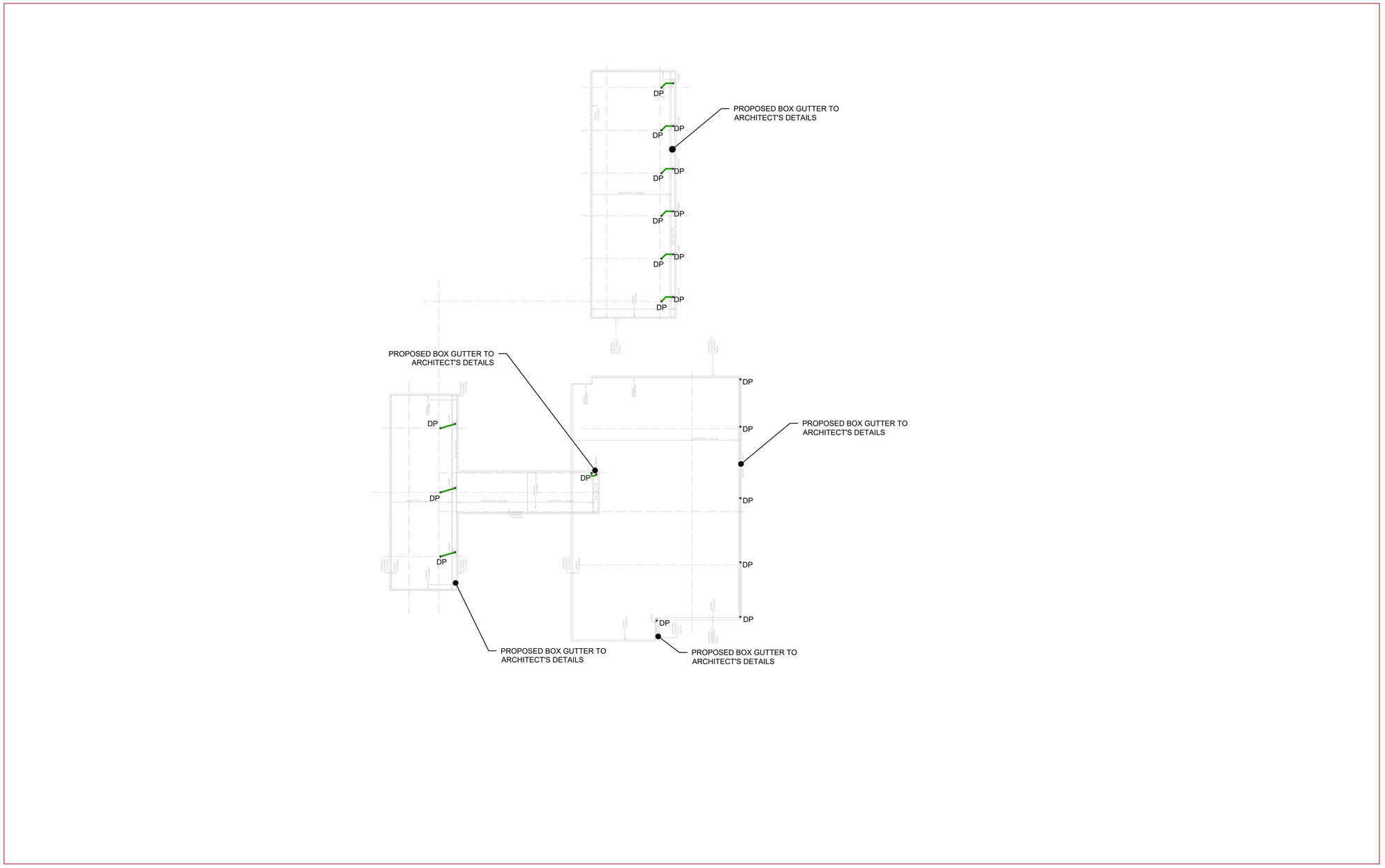
- PROPOSED STORMWATER DRAINAGE PIPE
- PROPOSED STORMWATER DRAINING TO OSD
- PROPOSED STORMWATER BYPASSING OSD
- PROPOSED WASTEMWATER HDPE DRAINAGE PIPE
- Ø100 HDPE OR PVC WRAPPED IN 20mm ABLEFLEX STORMWATER DRAINAGE PIPE CAST IN SLAB
- 65 — Ø65 HDPE OR PVC WRAPPED IN 20mm ABLEFLEX STORMWATER DRAINAGE PIPE CAST IN SLAB
- SS — Ø100mm SUBSOIL DRAINAGE TO BE WRAPPED IN GEOTEXTILE BIDIMA34
- IO — INSPECTION OPENING
- DP — DOWNPIPE Ø150
- X RL 47.00 — DESIGN SURFACE LEVEL
- NS 26.45 — EXISTING SURFACE LEVEL
- IL 47.00 — INVERT LEVEL
- EXISTING STORMWATER
- ExW — EXISTING WATER MAIN
- ExS — EXISTING SEWER MAIN
- ExT — EXISTING TELSTRA
- ExE — EXISTING ELECTRICAL
- ExG — EXISTING GAS
- ExOP — EXISTING OPTIC FIBER
- MASONRY RETAINING WALL TO STRUCTURAL ENGINEER'S DETAILS
- SWALE DRAIN



QUEEN STREET

STREET

QUEEN



NEWELL HIGHWAY

ROOF LEVEL

SCALE 1:250

PIPES NOTE:

Ø65 PVC @ MIN 1.0%
Ø90 PVC @ MIN 1.0%
Ø100 PVC @ MIN 1.0%
Ø150 PVC @ MIN 1.0%
Ø225 PVC @ MIN 0.5%
Ø300 PVC @ MIN 0.4%
UNLESS NOTED OTHERWISE

NOTES:

1- CONTRACTOR IS TO PROVIDE OVERFLOW OUTLETS & EMERGENCY OVERFLOW SPITTERS TO ALL TRAPPED AREAS.
2- DP/VD ARE Ø150mm PIPES U.N.O.
3- ALL TRANSFERRING PIPES ARE SUSPENDED U.N.O.
4- BALCONIES PIPES ARE Ø50mm HDPE OR PVC WRAPPED IN 20mm ABLEFLEX CAST IN SLAB AT MIN 1.0% SLOPE.

NOTE:

REFER ARCHITECTURAL DRAWINGS FOR FINAL SET-OUT LEVELS.

NOTE:

ALL STORMWATER DRAINAGE PIPES ARE Ø150 PVC U.N.O

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Issue	Description	Date	Designed	Engineer	Checked
A	ISSUE FOR DEVELOPMENT APPLICATION	16/12/2022	MD	EH	OC

1cm at full size

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Scale
0 2 4 6 8 10 12 m
SCALE 1:250 @ A1

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PROPOSED EDGEROI SERVICE STATION
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title
STORMWATER CONCEPT PLAN
ROOF LEVEL

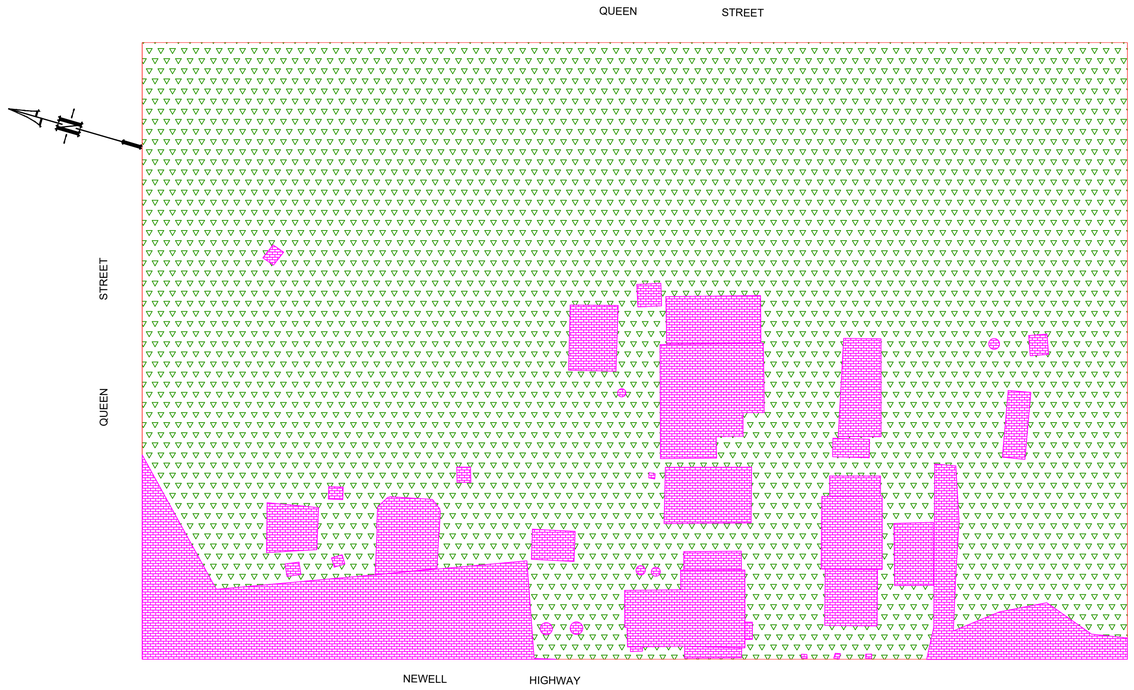
Scale	A1	Project No.	Dwg. No.	Issue
1:250		220139	102	A

PRE - DEV CATCHMENT LEGEND

IMPERVIOUS AREA = 2,877.85m² (17.8%)

PERVIOUS AREA = 13,304.35m² (82.2%)

TOTAL SITE AREA = 16,182.20 m²



PRE-DEVELOPMENT CATCHMENT PLAN

SCALE 1:500

POST - DEV CATCHMENT LEGEND

CANOPY AREA TO AQUATOR TANK/OSD BASIN = 557.27m² (100% IMPERVIOUS%)

OTHER AREA TO AQUATOR TANK/OSD BASIN = 162.18m² (100% IMPERVIOUS%)

OTHER IMPERVIOUS AREA TO OSD = 11,029.09m²

PERVIOUS AREA TO OSD BASIN = 1586.45m²

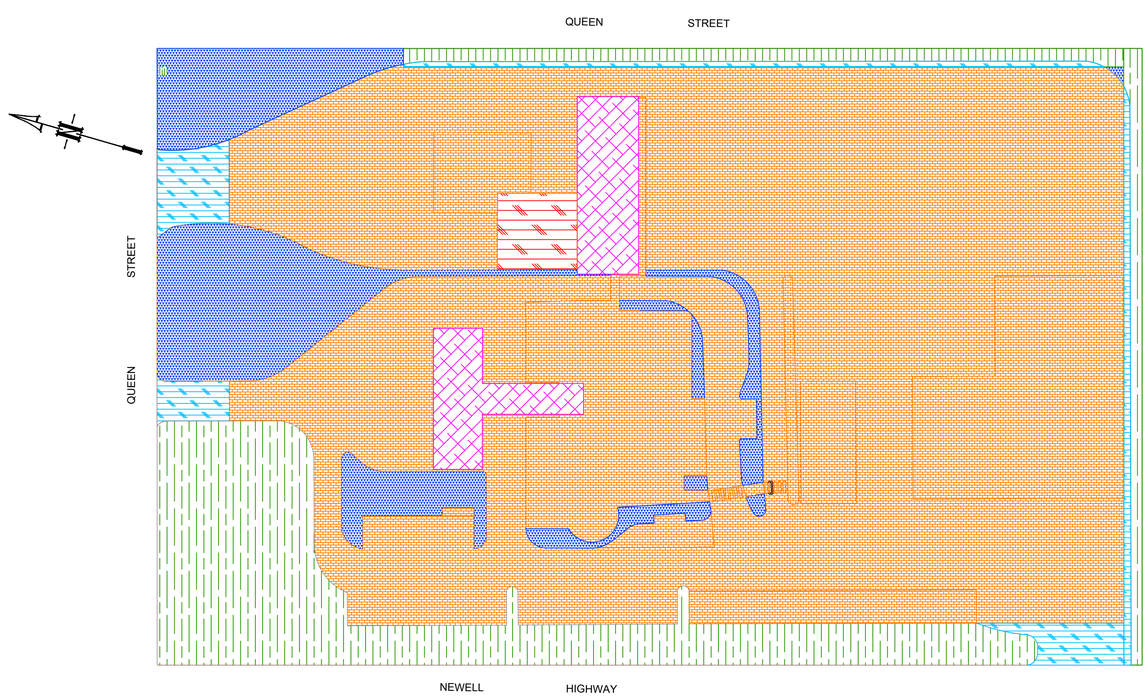
IMPERVIOUS AREA BY PASSING OSD BASIN= 542.35m²

PERVIOUS AREA BY PASSSING OSD BASIN= 2304.86m²

TOTAL SITE AREA = 16,182.2 m²

TOTAL AREA BY-PASSING OSD= 2847.21m² (80.95% PERVIOUS)

TOTAL AREA DRAINING TO OSD= 13,334.99m² (88.10% IMPERVIOUS)



POST-DEVELOPMENT CATCHMENT PLAN

SCALE 1:500

NOT FOR CONSTRUCTION

Issue	Description	Date	Designed	Engineer	Checked
A	ISSUE FOR DEVELOPMENT APPLICATION	16/12/2022	MD	EH	OC

0 10cm at full size 10cm 20cm

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Scale
0 10 20 30 m
SCALE 1:500 @ A1

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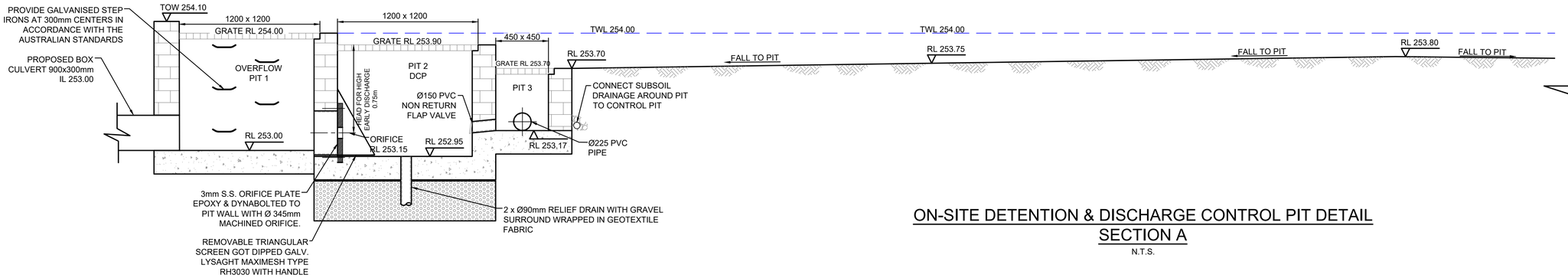
Project
14456 NEWELL HIGHWAY, EDGEROI
PROPOSED EDGEROI SERVICE STATION
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title
CATCHMENT PLAN

Scale	Project No.	Dwg. No.	Issue
1:500 A1	220139	103	A

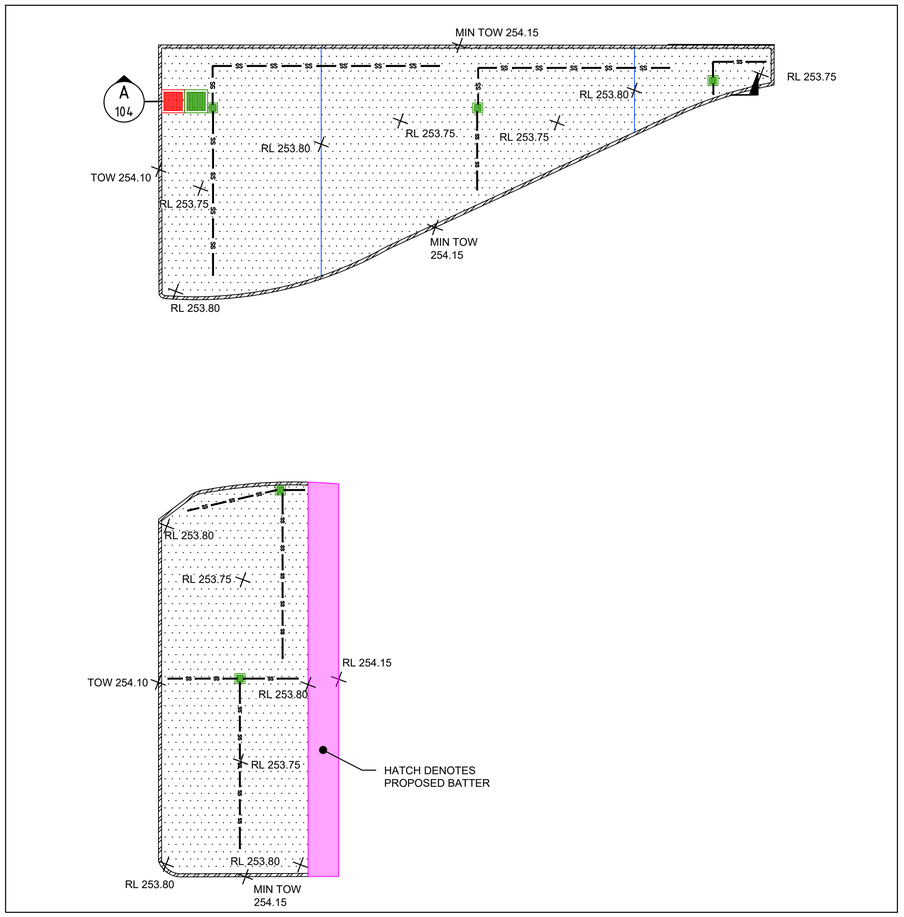
NOTE:

ALL OSD BASIN GRATES TO BE CLASS A LIGHT DUTY HINGED GALVANISED MILD STEEL GRATE AND FRAME & TO BE FITTED WITH CHILD PROOF LOCK DEVICE.



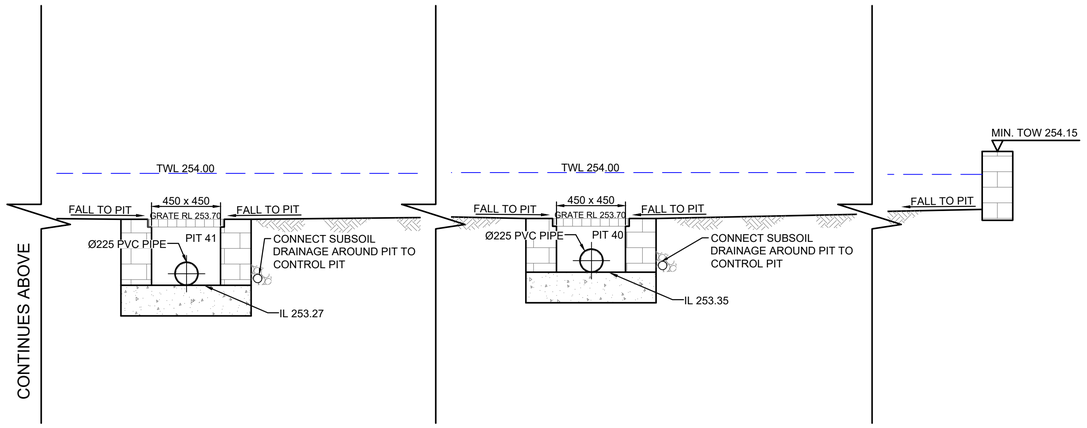
ON-SITE DETENTION & DISCHARGE CONTROL PIT DETAIL SECTION A

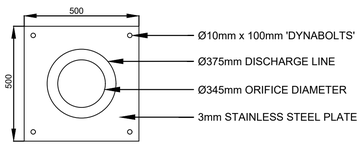
N.T.S.



INSET PLAN ON-SITE DETENTION BASIN DETAILS

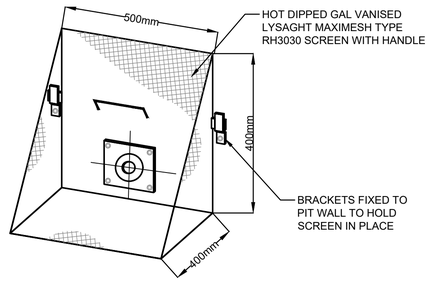
Scale 1:200





ORIFICE PLATE DETAIL

N.T.S.



TRASH SCREEN DETAIL

N.T.S.

DRAINS RESULTS

STORM EVENT (ARI)	PRE-DEV INTERNAL FLOWS (L/s)	OSD POST-DEV FLOWS (L/S)	BYPASS FLOWS (L/s)	TOTAL POST-DEV FLOWS (L/s)	WATER STORAGE LEVEL (m)
5YR	378	195	67	262	253.91
10YR	468	201	83	284	253.96
20YR	571	227	101	328	254.03
50YR	609	282	107	389	254.08
100YR	689	360	121	481	254.12

NOT FOR CONSTRUCTION

Issue	Description	Date	Designed	Engineer	Checked
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Scale
0 4 8 12 m
SCALE 1:200 @ A1

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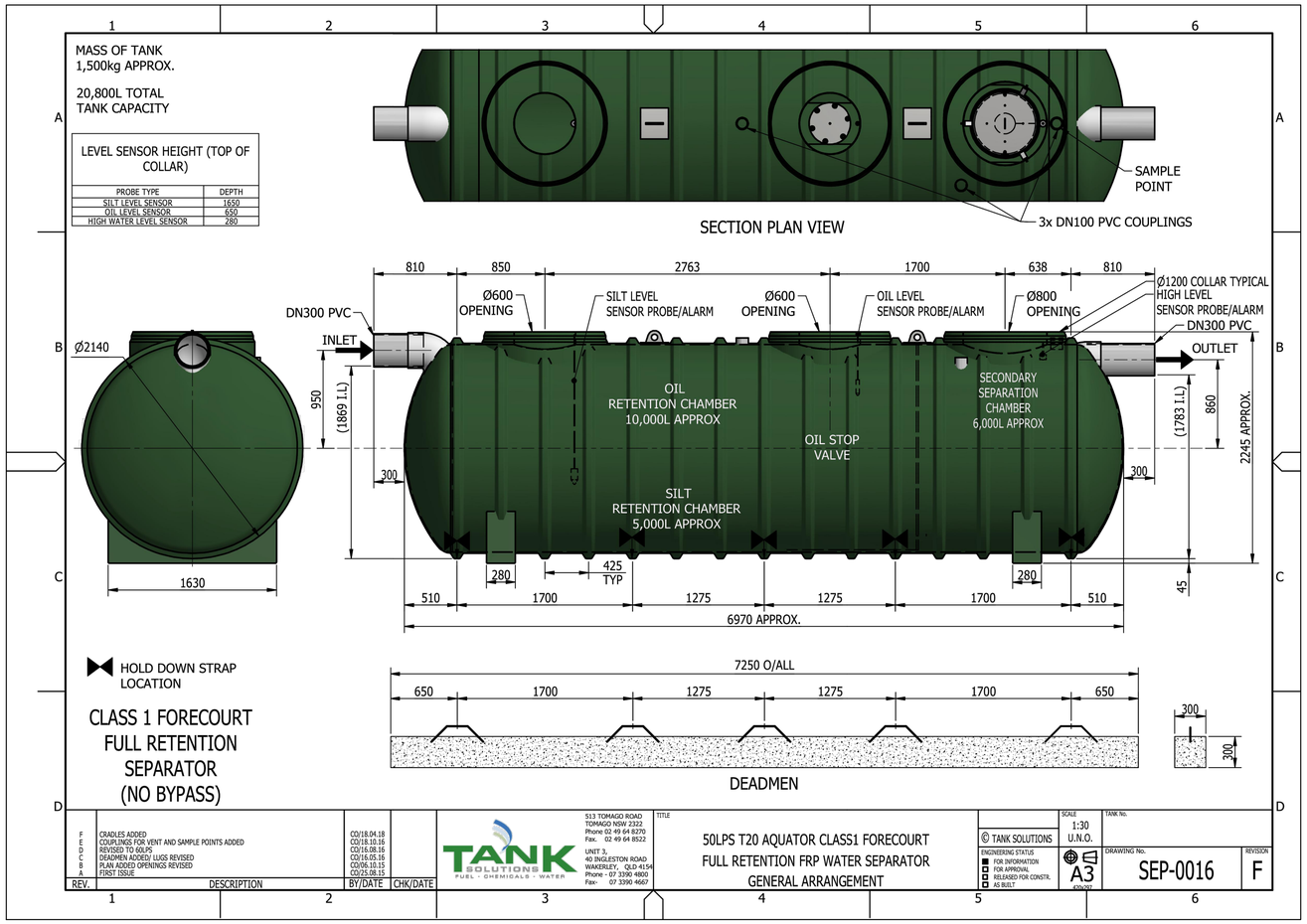
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title
ON-SITE DETENTION DETAILS AND CALCULATION SHEET

Scale	Project No.	Dwg. No.	Issue
A1 As Shown	220139	104	A



AQUATOR TANK DESIGN FLOW:

CANOPY AREA TO AQUATOR TANK = 557.27m^2

$Q_{1\ YEAR}$ = CxIxA/3600 = 1 x 73.3 x 557.27 / 3600 = 11.35 L/s

$Q_{3\ MONTHS}$ = $Q_{1\ YEAR}$ / 2 = 11.35 / 2 = 5.67 L/s

OTHER AREA TO AQUATOR TANK = 162.18m^2

$Q_{20\ YEAR}$ = CxIxA/3600 = 1 x 174 x 162.18 / 3600 = 7.84 L/s

TOTAL FLOW = 5.67 L/s + 7.84 L/s = 13.51 L/s

50 LPS AQUATOR TANK 20.8L CAPACITY IS PROVIDED

NOTE:

FINAL 50LPS T20 AQUATOR TANK SYSTEM DETAILS AND SHOP DRAWINGS BY MANUFACTURER.

Stormwater Drainage System Maintenance Schedule

Maintenance Action	Frequency	Responsibility	Procedure
General			
Inspect roof drainage system of building and remove any debris/sludge	Six Monthly	Strata/Maintenance Contractor	Remove any leaves or debris and sludge from gutters of building and flush downpipes of building to remove any blockages. Pits downstream of downpipes to be cleaned of flushed debris.
Inspect pits and trench drains on site and remove debris/litter/sludge	Monthly or following Rain Period	Strata/Maintenance Contractor	Remove grate. Remove any debris/litter/sludge from within pits.
Inspect site for litter and floatable debris and remove	Fortnightly	Strata/Maintenance Contractor	Remove litter from site and sweep all driveway and pathways in order to remove leaves or sediments that may enter into the drainage system.
Outlets			
Inspect & remove any blockage of orifices	Six monthly	Strata/Maintenance Contractor	Remove grate & screen to inspect orifice. See plan for location of outlets
Check attachment of orifice plates to wall of chamber and/or pit (gaps less than 5 mm)	Annually	Strata/Maintenance Contractor	Remove grate and screen. Ensure plates are mounted securely, tighten fixings if required. Seal gaps as required.
Check orifice diameters are correct and retain sharp edges	Five yearly	Strata/Maintenance Contractor	Compare diameter to design (see Work-as-Executed) and ensure edge is not pitted or damaged.
Inspect screen and clean	Six monthly	Strata/Maintenance Contractor	Remove grate(s) and screens if required to clean them.
Check attachment of screens to wall of chamber or pit	Annually	Strata/Maintenance Contractor	Remove grate(s) and screen(s). Ensure screen fixings are secure. Repair as required.
Check screen(s) for corrosion	Annually	Strata/Maintenance Contractor	Remove grate(s) and examine screen(s) for rust or corrosion, especially at corners or welds.
Inspect walls (internal and external, if appropriate) for cracks or spalling	Annually	Strata/Maintenance Contractor	Remove grate(s) to inspect internal walls. Repair as required. Clear vegetation from external walls if necessary and repair as required.
Inspect outlet sumps & remove any sediment/sludge	Six monthly	Strata/Maintenance Contractor	Remove grate(s) and screen(s). Remove sediment/sludge build-up and check orifices are clear.
Inspect grate(s) for damage or blockage	Six monthly	Strata/Maintenance Contractor	Check both sides of a grate for corrosion, (especially corners and welds) damage or blockage.
Inspect outlet pipe & remove any blockage	Six monthly	Strata/Maintenance Contractor	Remove grate(s) and screen(s). Ventilate underground storage if present. Check orifices and remove any blockages in outlet pipe. Flush outlet pipe to confirm it drains freely. Check for sludge/debris on upstream side of return line.
Check step irons for corrosion	Annually	Strata/Maintenance Contractor	Remove grate. Examine step irons and repair any corrosion or damage
Check fixing of step irons is secure	Six monthly	Strata/Maintenance Contractor	Remove grate(s) and ensure fixings are secure prior to placing weight on step iron.
Storage			
Inspect storage & remove any sediment/sludge in pit	Six monthly	Strata/Maintenance Contractor	Remove grate(s) and screen(s). Remove sediment/sludge build-up.
Inspect internal walls of storage (and external, if appropriate) for cracks or spalling	Annually	Strata/Maintenance Contractor	Remove grate(s) to inspect internal walls. Repair as required. Clear vegetation from external walls if necessary and repair as required.
Inspect & remove any debris/litter/mulch etc blocking grates	Six monthly	Strata/Maintenance Contractor	Remove blockages from grate(s) and check if storage is blocked.
Inspect areas draining to the storage(s) & remove debris/mulch/litter etc likely to block screens/grates	Six monthly	Strata/Maintenance Contractor	Remove debris and floatable material likely to be carried to grates.
Compare storage volume to volume approved. (Rectify if loss > 5%)	Annually	Strata/Maintenance Contractor	Compare actual storage available with Work-as Executed plans. If volume loss is greater than 5%, arrange for reconstruction to replace the volume lost. Council to be notified of the proposal.
Inspect storages for subsidence near pits	Annually	Strata/Maintenance Contractor	Check along drainage lines and at pits for subsidence likely to indicate leakages.

NOT FOR CONSTRUCTION

Issue	Description	Date	Designed	Engineer	Checked
A	ISSUE FOR DEVELOPMENT APPLICATION	16/12/2022	MD	EH	OC

Architect
A. Blefari
6 Lookout Ave, Blaxland East NSW 2774
Ph: 0414 660 400
e: tony@ecoinhouse.com.au

Council
Narrabri Shire Council

Client
Edgeroi Energy Pty Ltd

Scale

C & S ENGINEERING SERVICES
CIVIL & STORMWATER ENGINEERING SERVICES PTY LTD
ABN: 27 644 422 506
Shop 1, 143-147 Parramatta Road, Concord, NSW 2137
P:(02) 8397 6500
E:info@esgconsult.com.au

Project
14456 NEWELL HIGHWAY, EDGEROI
PROPOSED EDGEROI SERVICE STATION
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title
MAINTENANCE SCHEDULE & AQUATOR TANK DETAILS SHEET

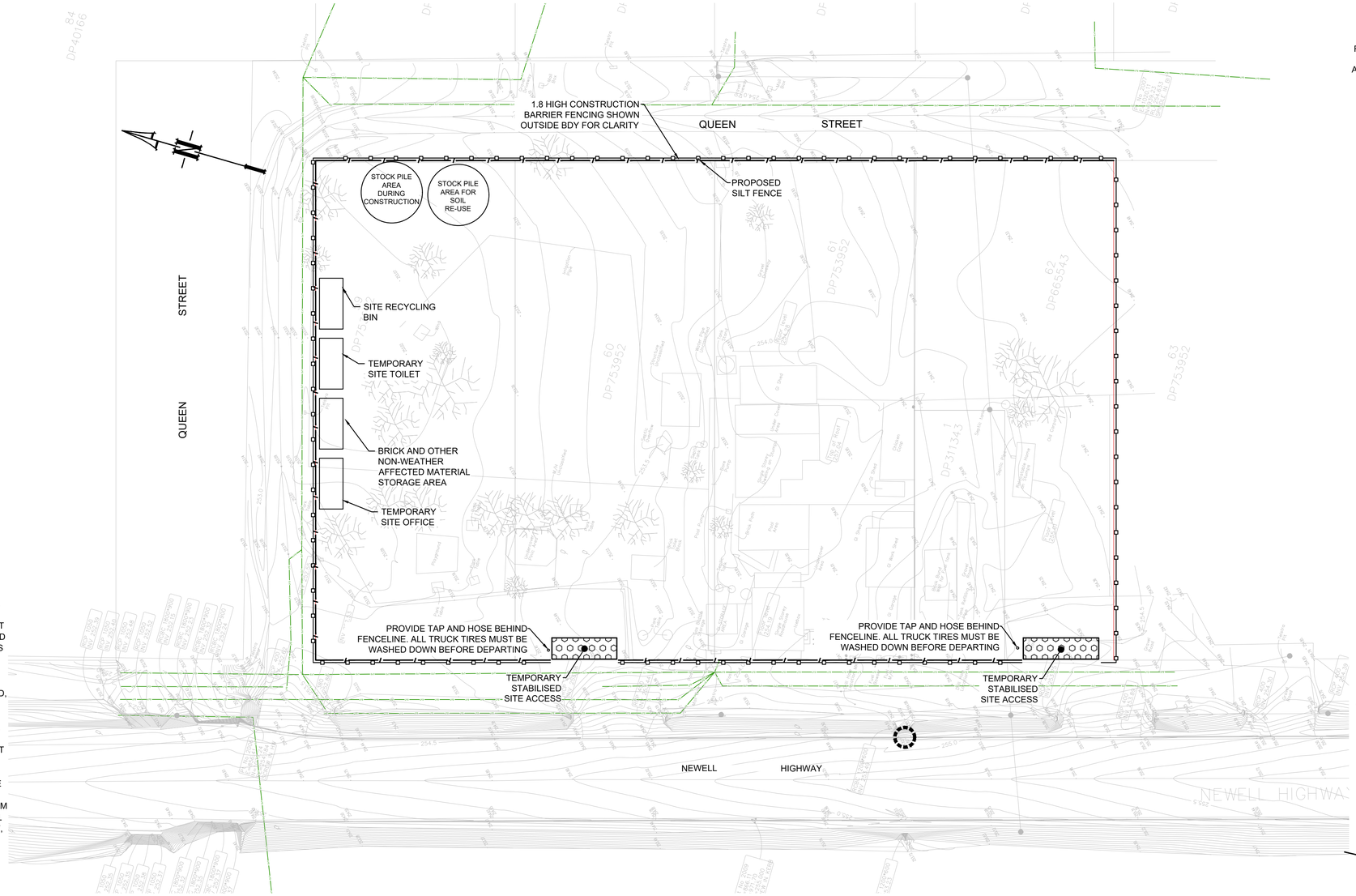
Scale	Project No.	Dwg. No.	Issue
N.T.S.	220139	105	A

LEGEND

- EXISTING WATER MAIN
- EXISTING SEWER MAIN
- EXISTING TELSTRA
- EXISTING ELECTRICAL
- EXISTING GAS
- EXISTING OPTIC FIBER
- EXISTING CONTOUR
- EXISTING SURFACE LEVEL
- EARTHWORKS LEVEL
- DESIGN SURFACE LEVEL
- SILT FENCE
- STABILISED SITE ACCESS
- 1.8 HIGH CONSTRUCTION BARRIER FENCING
- TREES TO BE RETAINED
- TREES TO BE REMOVED
- INLET PROTECTION

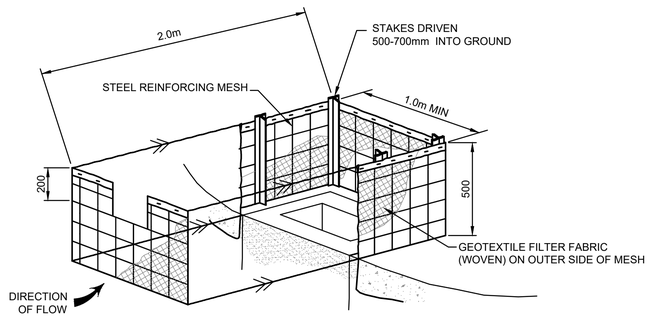
SEDIMENT & EROSION NOTES

1. IMMEDIATELY FOLLOWING SETTING OUT OF THE WORKS, BUT PRIOR TO COMMENCEMENT OF ANY CLEARING OR EARTHWORKS, THE CONTRACTOR AND SUPERINTENDENT SHALL WALK THE SITE TO NOMINATE THE LOCATIONS AND TYPES OF SEDIMENT AND EROSION CONTROL MEASURES TO BE ADOPTED. THESE MEASURES SHALL BE IMPLEMENTED PRIOR TO ANY CLEARING OR EARTHWORKS AND MAINTAINED UNTIL THE WORKS ARE COMPLETED AND NO LONGER POSE AN EROSION HAZARD, UNLESS OTHERWISE APPROVED BY THE SUPERINTENDENT.
2. IMMEDIATELY FOLLOWING SETTING OUT OF THE WORKS, BUT PRIOR TO COMMENCEMENT OF ANY CLEARING OR EARTHWORKS, THE CONTRACTOR AND SUPERINTENDENT SHALL WALK THE SITE TO IDENTIFY AND MARK TREES WHICH ARE TO BE PRESERVED. NOTWITHSTANDING THE ABOVE,THE CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO MINIMISE DISTURBANCE TO EXISTING VEGETATION AND GROUND COVER OUTSIDE THE MINIMUM AREAS REQUIRED TO COMPLETE THE WORKS AND SHALL BE RESPONSIBLE FOR RECTIFICATION, AT ITS OWN COST, OF ANY DISTURBANCE BEYOND THOSE AREAS.
3. PROVIDE GULLY GRATE INLET SEDIMENT TRAPS AT ALL GULLY PITS.
4. PROVIDE SILT FENCING ALONG PROPERTY LINE AS DIRECTED BY SUPERINTENDENT.
5. ADDITIONAL CONTROL DEVICES TO BE PLACED WHERE DIRECTED BY THE PRINCIPLE.
6. ALTERNATIVE DESIGNS TO BE APPROVED BY SUPERINTENDENT PRIOR TO CONSTRUCTION.
7. WASH DOWN/RUMBLE AREA TO BE CONSTRUCTED WITH PROVISIONS RESTRICTING ALL SILT AND TRAFFICKED DEBRIS FROM ENTERING THE STORMWATER SYSTEM.
8. NO WORK OR STOCKPILING OF MATERIALS TO BE PLACED OUTSIDE OF SITE WORK BOUNDARY.
9. APPROPRIATE EROSION AND SEDIMENT CONTROLS TO BE USED TO PROTECT STOCKPILES AND MAINTAINED THROUGH OUT CONSTRUCTION.
10. IT IS THE CONTRACTORS RESPONSIBILITY TO TAKE DUE CARE OF NATURAL VEGETATION. NO CLEARING IS TO BE UNDERTAKEN WITHOUT PRIOR APPROVAL FROM THE SUPERINTENDENT.
11. TO AVOID DISTURBANCE TO EXISTING TREES, EARTHWORKS WILL BE MODIFIED AS DIRECTED ON-SITE BY THE SUPERINTENDENT.
12. THE LOCATION OF EROSION AND SEDIMENTATION CONTROLS WILL BE DETERMINED ON SITE BY THE SUPERINTENDENT.
13. ACCESS TRACKS THROUGH THE SITE WILL BE LIMITED TO THOSE DETERMINED BY THE SUPERINTENDENT AND THE CONTRACTOR PRIOR TO ANY WORK COMMENCING.
14. ALL SETTING OUT IS THE RESPONSIBILITY OF THE CONTRACTOR PRIOR TO WORKS COMMENCING ON SITE. THE SUPERINTENDENT'S SURVEYOR SHALL PEG ALL ALLOTMENT BOUNDARIES, PROVIDE COORDINATE INFORMATION TO THESE PEGS AND PLACE BENCH MARKS. THE CONTRACTOR SHALL SET OUT THE WORKS FROM AND MAINTAIN THESE PEGS.



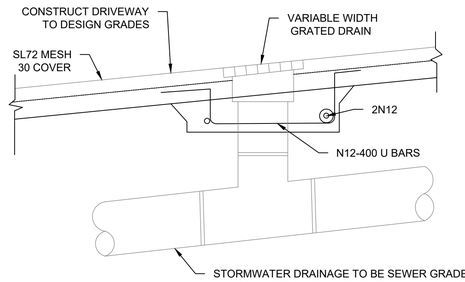
SEDIMENT & EROSION CONTROL PLAN

SCALE 1:500



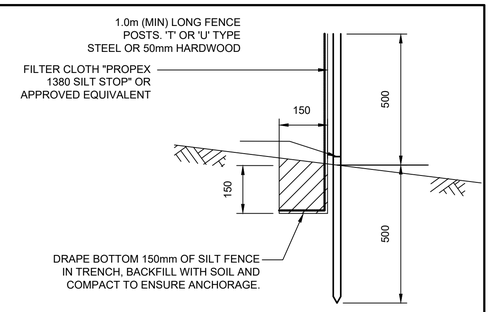
FIELD INLET SEDIMENT TRAP

N.T.S.



GRATED DRAIN DETAIL

N.T.S.

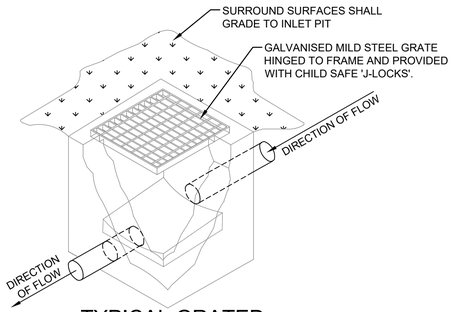


SILT FENCE DETAIL

N.T.S.

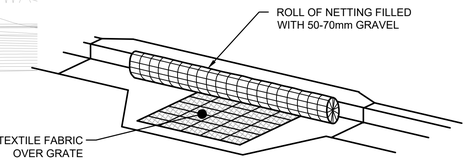
SILT FENCE NOTES:

1. FILTER CLOTH TO BE FASTENED SECURELY TO POSTS WITH GALVANISED WIRE TIES, STAPLES OR ATTACHMENT BELTS.
2. POSTS SHOULD NOT BE SPACED MORE THAN 3.0m APART.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY 150mm AND FOLDED.
4. FOR EXTRA STRENGTH TO SILT FENCE, WOVEN WIRE (14mm GAUGE, 150mm MESH SPACING) TO BE FASTENED SECURELY BETWEEN FILTER CLOTH AND POSTS BY WIRE TIES OR STAPLES
5. INSPECTIONS SHALL BE PROVIDED ON A REGULAR BASIS, ESPECIALLY AFTER RAINFALL AND EXCESSIVE SILT DEPOSITS REMOVED WHEN "BULGES" DEVELOP IN SILT FENCE
6. SEDIMENT FENCES SHALL BE CONSTRUCTED WITH SEDIMENT TRAPS AND EMERGENCY SPILLWAYS AT SPACINGS NO GREATER THAN 40m ON FLAT TERRAIN DECREASING TO 20m SPACINGS ON STEEP TERRAIN.



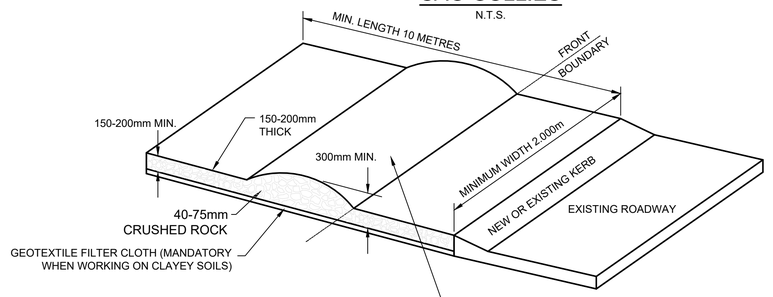
TYPICAL GRATED INLET PIT DETAIL

N.T.S.



KERB INLET PROTECTION SAG GULLIES

N.T.S.



SHAKEDOWN DEVICE

N.T.S.

NOT FOR CONSTRUCTION

Issue	Description	Date	Designed	Engineer	Checked
A	ISSUE FOR DEVELOPMENT APPLICATION	16/12/2022	MD	EH	OC

Architect
A. Blefari
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Council
Narrabri Shire Council

Client
Edgeroi Energy Pty Ltd

Scale
0 10 20 30 m
SCALE 1:500 @ A1

C & S ENGINEERING SERVICES
CIVIL & STORMWATER ENGINEERING SERVICES PTY LTD
ABN: 27 644 422 506
Shop 1, 143-147 Parramatta Road, Concord, NSW 2137
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E:info@esgconsult.com.au

Project
14456 NEWELL HIGHWAY, EDGEROI
PROPOSED EDGEROI SERVICE STATION
STORMWATER CONCEPT PLAN
DEVELOPMENT APPLICATION

Drawing Title
SEDIMENT & EROSION CONTROL PLAN & MISCELLANEOUS DETAILS SHEET

Scale	Project No.	Dwg. No.	Issue
As Shown A1	220139	106	A

Appendix 3: AHIM Search Results

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : 22-242

Client Service ID : 745615

SMK Consultants Pty Ltd - Moree

Date: 16 January 2023

P O Box 774
Moree New South Wales 2400

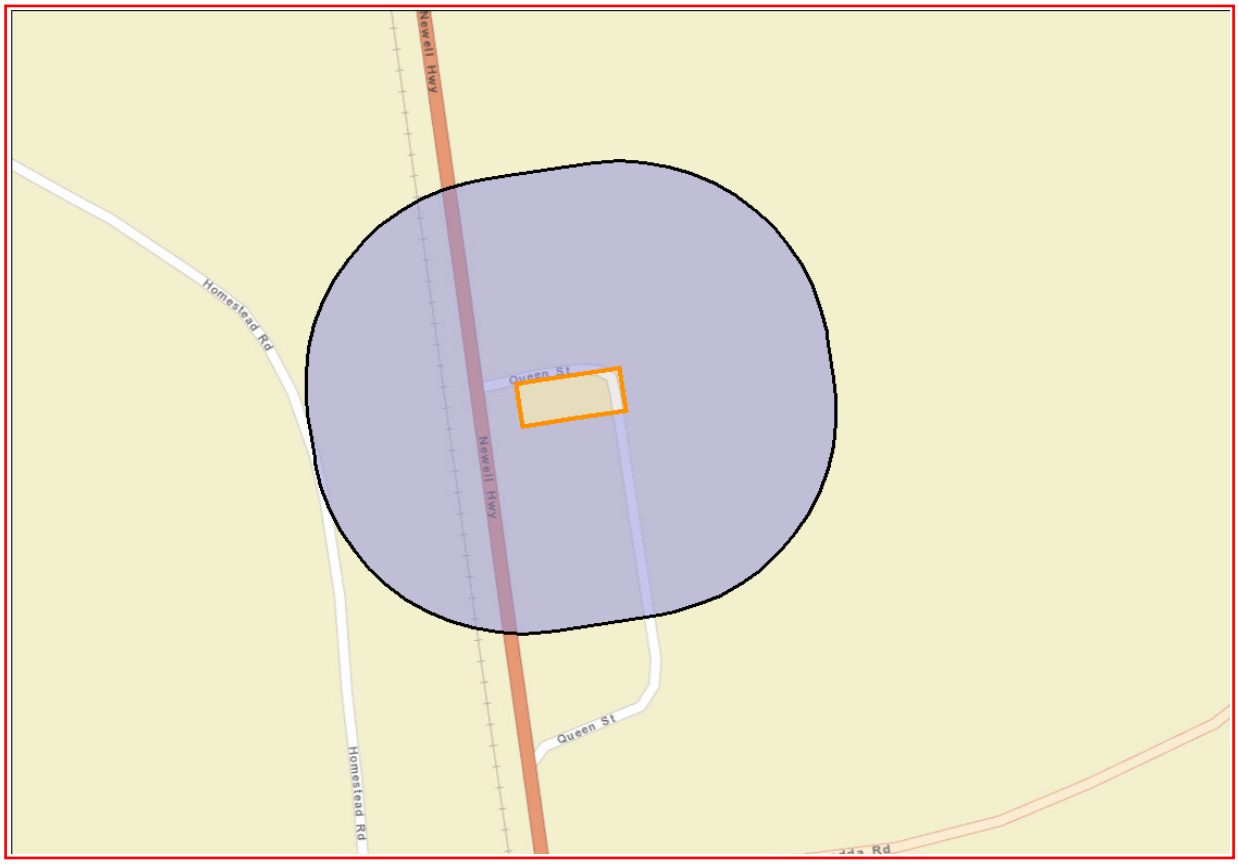
Attention: Marie Duffy

Email: marie@smk.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 59, DP:DP753952, Section : - with a Buffer of 200 meters, conducted by Marie Duffy on 16 January 2023.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : 22-242

Client Service ID : 745616

SMK Consultants Pty Ltd - Moree

P O Box 774

Moree New South Wales 2400

Attention: Marie Duffy

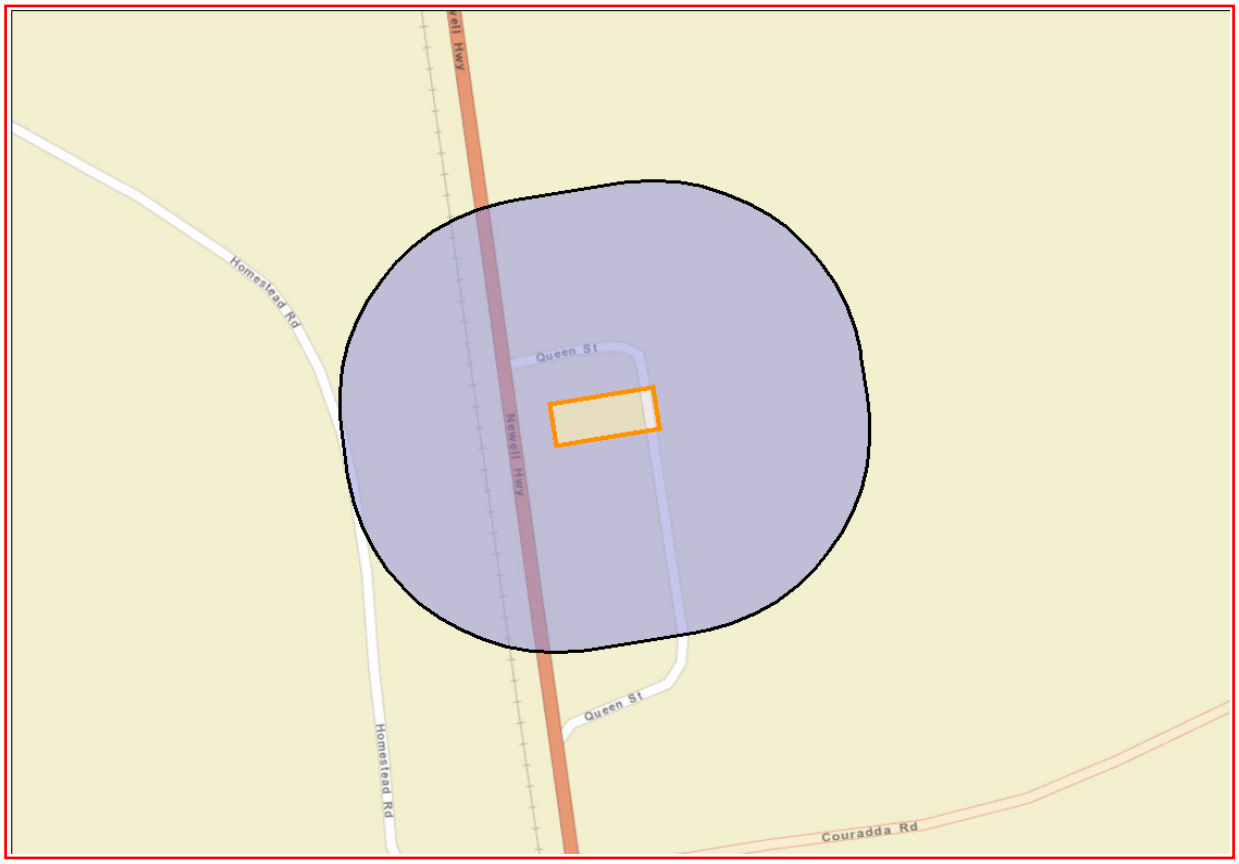
Email: marie@smk.com.au

Date: 16 January 2023

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 60, DP:DP753952, Section : - with a Buffer of 200 meters, conducted by Marie Duffy on 16 January 2023.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : 22-242

Client Service ID : 745617

SMK Consultants Pty Ltd - Moree

P O Box 774

Moree New South Wales 2400

Attention: Marie Duffy

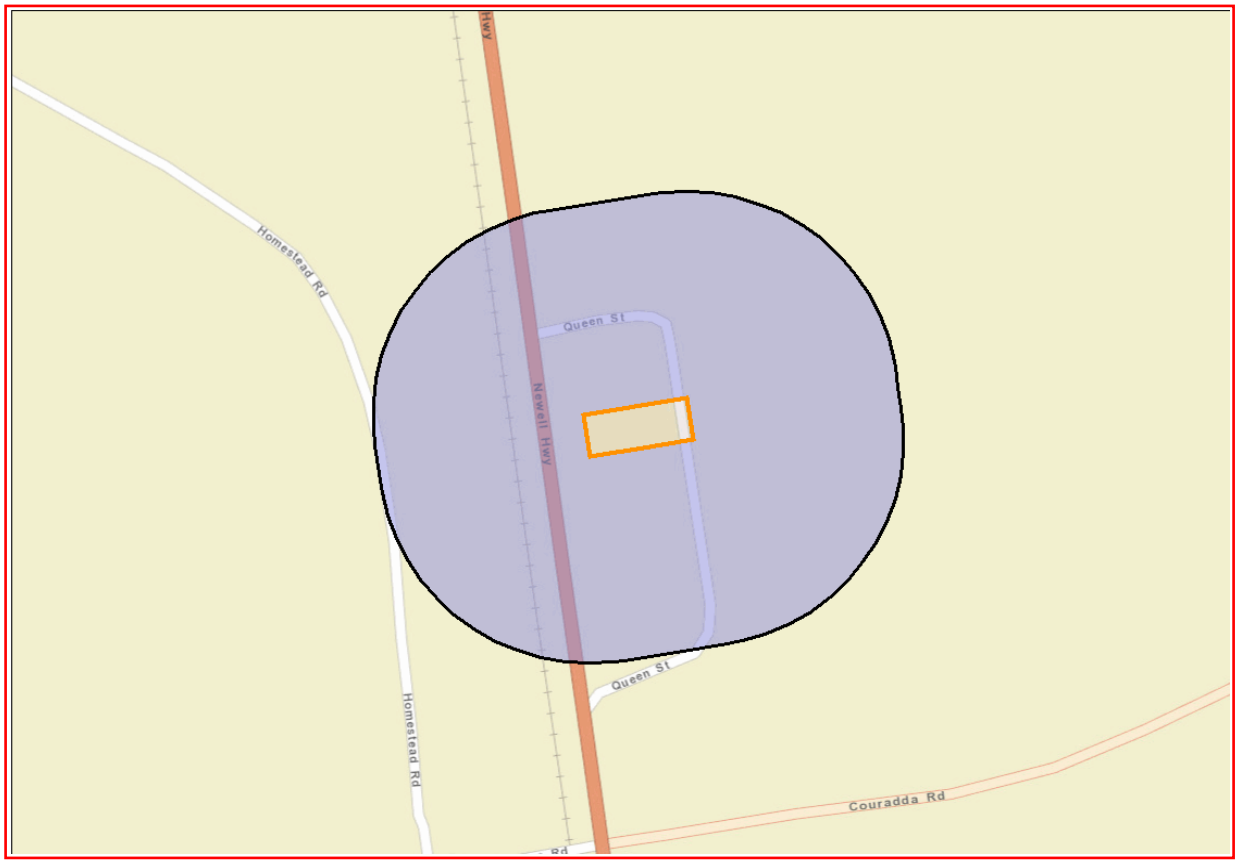
Email: marie@smk.com.au

Date: 16 January 2023

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 61, DP:DP753952, Section : - with a Buffer of 200 meters, conducted by Marie Duffy on 16 January 2023.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : 22-242

Client Service ID : 745618

SMK Consultants Pty Ltd - Moree

P O Box 774

Moree New South Wales 2400

Attention: Marie Duffy

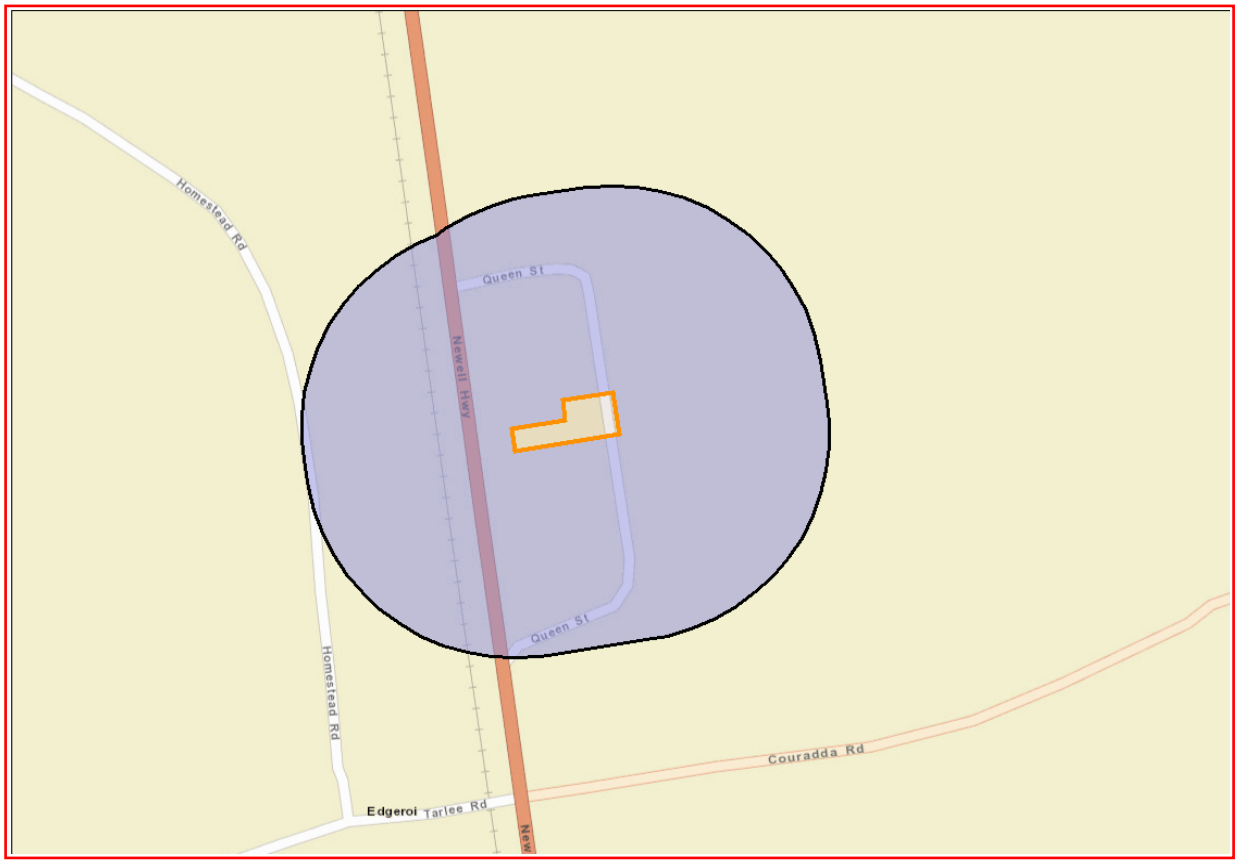
Email: marie@smk.com.au

Date: 16 January 2023

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 62, DP:DP665543, Section : - with a Buffer of 200 meters, conducted by Marie Duffy on 16 January 2023.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : 22-242

Client Service ID : 745619

SMK Consultants Pty Ltd - Moree

P O Box 774

Moree New South Wales 2400

Attention: Marie Duffy

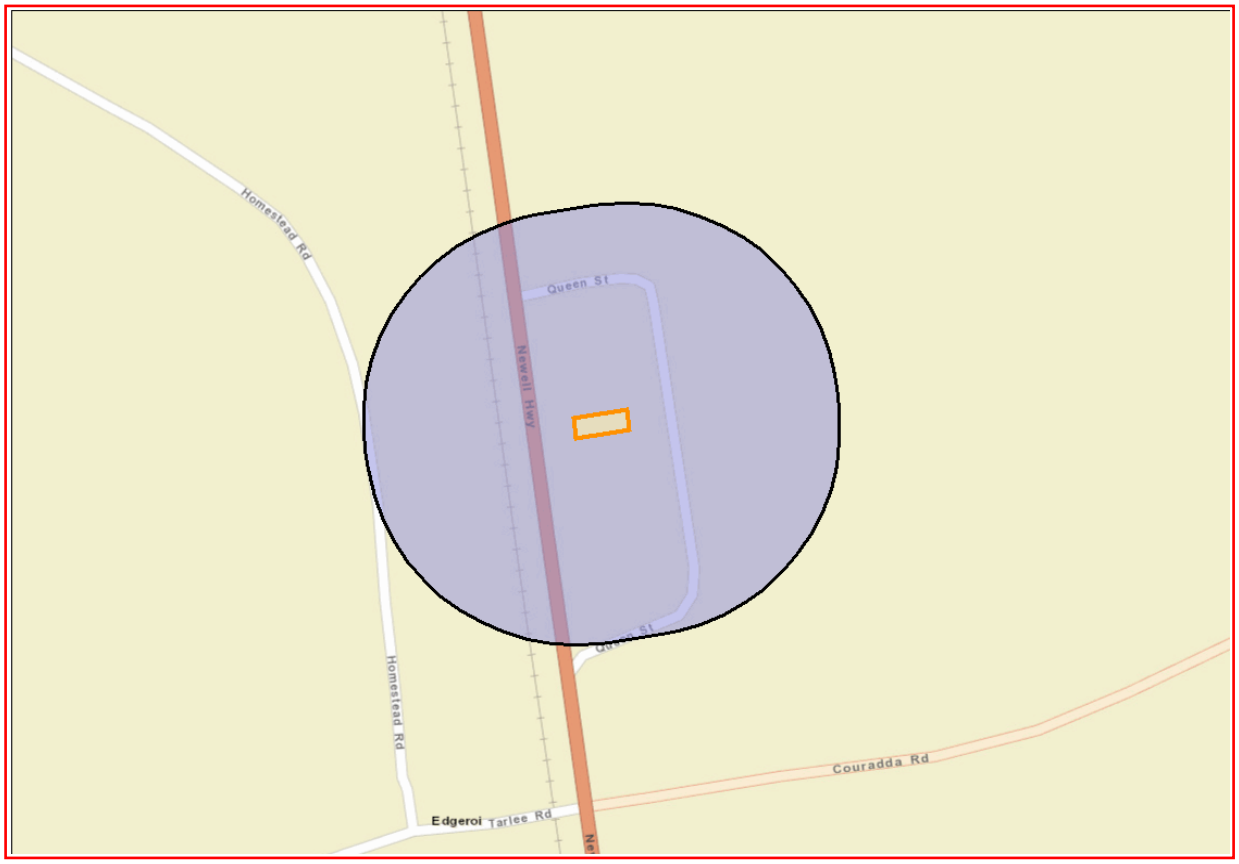
Email: marie@smk.com.au

Date: 16 January 2023

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 1, DP:DP311343, Section : - with a Buffer of 200 meters, conducted by Marie Duffy on 16 January 2023.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

Appendix 4: SEPP 33 Assessment

HAZARDOUS AND OFFENSIVE DEVEOPMENT

RISK SCREENING REPORT

SEPP 33

14456 Newell Highway Edgeroi NSW

Report Prepared for the

The Benzina Group

PO Box 365
Penrith NSW 2751

Fuel System Designers

ABN: **36 674 809 464**

M: 0403 181 316
E: vincent@vancorp.net.au

Disclaimer

This report was prepared for the Benzina Group for use with a Development Application in relation to 14456 Newell Highway Edgeroi NSW. It was prepared on the basis of information provided by the developer and can be used for general informational purposes only. Fuel Systems Design makes no representation or warranty, express or implied, as to the validity of the report's content. Use of this report by the Benzina Group is limited to providing it to the NSW Department of Planning and it may not be used for any other purposes unless expressly agreed to by the author in writing.

Vincent A Noviello
Report Author
B App Sci (Computing), MapLAW, Professional Cert (Mechanical Engineering)

12 December 2022

Table of Contents

EXECUTIVE SUMMARY

In a potentially hazardous industry, any development proposing the storage and handling of goods considered hazardous goods needs to be screened and have a risk assessment completed for consideration by the Department of Planning with the development application.

A screening process was undertaken for the proposed development of a service station at 14456 Newell Highway Edgeroi NSW.

The screening process included applying a rigorous analysis taking into account the hazardous materials to be stored, boundary setbacks, transportation services, external consequences and the probability of a hazardous event.

Calculations were undertaken in keeping with the Department of Planning's – Applying SEPP 33 and the Planning & Infrastructure's Assessment Guideline – Multi-level Risk Assessment.

The report findings for the Edgeroi proposal were made with all points on the indicative societal risk curve produced from the risk classification and prioritisation being below the negligible line.

FINDINGS AND RECOMMENDATIONS

Findings

The results of the screening process undertaken for the proposed service station development in Edgeroi indicates that it is not a potentially hazardous development.

Recommendations

As such, no further analysis (i.e. Preliminary Hazard Analysis) is necessary.

SITE DESCRIPTION

The land comprises 5 individually titled parcels as follows:

Lot	59	DP753952
Lot	60	DP753952
Lot	61	DP753952
Lot	62	DP665543
Lot	01	DP311343

The site is proposed to be a truck stop and service station development comprising; truck canopy, car canopy, service station shop, fast food restaurant, eating areas, truckies lounge, toilet and shower facilities, car park and truck parking.

The property sits on the eastern side of the Newell highway meaning that southbound traffic will have direct left-in left-out access.

The total area under proposed development is 15,750m2 with a 157.5m frontage on the Newall Highway with a depth of 100m with access from Queen Street on the northern boundary.

The main function of the development will be to supply motor spirit and other combustible fluid to the general public.

Industry standard fuel systems incorporating the highest grade double walled fuel tanks,

dispensers, pipes and sumps will be used with state of the art monitoring systems to prevent spillage, leakage and harm to the environment and people.

LOCATION

The location of the development under consideration is 14456 Newell Highway Edgeroi NSW 2390.

The subject site stands alone in a rural area with no residential structures in the immediate vicinity. Across from the subject site, on the other side of the Newell Highway, there is a railway track which will exclude any residential development in future.

Figure 1 – This a street view of the subject property.

Figure 2 – This is a satellite view of the subject property. The proposed service station will have the vehicular entry from Queen Street.

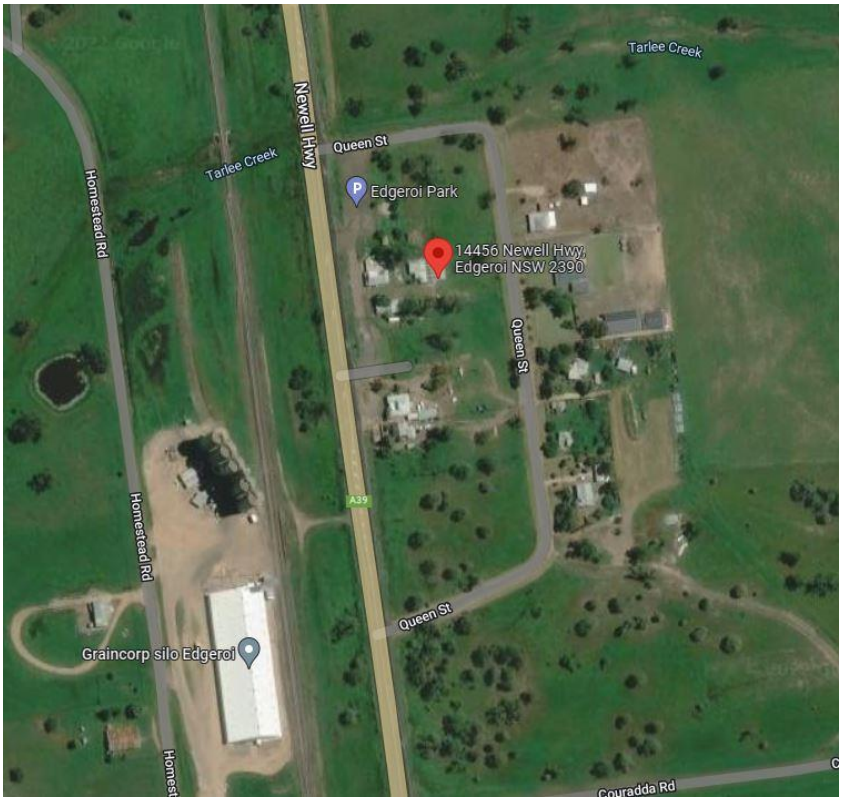
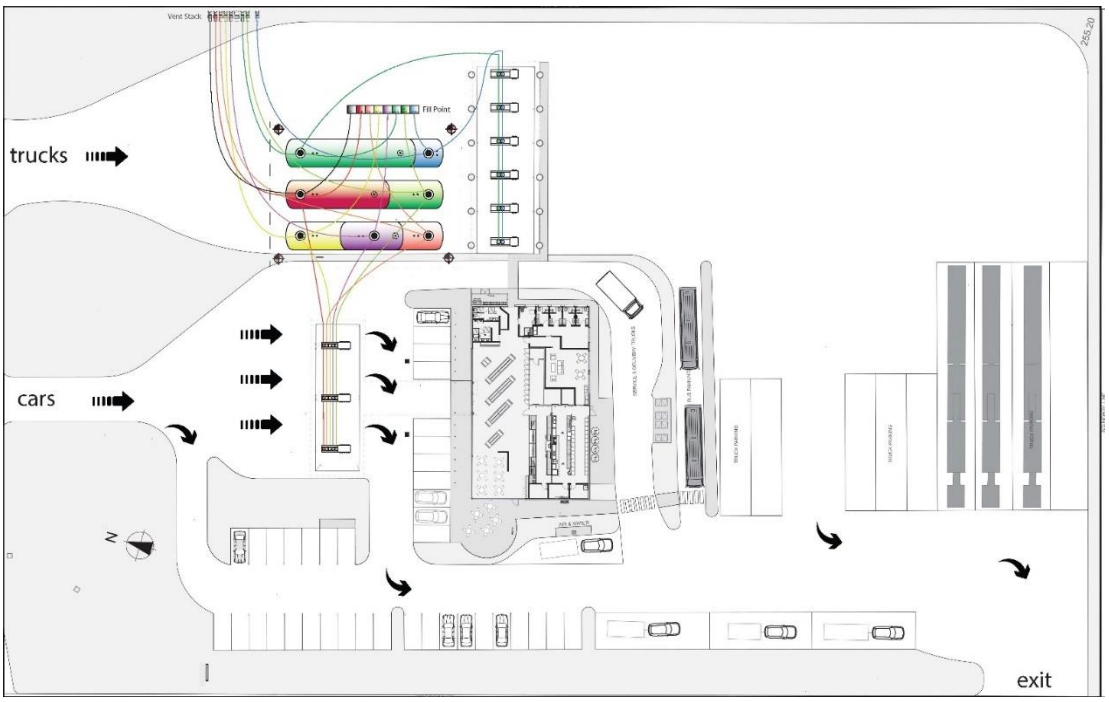


Figure 3 – Site Plan & Facility Layout (see Appendix 1 for enlarged image).



PROCESS

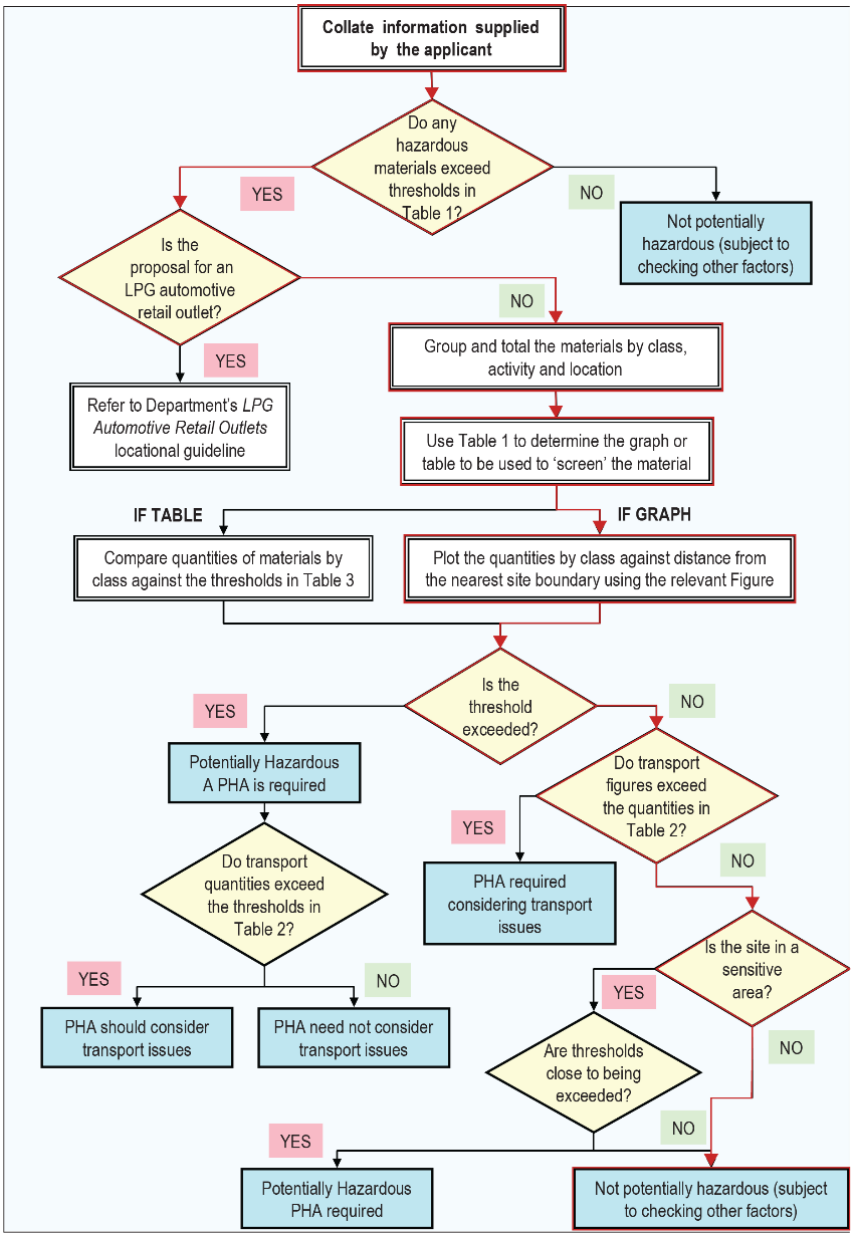
The process undertaken in this risk screening accords with the NSW Planning & Infrastructure *(Assessment Guidelines; Multi-level Risk Assessment)* guidelines. In particular, the SEPP 33 Figure 4 risk screening process as highlighted in Appendix 2.

The process identified that the quantum of hazardous materials proposed for the development exceeds the documented thresholds. The *Figure 9* graph was used to establish that after applying various factors pertaining to the storage type and distances from boundaries that the potentially hazardous region indicated in the graph is clearly avoided.

Transportation and area sensitivity were also considered per the Figure 4 process concluding that the subject site and proposed development is not potentially hazardous.

Other factors considered and analysed include hazard identification, consequence analysis and estimation of the likelihood of a hazardous event.

Figure 4 – Screening Process (see Appendix 2 for enlarged image).



Hazardous Materials

The proposed service station development will store a maximum of 330kL of flammable liquids in three underground storage tanks configured as follows:

Table 1 – Hazardous Materials.

Fuel Type	Amount	Class of Goods
95 Petrol	40,000 litres	3 PG II
98 Petrol	40,000 litres	3 PG II
E10 Petrol	30,000 litres	3 PG II
Diesel	70,000 litres	C1
Diesel	40,000	C1
Diesel	90,000	C1
Ad Blue	20,000	NDG

As Ad Blue is a water based product it is not classified under the ADG Code therefore it follows that this product does not need to be included in the total quantity of hazardous materials for the screening process.

Diesel is classified as a C1 chemical meaning it is not (in itself) considered to be a potentially hazardous product. However, the underground diesel storage tanks are placed alongside other tanks containing hazardous materials (petrol) as such, diesel has been included in the hazardous materials calculations.

PRELIMINARY SCREENING

Summary of Materials Held on Site for the Screening Process

Of the 330kL of combustible and flammable liquids to be stored in underground tanks on site; only 62kL will be considered for the screening process. This figure of 62kL has been arrived at as follows:

Table 2 below shows compartments 1 – 3 will contain 110kL of petrol including E10 in a single double walled underground tank. As this is an underground storage tank the total quantity may be divided by a factor of 5 as a reflection of the lower risk associated with underground tank systems. The resulting flammable liquid quantity for screening purposes in this tank is 22kL.

The second 110kL tank will store diesel fuel in two compartments 4 & 5 which is a combustible fuel (Class C1). However because this substance is stored alongside a Category II product, it is required to be included in the total quantity for screening purposes. As such, applying the same factor as with the first tank, (i.e. a factor of 5) the total combustible liquid quantity for screening purposes in this tank is also 22kL.

The third 110kL tank will store diesel fuel and Ad Blue also in two compartments 6 (diesel 90kL) and 7 (Ad Blue 20kL). As indicated above for tank number 2, diesel is required to be counted for screening purposes. However, Ad Blue is a water based fuel product and may be deducted from the total quantity of stored hazardous materials as it is neither flammable nor combustible. For the purposes of screening this tank contains 18kL.

Therefore, the total of hazardous material proposed to be stored on site is 62kL.

Table 2 – Summary of Materials to be Held on Site.

Tank No.	Compartment No.	Fuel Type	Dangerous Goods Classification	Total for Screening Process (Lt)
1 (110kL)	1 (40kL)	95 Petrol	3 PG II	40,000
	2 (40kL)	98 Petrol	3 PG II	40,000
	3 (30kL)	E10 Petrol	3 PG II	30,000
2 (110kL)	4 (70kL)	Diesel	C1	70,000
	5 (40kL)	Diesel	C1	40,000
3 (110kL)	6 (90kL)	Diesel	C1	90,000
	7 (20kL)	Ad Blue	NDG	Nil
Total Flammable Liquid to be stored on site				310,000
Divide by a factor of 5				/5
Total Flammable Liquid to be considered in the screening process				**62,000**

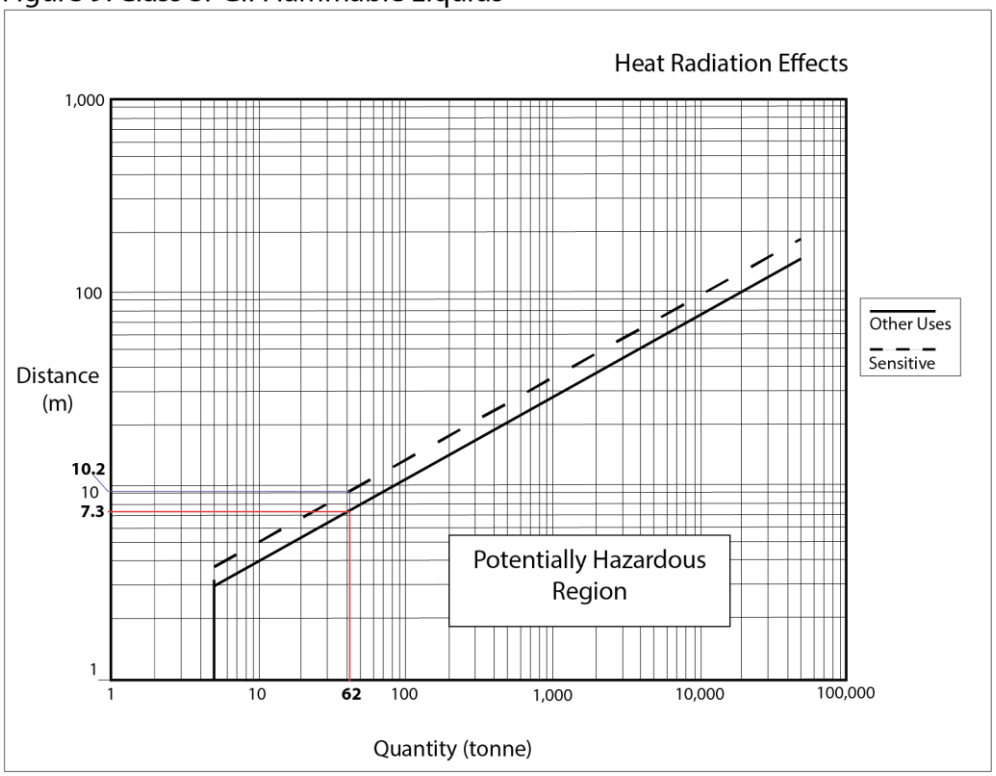
Screening Method to be Used

Given the maximum quantity of Class 3 PG II hazardous materials to be stored exceeds 5 tonnes, the screening method used is the Figure 9 graph as per *Applying SEPP 33 (January 2011).*

By utilising Figure 9 and measuring separation distances, it can be determined whether further analysis is required. The separation distances are measured from the underground tank fill points and the fuel dispensers to the site boundaries. Given only diesel (C1) will be dispensed at the truck/heavy vehicle filling canopy, only the separation distances for the car dispensers will be used.

Figure 5 – Setback Graph (see Appendix 3 for enlarged image).

Figure 9: Class 3PGII Flammable Liquids



Source: Applying SEPP 33 | January 2011

From Figure 9 we can observe that for 62kL of flammable liquid the minimum setback distance for the petrol dispensers and remote fill point is 7.3m from the site boundaries for other uses, or 10.2m for sensitive uses (i.e. residential).

The distances indicated above are the minimum distances for any boundary on the subject site. Other distances have also been calculated from each site boundary as indicated in Table 3 below.

Table 3 – Boundary Distances

Boundary	Distance to Fill Points	Distance to Diesel Dispensers	Distance to Petrol Dispensers	Distance to Tank Farm
North	57.5	75.1	49.5	41.2
South	102.5	82.4	108	100.3
East	12.8	8.65	51.5	26.8

West	86.0	68.0	37.1	72.4

Since the set back distances are in excess of 7.3m (for normal use) from boundaries to the fill points, petrol dispensers and diesel dispensers, the site is deemed to be non hazardous and there is no requirement to do a PHA for further analysis.

Table 4 – Transport Screening Thresholds (see Appendix 4 for complete table).

Vehicle Movements			**Minimum Quantity per load (tonne)**	
Class	Cumulative Annual	Peak Weekly	Bulk	Packages
3PGII	>750	>45	3	10

For the proposed service station development it is intended to retail approximately 800,000 Lt of fuel products per month. This will require a 40kL tanker to attend the site approximately 20 times per month or 240 times per year. The frequency of transport movements is well within the thresholds of 45 per week or 750 per annum as indicated above at Table 4 (sourced from *NSW Planning & Infrastructure Applying SEPP 33 (January 2011).*

CONSEQUENCE ANALYSIS

Risk Classification and Prioritisation

In order to calculate the external consequences of risk, the following equation is used:

$C_{a,s} = A \,.\, d \,.\, f_A \,.\, f_m$

$C_{a,s}$ = external consequences
A = affected area
d = population density
f_A = area correction factor for the populated area
f_m = correction factor for mitigation effects

In accordance with the *IAEA Table IV(a) (NSW Planning & Infrastructure Assessment Guidelines; Multi-level Risk Assessment)*, the classification for the type and quantity of flammable liquids under consideration is categorised as follows:

Table 5 – Incident Inventory Classification (see Appendix 5 for full table).

Material	**Site inventory (tonnes)**	**Reference no. IAEA Table IV(a)**	**Effect category IAEA Table V**
Petrol (bulk in a single tank)	62	6	CII

From the *IAEA Table V (NSW Planning & Infrastructure Assessment Guidelines; Multi-level Risk Assessment)* the effect distance and area of effect is calculated as follows:

Table 6 – Effect Distance and Area of Effect (see Appendix 6 for full table).

Material	**Effect category IAEA Table IV(a)**	**Effect area (ha) IAEA Table V**	**Maximum distance (m) from IAEA Table V**
Petrol (bulk in a	CII	1.5	50-

single tank)			100

The above table determines the effect area and maximum diameter of effect in the event of an accident involving the hazardous material (petrol).

External Consequences

From the above table it can be seen that in the event of an accident the maximum effect distance exceeds the proposed development's boundaries therefore, external consequences of such an event will impact the surrounding area and must be calculated taking account of the population within the immediate location of the proposed service station.

Figure 6 – Estimate of the Effect Distance and Area (see Appendix 7 for enlarged image).

Using Table VI *(NSW Planning & Infrastructure Assessment Guidelines; Multi-level Risk Assessment)* population density to be used follows:

Table 7 – Population Density (see Appendix 8 for full table).

Description of the area	Density (persons/ha)
Farmland, scattered houses	5

Table VII *(NSW Planning & Infrastructure Assessment Guideline; Multi-level Risk Assessment)* provides for a population correction factor calculated on the basis of estimated population distribution within the circular area (refer to Figure 6).

Table 8 – Population Correction Factor (see Appendix 9 for full table).

Effect area Category	Populated fraction (%) of circular area					
	100%	**50%**	**20%**	**15%**	**10%**	**5%**
I						
II			0.4	0.3	0.2	
III						

It is estimated that 15% of the circular area has a population distribution therefore the correction factor is 0.3.

For flammable liquids with reference numbers from 1 -12, the correction factor for mitigation is 1 as stated in Table VIII *(NSW Planning & Infrastructure Assessment Guidelines; Multi-level Risk Assessment)*.

Table 9 – Correction Factor for Mitigation (see Appendix 10 for full table).

Substance (reference number)	Factor
Flammable liquids (1 – 12)	1

It is now possible to calculate the external consequences of a major accident using the formular below and substituting the data obtained in Tables 1 – 9 above.

$C_{a,s} = A \,.\, d \,.\, f_A \,.\, f_m$

A = 1.5ha (affected area)
d = 5 (population density)
f_A = 0.3 (correction factor for the distribution of population)
f_m = 1 (correction factor for mitigation)

This translates to: $C_{a,s}$ = 1.5 x 5 x 0.3 x 1

Therefore, the external consequences of a single major accident is estimated to be 2.25 fatalities.

ESTIMATION OF THE LIKELIHOOD OF HAZARDOUS EVENTS

Probability Number

The probability of an incident occurring considering the installation and the materials being stored is arrived at using the following formular:

$N_{i,s} = N^*_{I,s} \,.\, n_I \,.\, n_f \,.\, n_o \,.\, n_p$

Where $N_{i,s}$ is the average probability number for the installation and the substance.

The relationship between probability and frequency is given by:

$N = | log10\ P$

Table IX *(NSW Planning & Infrastructure Assessment Guidelines; Multi-level Risk Assessment)* provides the Average Probability Number ($N_{i,s}$) as follows:

Table 10 – Average Probability Number ($N_{i,s}$) (see Appendix 11 for full table).

Substances	**Activity**	
(reference Nos)	**Storage**	**Plant**
Flammable liquids (1-3)	8	7

The following tables calculate the probability correction factors that may apply to the proposed development in relation to storage of flammable liquids.

Table 11 – Probability Number Correction Parameter for Loading/Unloading Operations Frequency (n_l) (see Appendix 12 for full table).

Frequency of loading/unloading (per year)	**Parameter**
500 – 2000	-2

Table 12 – Probability Number Correction Parameter for Organisational Safety (n_o) (see Appendix 13 for full table).

Frequency of loading/unloading (per year)	**Parameter**
Above average industry practice	+0.5

Table 13 – Probability Number Correction Parameter for Wind direction towards Populated Areas (n_p) (see Appendix 14 for full table).

Effect area Category	**Part of area (%) where people are living**					
	100%	**50%**	**20%**	**15%**	**10%**	**5%**
I						
II				0.5		
III						

It is now possible to calculate the probability number of a major accident using the formular below and substituting the data obtained in Tables 10 – 13 above.

$N_{i,s} = N^*_{I,s} . n_l . n_f . n_o . n_p$

$N^*_{I,s}$ = average probability number
n_l = frequency of loading/unloading
n_f = safety systems associated with flammable substances
n_o = organisational and management safety
n_p = wind direction towards populated area

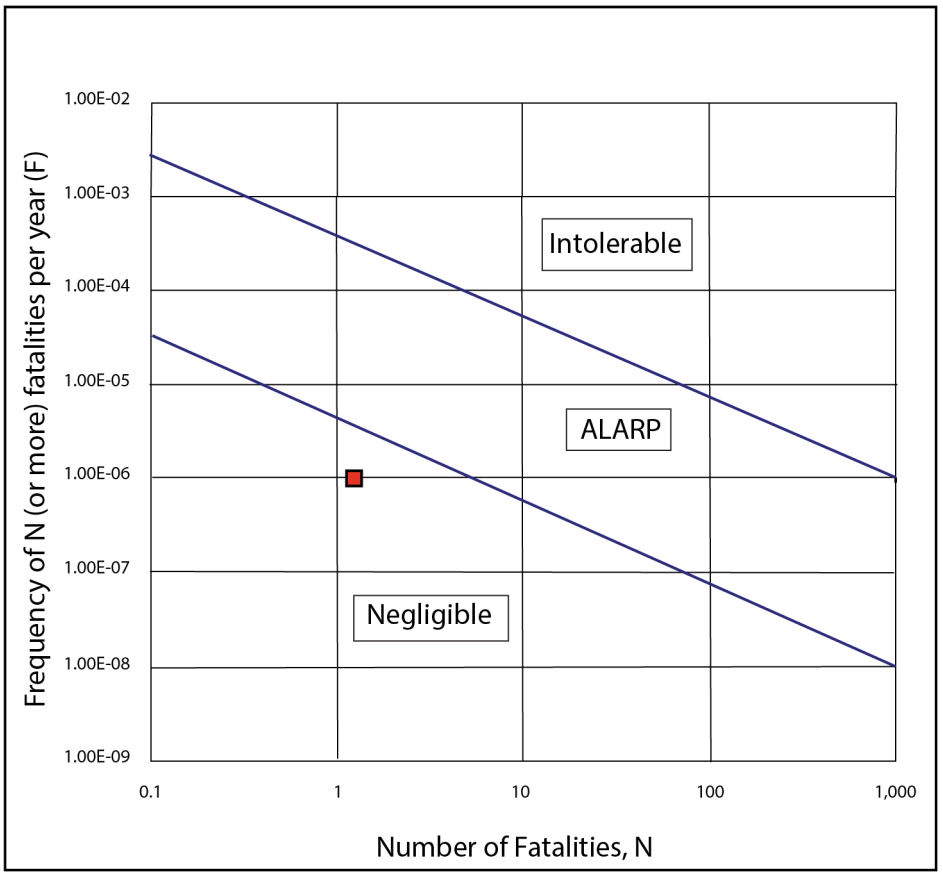
This translates to: $N_{i,s} = 8 + (-)2 + 0.5 - 0.5 = 6$

Therefore, the probability of a major accident is estimated to be 1 x 10^{-6} or 1 in 1,000,000 years.

Societal Risk

It is now possible to calculate societal risk in light of the results of the both the external consequences and the probability of an even occurring. The following graph plots the results of both calculations and demonstrates societal risk of the proposed service station development.

Figure 7 – Societal Risk (see Appendix 15 for enlarged image).



LEVEL OF ASSESSMENT

The results of both the external consequences and the probability of a major event occurring can be seen in Figure 7. The risk screening for the proposed development indicates an acceptable level of risk which falls within the acceptable parameters.

Using the principles as set out in section A1.3.1 of *(NSW Planning & Infrastructure Assessment Guidelines; Multi-level Risk Assessment)* the following analysis is provided by way of a hazard identification table.

Table 14 – Hazard Identification Word Diagram – <u>Sample Only</u> (see Appendix 16 for a more complete listing of potential Events).

Event	Cause	Consequence	Mitigating Factor
Underground tank leak	• mechanical damage • equipment failure	• dispersion underground without ignition	• use of double walled fibreglass tanks • primary and secondary leak detection

			• systems • management procedures to monitor tank levels
Underground piping leak	• mechanical damage • equipment failure	• dispersion underground without ignition	• use of multi-layer piping • leak detection systems
Tanker rupture or major leak	• mechanical damage • equipment failure • traffic accident	• release of significant quantities of fuel to the environment • dispersion without ignition • fire may result if ignition source is present	• fuel system design to AS 1940 • regular testing and maintenance of tanker • fire fighting equipment to be provided

CONCLUSION

By using the methodologies provided by State Environmental Planning Policy No 33 (SEPP 33) a screening process was undertaken for the proposed development of a service station at 14456 Newell Highway Edgeroi NSW. After applying a rigorous screening process taking into account the materials to be stored, boundary setbacks, transportation services, external consequences and the probabilities of a hazardous event; it is concluded that the proposed service station development is deemed *not potentially hazardous*.

As such, no further analysis (i.e. Preliminary Hazard Analysis) is necessary.

REFERENCE LIST

Australian Code for the Transportation of Dangerous Goods by Road and Rail, Edition 7.7 2020

Australian Standard AS 1940-2017 – *The Storage & Handling of Flammable & Combustible Liquids*

Australian Standard AS 4897-2008 – *The Design, Installation and Operation of Underground Petroleum Storage Systems*

Department of Planning Hazardous Industry Planning Advisory Paper No 3 '*Risk Assessment' 2011*

Department of Planning Hazardous Industry Planning Advisory Paper No 4 '*Risk Criteria for Land Use Safety Planning' 2011*

Department of Planning Hazardous Industry Planning Advisory Paper No 6. '*Guidelines for Hazard Analysis*"

Department of Planning Hazardous Industry Planning Advisory Paper No 8 '*HAZOP Guidelines*'

National Code National Code of Practice Storage and Handling of Workplace Dangerous Goods March 2001 [NOHSC:2017(2001)]

NSW Department of Planning *Hazardous and Offensive Development Application Guideline Applying SEPP 33*

NSW Department of Planning and Infrastructure *Assessment Guidelines Multi Level Risk Assessment*.

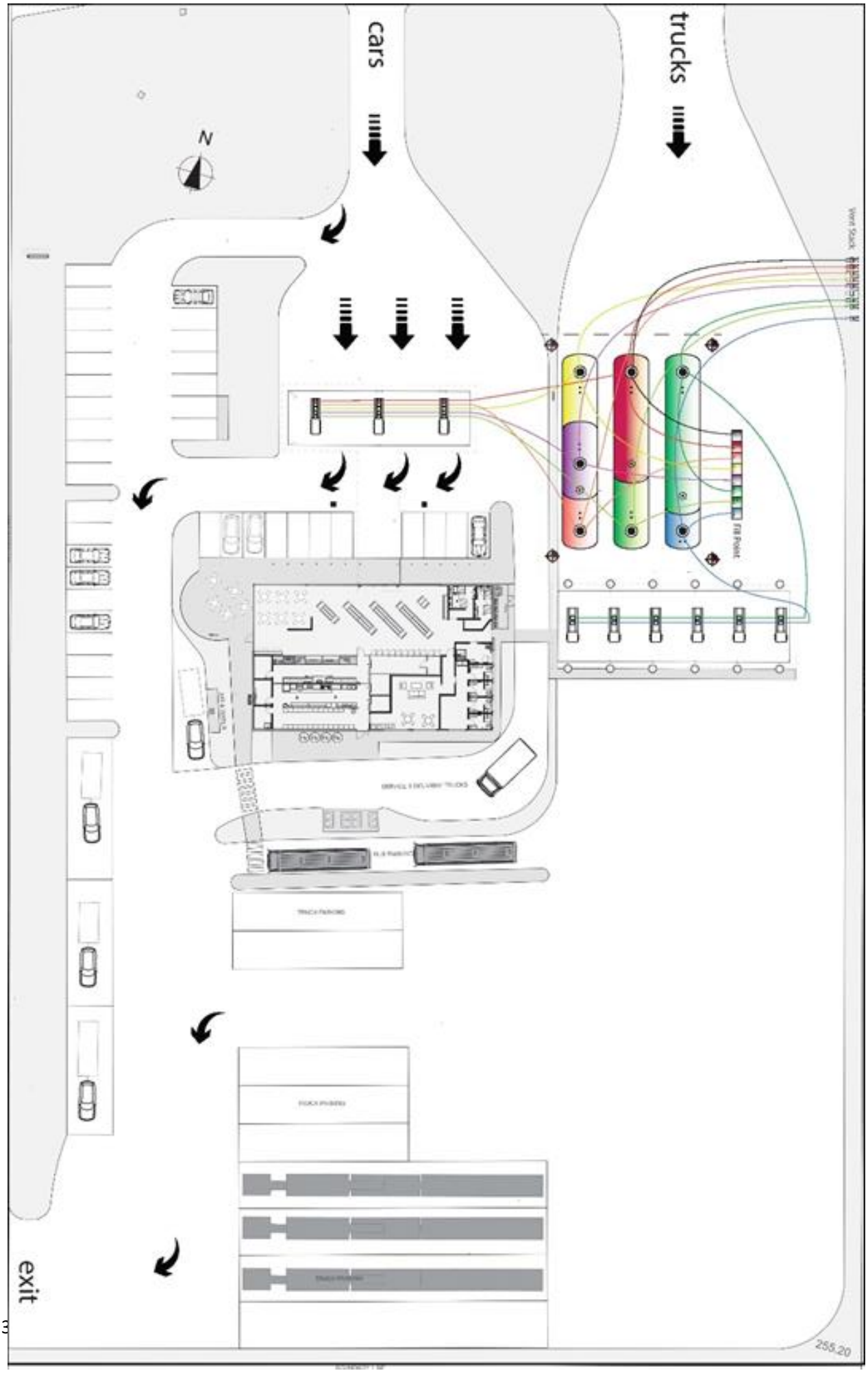
Site Specific Fuel System Specifications and Drawings.

Site Specific Architectural Drawings

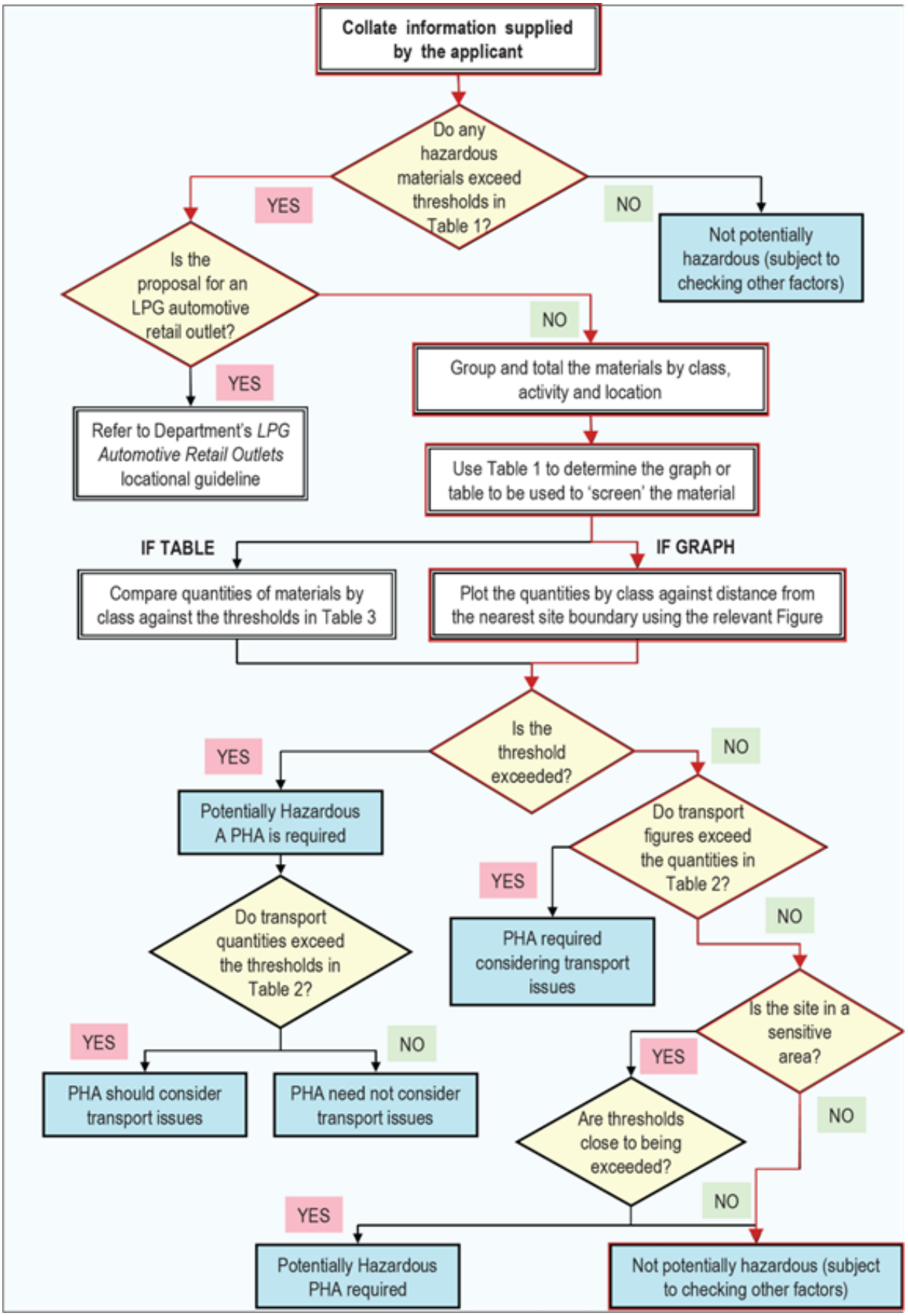
Survey Plan

APPENDICES

Appendix 1 – Site Plan & Facility Layout.

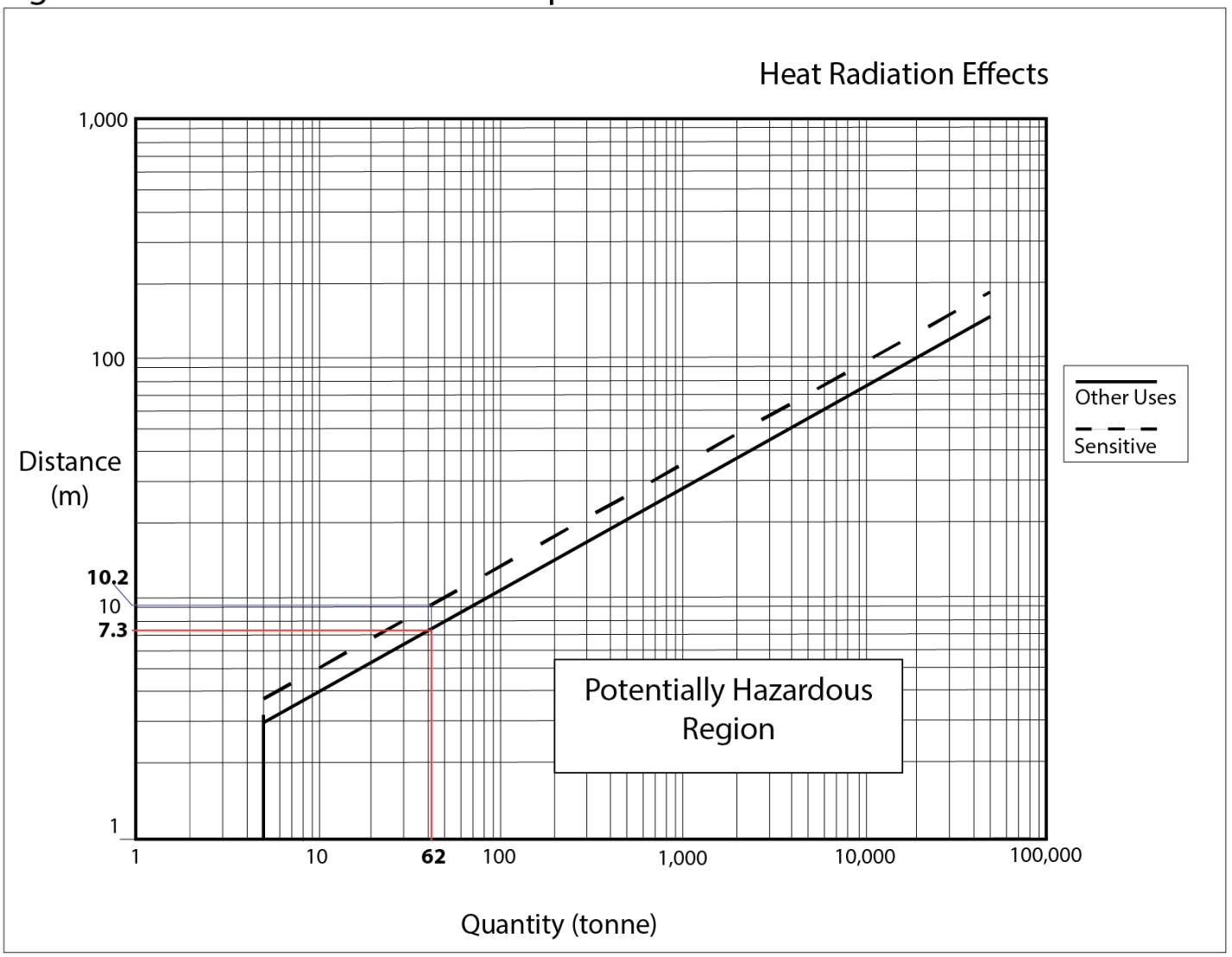


Appendix 2 – Screening Process



Appendix 3 – Figure 9: Class 3PGII Flammable Liquids

Figure 9: Class 3PGII Flammable Liquids



Source: Applying SEPP 33 | January 2011

Appendix 4 – Transport Screening Thresholds

Transportation Screening Thresholds

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

Appendix 5 – Incident Inventory Classification

IAEA Table IV(a): Classification of Substances by Effect Categories

Ref. No.	Type of substance	Description of substance	Activity	Quantity (t)							
				0.2-1	1-5	5-10	10-50	50-200	200-1000	1000-5000	5000-10000	>10000
1	Flammable liquid	Vapour pressure <0.3 bar at 20°C	Storage with tank pit	-	-	-	-		AI	BI	BI	CI
2			Pipeline	-	-	-	-	-	-	-	-	-
3			Other	-	-	-	AI	BI	CI	DII	X	X
4		Vapour Pressure 0.3 bar at 20°C	Storage with tank pit	-	-	-	-	-	BI	CII	CII	DII
6			Other	-	-	-	BII	CII	DII	E II	X	X
7	Flammable gas	Liquefied by pressure	Rail, road, overground storage	-	AI	BI	C I	D I	E I	X	X	X
9			Other	-	BII	CIII	CIII	DIII	E III	X	X	X
10		Liquefied by cooling	Storage with tank pit	-	-	-	-	-	BI	CII	CII	DII
11			Other	-	-	-	BII	CII	DII	E II	X	X
13		Under pressure > 25 bar: high toxicity	Storage of cylinders (25-100kg)	-	-	CIII	CII	CI	CI	X	X	X
14	Explosive	In bulk (causing single explosion)		AI	BI	BI	CI	CI	DI	X	X	X
15		In packages (e.g. shells)		BIII	BIII	CIII	CI	CI	DI	X	X	X
16	Toxic liquid	Low toxicity	Storage with tank pit	-	-	-	-	A II	A II	A II	B II	C III
17			Other	-	-	-	A III	B III	B II	C II	C II	C II
18		Medium toxicity	Storage with tank pit	-	-	-	A III	B III	D III	E III	F III	F III
21			Other	-	BII	C III	D III	E III	F III	F III	X	X
22		High toxicity	Storage with tank pit	-	-	A II	B III	C III	E III	F III	G III	G III
25			Other	-	CII	D III	E III	F III	F III	G III	X	X
26		Very high toxicity	Storage with tank pit	AII	BII	C III	E III	F III	G III	G III	H III	H III
29			Other	CIII	DIII	E III	F III	G III	H III	H III	X	X
30	Toxic gas	Liquefied by pressure: low toxicity	Storage with tank pit	AII	BII	B II	CIII	C II	DIII	D III	D III	E III
31		medium toxicity	Other	BII	CII	C II	DIII	E III	F III	F III	G III	H III
32		high toxicity	Storage with tank pit	CII	DIII	E III	E III	F III	G III	G III	X	X
33		very high toxicity	Other	DIII	EIII	F III	G III	G III	H III	X	X	X
34		extreme toxicity		EIII	FIII	G III	H III	H III	X	X	X	X
35		Liquefied by cooling: low toxicity		-	-	A II	A II	A II	B II	B II	C II	D III
36		medium toxicity		-	AII	B II	C II	D III	D III	E III	F III	G III
37		high toxicity		BII	CII	D III	E III	E III	F III	F III	G III	H III
38		very high toxicity		DIII	EIII	F III	F III	G III	G III	X	X	X
39		extreme toxicity		EIII	FIII	G III	H III	H III	X	X	X	X

Note: *For flammable liquids in underground tanks, the quantity should be divided by 5 and the substance treated as 'other' i.e. Refs 3 or 6.*

Symbols: *'X' means the combination of that substance and that amount does not usually exist in practice. It is suggested that a full QRA should be carried out in any such case. '-' means that the effects are small enough to be ignored.*

Appendix 6 – Effect Distance and Area Effect

IAEA Table V: Effect Categories: Maximum Distance and Area of Effect (*A*)

Effect distance (m)		Effect area category (ha)		
Category	**Max. Distance (m)**	**I**	**II**	**III**
A	0-25	0.2	0.1	0.02
B	25-50	0.8	0:4	0.1
C	50-100	3	1.5	0.3
D	100-200	12	6	1
E	200-500	80	40	8
F	500-1000	-	-	30
G	1000-3000	-	-	300
H	3000-10 000	-	-	1000

Appendix 7 – Estimate of the Effect Distance and Area

Appendix 8 – Population Density

IAEA Table VI: Population Density (σ)

Description of the area	Density (persons/ha)
Farmland, scattered houses	5
Individual dwellings	10
Village, quiet residential area	20
Residential area	40
Busy residential area	80
Urban area, shopping centres, centre of city	160

Appendix 9 – Population Correction Factor

IAEA Table VII: Population Correction Factor (f_A)

Effect area Category	Populated fraction (%) of circular area				
	100%	50%	20%	10%	5%
I	1	0.6	0.2	0.1	0.05
II	1	1	0.4	0.2	0.1
III	1	1	1	1	1

Appendix 10 – Correction Factor for Mitigation

IAEA Table VIII: Correction Factor for Mitigation (f_m)

Substances (reference numbers)	Factor
Flammables (1-12)	1
Flammables (13)	0.1
Explosives (14, 15)	1
Toxic liquid (16-29, 43-46)	0.05
Toxic gas (30-34, 37-39, 40-42)	0.1
Toxic gas (35-36)	0.05

Appendix 11 – Average Probability Number

IAEA Table IX: Average Probability Number ($N^*_{i,s}$)

Substances	Activity	
(reference numbers)	Storage	Plant
Flammable liquid (1-3)	8	7
Flammable liquid (4-6)	7	6
Flammable gas (7)	6	5
Flammable gas (9)	7	6
Flammable gas (10,11)	6	-
Flammable gas (13)	4	-
Explosive (14,15)	7	6
Toxic liquid (16-29)	5	4
Toxic gas (30-34)	6	5
Toxic gas (35-39)	6	-
Toxic gas (42)	5	4
Combustion products (43-46)	3	-

Appendix 12 – Probability Number Correction Parameter for Loading/Unloading Operations Frequency

IAEA Table X(a): Probability Number Correction Parameter (n) For Loading/Unloading Operations Frequency

Frequency of loading/ unloading (per year)	Parameter
1-10	+0.5
10-50	0
50-200	-1
200-500	-1.5
500-2000	-2

***Note** that this does not apply to cylinders (Ref No 13)*

Appendix 13 – Probability Number Correction Parameter for Organisational Safety

IAEA Table XII: Probability Number Correction Parameter (n_o) for Organisational Safety

Above average industry practice	+0.5
Average industry practice	0
Below average industry practice	-0.5
Poor industry practice	-1
Non-existent safety practices	-1.5

Note: *Several factors are included: safety management, age of the plant, maintenance, documentation and procedures, safety culture, training, emergency planning etc.*

In the case of organisational and management safety, it would usually be considered inappropriate to make a positive correction unless superior systems had been clearly demonstrated by, for example, an audit of the safety management systems. This would only apply to existing plants or to new plants established by an operator with a strong track record.

Appendix 14 – Probability Number Correction Parameter for Wind direction towards Populated Areas

IAEA Table XIII: Probability Number Correction Parameter (n_p) for Wind Direction Towards Populated Area(s) in the Affected Zone

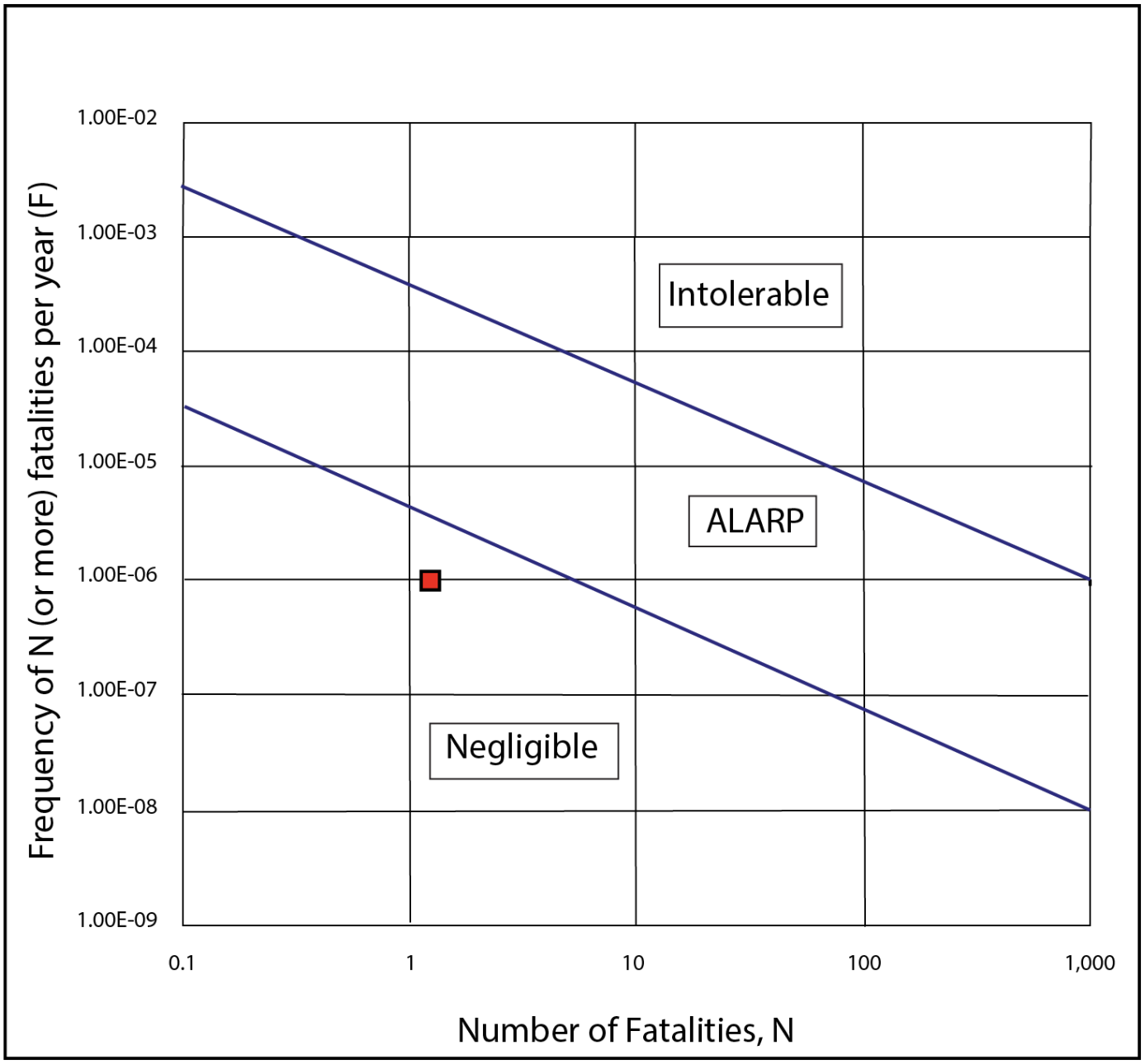
Effect area category	Part of the area (%) where people are living				
	100%	50%	20%	10%	5%
I	0	0	0	0	0
II	0	0.5	0.5	0.5	0.5
III	0	0.5	0.5	1	1.5

Appendix 15 – Societal Risk

IAEA Table XIV: Conversion of Probability Numbers (*N*) Into Frequencies (*P*, event/year)

N	*P*	*N*	*P*	*N*	*P*
0	1×10^{0}	5	1×10^{-5}	10	1×10^{-10}
0.5	1×10^{-1}	5.5	1×10^{-6}	10.5	1×10^{-11}
1	1×10^{-1}	6	1×10^{-6}	11	1×10^{-11}
1.5	1×10^{-2}	6.5	1×10^{-7}	11.5	1×10^{-12}
2	1×10^{-2}	7	1×10^{-7}	12	1×10^{-12}
2.5	1×10^{-3}	7.5	1×10^{-8}	12.5	1×10^{-13}
3	1×10^{-3}	8	1×10^{-8}	13	1×10^{-13}
3.5	1×10^{-4}	8.5	1×10^{-9}	13.5	1×10^{-14}
4	1×10^{-4}	9	1×10^{-9}	14	1×10^{-14}
4.5	1×10^{-5}	9.5	1×10^{-10}	14.5	1×10^{-15}

Note: N is the abs of the logarithm of $P(N = | \log_{10} P |)$


1.00E-02
1.00E-03
1.00E-04
1.00E-05
1.00E-06
1.00E-07
1.00E-08
1.00E-09
Frequency of N (or more) fatalities per year (F)
Intolerable
ALARP
Negligible
0.1
1
10
100
1,000
Number of Fatalities, N

Appendix 16 – Hazard Identification Word Diagram

Event	Cause	Consequence	Mitigating Factor
Underground tank leak	• mechanical damage • equipment failure	• dispersion underground without ignition	• use of double walled fibreglass tanks • primary and secondary leak detection systems • management procedures to monitor tank levels
Underground piping leak	• mechanical damage • equipment failure	• dispersion underground without ignition	• use of multi-layer piping • leak detection systems
Tanker rupture or major leak	• mechanical damage • equipment failure • traffic accident	• release of significant quantities of fuel to the environment • dispersion without ignition • fire may result if ignition source is present	• fuel system design to AS 1940 • regular testing and maintenance of tanker • fire fighting equipment to be provided
Tanker hose rupture of leak	• mechanical damage • material failure • wear and tear • misuse	• release of significant quantities of fuel to the environment • dispersion without ignition • fire may result if ignition source is present	• regular inspection and testing of hose and fittings • tanker brakes interlocked to prevent drive away while connected • unloading operations should be in bonded area • fire fighting equipment to be provided
Underground tank overfill	• incorrect level reading • incorrect connection to fill box	• release of significant quantities of fuel to the environment	• drivers are trained to ensure that there is enough ullage available

		• dispersion without ignition • fire may result if ignition source is present	in the target tank • drivers are to stay in attendance while unloading • spill kits available on site • fire fighting equipment to be provided
Customer overfill	• faulty dispenser nozzle • non attendant customer	• minor spill to forecourt • fire may result if ignition source is present	• signage directed at customer • spill kits available on site • fire fighting equipment to be provided
Customer drives away with dispenser nozzle attached	• non attendant customer	• minimal fuel spillage to forecourt	• spill kits available on site • staff training for this sort of incident
Use of mobile phone or smoking at the dispenser	• non attendant customer	• fire	• signage directed at customer • fire fighting equipment to be provided • operator control of dispenser remotely
Vandalism	• violence	• damage to equipment	• regular checks of equipment • maintenance contracts • dispenser shut down
Off site fire (adjoining property)	• various	• fire	• fuel system can be shut down • evacuation of staff and customers • fire fighting / protection to be provided

Appendix 5: Transport Impact Assessment

PROPOSED SERVICE STATION, EDGEROI

TRANSPORT IMPACT ASSESSMENT

PREPARED FOR BENZINA GROUP | 12 JANUARY 2023

Stantec

Revision	Description	Author	Quality Check	Approval
A	Final	Desmond Ang	Rhys Hazell	Rhys Hazell

The conclusions in the Report titled Proposed Service Station at Edgeroi are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

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Printed Name

Approved by: 

Signature

Rhys Hazell

Printed Name

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1 Introduction

1.1 Proposal

A Development Application is to be lodged with Narrabri Shire Council (Council) for a proposed service station development on land at 14454 to 14456 Newell Highway, Edgeroi (Lot 59, 60 & 61 DP 753952, Lot 62 DP 665543 and Lot 1 DP 311343). The proposed development incorporates both light and heavy vehicle refuelling areas, convenience store, as well as a food and drink premises. Car, trailer with caravan and heavy vehicle parking is also proposed.

Benzina Group engaged Stantec in July 2022 to complete a transport impact assessment for the proposed development.

1.2 Background

In June 2016, the previous landowner lodged a Development Application for construction of a service station, restaurant and motel on the site. From July 2016 to 2018, there had been Requests for Information (RFI) from Council and then Roads and Maritime Services (now Transport for NSW), with the most recent requests pertaining to the following:

Council (Oct 2018):

a) Parking

a. Parking for the development is required to be provided in accordance with the Guide to Traffic Generating Developments (GTTGD). Specifically:

i. For truck stops, 50% of the restaurant parking requirements are to be provided as truck parking spaces. A total of 22 restaurant parking are required, thus requiring 11 truck parking spaces. The development only provides for nine (9) truck parking spaces. In this regard two (2) additional truck parking spaces are required to be provided on site.

ii. For the care takers dwellings, further information is required on the number of parking spaces provided for each dwelling in order to determine compliance with the GTTGD.

b. Design of parking spaces is to be in accordance with Australian Standard AS2890.1 Parking facilities Part 1: Off-street car parking. The development is required to provide User Class 3 parking spaces, which have a minimum width of 2.6m. It is not clear from the scale of the plans provided whether or not the parking spaces have been designed to comply with this requirement. In this regard, dimensions (length and width) of all car parking and shared spaces are to be included on the plans.

b) Traffic & Access

a. Background traffic counts should be cumulatively annually indexed to determine current and projected baseline traffic data. The rate of indexation is to be determined in consultation with the RMS.

b. Whilst it is understood that the development is not likely to generate any significant traffic above the existing background levels on the highway, the amount of traffic accessing the site needs to be quantified both as a daily rate, but also peak hourly traffic generation.

These comments have been considered as part of this proposed development.

In addition, it is understood that the Newell Highway at Edgeroi will be upgraded as part of the Newell Highway Corridor Strategy. It is expected for these works to be undertaken along the Newell Highway through Edgeroi, including at the Newell Highway and Queen Street North intersection and the existing crossover close to the site's southern boundary. Consultation with both Transport for NSW (TfNSW)

and Council is ongoing, with information and details shared to ensure the proposed development considers such works.

1.3 Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposed development, including consideration of the following:

- existing traffic and parking conditions surrounding the site
- suitability of the proposed parking in terms of supply and layout
- service vehicle requirements
- pedestrian and bicycle requirements
- the traffic generating characteristics of the proposed development
- suitability of the proposed access arrangements for the site
- the transport impact of the development proposal on the surrounding road network.

1.4 References

In preparing this report, reference has been made to the following:

- Narrabri Development Control Plan (DCP)
- Narrabri Local Environmental Plan (LEP) 2012
- Australian Standard/ New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking AS/NZS 2890.1:2004
- Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS2890.2:2018
- Australian Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities AS2890.6:2022
- plans for the proposed development prepared by A. Blefari, Project number 10322, drawing number A002, dated November 2022
- other documents and data as referenced in this report.

2 Existing Conditions

2.1 Location of site

The subject site is at 14454 to 14456 Newell Highway, Edgeroi and legally described as Lot 59, 60 & 61 DP 753952, Lot 62 DP665543 and Lot 1 DP 311343. It has a total area of 16,178 square metres and has a single frontage of about 160 metres to Newell Highway along the western boundary.

The existing land uses include a petrol station with surrounding properties mostly comprising of rural agriculture uses and select rural residential dwellings to the east. Under Narrabri Local Environmental Plan (LEP) 2012, the site is zoned as RU5 – Village.

The location of the site and its surrounding environment is shown in Figure 2-1, with the land use map shown in Figure 2-2.

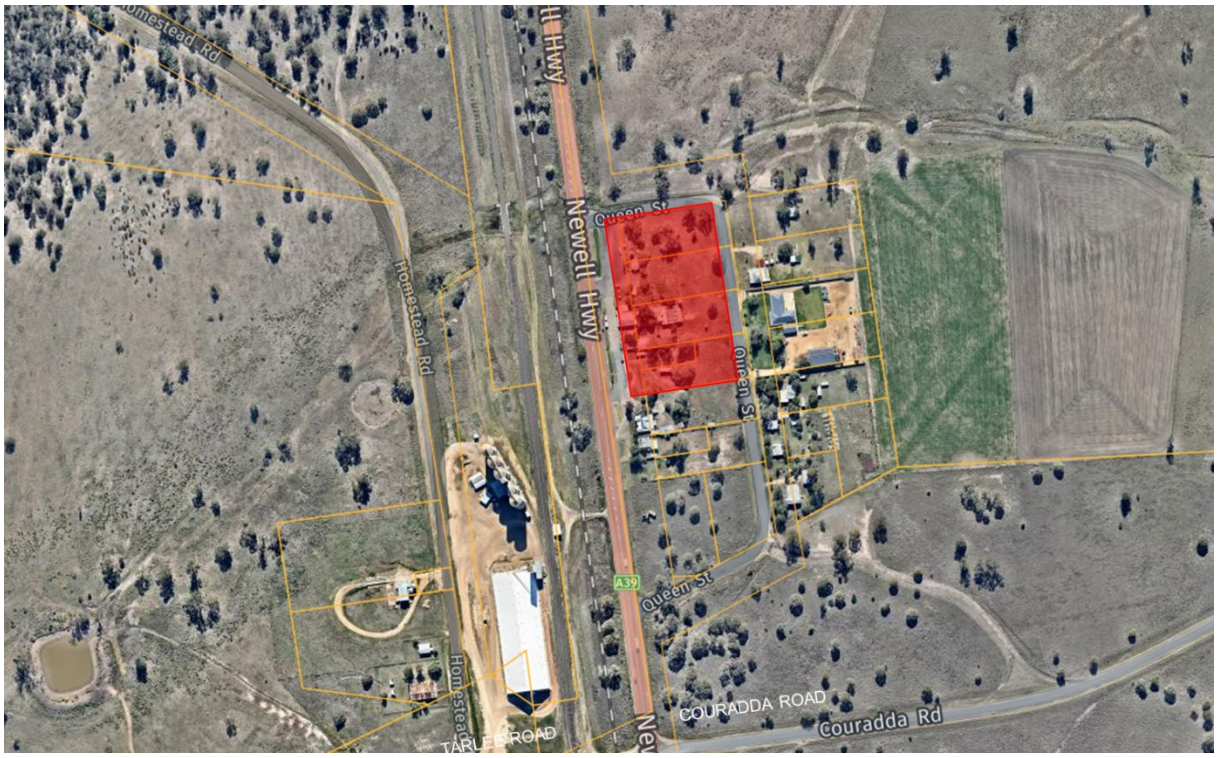

Figure 2-1: Subject site and surrounding environment

Base image source: Nearmap https://www.nearmap.com/

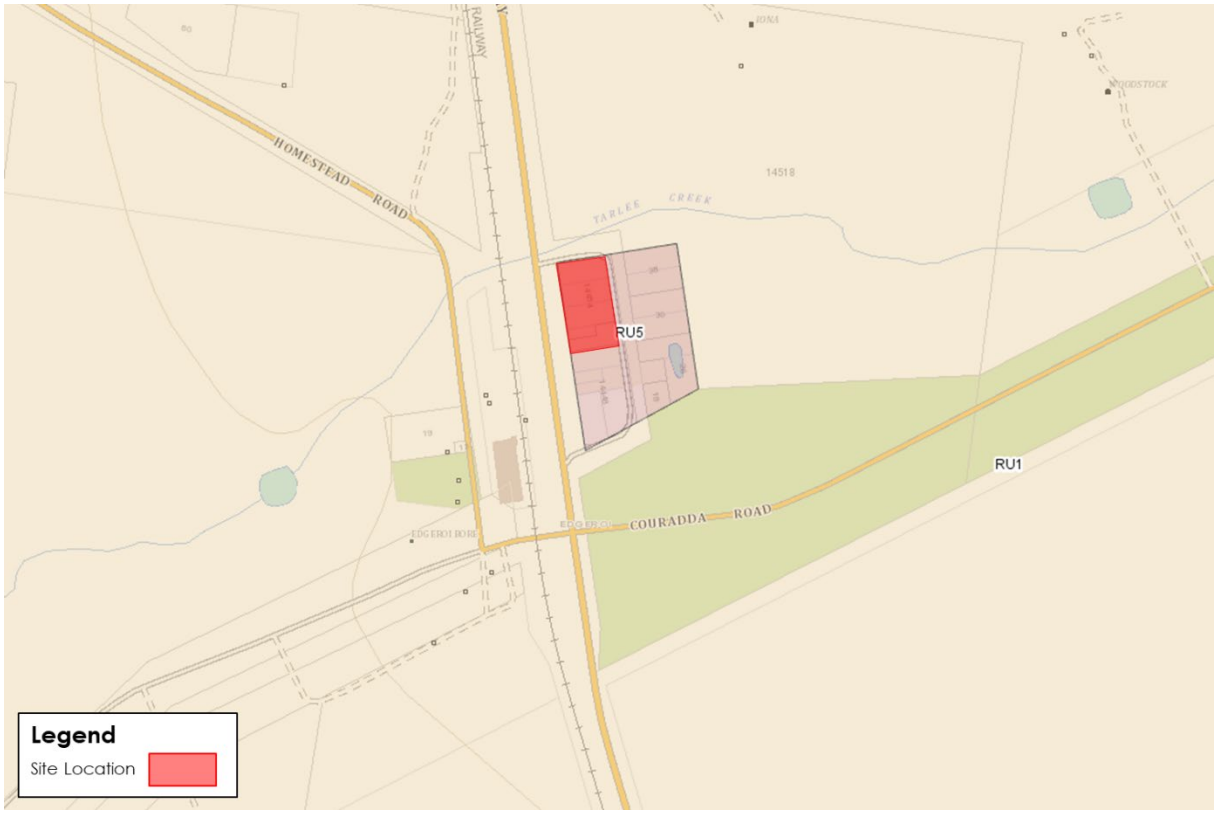

Figure 2-2: Land use map

Base image source: NSW Planning portal planningportal.nsw.gov.au/

2.2 Transport Network

2.2.1 Road Hierarchy

Roads are classified according to the functions they perform. The main purpose of defining a road's functional class is to provide a basis for establishing the policies which guide the management of the road according to their intended service or qualities.

In terms of functional road classification, State roads are strategically important as they form the primary network used for the movement of people and goods between regions, and throughout the State. TfNSW is responsible for funding, prioritising and carrying out works on State roads. State roads generally include roads classified as freeways, state highways, and main roads under the Roads Act 1993, and the regulation to manage the road system is stated in the Australian Road Rules, most recently amended on 19 March 2018.

TfNSW defines four levels in a typical functional road hierarchy, ranking from high-mobility and low-accessibility, to high-accessibility and low-mobility. These road classes are:

Arterial Roads – Controlled by TfNSW, typically no limit in flow and designed to carry vehicles long distance between regional centres.

Sub-Arterial Roads – Managed by either Council or TfNSW under a joint agreement. Typically, their operating capacity ranges between 10,000 and 20,000 vehicles per day, and their aim is to carry through traffic between specific areas in a sub region or provide connectivity from arterial road routes (regional links).

Collector Roads – Provide connectivity between local sites and the sub-arterial road network, and typically carry between 2,000 and 10,000 vehicles per day.

Local Roads – Provide direct access to properties and the collector road system and typically carry between 500 and 4,000 vehicles per day.

2.2.2 Surrounding Road Network

2.2.2.1 NEWELL HIGHWAY

The Newell Highway is a classified State Road generally providing one traffic lane in each direction with dedicated turn bays through Edgeroi. It is a key inland arterial road through regional NSW and effectively links Melbourne with Brisbane providing for critical heavy vehicle freight transport.

Near the site, the Newell Highway is aligned in a north-south direction and includes four traffic lanes (two in each direction) within a 16.4 metre wide carriageway. Near the site, it has a posted speed limit of 80 kilometres per hour, increasing to 110 kilometres per hour about 100 metres north of the site.

Newell Highway along the property boundary is shown in Figure 2-3 and Figure 2-4

Figure 2-3: Newell Highway (looking north)

Figure 2-4: Newell Highway (looking south)

source: Google Street View https://www.google.com/maps

2.3 Traffic Volumes

TfNSW provides average road traffic volumes in the form of permanent and sample counters at key locations across New South Wales. The closest traffic volume station (Station Id: 92725) is located about 50 metres north from the intersection of Newell Highway with Wee Waa Road and about 23 kilometres south of the site, with the most recent volumes available recorded in 2008.

The annual average daily traffic (AADT) volumes and the average peak volumes are summarised in Table 2-1 and Table 2-2, together with the estimated 2022 volumes.

A one per cent per annum growth rate has been applied to estimate the current traffic volumes on the Newell Highway through the area. In this regard, Table 2-1 indicates that the Newell Highway likely carries an average of around 3,600 vehicles per day (vpd) North of Narrabri in 2022. This equates to about 250 to 300 vehicles per hour two-way in any peak period. With the available data also indicating that heavy vehicles account for about 35 per cent of all traffic on the Newell Highway, about 85 to 105 heavy vehicles would pass the site in the same peak hour.

Table 2-1: Newell Highway AADT volumes

Year	Direction		Total
	Northbound	Southbound	
2008 [1]	1,602	1,497	**3,099**
2022 [2]	1,841	1,721	**3,562**

[1] based on TfNSW Traffic Volume Viewer Traffic Volume Viewer (nsw.gov.au)
[2] one per cent annual growth rate applied

Table 2-2: Newell Highway Peak hour volumes

Year	Northbound		Southbound	
	AM (9am-10am)	PM (3pm-4pm)	AM (9am-10am)	PM (4pm-5pm)
2008	124	115	101	114
2022	143	132	116	131

3 Development Proposal

3.1 Land Use

The proposed service station development includes separate car and heavy vehicle refuelling hardstand areas, air and water facilities, and convenience/ food and drink premises. Car and car with caravan plus dedicated heavy vehicle and coach parking is also provided.

Three double sided light vehicle fuel pumps accommodating six vehicles and five high flow heavy vehicle fuel pumps are proposed. The light vehicle refuelling area and associated customer parking is located along the Newell Highway side of the site with heavy vehicle refuelling to the east of the main structure. Heavy vehicle parking is provided at the southern end of the site.

The main structure covers 492 sqm Gross Floor Area (GFA) and includes the following:

- convenience store of about 180 sqm
- a food and drink premise (with 48 seats) of about 195 sqm
- a dedicated truckies area including lounge (with eight seats) of about 72 sqm
- shower facilities and other amenities amounting to about 45 sqm.

An independent operator (as opposed to a commercial fast-food provider) is expected to operate the food and drink premise. The proposed site layout is shown in Figure 3-1.

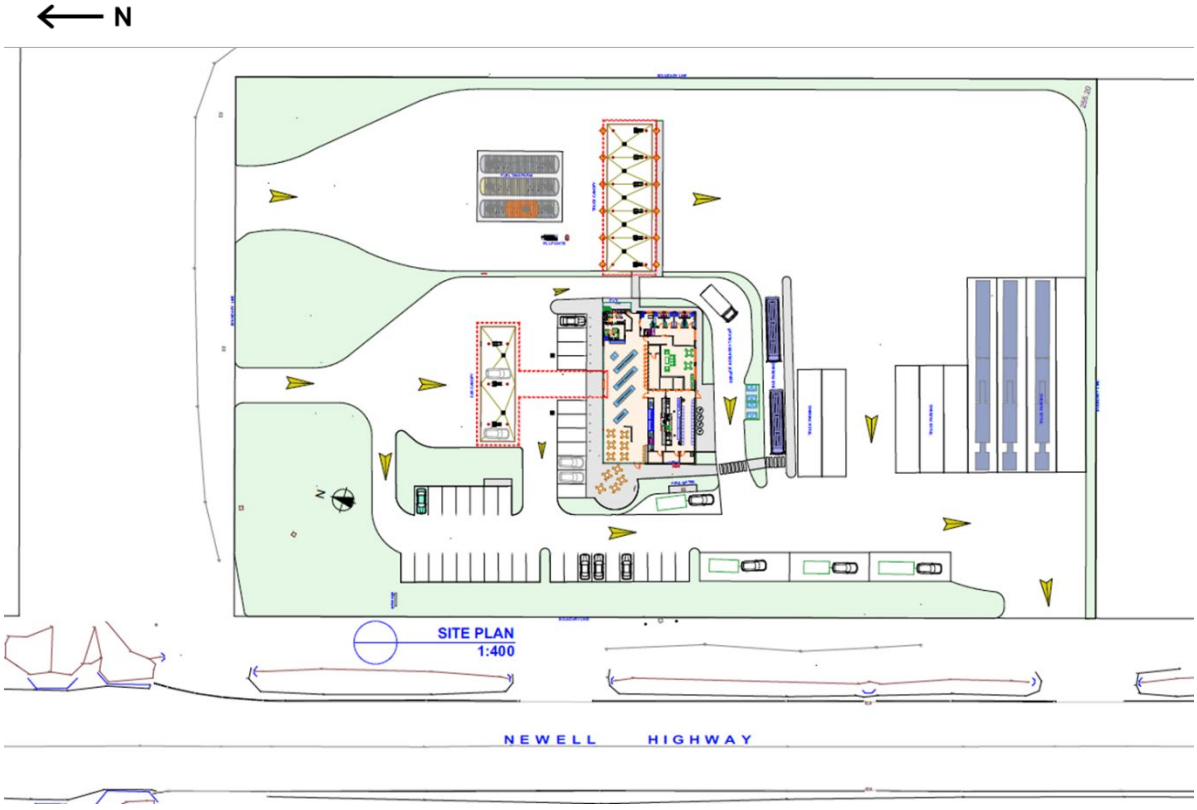

Figure 3-1: Proposed site layout

Source: Site Plan - A Blefari, drawing no. A002, dated 29 November 2022

3.2 Site Access and Parking

The proposed development includes two separated entry driveways along Queen Street North and an exit driveway to the south directly to the Newell Highway. Heavy vehicle parking and refuelling will be accessed by the eastern entry only driveway. The access is appropriately dimensioned to ensure access by all vehicles up to 36.5-metre-long A-Doubles and B-Triples. All vehicles will enter and exit in a forward direction.

The proposed development includes 63 on-site spaces, including:

- 41 car parking spaces, including air and water fill point spaces, three car with caravan spaces and two accessible spaces
- six spaces for light vehicles at the fuel pumps
- five heavy vehicle spaces at the high flow fuel pumps
- two bus parking spaces
- nine heavy vehicle parking spaces including four spaces for 36.5m A-Doubles and five spaces for 20m semi-trailers.

3.3 Waste Collection and Loading

A waste storage area and loading are proposed at the rear of the main structure and adjacent to the drive-thru facility. The area would ensure access by all rigid trucks including 12.5m heavy rigid vehicles. Waste trucks and service vehicles would use this area as necessary, with access via a dedicated road with the area adequately separated from other on-site facilities. Pedestrian connection to the main structure ensures practical use with marked crossings where necessary.

A pedestrian path connects the coach and heavy vehicle parking areas with the main building adjacent to the loading area. A dedicated service lane at the rear of the building will allow for waste collection and loading/ unloading to occur in an area adequately separated from the general public.

Refuelling of the underground tanks would be facilitated as part of the heavy vehicle refuelling area with practical access by the largest tanker to the underground fill points while not unreasonably affecting access to the heavy vehicle fuel pumps.

4 Parking Appraisal

4.1 Parking Requirements

4.1.1 Parking Requirements

Narrabri Shire DCP 2011 specifies the following parking rates for service station developments:

- 5 spaces per 100m^2 GFA of convenience store.
- if restaurant present, greater of 15 spaces per 100m2 GFA, or 1 space per 3 seats.

In this regard, the DCP parking rates are consistent with the TfNSW Guide to Traffic Generating Developments (2002) with the specific parking requirements for the proposed development included in Table 4-1. For the purposes of the assessment an even split between the convenience store and food and drink premises has been applied.

Table 4-1: TfNSW and DCP service station parking requirements

Type	Size / No	Rate	Requirement
Convenience Store	180 sqm GFA	5 spaces per 100 sqm GFA	9-10
Restaurant	195 sqm GFA and 56 seats	greater of 15 spaces per 100 sqm GFA or 1 space per 3 seats	30
		Total	**39-40 spaces**

On this basis, the proposed development generates a parking requirement of up to 40 spaces under the TfNSW Guide.

For developments including 50 or more parking spaces, DCP 2011 also requires a minimum of two per cent of the parking supply be dedicated for accessible users and located close to the building entrances.

4.2 Parking Adequacy

The proposed development includes a total of 63 on-site parking spaces, including 11 heavy vehicle parking spaces (nine for heavy vehicles and two for coaches).

It is noted within the TfNSW guidelines that "*Of these parking spaces allocated to overnight accommodation and restaurant facilities, 50% should be truck parking spaces.*" With no overnight accommodation proposed, all parking demand is expected to be short-term and hence the 50% truck parking allocation is not considered appropriate for the proposed development.

In this regard, the proposed parking provision and separation of light and heavy vehicle parking meets the intent of the TfNSW guidelines and is considered appropriate for the proposed land use in this location. The split between light and heavy vehicle parking supply and the refuelling areas is appropriate, especially considering the importance of the Newell Highway as the key inland freight route through NSW. Two accessible spaces adjacent to the building entrances are also provided.

4.3 Car Park Layout Review

The car park layout has been reviewed against the requirements of DCP 2011 and the Australian Standard for Off Street Car Parking (AS/NZS2890.1:2004, AS/NZS2890.2:2018 and AS/NZS2890.6:2009). This assessment included a review of the following:

- access driveways
- car space dimensions and aisle widths
- refuelling areas and queuing capacity
- service areas/ loading
- adjacent structures
- internal circulation
- parking for persons with disabilities.

The assessment confirms that the proposed access arrangements, refuelling areas, queuing space and parking layout are expected to operate satisfactorily, with a detailed review included in Appendix A.

All light and heavy vehicle parking spaces have been designed in accordance with the relevant Australian Standards, with more than adequate aisle widths and manoeuvring areas. All car spaces are 2.6 metres wide and 5.4 metres long with accessible spaces a minimum 2.4 metres wide with adjacent dedicated shared area (with bollard) to ensure appropriate use, in accordance with AS2890.6.

The underground fuel tanks will be filled from a central remote filling point close to the heavy vehicle refuelling area. This will ensure minimal disruption to site operations, with temporary minor reduction in the heavy vehicle refuelling capacity outside peak periods. The fuel storage tanks are typically serviced by 36.5m A-Doubles and B-Triples in such locations.

5 Traffic Appraisal

5.1 Traffic Generation

5.1.1 Guideline Trip Rates

Traffic generation estimates for service stations with a convenience store have been sourced from TfNSW Guidelines. The Guide provides the following formula to calculate the evening peak two-way (in and out) vehicle trips:

- evening peak hour vehicle trips = 0.04 A(S) + 0.3 A(F) or
- evening peak hour vehicle trips = 0.66 A(F)

where A(S) = area of site (square metres) and A(F) = gross floor area of convenience store (square metres).

With the site covering a significant area, and with much incorporating heavy vehicle parking and manoeuvring areas, application of the above calculated rate based on a combination of site area and convenience store GFA is not considered appropriate. It would result in an impractical traffic generation.

Similarly, application of the convenience store GFA rate is also considered excessive when considering existing traffic volumes on the Newell Highway. Application of this rate (assuming the convenience store over 246 sqm) would result in 163 vehicle trips per hour. It is expected that the food and drink premises is ancillary to the main use.

This trip generation is excessive and impractical given the existing peak hour traffic volumes passing the site on the Newell Highway are estimated to be around 250 to 300 vehicles.

In this regard, a practical first principles assessment that considers the ‘draw-in’ ability of the site is considered more accurate and to assess future traffic movements associated with the proposed development.

A spot-check count of an existing Caltex service station on the Newell Highway in Gilgandra was completed in mid-February 2021. From a total of 170 vehicles passing the site on the Newell Highway, about 20 vehicles entered the Caltex during the mid-morning weekday peak. This indicates that the Caltex draws in about 12 per cent of passing traffic.

On this basis, the proposed development in Edgeroi could generate about 30 to 35 vehicles in any peak hour. Applying a 20 per cent contingency to account for seasonal holiday periods, the proposed development could generate 36 to 42 vehicles per hour. This equates to between about 75 and 85 vehicle trips (two-way) in any peak hour and is considered appropriate for the proposed development.

The intersection of the Newell Highway and Queen Street North (the intersection leading to the site entry driveways on the northern boundary) and the site exit driveway directly on the Newell Highway close to the southern boundary would need to be modified to facilitate the safe movement of vehicles in and out of the site. The site layout and access review included in Appendix A includes details of intersection modifications and site access arrangements. The review also details the TfNSW works being commissioned along the Newell Highway through Edgeroi, including all drainage/ culvert works and intersection modifications. With the TfNSW not considering any such development on the site, minor modifications would be necessary should the proposed development be approved. Naturally, the need to minimise external works (and re-work) is critical to both TfNSW and the applicant with ongoing stakeholder consultation key in this regard.

It is also noted that widening of the Queen Street North road reserve is recommended along the sites northern boundary to better align the intersection works and Queen Street North, with logical paths of travel, and two-way independent movements maintained. The review includes several vehicle swept paths, including 36.5m A-Doubles to ensure appropriate access is possible for all design vehicles.

The site access arrangements do not materially change historic movements in and around Edgeroi with the proposed modifications also considering neighbouring property access immediately south of the site. Modifications to the TfNSW works on the Newell Highway are largely limited to linemarking on

account of the existing traffic lanes and turn bays long provided through Edgeroi. The anticipated traffic volumes are manageable with turning movements appropriate having regard to the through traffic volumes, vehicle type, posted speed limit and available sightlines.

Overall, there are no noticeable adverse traffic impacts anticipated as a result of the proposed development and it can be supported on traffic grounds.

6 Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made:

- It is proposed that a service station be developed on land at 14454 to 14456 Newell Highway, Edgeroi (Lot 59, 60 & 61 DP 753952, Lot 62 DP 665543 and Lot 1 DP 311343). The proposal includes both light vehicle and heavy vehicle refuelling areas, air and water fill points, convenience store, food and drink premises, and all necessary on-site car, car with trailer and heavy vehicle parking.
- The site area covers a total of 16,178 square metres, with a single main structure housing the convenience store and food and drinks premises across 492 square metres GFA.
- A total of 63 on-site parking spaces are proposed, including two accessible spaces and complies with TfNSW guidelines. This includes six light vehicle refuelling spaces and five spaces at the high flow heavy vehicle fuel pumps.
- The car park layout and access driveways have been reviewed against the requirements of DCP 2011 and the Australian Standard for Off Street Car Parking (AS/NZS2890.1:2004, AS/NZS2890.2:2018 and AS/NZS2890.6:2009). Overall, the review confirms that the proposed layout is expected to operate well with appropriate separation of light and heavy vehicles and loading area, with all vehicles entering and exiting the site in a forward direction. The full review is included in Appendix A.
- The proposed development is expected to generate up to 85 vehicle trips during any peak hour, with all demand associated with vehicles already on the Newell Highway passing the site.
- The intersection of the Newell Highway and Queen Street North (the intersection leading to the site entry driveways on the northern boundary) and the site exit driveway directly on the Newell Highway close to the southern boundary would need to be modified to facilitate the safe movement of vehicles in and out of the site.
- TfNSW is understood to be in the process of commissioning works along the Newell Highway through Edgeroi, including drainage/ culvert works and intersection modifications. With no development considered on the site at the time, the TfNSW works would require minor modifications should the proposed development be approved.
- Widening of the Queen Street North road reserve along the northern boundary is recommended to better align the intersection works and Queen Street North and ensure appropriate access paths for 36.5m A-Double vehicles.
- Based on the estimated existing traffic volumes passing the site, the proposal could be expected to draw in about 36 to 42 vehicles per hour. This equates to between 75 and 85 vehicle trips (two-way) in any peak hour and is considered appropriate.
- Overall, the proposed development is not expected to present a significant impact to the operation and safety of the Newell Highway and can be supported from a traffic and transport perspective.

APPENDICES

Appendix A Compliance Review and Swept Path Analysis

MINOR MODIFICATIONS AS SHOWN TO ACCOMMODATE TWO-WAY TRAFFIC FLOW ON QUEEN STREET.
MODIFICATIONS INCLUDE MINOR CHANGES TO PAINTED MEDIANS TO ACCOMMODATE A-DOUBLE/B-TRIPLE VEHICLES WITH ROAD WIDENING AND ALIGNMENT CHANGES TO ENSURE TWO-WAY TRAFFIC FLOWS.

PROVIDE TURNING BAY

POTENTIAL MINOR MODIFICATION TO NEWELL HIGHWAY TRAFFIC LANES, LINE MARKING AS SHOWN.
STAKEHOLDER ENGAGEMENT ONGOING.

PROVIDE MINIMUM 4.0m WIDE LANE, WITH STORAGE FOR UP TO 2 COACHES

SOME MODIFICATION WOULD BE REQUIRED TO TfNSW UPGRADE WORKS, AS A RESULT OF THE PROPOSAL.
INDICATIVE LAYOUT SHOWN.

WIDEN QUEEN STREET TO PROVIDE 10.0m WIDE CARRIAGEWAY WIDTH TO CATER FOR TWO-WAY TRAFFIC FLOW

INDICATIVE RELOCATED SITE BOUNDARY SHOWN.
PROVIDED 3.5m FROM SOUTHERN KERB OF WIDENED QUEEN STREET.

PROVIDE 12.5m WIDE ENTRY ONLY TRUCK ACCESS FROM QUEEN STREET

PROVIDE 6.5m WIDE ENTRY ONLY ACCESS, ACCOMMODATING VEHICLES UP TO 12.5m LARGE RIGID TRUCKS

ARCHITECTURAL PLAN (SHOWING TfNSW UPGRADE WORKS) IN GREEN
DRAWING A002
REVISION -
BY A.BLEFARI DESIGN & CONSTRUCTION
DATE RECEIVED 21.11.2022

ARCHITECTURAL PLAN IN BLUE
DRAWING A002
REVISION -
BY A.BLEFARI DESIGN & CONSTRUCTION
DATE RECEIVED 02.12.2022

NEARMAP AERIAL IMAGE
DATED 30.05.2016

Stantec

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PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DESIGNED M.RIMAC	DESIGN CHECK R.HAZELL
APPROVED BY R.HAZELL	DATE ISSUED 2 DECEMBER 2022
SCALE A3 0 5 10 20 1:1000	CAD FILE NO. 300303962-01-P5.DWG

14456 NEWELL HIGHWAY, EDGEROI

COMPLIANCE REVIEW

DRAWING NO. 300303962-01-01 SHEET 01 OF 07 ISSUE P5

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SWEPT PATH KEY

VEHICLE CENTRE LINE

VEHICLE TYRE PATH

VEHICLE BODY PATH

600mm CLEARANCE FROM VEHICLE BODY

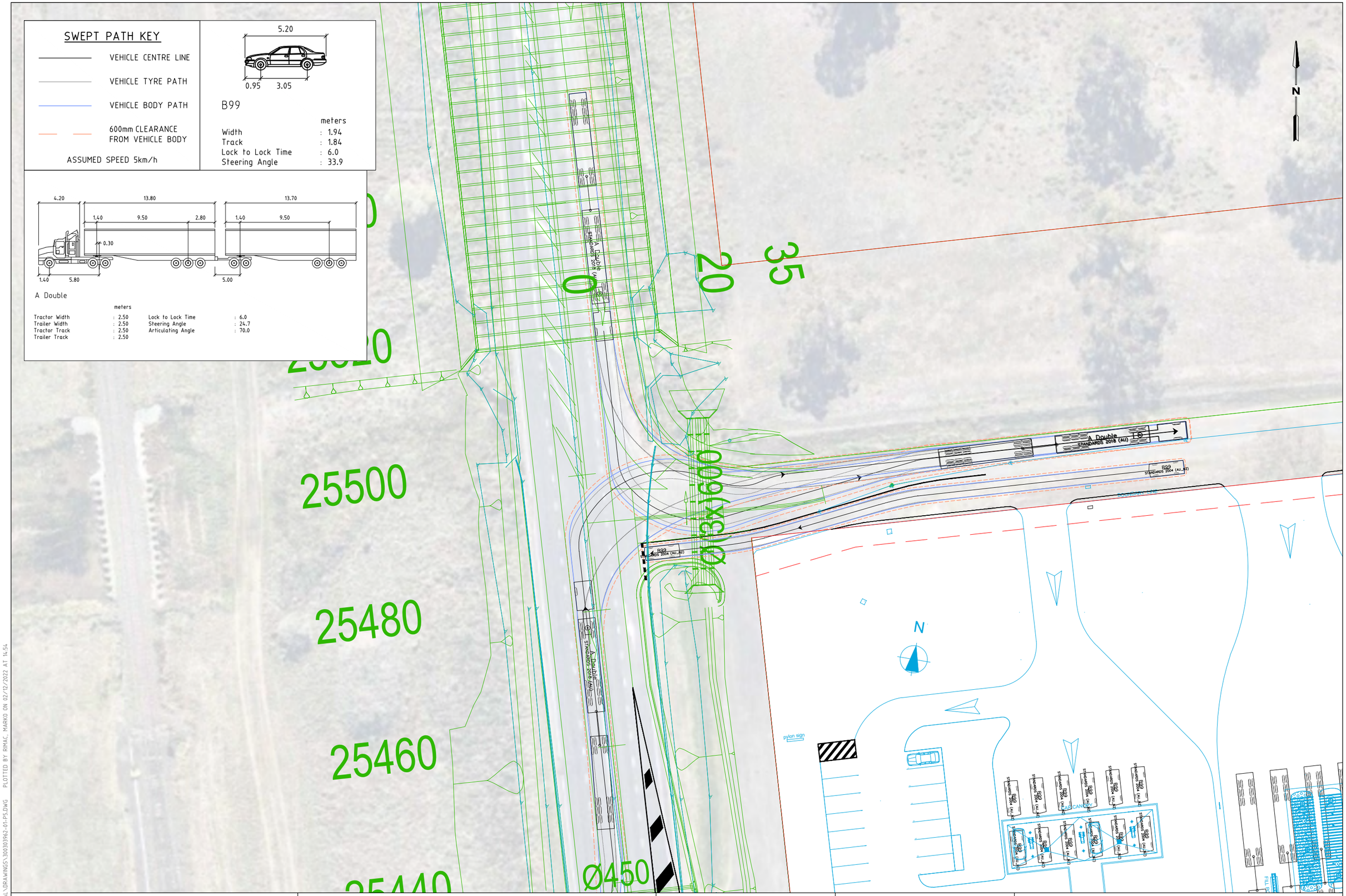
ASSUMED SPEED 5km/h

B99

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

A Double

	meters		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 24.7
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		



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CAD FILE NO. 300303962-01-P5.DWG

14456 NEWELL HIGHWAY, EDGEROI
INTERSECTION NEWELL HIGHWAY AND QUEEN STREET

VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 300303962-01-02 SHEET 02 OF 07 ISSUE P5

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SWEPT PATH KEY

VEHICLE CENTRE LINE

VEHICLE TYRE PATH

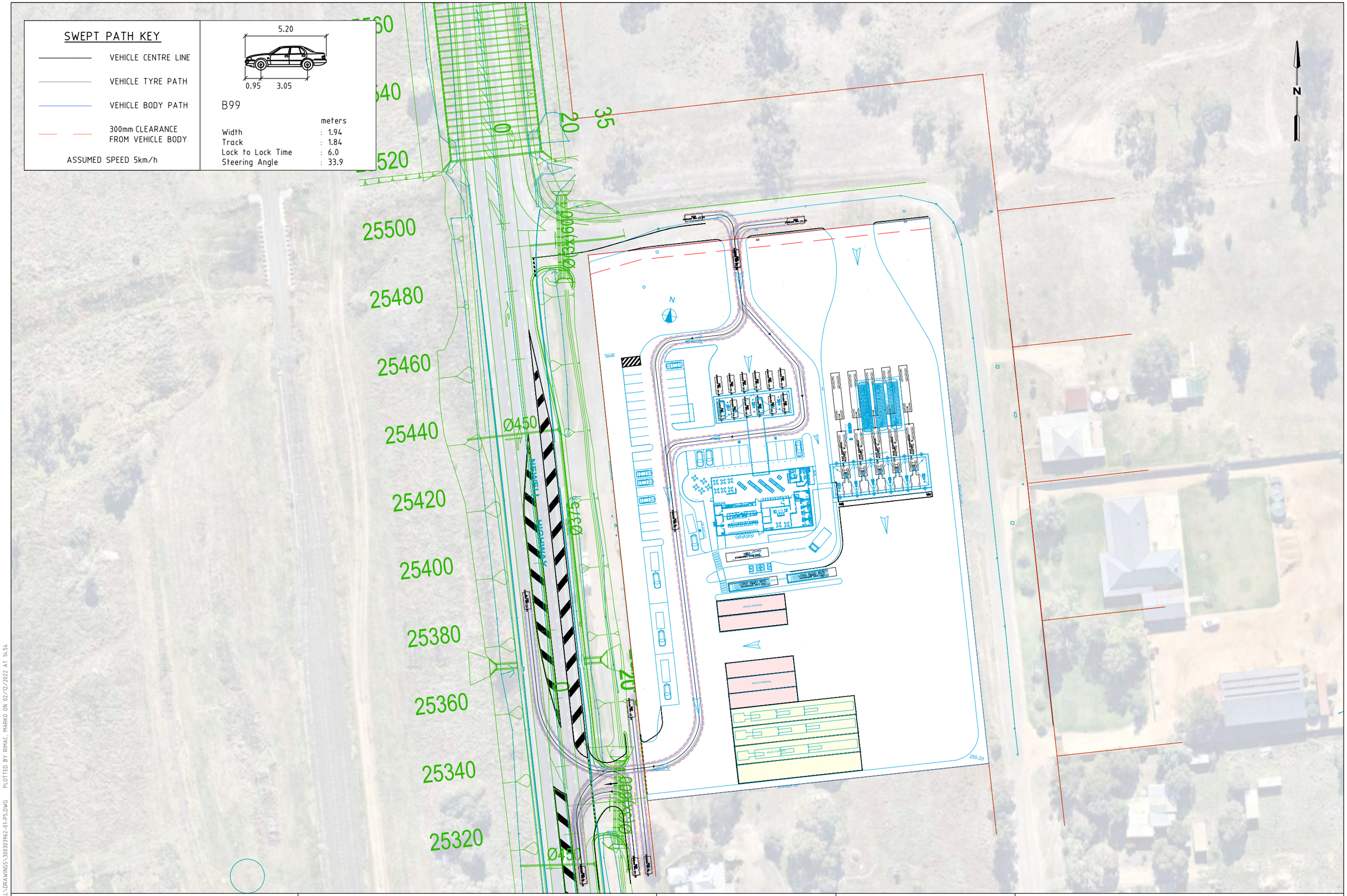
VEHICLE BODY PATH

300mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h

B99

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9



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APPROVED BY R.HAZELL
DATE ISSUED 2 DECEMBER 2022

SCALE A3 0 5 10 20 1:1000
CAD FILE NO. 300303962-01-P5.DWG

14456 NEWELL HIGHWAY, EDGEROI

VEHICLE SWEPT PATH ASSESSMENT

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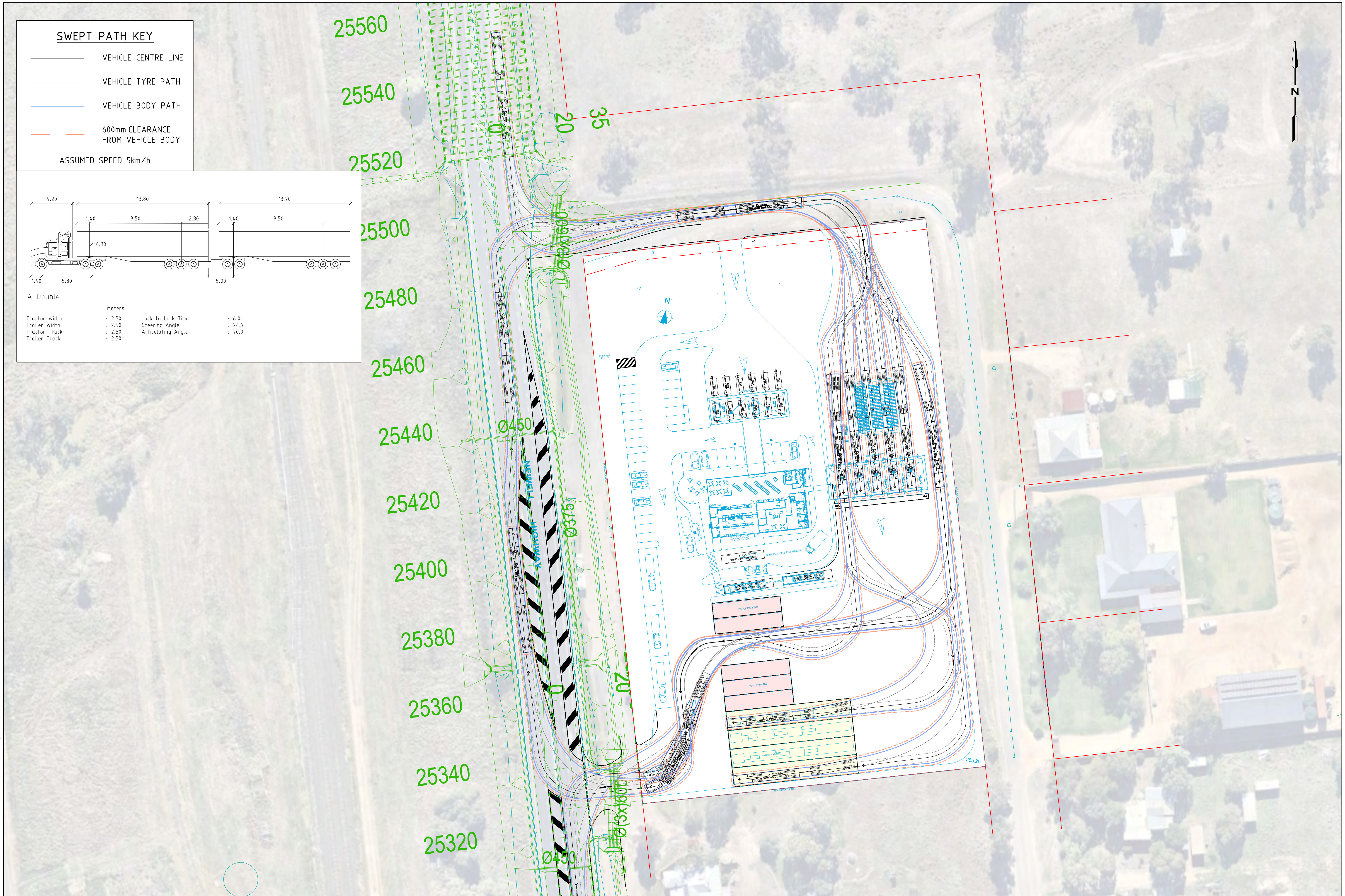

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DESIGNED	DESIGN CHECK	SCALE
M.RIMAC	R.HAZELL	A3 1:1000 (0 5 10 20)
APPROVED BY	DATE ISSUED	CAD FILE NO.
R.HAZELL	2 DECEMBER 2022	300303962-01-P5.DWG

14456 NEWELL HIGHWAY, EDGEROI

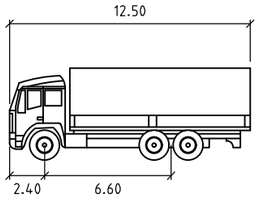
VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 300303962-01-04 SHEET 04 OF 07 ISSUE P5

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 600mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h



HRV

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 35.2

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SCALE A3 0 5 10 20 1:1000

CAD FILE NO. 300303962-01-P5.DWG

14456 NEWELL HIGHWAY, EDGEROI

VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 300303962-01-05 SHEET 05 OF 07 ISSUE P5

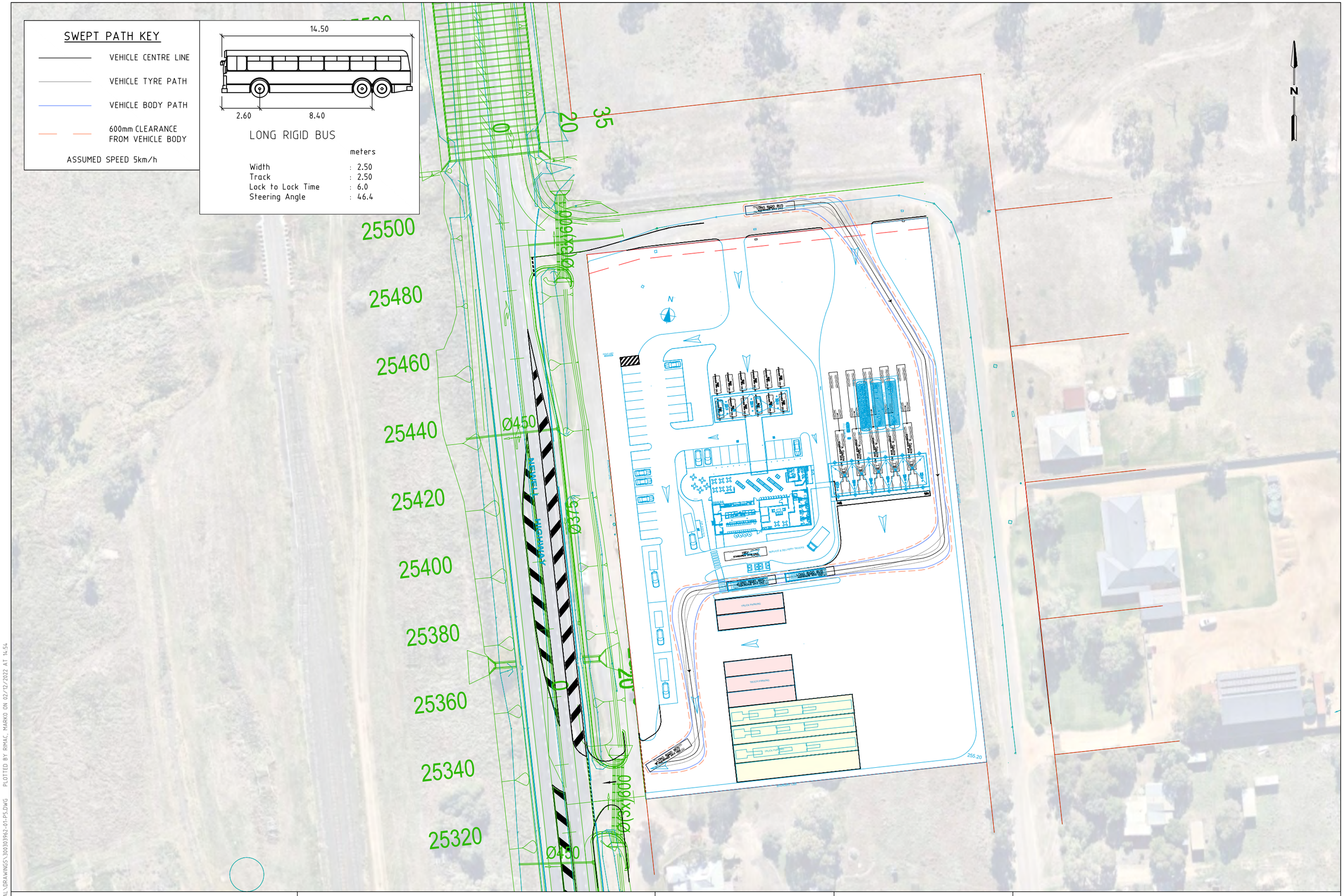
SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 600mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h

LONG RIGID BUS

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 46.4



Stantec

nearmap.com

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DESIGNED M.RIMAC	DESIGN CHECK R.HAZELL
APPROVED BY R.HAZELL	DATE ISSUED 2 DECEMBER 2022

SCALE A3 0 5 10 20 1:1000

CAD FILE NO. 300303962-01-P5.DWG

14456 NEWELL HIGHWAY, EDGEROI

VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 300303962-01-06 SHEET 06 OF 07 ISSUE P5

U:\300303962\TECHNICAL\DRAWINGS\300303962-01-P5.DWG PLOTTED BY RIMAC, MARKO ON 02/12/2022 AT 14:54

SWEPT PATH KEY

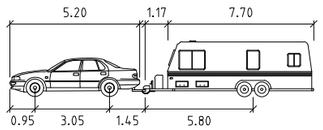
VEHICLE CENTRE LINE

VEHICLE TYRE PATH

VEHICLE BODY PATH

300mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h



B99+Caravan

	meters
Car Width	: 1.94
Trailer Width	: 2.42
Car Track	: 1.84
Trailer Track	: 2.32
Lock to Lock Time	: 6.0
Steering Angle	: 33.5
Articulating Angle	: 70.0

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PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
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DESIGNED M.RIMAC	DESIGN CHECK R.HAZELL
APPROVED BY R.HAZELL	DATE ISSUED 2 DECEMBER 2022

SCALE A3 0 5 10 20 1:1000

CAD FILE NO. 300303962-01-P5.DWG

14456 NEWELL HIGHWAY, EDGEROI

VEHICLE SWEPT PATH ASSESSMENT

DRAWING NO. 300303962-01-07 SHEET 07 OF 07 ISSUE P5

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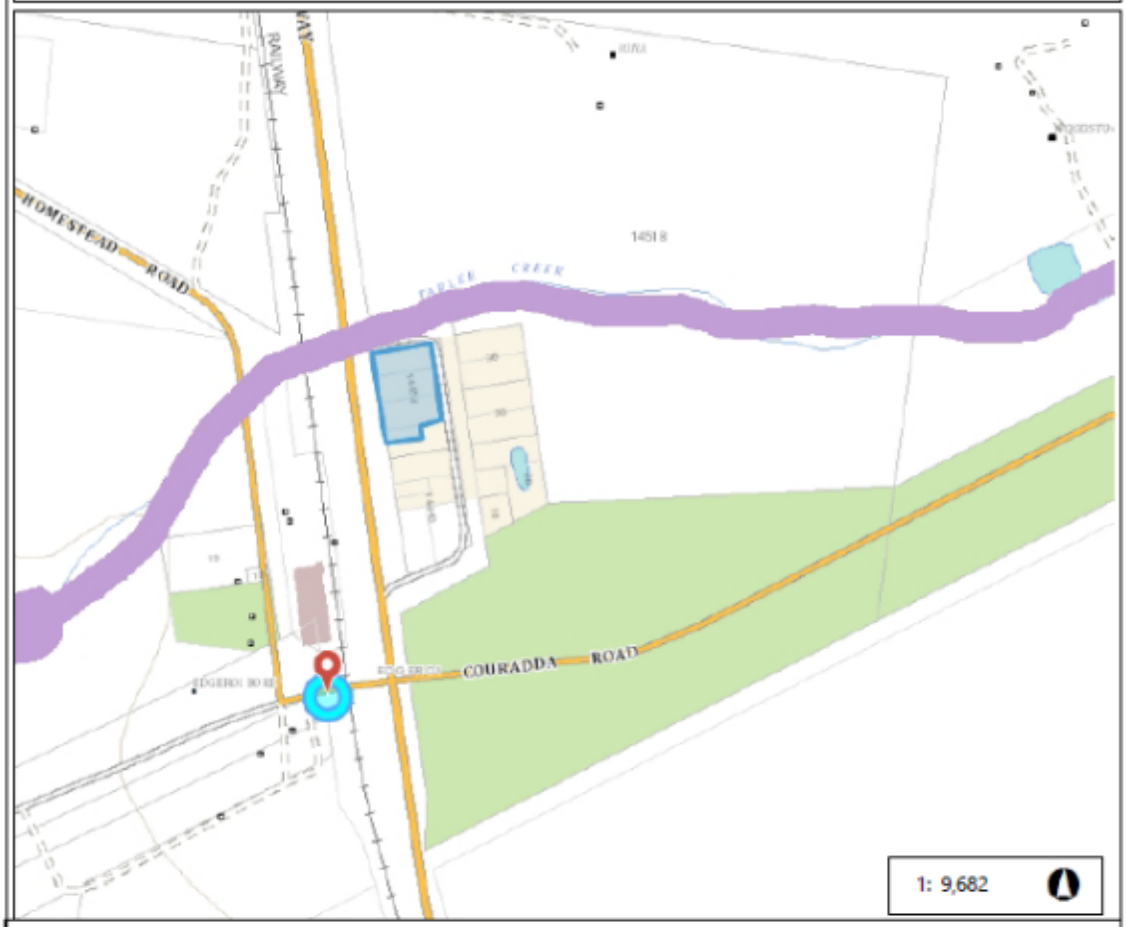
Appendix 6: Biodiversity Values Map

NSW GOVERNMENT

Biodiversity Values Map



Legend

- Biodiversity Values that have been mapped for more than 90 days
- Biodiversity Values added within last 90 days

Notes

© NSW Department of Planning and Environment

NSW GOVERNMENT

Biodiversity Values Map and Threshold Report

Results Summary

Date of Calculation	23/09/2022 2:50 PM	**BDAR Required***
Total Digitised Area	11,232.2 sqm	
Minimum Lot Size Method	LEP	
Minimum Lot Size 10,000sqm = 1ha	2,000 sqm	
Area Clearing Threshold 10,000sqm = 1ha	2,500 sqm	
Area clearing trigger Area of native vegetation cleared	Unknown #	Unknown #
Biodiversity values map trigger Impact on biodiversity values map(not including values added within the last 90 days)?	no	no
Date of the 90 day Expiry	N/A	

*If BDAR required has:

- at least one 'Yes': you have exceeded the BOS threshold. You are now required to submit a Biodiversity Development Assessment Report with your development application. Go to https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor to access a list of assessors who are accredited to apply the Biodiversity Assessment Method and write a Biodiversity Development Assessment Report
- 'No': you have not exceeded the BOS threshold. You may still require a permit from local council. Review the development control plan and consult with council. You may still be required to assess whether the development is '"likely to significantly affect threatened species' as determined under the test in s. 7.3 of the Biodiversity Conservation Act 2016. You may still be required to review the area where no vegetation mapping is available.

Where the area of impact occurs on land with no vegetation mapping available, the tool cannot determine the area of native vegetation cleared and if this exceeds the Area Threshold. You will need to work out the area of native vegetation cleared - refer to the BMAT user guide for how to do this.

On and after the 90 day expiry date a BDAR will be required.

Disclaimer

This results summary and map can be used as guidance material only. This results summary and map is not guaranteed to be free from error or omission. The State of NSW and Department of Planning and Environment and its employees disclaim liability for any act done on the information in the results summary or map and any consequences of such acts or omissions. It remains the responsibility of the proponent to ensure that their development application complies will all aspects of the *Biodiversity Conservation Act 2016*.

The mapping provided in this tool has been done with the best available mapping and knowledge of species habitat requirements. This map is valid for a period of 30 days from the date of calculation (above).

Acknowledgement

I as the applicant for this development, submit that I have correctly depicted the area that will be impacted or likely to be impacted as a result of the proposed development.

Signature_____ Date: 23/09/2022 02:50 PM

Appendix 7: Bore Log Data – GW969838

WaterNSW
Work Summary

GW969838

Licence:
Licence Status:

Authorised Purpose(s):
Intended Purpose(s): STOCK, DOMESTIC

Work Type: Bore - GAB
Work Status: Supply Obtained
Construct.Method: Rotary Air
Owner Type: Private

Commenced Date:
Completion Date: 30/01/2011
Final Depth: 119.00 m
Drilled Depth: 110.00 m

Contractor Name: TIM ELLIS
Driller: Timothy Ian Ellis
Assistant Driller: Annette Moerike

Property:
GWMA:
GW Zone:
Standing Water Level (m): 27.000
Salinity Description:
Yield (L/s): 3.800

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	JAMISON	NUNDI	69//753952
Licensed:			

Region: 90 - Barwon
River Basin: 418 - GWYDIR RIVER
Area/District:
CMA Map: 8837-1N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6665213.000
Easting: 769858.000
Latitude: 30°06'52.3"S
Longitude: 149°48'02.3"E

GS Map: -
MGA Zone: 55
Coordinate Source: GPS - Global

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	12.00	200			Rotary Air
1		Hole	Hole	12.00	26.00	200			Down Hole Hammer
1		Hole	Hole	26.00	119.00	200			Rotary - Air/Foam
1		Annulus	Cement Grout	0.00	5.00	200	139		PL:Poured/Shovelled
1		Annulus	Drill Cuttings	5.00	78.00	200	139		PL:Poured/Shovelled
1		Annulus	Bentonite	78.00	80.00	200	139		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	80.00	119.00	200	139		Graded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 12	0.00	119.00	139	125		Seated on Bottom, Glued
1	1	Opening	Slots - Horizontal	89.00	119.00	139		0	Casing - Hand Sawn Slot, PVC Class 12, Glued, SL: 80.0mm, A: 2.50mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
90.00	119.00	29.00	Unknown	27.00		3.80		01:00:00	

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	6.00	6.00	Sandy Clay, black, with some Basalt rocks	Sandy Clay	
6.00	12.00	6.00	Claystone, hard, grey	Claystone	
12.00	26.00	14.00	Basalt, hard	Basalt	
26.00	31.00	5.00	Clay, wet, light grey	Clay	
31.00	46.00	15.00	Sandstone, grey, white, soft, with bands of grey to black Shale	Sandstone	
46.00	47.00	1.00	Coal, brown	Coal	
47.00	52.00	5.00	Shale	Shale	
52.00	60.00	8.00	Sandstone, hard, grey	Sandstone	
60.00	78.00	18.00	Shale, bands of grey & grey Sandstone	Shale	
78.00	90.00	12.00	Shale, grey	Shale	
90.00	110.00	20.00	Sandstone, grey, with layers of Quartz Gravel, water bearing	Sandstone	

Remarks

30/01/2011: Form A Remarks:
Nat Carling, 17-Nov-2011: GPS provided by the driller.

***** End of GW969838 *****

Appendix 8: Preliminary Site Investigation Report

Preliminary Site Investigation

Service Station at:

14456 Newell Highway,

Edgeroi NSW 2390

Lot 60/-/DP753952

N5148

4th November 2021

Report distribution

Preliminary Site Investigation

Address: 14456 Newell Highway, Edgeroi NSW 2390

Application Number: N5148

Date of Report Written: 4th November 2021

Copies	**Recipient/Custodian**
1 Soft Copy (PDF) – Secured and issued by email	Mr Pankaj Berry E: pankaj_berry@hotmail.com
1 Original – Saved to NEO Consulting Archives	Secured and Saved by NEO Consulting on Register.

Version	**Prepared by**	**Reviewed by**	**Date issue**
Draft	Ehsan Zare *Environmental Consultant* 	Nick Caltabiano *Project Manager* 	2nd November 2021
FINAL	Ehsan Zare *Environmental Consultant* 	Nick Caltabiano *Project Manager* 	4th November 2021

Report Revision	**Details**	**Report No.**	**Date**	**Amended By**
1	FINAL Report	N5148	4th November 2021	Nick Caltabiano
Issued By:			 **Nick Caltabiano**	

Table of Contents

APPENDICES

Executive Summary

NEO Consulting Pty Ltd were appointed by Mr Pankaj Berry ('the client') to undertake a Preliminary Site Investigation (PSI) for the services station located at No. 14456 Newell Highway, Edgeroi NSW 2390 ('the site'). The site contains a non-operational fuel station and retail store.

The objective of the PSI was to provide a preliminary assessment of potentially contaminating activities which may have impacted the site.

A site investigation was conducted on the 21st October 2021 by NEO Consulting. The site contains a retail outlet and a building structure and underground fuel tanks. The fuel bowsers within the site have been removed. The site is relatively flat and contains a mix groundcover including concrete, grass and gravel.

Six (6) soil and one (1) water samples were collected from a close proximity of the underground fuel storage tanks within the site and submitted for laboratory testing at SGS Alexandria, a NATA accredited laboratory. These samples were tested for CoPC including Benzene, Toluene, Ethylbenzene and Xylenes (BTEX), Naphthalene, Total Recoverable Hydrocarbons (TRH) and Heavy Metals.

All analytical results for soil were below the relevant NEPM Assessment Criteria for Commercial and Industrial site. All analytical results for groundwater were below the relevant NEPM, ARMCANZ and ANZECC Assessment Criteria. NEO Consulting finds the site is suitable for use, providing the recommendations within **Section 15** of this report are undertaken.

1. Introduction

NEO Consulting Pty Ltd were appointed by Mr Pankaj Berry ('the client') to undertake a Preliminary Site Investigation (PSI) for the services station located at No. 14456 Newell Highway, Edgeroi NSW 2390 ('the site'). The site is legally identified as Lot 60/-/DP753952 and has a total area of approximately 4,111m^2.

This PSI was aimed to provide a preliminary assessment of potentially contaminating activities which may have impacted the site. In addition, NEO Consulting will provide recommendations if further investigation on site is required.

A site inspection was undertaken on the 21st October 2021 by NEO Consulting. Reporting and photos were conducted on the day of inspection and with reference to the relevant regulatory criteria. Further information from the inspection is outlined in Section 4 of this report.

2. Scope of Work

The PSI has been prepared in general accordance with the following regulatory framework:

- NSW EPA, *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation,* 2019;
- NSW EPA, *Technical Note: Investigation of Service Station Sites,* 2014;
- NSW EPA, Contaminated Sites: Guideline for Assessing Service Station Sites, 2003;
- NSW EPA, *Guidelines for Consultants Reporting on Contaminated Sites,* 2020;
- NSW EPA, *Contaminated Land Management, Guidelines for the NSW Site Auditor Scheme,* 2017 (4th Edition);
- NSW EPA, *Waste Classification Guidelines Part 1: Classifying Waste,* 2014;
- NSW EPA, *Sampling Design Guidelines*, 1995;
- NSW EPA, *Guidelines on the Duty to Report Contamination under Contaminated Land Management Act*, 1997;
- NSW DECCW, UPSS Technical Note: Decommissioning, Abandonment and Removal of UPSS, 2010;
- NSW DECCW, UPSS Technical Note: Site Validation Reporting, 2010;
- NSW DECCW, *Guidelines for the Assessment and Management of Groundwater Contamination,* 2007;
- Australian Standard (AS 4482.1) – Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil, Part 2: Non-volatile and Semi-volatile compounds (2005);
- Australian Standard (AS 4482.2) – Guide to the Sampling and Investigation of Potentially Contaminated Soil, Part 2: Volatile Substances (1999);
- Australian Standard (AS 4964) *Method for the Qualitative Identification of Asbestos in Bulk Samples* (2004);
- Department of Urban Affairs and Planning, NSW Environmental Protection Authority, *Managing Land Contamination – Planning Guidelines – SEPP 55 – Remediation of Land,* 1998;

- National Environmental Protection Council (NEPC) – National Environment Protection (Assessment of Site Contamination) Amendment Measure (NEPM), (2013);
- NEPM *Schedule B1 – Guideline on Investigation Levels for Soil and Groundwater,* 2013;
- NEPM *Schedule B2 – Guideline on Site Characterisation,* 2013;
- NEPM Schedule B5c – *Guideline on Ecological Investigation Levels for Arsenic, Chromium (III), Copper, DDT, Lead, Naphthalene, Nickel and Zinc, 2013;*
- NEPM Schedule B7 – *Guideline on Derivation of Health – Based Investigation Levels, 2013;*
- NEPM *Appendix 1 – The Derivation of HILS for Metals and Inorganics, 2013;*
- Protection of the Environment Operations (Waste) Regulations, 2005;
- SafeWork NSW Code of Practice, How to Safely Remove Asbestos, 2016;
- SafeWork NSW Code of Practice, How to Manage and Control Asbestos in the Workplace, 2016;
- SafeWork NSW, *Managing Asbestos in or On Soil*, 2014
- State Environment Protection Policy 55 (SEPP 55). *Remediation of Land Under the Environmental Planning and Assessment Act,* 1998;
- Work Health and Safety Act, 2011; and
- Work Health and Safety Regulation, 2011.

The scope of works required to complete the PSI includes:

- A site inspection for evidence of sources of potential contamination on-site and neighbouring properties;
- A soil sampling program, and laboratory testing for CoPC including Total Recoverable Hydrocarbons (TRH), Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) and Heavy Metals
- Historical investigations relating to the site;
- Information on the current and Historical Certificates of Title;
- Local Council records and planning certificates;
- Dial-Before-You-Dig enquiry for an evaluation into local underground services and assets;
- Acid sulphate soils (ASS) data maps;
- Establish whether data gaps may exist within the investigation;
- Development of a Conceptual Site Model (CSM) to identify the connections between potential sources of contamination, exposure pathways, and human/ecological receptors; and
- Recommendations for additional investigations (if any), based on the identified data gaps and findings of the PSI.

3. Site Details

Table 1. Site Details

Address	14456 Newell Highway, Edgeroi NSW 2390
Deposited Plan	Lot 60/-/DP753952
Locality Map	Figure 1
Site Plan	Figure 2
Area (approx.)	4,111m^2

Table 2. Surrounding Land-Use Adjacent to the Site

Direction from Site	Land-Use
North	Vacant land and Recreational area
East	Queen Street and Rural residential property
West	Newell Highway
South	Vacant land and Rural residential property

4. Site Condition

A qualified environmental consultant inspected the site on the 14th July 2021. Site photographs are provided in **Appendix A**. Observations noted during the inspection are summarised below:

- The site contains a non-operational fuel. The fuel bowsers within the site have been removed;
- The site is a rectangular-shaped lot and is surrounded by rural residential properties;
- The site contains a building structure to the back and a shed to the southwestern portion;
- The site is relatively flat and contains a mixed groundcover including concrete, grass and gravel;
- The eastern portion of the site is empty of any infrastructure and has a grass groundcover;
- The site gradient is relatively flat; and
- No visual or aromatic indications of contamination were encountered.

5. Site History

The only available historical aerial photograph of this site is an image from 2015. A description of this image is presented in **Table 3.**

Table 3. Historical Aerial photograph of the site.

Year	Description
2015	The site was a rectangular-shaped lot that contained three separated building structures within the western portion. The eastern portion of the site is empty of infrastructure and used as parking for trucks. The site was sparsely vegetated. The surrounding area of the site was composed of vacant lands and rural residential properties.

5.1 Section 10.7 (2) Planning Certificate

A Section 10.7 Planning Certificate describes how a property may be used and the restrictions on development. The Planning Certificate is issued under Section 149 of the Environmental Planning and Assessment Act 1979. At the time of reporting, NSW could not get access to the Planning Certificate.

5.2 NSW EPA Contaminated Land Register

A search within the NSW EPA contaminated land register was undertaken for the subject site. No result was found for this site.

5.3 Protection of the Environment Operations Act (POEO) Public Register

A search on the POEO public register of licensed and delicensed premises (DECC) was undertaken for the subject site. No result was found for this site.

5.4 SafeWork NSW Hazardous Goods

A search was not undertaken with NSW SafeWork for historical Dangerous Goods stored onsite. Based on site inspection, the storage of petroleum products within USTs appears to be the only dangerous goods stored on site.

5.5 Product Spill and Loss History

The site inspection carried out found no evidence to suggest chemical contamination impact on the site (i.e. chemical staining, unhealthy vegetation).

5.6 Dial Before You Dig

A Dial-Before-You-Dig request suggests the potential for underground services and assets to be impacted or act as a portal to transport contamination off-site (**Appendix D**).

6. Site Geology and Hydrology

The Geological Map of Penrite (Geological Series Sheet 9030, Scale 1:100,000, Edition 1, 1991), published by the Department of Minerals and Energy indicates the site located within a geological region characterised by Tertiary sandstone overlies by alluvial clays which consists of Vertosols.

A groundwater bore search was conducted on 4th November 2021 and five (5) groundwater bores (GW061127 GW007525, GW969838, GW034649, GW068688) were within 500m radius of the site.

It was beyond the scope of works to study the groundwater flow direction. However, based on regional topography and the nearest surface water source, Tarlee Creek (approximately 200m north of the site), groundwater is expected to flow north and the surface water across the majority of the site is expected to also flow north into Tarlee Creek.

7. Acid Sulphate Soils

To determine whether there is a potential for ASS to be present at the site, information was reviewed utilising the NSW Department of Planning, Industry and Environment eSPADE map viewer. The ASS maps identify five (5) classes of sulphuric acid on land, with Class 1 being the highest at risk of ASS. This search indicated that there is "no known occurrence" of ASS underlying the soil at this site.

8. Areas of Environmental Concern

Based on the above information, the potential Areas of Environmental Concern (AEC) and their associated Contaminants of Potential Concern (CoPC) for the site were identified and summarised below.

Table 4. AEC and associated CoPC

AEC	Potentially Contaminating / Hazardous Activity	CoPC	Likelihood of Site Impact	Comments
Entire site	Importation of fill material from unknown origin.	Heavy Metals, TRH, BTEX, PAH	Low	Based on site observations, the presence of imported fill material is unlikely.
Self service area and underground storage of petroleum products	Storage and dispensing of Petroleum Fuels underground.	Heavy Metals, TRH and BTEX	Moderate	Based on site observation, the potential for hydrocarbon spills within the service area, leaks from the underground tank and associated lines is possible.

AEC	Potentially Contaminating / Hazardous Activity	CoPC	Likelihood of Site Impact	Comments
Building structures	Hazardous materials	ACM, SMF, ODS, Lead (paint and/or dust), PCBs	Low	Based on site observations, it cannot be concluded that any of the hazardous materials mentioned here are present at this location.

Abbreviations: Asbestos Containing Materials (ACM), Benzene, Toluene, Ethylbenzene and Xylene (BTEX), Ozone Depleting Substances (ODS), Polychlorinated biphenyls (PCBs), Polycyclic Aromatic Hydrocarbon (PAH), Total Recoverable Hydrocarbons (TRH), Synthetic Mineral Fibres (SMF).

9. Conceptual Site Model

A Conceptual Site Model (CSM) has been developed and presented below, and provides a representation of the potential risks associated with the connections between the following elements:

- Potential contamination sources and their associated CoPCs;
- Potential human receptors that may be impacted by the site contamination are current and future site users including occupants to the dwelling/infrastructures onsite, site workers and the general public within the immediate vicinity of the site;
- Potential environmental receptors to the site including but not limited to: groundwater and surface water bodies, residual soils at and/or nearby the site.
- Potential exposure pathways; and
- Whether source-pathway-receptor connections are complete based on current and future suite conditions.

Table 5. Conceptual Site Model

Potential Sources	Potential Receptor	Potential Exposure Pathway	Complete connection	Risk	Justification/ Control Measures
Contaminated soil from importation of uncontrolled fill across the site.	Site occupants, workers, general public	Dermal contact, inhalation/ingestion of particulates	Limited (current)	Moderate	Exposure to potentially contaminated soils is possible.
			No (Future)	Low	If present, impacted soils are likely to be disposed of off-site.

Potential Sources	Potential Receptor	Potential Exposure Pathway	Complete connection	Risk	Justification/ Control Measures
Contaminated soil from historical onsite operations. ACM and other hazardous material within onsite structures. Historical small-scale hydrocarbon spills from refuelling events (tanks or vehicles). Storage of petroleum products beneath site within UPSS.	Tarlee Creek	Migration of impacted groundwater and surface water run-off.	No (current)	Moderate	Due to proximity and topography, possible that contaminated waters could reach this surface water receptor.
			Limited (Future)	Low	If present, contaminated soils and groundwater are likely to be remediated.
	Underlying aquifer	Leaching and migration of contaminants through groundwater infiltration.	Limited (current)	Low	Due to existing sealed surfaces across operational area, migration of CoPC is likely to be limited.
			Limited (Future)	Low	If present, contaminated soil and/or groundwater is likely to be remediated.

10. Data Gaps

The following data gaps have been identified at the site:

- Groundwater flow direction;
- The presence of hazardous materials within on site structures.

11. Sampling Analysis Plan

11.1 Field Sampling Methodology

All boreholes were completed with a drill auger. By using a drill auger for the boreholes, the qualified environmental consultant was able to conduct a visual inspection of the soil cross section. Soil was scraped from the freshly cut cross section for sample collection. Drill auger was decontaminated with deionised water between boreholes. Samples were immediately placed in laboratory prepared jars (labelled prior to arriving on site), with the lid securely attached to jar and only removed for the purpose of storing each sample. This sample storage approach allowed the preservation of any potential fill layers as well as natural underlying clay to be stored in stratigraphic layers.

Table 6. Sample details

Borehole ID	Sample ID	Depth (m)	Soil Type
BH1	S1	1.5m	Clay
BH1	S2	3.3m	Clay
BH2	S3	1.5m	Clay
BH3	S4	2.9m	Clay
BH3	S5	1.5m	Clay
BH4	S6	1.5m	Clay

Table 7. Borelogs

BH1		
0-1.5m	Medium clay	Fill
1.5-3.3m	Heavy clay	Naturals soils
BH2		
0-1.5m	Medium clay	Fill
1.5-2.9m	Heavy clay	Naturals soils

BH3		
0.0-1.5m	Medium clay	Fill
BH4		
0.0-1.5m	Medium clay	Fill/natural layer

The groundwater sample was collected from a monitoring well (MW1). The monitoring well cap was removed to enable groundwater stabilisation. HydraSleeve was lowered into the well and positioned appropriately and allowed to reach equilibrium before retrieval. Depth to water and depth of well were recorded and a PID reading was collected. Groundwater samples were placed in laboratory prepared bottles: one (1) amber glass vial for Metal analysis and two (2) glass vials for VOCs and TRH.

Table 8. Groundwater monitoring well details

Well	Depth to Water (m)	Cap Depth (m)
1	228	2284

Both the soil and groundwater samples were placed on ice in an esky for transport under Chain of Custody (COC) to a NATA accredited laboratory for the analysis of the COPC.

11.3 Field Quality Assurance & Quality Control Procedures

The following procedures were undertaken to ensure the data quality for each sample:

- Selection of appropriate sampling methods;
- Decontamination procedures;
- Appropriate containers selected for planned analyses;
- Appropriate preservation and storage measures to minimise contamination or analyte loss;
- Statement of duplicate frequency;
- Sampling devices and equipment;
- Field instrument calibrations.

12. Assessment Criteria

The following assessment criteria were adopted for the investigation.

12.1 NEPM Health Screening Level D (HSL-D) – Commercial/Industrial

HSLs have been developed for selected petroleum compounds and fractions and are used for the assessment of potential risks to human health from chronic inhalation and direct contact pathways of petroleum vapour emanating off petroleum contaminated soils (Vapour Risk). HSLs are guided by land-use scenarios, specific soil physicochemical properties and generally apply to depths below surface to >4m.

Tier 1 HSLs are divided into the following sub-criteria:

- HSL A – residential with garden/accessible soils
- HSL B – residential with minimal opportunities for soil access
- HSL C – public open space/recreational areas
- HSL D – commercial/industrial premises

12.2 NEPM Health Investigation Level D (HIL-D) – Commercial/Industrial

HILs are scientific, risk-based guidance levels to be used as in the primary stage of assessing soil contamination to evaluate the potential risks to human health from chronic exposure to contaminants. HILs are applicable to a broad range of metals and organic substances, and generally apply to depths up to 3m below the surface for residential use.

Tier 1 HILs are divided into the following sub-criteria:

- HIL A – residential with garden/accessible soils.
- HIL B – residential with minimal opportunities for soil access.
- HIL C – public open space/recreational areas.
- HIL D – commercial/industrial premises.

12.3 NEPM Ecological Investigation Level (EIL) – Commercial/Industrial

Ecological investigation levels (EILs) have been developed to assess the risk for the presence of metals and organic substance in a terrestrial ecosystem. EILs are guided by land-use scenarios, specific soil physicochemical properties and generally apply to the top 2m of soil. EILs can be applied for arsenic (As), copper (Cu), chromium III (Cr(III)), dichlorodiphenyltrichloroethane (DDT), naphthalene, nickel (Ni), lead (Pb) and zinc (Zn). The NEPM Soil Quality Guidelines (SQG) for EILs are calculated using the Added Contamination Limit (ACL) to determine the amount of contamination that had to be added to the soil to cause toxicity, including ambient background concentration (ABC).

12.4 NEPM Ecological Screening Level (ESL) – Commercial/Industrial

ESLs have been developed for selected petroleum hydrocarbons (BTEX, benzo(a)pyrene, TRH F1 and F2) in soil, based on fresh contamination. These parameters are applicable to coarse and fine-grained soil and apply from the surface of the soil to 2m below ground level, which corresponds with the root and habitat zone for many species.

12.5 NEPM Management Limits – Commercial/Industrial

Management Limits for petroleum have been developed for prevention of explosive vapour accumulation, prevention of the formation of observable Light Non-Aqueous Phase Liquids (LNAPL) and protection against effects on buried infrastructure. Commercial/Industrial limits have been adopted based on the proposed land use.

12.6 NEPM Groundwater Investigation Levels (GIL)

GILs are the concentration of a contaminant in the groundwater above which further investigation or a response is required. These levels are based on Australian water quality guidelines and drinking water guidelines and are applicable for assessing human health risk and ecological risk (fresh water or marine water) from direct contact within groundwater.

12.7 ARMCANZ & ANZECC 2000 - Freshwater 95% level of protection (% species)

The 95% protection level trigger value applies to ecosystems that could be classified as slightly-moderately disturbed. This statistical approach is based on calculations of a probability distribution of aquatic toxicity endpoints and attempts to protect a pre-determined percentage of species (in this case, 95%).

13. Investigation Results

The analytical results are summarised below. Detailed analytical results are presented in the laboratory reports in **Appendix C.**

Table 9. Health Screening Levels and Ecological Screening Levels for Benzene, Toluene, Ethylbenzene, Xylenes (BTEX). NL = Not Limiting. Values are presented as mg/kg.

NEPM Assessment Criteria	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
NEPM 2013 Commercial/Industrial Soil **HSL-D** for Vapour Intrusion, 1-<2m depth, **Clay**, mg/kg	**6**	**NL**	**NL**	**NL**	**NL**
NEPM 2013 Commercial/Industrial Soil **HSL-D** for Vapour Intrusion, 2-<4m depth, **Clay**, mg/kg	**9**	**NL**	**NL**	**NL**	**NL**

NEPM 2013 Commercial/Industrial Soil **HSL-D** for Vapour Intrusion, 4m+ depth, **Clay**, mg/kg		**20**	**NL**	**NL**	**NL**	**NL**
NEPM 2013 Commercial/Industrial Soil **HSL-D** for direct contact, mg/kg		**430**	**99 000**	**27 000**	**81 000**	**11 000**
NEPM 2013 Soil **ESL** for Commercial/Industrial for **fine-grained soil**, mg/kg		**95**	**135**	**185**	**95**	
NEPM 2013 Soil Generic **EIL** for Commercial/Industrial, mg/kg						**370**
Sample	Depth (m)	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
S1	1.5m	<0.1	<0.1	<0.1	<0.3	<0.1
S2	3.3m	<0.1	<0.1	<0.1	<0.3	<0.1
S3	1.5m	<0.1	<0.1	<0.1	<0.3	<0.1
S4	2.9m	<0.1	<0.1	<0.1	<0.3	<0.1
S5	1.5m	<0.1	<0.1	<0.1	<0.3	<0.1
S6	1.5m	<0.1	<0.1	<0.1	<0.3	<0.1

Table 10. Health Screening Levels, Ecological Screening Levels and Management Limits for TRH C_6-C_{10}, C_6-C_{10} F1*, >C_{10}-C_{16}, >C_{10}-C_{16} F2**, >C_{16}-C_{34} and >C_{34}-C_{40} * = F1 is calculated by subtracting the sum of BTEX concentrations from the C_6-C_{10} aliphatic hydrocarbon fraction. ** = F2 is calculated by subtracting Naphthalene from the >C_{10}-C_{16} aliphatic hydrocarbon fraction. NL = Not Limiting. Values are presented as mg/kg.

NEPM Assessment Criteria	TRH C6-C10	TRH C6-C10 - BTEX (F1)	TRH >C10-C16	TRH >C10-C16 - N (F2)	TRH >C16-C34 (F3)	TRH >C34-C40 (F4)
NEPM 2013 Commercial/Industrial Soil **HSL-D** for Vapour Intrusion, 1-<2m depth, **Clay**, mg/kg		**480**		**NL**		
NEPM 2013 Commercial/Industrial Soil **HSL-D** for Vapour Intrusion, 2-<4m depth, **Clay**, mg/kg		**NL**		**NL**		
NEPM 2013 Commercial/Industrial Soil **HSL-D**		**NL**		**NL**		

for Vapour Intrusion, 4m+ depth, **Clay**, mg/kg							
NEPM 2013 Commercial/Industrial Soil **HSL-D** for direct contact, mg/kg		**26 000**		**20 000**		**27 000**	**38 000**
NEPM 2013 Soil **ESL** for Commercial/Industrial for **fine-grained soil**, mg/kg		**215**		**170**		**2500**	**6600**
NEPM 2013 **Management Limits** for Commercial/Industrial for **fine-grained soil**, mg/kg		**800**		**1000**		**5000**	**10 000**
Sample	Depth (m)	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
S1	1.5m	<25	<25	<25	<25	<90	<120
S2	3.3m	<25	<25	<25	<25	<90	<120
S3	1.5m	<25	<25	<25	<25	<90	<120
S4	2.9m	<25	<25	<25	<25	<90	<120
S5	1.5m	<25	<25	<25	<25	<90	<120
S6	1.5m	<25	<25	<25	<25	<90	<120

Table 11. Health Investigation Levels and Ecological Investigation Levels for metals. Values are presented as mg/kg.

NEPM Assessment Criteria		Arsenic, As	Cadmium, Cd	Chromium, Cr	Copper, Cu	Lead, Pb	Nickel, Ni	Zinc, Zn	Mercury, Hg
NEPM 2013 Commercial/Industrial Soil **HIL-D**, mg/kg		**3000**	**900**	**3600**	**240 000**	**1500**	**6000**	**400 000**	**730**
NEPM 2013 Soil Generic **EIL** for Commercial/Industrial, mg/kg		**160**							
Sample	Depth (m)	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
S1	1.5m	<1	<0.3	**12**	**6.4**	**5**	**10**	**24**	<0.05
S2	3.3m	**2**	<0.3	**9.5**	**5.6**	**5**	**12**	**19**	<0.05
S3	1.5m	**1**	<0.3	**11**	**6.1**	**4**	**12**	**12**	<0.05
S4	2.9m	**2**	<0.3	**10**	**7.4**	**5**	**17**	**42**	<0.05

S5	1.5m	<1	<0.3	**12**	**6.0**	**4**	**11**	**12**	<0.05
S6	1.5m	<1	<0.3	**10**	**6.3**	**12**	**10**	**12**	<0.05

Table 12. Groundwater Health Screening Levels for BTEX, TRH C6-C10 - BTEX (F1) and TRH >C10-C16 - N (F2). NL = Not Limiting. Values are presented as mg/kg.

NEPM Assessment Criteria	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	F1	F2
NEPM 2013 Commercial/Industrial Groundwater **HSL-D** for Vapour Intrusion, 2 - <4m depth, **Clay**, mg/L	**30**	NL	NL	NL	NL	NL	NL
NEPM 2013 Commercial/Industrial Groundwater **HSL-D** for Vapour Intrusion, 4 - <8m depth, **Clay**, mg/L	**30**	NL	NL	NL	NL	NL	NL
NEPM 2013 Commercial/Industrial Groundwater **HSL-D** for Vapour Intrusion, 8m+ depth, **Clay**, mg/L	**35**	NL	NL	NL	NL	NL	NL
MW1 (µg/L)	<0.5	<0.5	<0.5	<1.5	<0.5	<50	<60

Table 13. Groundwater Investigation Levels for BTEX, Naphthalene and Benzo(a)pyrene. NL = Not Limiting. Values are presented as mg/kg.

NEPM Assessment Criteria	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	Benzo(a)pyrene
NEPM 2013 GIL Drinking Water, mg/L	0.001	0.8	0.3	0.6	-	0.00001
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NEPM 2013 GIL Marine Waters, µg/L	500C	-	-	-	50C	-
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
NEPM 2013 GIL Fresh Waters, µg/L	950	-	-	350 as o-x; 200 as p-x	16	-
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ARMCANZ & ANZECC 2000 - Freshwater 95% level of protection (% species), µg/L	950	ID	ID	200 (*p*-xylene)	16	ID
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW1 (µg/L)	<0.5	<0.5	<0.5	<1.5	<0.5	Not Analysed

Table 14. Groundwater Investigation Levels for metals. Values are presented as mg/kg for Drinking Waters and µg/L for Fresh and Marine Waters.

NEPM Assessment Criteria	Arsenic, As	Cadmium, Cd	Chromium, Cr	Copper, Cu	Lead, Pb	Nickel, Ni	Zinc, Zn	Mercury, Hg
NEPM 2013 GIL Drinking Water, mg/L	0.01	0.002	0.05	2	0.01	0.02	-	0.001
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NEPM 2013 GIL Marine Waters, µg/L	-	0.7	4.4	1.3	4.4	7	15	0.1
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
NEPM 2013 GIL Fresh Waters, µg/L	24 A(III); 13 As(V)	0.2	1	1.4	3.4	11	8	0.06
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ARMCANZ & ANZECC 2000 - Freshwater 95% level of protection (% species), µg/L	24 A(III); 13 As(V)	0.2	1	1.4	3.4	11	8	0.6
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW1 (µg/L)	<1	<0.1	**1**	<1	<1	<1	<5	<0.0001

14. Conclusion

All analytical results for soil were below the relevant NEPM Assessment Criteria for Commercial and Industrial site. All analytical results for groundwater were below the relevant NEPM, ARMCANZ and ANZECC Assessment Criteria. NEO Consulting finds the site is suitable for use, providing the recommendations within **Section 15** of this report are undertaken.

15. Recommendations

Based on the information collected and available during this investigation, the following recommendations have been undertaken:

- Considering the site has been closed, the UPSS onsite should be decommissioned in accordance with NSW SafeWork, or re-commissioned for use.
- Any soils requiring excavation, on-site reuse and/or removal must be classified in accordance with "Waste Classification Guidelines Part 1: Classifying Waste" NSW EPA (2014);
- All on site structures should be assessed within a Hazardous Materials Survey prior to demolition.

References

- NSW EPA, *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation,* 2019;
- NSW EPA, *Technical Note: Investigation of Service Station Sites,* 2014;
- NSW EPA, Contaminated Sites: Guideline for Assessing Service Station Sites, 2003;
- NSW EPA, *Guidelines for Consultants Reporting on Contaminated Sites,* 2020;
- NSW EPA, *Contaminated Land Management, Guidelines for the NSW Site Auditor Scheme,* 2017 (4th Edition);
- NSW EPA, *Waste Classification Guidelines Part 1: Classifying Waste,* 2014;
- NSW EPA, *Sampling Design Guidelines*, 1995;
- NSW EPA, *Guidelines on the Duty to Report Contamination under Contaminated Land Management Act*, 1997;
- NSW DECCW, UPSS Technical Note: Decommissioning, Abandonment and Removal of UPSS, 2010;
- NSW DECCW, UPSS Technical Note: Site Validation Reporting, 2010;
- NSW DECCW, *Guidelines for the Assessment and Management of Groundwater Contamination,* 2007;
- Australian Standard (AS 4482.1) – Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil, Part 2: Non-volatile and Semi-volatile compounds (2005);
- Australian Standard (AS 4482.2) – Guide to the Sampling and Investigation of Potentially Contaminated Soil, Part 2: Volatile Substances (1999);
- Australian Standard (AS 4964) *Method for the Qualitative Identification of Asbestos in Bulk Samples* (2004);
- Department of Urban Affairs and Planning, NSW Environmental Protection Authority, *Managing Land Contamination – Planning Guidelines – SEPP 55 – Remediation of Land,* 1998;
- National Environmental Protection Council (NEPC) – National Environment Protection (Assessment of Site Contamination) Amendment Measure (NEPM), (2013);
- NEPM *Schedule B1 – Guideline on Investigation Levels for Soil and Groundwater,* 2013;
- NEPM *Schedule B2 – Guideline on Site Characterisation,* 2013;
- NEPM Schedule B5c – *Guideline on Ecological Investigation Levels for Arsenic, Chromium (III), Copper, DDT, Lead, Naphthalene, Nickel and Zinc, 2013;*
- NEPM Schedule B7 – *Guideline on Derivation of Health – Based Investigation Levels, 2013;*
- NEPM *Appendix 1 – The Derivation of HILS for Metals and Inorganics, 2013;*
- Protection of the Environment Operations (Waste) Regulations, 2005;
- SafeWork NSW Code of Practice, How to Safely Remove Asbestos, 2016;
- SafeWork NSW Code of Practice, How to Manage and Control Asbestos in the Workplace, 2016;
- SafeWork NSW, *Managing Asbestos in or On Soil*, 2014
- State Environment Protection Policy 55 (SEPP 55). *Remediation of Land Under the Environmental Planning and Assessment Act,* 1998;

- Work Health and Safety Act, 2011; and
- Work Health and Safety Regulation, 2011.

Limitations

The findings of this report are based on the scope of work outlined in Section 2. Neo Consultants performed the services in a manner consistent with the normal level of care and expertise exercised by members of the environmental consulting profession. No warranties, express or implied are made.

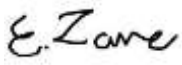
The results of this assessment are based upon the information documented and presented in this report. All conclusions and recommendations regarding the site are the professional opinions of Neo Consultants personnel involved with the project, subject to the qualifications made above. While normal assessments of data reliability have been made, Neo Consultants assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside of Neo Consulting, or developments resulting from situations outside the scope of this project.

The results of this assessment are based on the site conditions identified at the time of the site inspection and validation sampling. Neo Consulting will not be liable to revise the report to account for any changes in site characteristics, regulatory requirements, assessment criteria or the availability of additional information, subsequent to the issue date of this report.

Neo Consulting is not engaged in environmental consulting and reporting for the purpose of advertising sales promoting, or endorsement of any client interests, including raising investment capital, recommending investment decisions, or other publicity purposes.

Neo Consulting Pty Ltd

Prepared by:



Ehsan Zare

Environmental Scientist

Reviewed by:

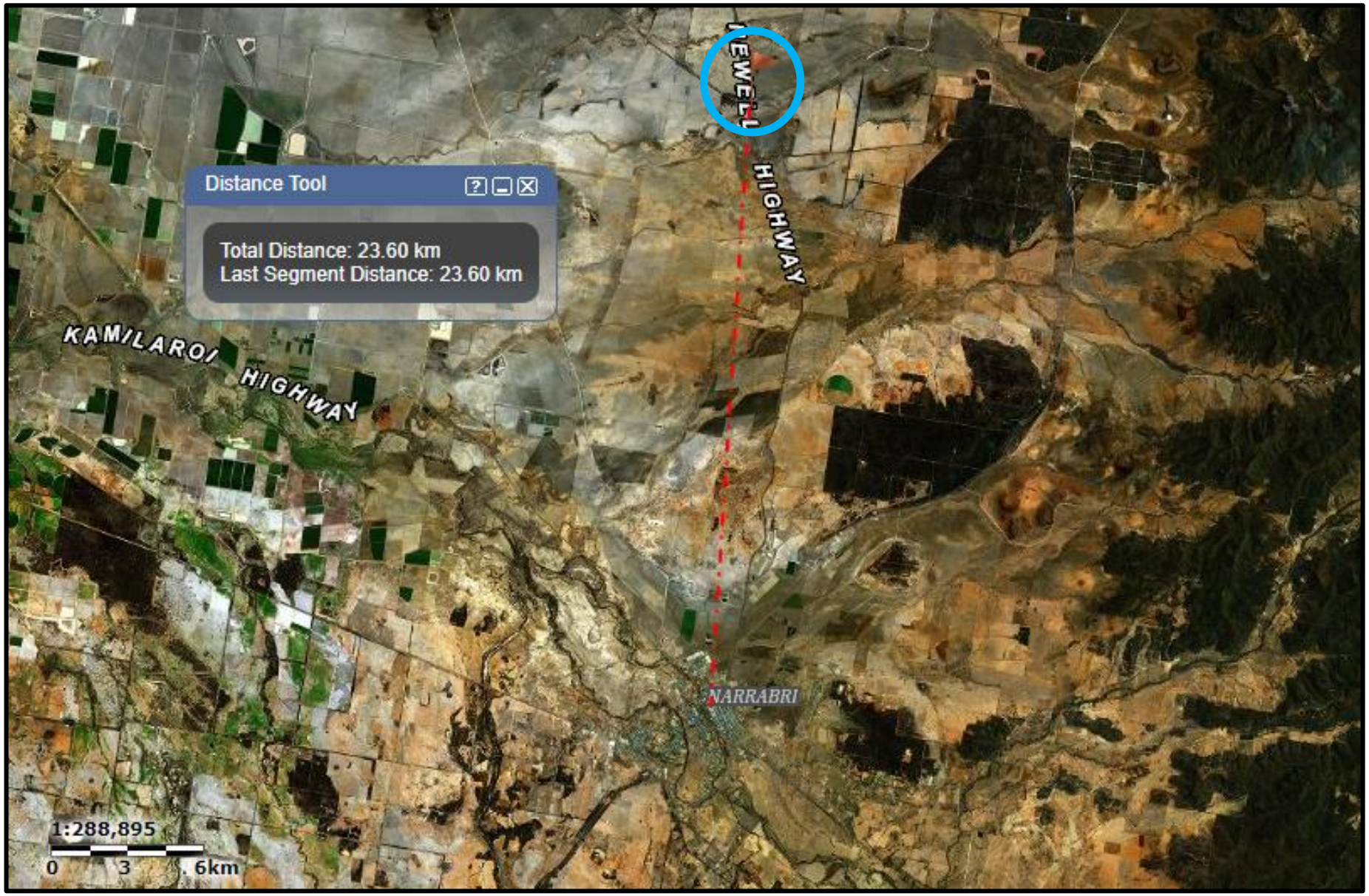
Nick Caltabiano

Project Manager

APPENDIX A

Figures and Site Photographic Log

Figure 1. Aerial map indicating that the site is approximately 23.60km north of township of Narrabri.



Site location

Source: Sixmaps 2021

Figure 1	Locality Map
Project	14456 Newell Highway, Edgeroi NSW 2390

Figure 2. The site contains a non-operational service station within the eastern portion of the lot. Area of site is approximately 4111.02m^2.

Figure 2	Site Map
Project	14456 Newell Highway, Edgeroi NSW 2390

Source: Nearmaps 2021

Figure 3. Six (6) soil and one (1) water samples were taken across the site.

Sample ID	Approximate Sample Depth (m)	Texture
S1 (BH1.1)	1.5 (fill layer)	Medium Clay
S2 (BH1.2)	3.3 (Natural layer)	Heavy Clay
S3 (BH2.1)	1.5 (fill layer)	Medium Clay
S4 (BH2.2)	2.9 (Natural layer)	Heavy Clay
S5 (BH3)	1.5 (fill layer)	Medium Clay
S6 (BH4)	1.5 (Natural layer)	Medium Clay

Borehole Location

Monitoring well Location

Source: Nearmaps 2021

Figure 3	Sample Locations
Project	14456 Newell Highway, Edgeroi NSW 2390

N

Figure 4. Aerial image of the site and surrounding area 2015. The site was a rectangular-shaped lot that contained three separated building structures within the western portion. The eastern portion of the site is empty of infrastructure and used as parking for trucks. The site was sparsely vegetated. The surrounding area of the site was composed of vacant lands and rural residential properties.

Source: Nearmaps 2021

Figure 4	Aerial Image 2015
Project	14456 Newell Highway, Edgeroi NSW 2390

Figure 5. A view of the site including the former retail store from Newell Highway. The front of the site is fenced off to public access and all the fuel bowsers have been removed.

Figure 6. The eastern portion of the retail store including the metal canopy.

Figure 7. Rear end of the site including the single storey weatherboard building structure.

Figure 8. The entrance to the backyard and the location of one of the underground fuel tanks.

Figure 9. Front of the site including the metal shed and former location of the fuel bowsers.

Figure 10. The southern portion of the site.

Figure 11. The groundwater monitoring well to the front portion of the site.

Figure 12. Front of the site including the air vent.

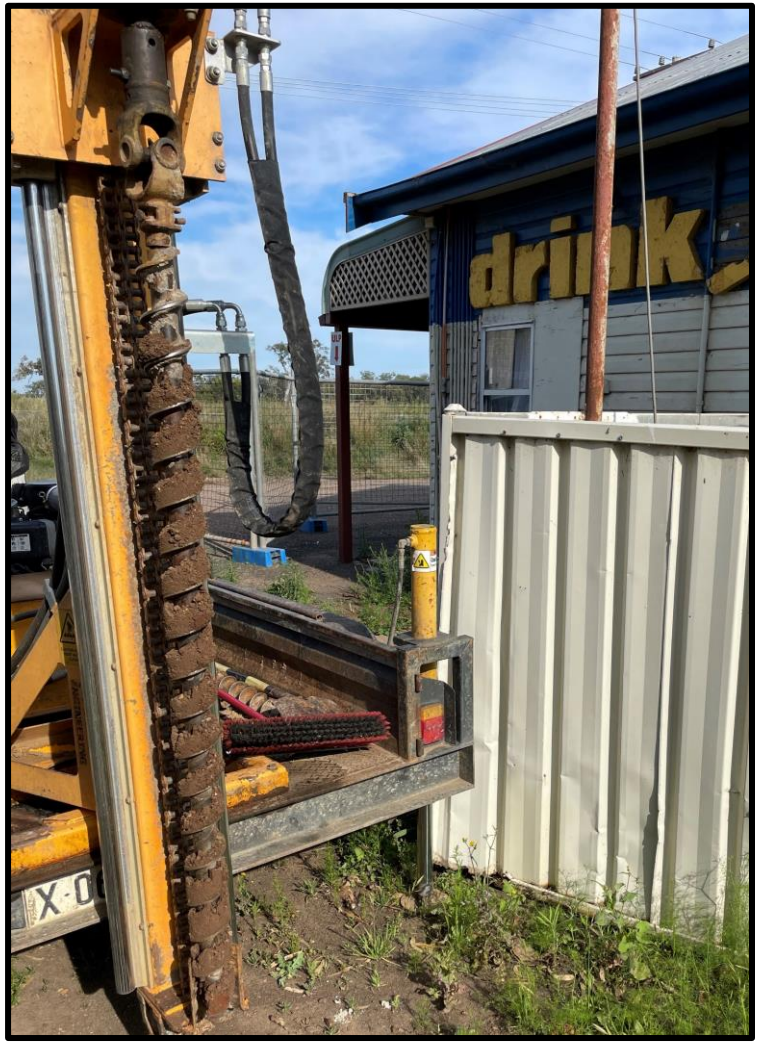


Figure 13. Drilling of S1. The fill layer consisted of a Dark Brown Medium Clay soil.

Figure 14. Drilling of S3. The soil is Dark Grey Medium Clay within fill layer.

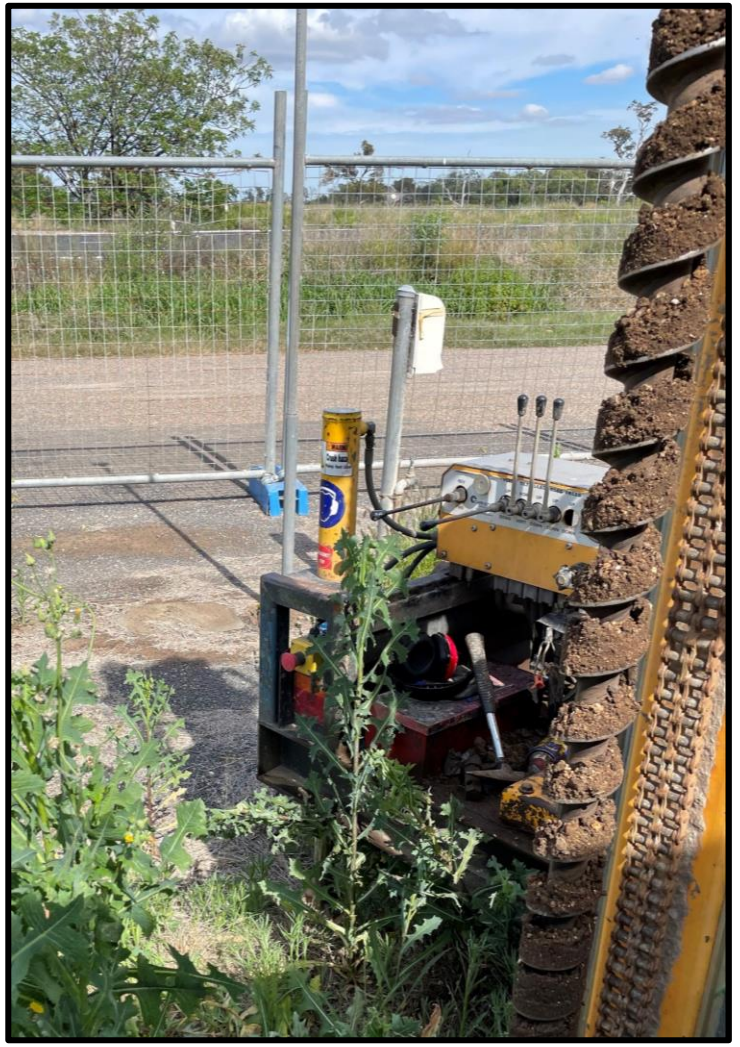


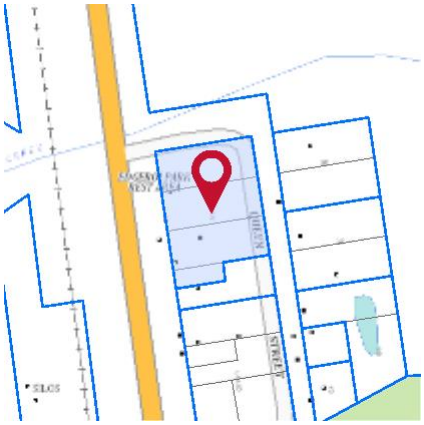
Figure 15. Drilling of S4. The soil is Dark Grey Medium Clay within fill layer.

APPENDIX B

Property Report

Property Report

14454 NEWELL HIGHWAY EDGEROI 2390



Property Details

Address:	14454 NEWELL HIGHWAY EDGEROI 2390
Lot/Section /Plan No:	1/-/DP311343 59/-/DP753952 60/-/DP753952 61/-/DP753952
Council:	NARRABRI SHIRE COUNCIL

Summary of planning controls

Planning controls held within the Planning Database are summarised below. The property may be affected by additional planning controls not outlined in this report. Please contact your council for more information.

Local Environmental Plans	Narrabri Local Environmental Plan 2012 (pub. 21-12-2012)
Land Zoning	RU5 - Village: (pub. 21-12-2012)
Height Of Building	NA
Floor Space Ratio	NA
Minimum Lot Size	2000 m²
Heritage	NA
Land Reservation Acquisition	NA
Foreshore Building Line	NA
Mineral and Resource Land	Subject Land

Detailed planning information

State Environmental Planning Policies which apply to this property

State Environmental Planning Policies can specify planning controls for certain areas and/or types of development. They can also identify the development assessment system that applies and the type of environmental assessment that is required.

- State Environmental Planning Policy (Affordable Rental Housing) 2009: Land Application (pub. 31-7-2009)
- State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004: Land Application (pub. 25-6-2004)
- State Environmental Planning Policy (Concurrences and Consents) 2018: Land Application (pub. 21-12-2018)
- State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017: Land Application (pub. 1-9-2017)
- State Environmental Planning Policy (Exempt and Complying Development Codes) 2008: Land Application (pub. 12-12-2008)
- State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004: Land Application (pub. 31-3-2004)
- State Environmental Planning Policy (Infrastructure) 2007: Land Application (pub. 21-12-2007)
- State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007: Land Application (pub. 16-2-2007)
- State Environmental Planning Policy (Primary Production and Rural Development) 2019: Land Application (pub. 28-2-2019)
- State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017: Allowable Clearing Area (pub. 17-9-2021)
- State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017: Subject Land (pub. 25-8-2017)
- State Environmental Planning Policy No 21—Caravan Parks: Land Application (pub. 24-4-1992)
- State Environmental Planning Policy No 33—Hazardous and Offensive Development: Land Application (pub. 13-3-1992)
- State Environmental Planning Policy No 36—Manufactured Home Estates: Land Application (pub. 16-7-1993)
- State Environmental Planning Policy No 50—Canal Estate Development: Land Application (pub. 10-11-1997)
- State Environmental Planning Policy No 55—Remediation of Land: Land Application (pub. 28-8-1998)
- State Environmental Planning Policy No 64—Advertising and Signage: Land Application (pub. 16-3-2001)
- State Environmental Planning Policy No 65—Design Quality of Residential Apartment Development: Land Application (pub. 26-7-2002)

Other matters affecting the property

Information held in the Planning Database about other matters affecting the property appears below. The property may also be affected by additional planning controls not outlined in this report. Please speak to your council for more information

Land near Electrical Infrastructure	This property may be located near electrical infrastructure and could be subject to requirements listed under ISEPP Clause 45. Please contact Essential Energy for more information.
Local Aboriginal Land Council	NARRABRI
Regional Plan Boundary	New England North West

APPENDIX C

Laboratory Results and Chain of Custody

SGS

CHAIN OF CUSTODY & ANALYSIS REQUEST

Page 1 of 1

SGS Environmental Services
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Company Name: NEO Consulting Pty Ltd
Address: 186 Riverstone Parade, Riverstone, NSW, 2765
Contact Name: Nick Caltabiano, Luke Brevu

Project Name/No: N348
Purchase Order No:
Results Required By: Next day / 3 days / Standard (Circle one)
Telephone: Nick's mobile: 0416 680 375 Luke's mobile: 0455 485 502
Facsimile:
Email Results: [Read Comment section]

Client Sample ID	Date Sampled	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	TPH	BTEX	Heavy Metals	Dissolved Metals
S1		1					✓	✓	✓	
S2		2					✓	✓	✓	
S3		3					✓	✓	✓	
S4		4					✓	✓	✓	
S5		5					✓	✓	✓	
S6		6					✓	✓	✓	
MW1		2								✓

SGS EHS Sydney COC
SE224999

Relinquished By:	Date/Time:	Received By:	Date/Time 25.10.21 11:00
Relinquished By:	Date/Time:	Received By:	Date/Time
Samples Intact: (Yes) No	Temperature: Ambient / (Chilled) 10°	Sample Cooler Sealed: (Yes) No	Laboratory Quotation No:
	Comments: Email Reports and Invoices to all emails => ① Nick@neoconsulting.com.au ② Luke@neoconsulting.com.au ③ admin@neoconsulting.com.au ④ Oskar@neoconsulting.com.au ⑤ Sarah@neoconsulting.com.au ⑥ Ehsan@neoconsulting.com.au		

Yin, Emily (Sydney)

From: nick caltabiano <nick@neoconsulting.com.au>
Sent: Thursday, 28 October 2021 2:49 PM
To: AU.SampleReceipt.Sydney (Sydney); Crawford, Huong (Sydney)
Cc: NEO Consulting; Ehsan Zare; Luke Breva; Oskar Lamperts; Sarah Houlahan
Subject: [EXTERNAL] Re: SGS Sample Receipt Advice (Ref: N5148, Lab Ref: SE224999)

Hi Huong,

We have just realised the water samples did not include TRH and BTEX could we please add this into the requested suite?

Kind regards,

Nick

On Mon, Oct 25, 2021 at 2:37 PM <AU.Samplereceipt.Sydney@sgs.com> wrote:

> Dear Admin,
>
> Please be advised we have received samples for analysis as detailed in the attached documentation.
>
> Covid-19 update: SGS Australia is open, with our Business Service Continuity Plans being put in place to ensure your project can be delivered as normal, please see the following links further details:
> 19 March 2020 Letter.
> 30 March 2020 Update.
>
> Best regards,
> SGS Alexandria Sample Administration Team
> SGS Australia Pty Ltd
> Phone: +61 (0)2 8594 0400
> Fax: +61 (0)2 8594 0499
>
>

--

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Admin
Client	NEO CONSULTING PTY LTD
Address	PO BOX 279 RIVERSTONE NSW 2765
Telephone	0416 680 375
Facsimile	(Not specified)
Email	admin@neoconsulting.com.au
Project	**N5148**
Order Number	**N5148**
Samples	7

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE224999 R0**
Date Received	25/10/2021
Date Reported	4/11/2021

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

SIGNATORIES

Akheeqar BENIAMEEN
Chemist

Bennet LO
Senior Chemist

Dong LIANG
Metals/Inorganics Team Leader

Kamrul AHSAN
Senior Chemist

Shane MCDERMOTT
Inorganic/Metals Chemist

Teresa NGUYEN
Organic Chemist

VOC's in Soil [AN433] Tested: 25/10/2021

PARAMETER	UOM	LOR	S1 SOIL - 22/10/2021 SE224999.001	S2 SOIL - 22/10/2021 SE224999.002	S3 SOIL - 22/10/2021 SE224999.003	S4 SOIL - 22/10/2021 SE224999.004	S5 SOIL - 22/10/2021 SE224999.005
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	S6 SOIL - 22/10/2021 SE224999.006
Benzene	mg/kg	0.1	<0.1
Toluene	mg/kg	0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2
o-xylene	mg/kg	0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 25/10/2021

PARAMETER	UOM	LOR	S1 SOIL - 22/10/2021 SE224999.001	S2 SOIL - 22/10/2021 SE224999.002	S3 SOIL - 22/10/2021 SE224999.003	S4 SOIL - 22/10/2021 SE224999.004	S5 SOIL - 22/10/2021 SE224999.005
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	S6 SOIL - 22/10/2021 SE224999.006
TRH C6-C9	mg/kg	20	<20
Benzene (F0)	mg/kg	0.1	<0.1
TRH C6-C10	mg/kg	25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 25/10/2021

PARAMETER	UOM	LOR	S1 SOIL - 22/10/2021 SE224999.001	S2 SOIL - 22/10/2021 SE224999.002	S3 SOIL - 22/10/2021 SE224999.003	S4 SOIL - 22/10/2021 SE224999.004	S5 SOIL - 22/10/2021 SE224999.005
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	S6 SOIL - 22/10/2021 SE224999.006
TRH C10-C14	mg/kg	20	<20
TRH C15-C28	mg/kg	45	<45
TRH C29-C36	mg/kg	45	<45
TRH C37-C40	mg/kg	100	<100
TRH >C10-C16	mg/kg	25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120
TRH C10-C36 Total	mg/kg	110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 29/10/2021

PARAMETER	UOM	LOR	S1 SOIL - 22/10/2021 SE224999.001	S2 SOIL - 22/10/2021 SE224999.002	S3 SOIL - 22/10/2021 SE224999.003	S4 SOIL - 22/10/2021 SE224999.004	S5 SOIL - 22/10/2021 SE224999.005
Arsenic, As	mg/kg	1	<1	2	1	2	<1
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	12	9.5	11	10	12
Copper, Cu	mg/kg	0.5	6.4	5.6	6.1	7.4	6.0
Lead, Pb	mg/kg	1	5	5	4	5	4
Nickel, Ni	mg/kg	0.5	10	12	12	17	11
Zinc, Zn	mg/kg	2	24	19	12	42	12

PARAMETER	UOM	LOR	S6 SOIL - 22/10/2021 SE224999.006
Arsenic, As	mg/kg	1	<1
Cadmium, Cd	mg/kg	0.3	<0.3
Chromium, Cr	mg/kg	0.5	10
Copper, Cu	mg/kg	0.5	6.3
Lead, Pb	mg/kg	1	12
Nickel, Ni	mg/kg	0.5	10
Zinc, Zn	mg/kg	2	12

Mercury in Soil [AN312] Tested: 29/10/2021

PARAMETER	UOM	LOR	S1 SOIL - 22/10/2021 SE224999.001	S2 SOIL - 22/10/2021 SE224999.002	S3 SOIL - 22/10/2021 SE224999.003	S4 SOIL - 22/10/2021 SE224999.004	S5 SOIL - 22/10/2021 SE224999.005
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

PARAMETER	UOM	LOR	S6 SOIL - 22/10/2021 SE224999.006
Mercury	mg/kg	0.05	<0.05

Moisture Content [AN002] Tested: 28/10/2021

PARAMETER	UOM	LOR	S1 SOIL - 22/10/2021 SE224999.001	S2 SOIL - 22/10/2021 SE224999.002	S3 SOIL - 22/10/2021 SE224999.003	S4 SOIL - 22/10/2021 SE224999.004	S5 SOIL - 22/10/2021 SE224999.005
% Moisture	%w/w	1	**16.3**	**14.2**	**16.1**	**13.7**	**15.3**

PARAMETER	UOM	LOR	S6 SOIL - 22/10/2021 SE224999.006
% Moisture	%w/w	1	**15.1**

VOCs in Water [AN433] Tested: 29/10/2021

PARAMETER	UOM	LOR	MW1 WATER - 22/10/2021 SE224999.007
Benzene	µg/L	0.5	<0.5
Toluene	µg/L	0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5
m/p-xylene	µg/L	1	<1
o-xylene	µg/L	0.5	<0.5
Total Xylenes	µg/L	1.5	<1.5
Total BTEX	µg/L	3	<3
Naphthalene	µg/L	0.5	<0.5

Volatile Petroleum Hydrocarbons in Water [AN433] Tested: 29/10/2021

PARAMETER	UOM	LOR	MW1 WATER - 22/10/2021 SE224999.007
TRH C6-C9	µg/L	40	<40
Benzene (F0)	µg/L	0.5	<0.5
TRH C6-C10	µg/L	50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50

TRH (Total Recoverable Hydrocarbons) in Water [AN403] Tested: 29/10/2021

PARAMETER	UOM	LOR	MW1 WATER - 22/10/2021 SE224999.007
TRH C10-C14	µg/L	50	<50
TRH C15-C28	µg/L	200	<200
TRH C29-C36	µg/L	200	<200
TRH C37-C40	µg/L	200	<200
TRH >C10-C16	µg/L	60	<60
TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60
TRH >C16-C34 (F3)	µg/L	500	<500
TRH >C34-C40 (F4)	µg/L	500	<500
TRH C10-C40	µg/L	320	<320

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 25/10/2021

PARAMETER	UOM	LOR	MW1 WATER - 22/10/2021 SE224999.007
Arsenic, As	µg/L	1	<1
Cadmium, Cd	µg/L	0.1	<0.1
Copper, Cu	µg/L	1	1
Chromium, Cr	µg/L	1	<1
Nickel, Ni	µg/L	1	<1
Lead, Pb	µg/L	1	<1
Zinc, Zn	µg/L	5	<5

Mercury (dissolved) in Water [AN311(Perth)/AN312] Tested: 26/10/2021

PARAMETER	UOM	LOR	MW1 WATER - 22/10/2021 SE224999.007
Mercury	mg/L	0.0001	<0.0001

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN311(Perth)/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid , mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser . Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN318	Determination of elements at trace level in waters by ICP-MS technique,, referenced to USEPA 6020B and USEPA 200.8 (5.4).
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents .
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		
***	Indicates that both * and ** apply.				

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

STATEMENT OF QA/QC PERFORMANCE

SE224999 R0

CLIENT DETAILS

Contact	Admin
Client	NEO CONSULTING PTY LTD
Address	PO BOX 279 RIVERSTONE NSW 2765
Telephone	0416 680 375
Facsimile	(Not specified)
Email	admin@neoconsulting.com.au
Project	**N5148**
Order Number	**N5148**
Samples	7

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE224999 R0**
Date Received	25 Oct 2021
Date Reported	04 Nov 2021

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Matrix Spike	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	1 item

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	6 Soil, 1 Water
Date documentation received	25/10/2021	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	10.0°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

SE224999 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Mercury (dissolved) in Water — Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	SE224999.007	LB235542	22 Oct 2021	25 Oct 2021	19 Nov 2021	26 Oct 2021	19 Nov 2021	26 Oct 2021

Mercury in Soil — Method: ME-(AU)-[ENV]AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
S1	SE224999.001	LB235842	22 Oct 2021	25 Oct 2021	19 Nov 2021	29 Oct 2021	19 Nov 2021	01 Nov 2021
S2	SE224999.002	LB235842	22 Oct 2021	25 Oct 2021	19 Nov 2021	29 Oct 2021	19 Nov 2021	01 Nov 2021
S3	SE224999.003	LB235842	22 Oct 2021	25 Oct 2021	19 Nov 2021	29 Oct 2021	19 Nov 2021	01 Nov 2021
S4	SE224999.004	LB235842	22 Oct 2021	25 Oct 2021	19 Nov 2021	29 Oct 2021	19 Nov 2021	01 Nov 2021
S5	SE224999.005	LB235842	22 Oct 2021	25 Oct 2021	19 Nov 2021	29 Oct 2021	19 Nov 2021	01 Nov 2021
S6	SE224999.006	LB235842	22 Oct 2021	25 Oct 2021	19 Nov 2021	29 Oct 2021	19 Nov 2021	01 Nov 2021

Moisture Content — Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
S1	SE224999.001	LB235752	22 Oct 2021	25 Oct 2021	05 Nov 2021	28 Oct 2021	02 Nov 2021	01 Nov 2021
S2	SE224999.002	LB235752	22 Oct 2021	25 Oct 2021	05 Nov 2021	28 Oct 2021	02 Nov 2021	01 Nov 2021
S3	SE224999.003	LB235752	22 Oct 2021	25 Oct 2021	05 Nov 2021	28 Oct 2021	02 Nov 2021	01 Nov 2021
S4	SE224999.004	LB235752	22 Oct 2021	25 Oct 2021	05 Nov 2021	28 Oct 2021	02 Nov 2021	01 Nov 2021
S5	SE224999.005	LB235752	22 Oct 2021	25 Oct 2021	05 Nov 2021	28 Oct 2021	02 Nov 2021	01 Nov 2021
S6	SE224999.006	LB235752	22 Oct 2021	25 Oct 2021	05 Nov 2021	28 Oct 2021	02 Nov 2021	01 Nov 2021

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES — Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
S1	SE224999.001	LB235833	22 Oct 2021	25 Oct 2021	20 Apr 2022	29 Oct 2021	20 Apr 2022	01 Nov 2021
S2	SE224999.002	LB235833	22 Oct 2021	25 Oct 2021	20 Apr 2022	29 Oct 2021	20 Apr 2022	01 Nov 2021
S3	SE224999.003	LB235833	22 Oct 2021	25 Oct 2021	20 Apr 2022	29 Oct 2021	20 Apr 2022	01 Nov 2021
S4	SE224999.004	LB235833	22 Oct 2021	25 Oct 2021	20 Apr 2022	29 Oct 2021	20 Apr 2022	01 Nov 2021
S5	SE224999.005	LB235833	22 Oct 2021	25 Oct 2021	20 Apr 2022	29 Oct 2021	20 Apr 2022	01 Nov 2021
S6	SE224999.006	LB235833	22 Oct 2021	25 Oct 2021	20 Apr 2022	29 Oct 2021	20 Apr 2022	01 Nov 2021

Trace Metals (Dissolved) in Water by ICPMS — Method: ME-(AU)-[ENV]AN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	SE224999.007	LB235459	22 Oct 2021	25 Oct 2021	20 Apr 2022	25 Oct 2021	20 Apr 2022	26 Oct 2021

TRH (Total Recoverable Hydrocarbons) in Soil — Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
S1	SE224999.001	LB235500	22 Oct 2021	25 Oct 2021	05 Nov 2021	25 Oct 2021	04 Dec 2021	01 Nov 2021
S2	SE224999.002	LB235500	22 Oct 2021	25 Oct 2021	05 Nov 2021	25 Oct 2021	04 Dec 2021	01 Nov 2021
S3	SE224999.003	LB235500	22 Oct 2021	25 Oct 2021	05 Nov 2021	25 Oct 2021	04 Dec 2021	01 Nov 2021
S4	SE224999.004	LB235500	22 Oct 2021	25 Oct 2021	05 Nov 2021	25 Oct 2021	04 Dec 2021	01 Nov 2021
S5	SE224999.005	LB235500	22 Oct 2021	25 Oct 2021	05 Nov 2021	25 Oct 2021	04 Dec 2021	01 Nov 2021
S6	SE224999.006	LB235500	22 Oct 2021	25 Oct 2021	05 Nov 2021	25 Oct 2021	04 Dec 2021	01 Nov 2021

TRH (Total Recoverable Hydrocarbons) in Water — Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	SE224999.007	LB235810	22 Oct 2021	25 Oct 2021	29 Oct 2021	29 Oct 2021	08 Dec 2021	02 Nov 2021

VOC's in Soil — Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
S1	SE224999.001	LB235509	22 Oct 2021	25 Oct 2021	05 Nov 2021	25 Oct 2021	05 Nov 2021	01 Nov 2021
S2	SE224999.002	LB235509	22 Oct 2021	25 Oct 2021	05 Nov 2021	25 Oct 2021	05 Nov 2021	01 Nov 2021
S3	SE224999.003	LB235509	22 Oct 2021	25 Oct 2021	05 Nov 2021	25 Oct 2021	05 Nov 2021	01 Nov 2021
S4	SE224999.004	LB235509	22 Oct 2021	25 Oct 2021	05 Nov 2021	25 Oct 2021	05 Nov 2021	01 Nov 2021
S5	SE224999.005	LB235509	22 Oct 2021	25 Oct 2021	05 Nov 2021	25 Oct 2021	05 Nov 2021	01 Nov 2021
S6	SE224999.006	LB235509	22 Oct 2021	25 Oct 2021	05 Nov 2021	25 Oct 2021	05 Nov 2021	01 Nov 2021

VOCs in Water — Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	SE224999.007	LB235818	22 Oct 2021	25 Oct 2021	05 Nov 2021	29 Oct 2021	05 Nov 2021	01 Nov 2021

HOLDING TIME SUMMARY

SE224999 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Volatile Petroleum Hydrocarbons in Soil — Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
S1	SE224999.001	LB235509	22 Oct 2021	25 Oct 2021	05 Nov 2021	25 Oct 2021	05 Nov 2021	01 Nov 2021
S2	SE224999.002	LB235509	22 Oct 2021	25 Oct 2021	05 Nov 2021	25 Oct 2021	05 Nov 2021	01 Nov 2021
S3	SE224999.003	LB235509	22 Oct 2021	25 Oct 2021	05 Nov 2021	25 Oct 2021	05 Nov 2021	01 Nov 2021
S4	SE224999.004	LB235509	22 Oct 2021	25 Oct 2021	05 Nov 2021	25 Oct 2021	05 Nov 2021	01 Nov 2021
S5	SE224999.005	LB235509	22 Oct 2021	25 Oct 2021	05 Nov 2021	25 Oct 2021	05 Nov 2021	01 Nov 2021
S6	SE224999.006	LB235509	22 Oct 2021	25 Oct 2021	05 Nov 2021	25 Oct 2021	05 Nov 2021	01 Nov 2021

Volatile Petroleum Hydrocarbons in Water — Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	SE224999.007	LB235818	22 Oct 2021	25 Oct 2021	05 Nov 2021	29 Oct 2021	05 Nov 2021	01 Nov 2021

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	S1	SE224999.001	%	60 - 130%	80
	S2	SE224999.002	%	60 - 130%	78
	S3	SE224999.003	%	60 - 130%	82
	S4	SE224999.004	%	60 - 130%	77
	S5	SE224999.005	%	60 - 130%	66
	S6	SE224999.006	%	60 - 130%	65
d4-1,2-dichloroethane (Surrogate)	S1	SE224999.001	%	60 - 130%	83
	S2	SE224999.002	%	60 - 130%	82
	S3	SE224999.003	%	60 - 130%	87
	S4	SE224999.004	%	60 - 130%	77
	S5	SE224999.005	%	60 - 130%	74
	S6	SE224999.006	%	60 - 130%	75
d8-toluene (Surrogate)	S1	SE224999.001	%	60 - 130%	83
	S2	SE224999.002	%	60 - 130%	82
	S3	SE224999.003	%	60 - 130%	87
	S4	SE224999.004	%	60 - 130%	82
	S5	SE224999.005	%	60 - 130%	71
	S6	SE224999.006	%	60 - 130%	74

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	MW1	SE224999.007	%	40 - 130%	106
d4-1,2-dichloroethane (Surrogate)	MW1	SE224999.007	%	40 - 130%	99
d8-toluene (Surrogate)	MW1	SE224999.007	%	40 - 130%	100

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	S1	SE224999.001	%	60 - 130%	80
	S2	SE224999.002	%	60 - 130%	78
	S3	SE224999.003	%	60 - 130%	82
	S4	SE224999.004	%	60 - 130%	77
	S5	SE224999.005	%	60 - 130%	66
	S6	SE224999.006	%	60 - 130%	65
d4-1,2-dichloroethane (Surrogate)	S1	SE224999.001	%	60 - 130%	83
	S2	SE224999.002	%	60 - 130%	82
	S3	SE224999.003	%	60 - 130%	87
	S4	SE224999.004	%	60 - 130%	77
	S5	SE224999.005	%	60 - 130%	74
	S6	SE224999.006	%	60 - 130%	75
d8-toluene (Surrogate)	S1	SE224999.001	%	60 - 130%	83
	S2	SE224999.002	%	60 - 130%	82
	S3	SE224999.003	%	60 - 130%	87
	S4	SE224999.004	%	60 - 130%	82
	S5	SE224999.005	%	60 - 130%	71
	S6	SE224999.006	%	60 - 130%	74

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	MW1	SE224999.007	%	40 - 130%	106
d4-1,2-dichloroethane (Surrogate)	MW1	SE224999.007	%	60 - 130%	99
d8-toluene (Surrogate)	MW1	SE224999.007	%	40 - 130%	100

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Number	Parameter	Units	LOR	Result
LB235542.001	Mercury	mg/L	0.0001	<0.0001

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result
LB235842.001	Mercury	mg/kg	0.05	<0.05

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result
LB235833.001	Arsenic, As	mg/kg	1	<1
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.5	<0.5
	Copper, Cu	mg/kg	0.5	<0.5
	Nickel, Ni	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Zinc, Zn	mg/kg	2	<2.0

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB235459.001	Arsenic, As	µg/L	1	<1
	Cadmium, Cd	µg/L	0.1	<0.1
	Chromium, Cr	µg/L	1	<1
	Copper, Cu	µg/L	1	<1
	Lead, Pb	µg/L	1	<1
	Nickel, Ni	µg/L	1	<1
	Zinc, Zn	µg/L	5	<5

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB235500.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	45	<45
	TRH C29-C36	mg/kg	45	<45
	TRH C37-C40	mg/kg	100	<100
	TRH C10-C36 Total	mg/kg	110	<110

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB235810.001	TRH C10-C14	µg/L	50	<50
	TRH C15-C28	µg/L	200	<200
	TRH C29-C36	µg/L	200	<200
	TRH C37-C40	µg/L	200	<200

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB235509.001	Monocyclic Aromatic Hydrocarbons	Benzene	mg/kg	0.1	<0.1
		Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	88
		d8-toluene (Surrogate)	%	-	86
		Bromofluorobenzene (Surrogate)	%	-	82
	Totals	Total BTEX	mg/kg	0.6	<0.3

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB235818.001	Monocyclic Aromatic Hydrocarbons	Benzene	µg/L	0.5	<0.5
		Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5
		m/p-xylene	µg/L	1	<1

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB235818.001	Monocyclic Aromatic	o-xylene	µg/L	0.5	<0.5
	Polycyclic VOCs	Naphthalene	µg/L	0.5	<0.5
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	88
		d8-toluene (Surrogate)	%	-	101
		Bromofluorobenzene (Surrogate)	%	-	96

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB235509.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	88

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB235818.001		TRH C6-C9	µg/L	40	<40
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	88
		d8-toluene (Surrogate)	%	-	101
		Bromofluorobenzene (Surrogate)	%	-	96

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE224994.029	LB235542.014	Mercury	µg/L	0.0001	<0.0001	<0.0001	200	190
SE224999.007	LB235542.017	Mercury	µg/L	0.0001	<0.0001	<0.0001	200	199

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE224999.002	LB235842.014	Mercury	mg/kg	0.05	<0.05	<0.05	200	0
SE225037.002	LB235842.024	Mercury	mg/kg	0.05	<0.05	<0.05	200	0

Moisture Content

Method: ME-(AU)-[ENV]AN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE225000.004	LB235752.011	% Moisture	%w/w	1	16.5	17.0	36	3
SE225001.006	LB235752.020	% Moisture	%w/w	1	13.6	12.7	38	7

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE224999.002	LB235833.014	Arsenic, As	mg/kg	1	2	1	85	43
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	9.5	7.7	36	20
		Copper, Cu	mg/kg	0.5	5.6	4.4	40	24
		Nickel, Ni	mg/kg	0.5	12	11	34	8
		Lead, Pb	mg/kg	1	5	4	53	13
		Zinc, Zn	mg/kg	2	19	15	42	26
SE225037.002	LB235833.024	Arsenic, As	mg/kg	1	6	5	49	8
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	8.6	9.0	36	5
		Copper, Cu	mg/kg	0.5	20	22	32	8
		Nickel, Ni	mg/kg	0.5	9.9	11	35	8
		Lead, Pb	mg/kg	1	10	12	39	15
		Zinc, Zn	mg/kg	2	67	74	33	11

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE224933.002	LB235459.014	Chromium, Cr	µg/L	1	3	3	45	3
		Copper, Cu	µg/L	1	<1	<1	173	0
		Zinc, Zn	µg/L	5	9	9	72	4
SE224978.004	LB235459.028	Arsenic, As	µg/L	1	2	2	66	0
		Cadmium, Cd	µg/L	0.1	<0.1	<0.1	200	0
		Chromium, Cr	µg/L	1	1	<1	114	3
		Copper, Cu	µg/L	1	2	2	75	2
		Lead, Pb	µg/L	1	<1	<1	200	0
		Nickel, Ni	µg/L	1	3	3	51	2
		Zinc, Zn	µg/L	5	120	120	19	1
SE224999.007	LB235459.033	Arsenic, As	µg/L	1	<1	<1	200	0
		Cadmium, Cd	µg/L	0.1	<0.1	<0.1	200	0
		Chromium, Cr	µg/L	1	<1	<1	200	0
		Copper, Cu	µg/L	1	1	1	97	2
		Lead, Pb	µg/L	1	<1	<1	200	0
		Nickel, Ni	µg/L	1	<1	<1	200	0
		Zinc, Zn	µg/L	5	<5	<5	200	0

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE225000.004	LB235500.014		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

TRH (Total Recoverable Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE225000.004	LB235500.014	TRH F Bands	TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0
SE225000.005	LB235500.025		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE225069.001	LB235810.025		TRH C10-C14	µg/L	50	<50	<50	200	0
			TRH C15-C28	µg/L	200	440	390	79	12
			TRH C29-C36	µg/L	200	<200	<200	200	0
			TRH C37-C40	µg/L	200	<200	<200	200	0
			TRH C10-C40	µg/L	320	440	390	108	12
		TRH F Bands	TRH >C10-C16	µg/L	60	<60	<60	200	0
			TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60	<60	200	0
			TRH >C16-C34 (F3)	µg/L	500	<500	<500	200	0
			TRH >C34-C40 (F4)	µg/L	500	<500	<500	200	0

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE225000.004	LB235509.014	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
			Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.1	7.3	50	11
			d8-toluene (Surrogate)	mg/kg	-	8.0	7.0	50	13
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.2	6.4	50	12
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.3	200	0
SE225001.006	LB235509.023	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
			Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	176	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	7.3	7.8	50	8
			d8-toluene (Surrogate)	mg/kg	-	7.1	7.7	50	8
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.1	7.5	50	6
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	194	0
			Total BTEX	mg/kg	0.6	<0.6	<0.3	200	0

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE225123.004	LB235818.021	Monocyclic Aromatic	Benzene	µg/L	0.5	<0.5	<0.5	200	0
			Toluene	µg/L	0.5	<0.5	<0.5	200	0
			Ethylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			m/p-xylene	µg/L	1	<1	<1	200	0
			o-xylene	µg/L	0.5	<0.5	<0.5	200	0
		Polycyclic	Naphthalene	µg/L	0.5	<0.5	<0.5	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.8	9.7	30	0
			d8-toluene (Surrogate)	µg/L	-	10.0	11.1	30	11
			Bromofluorobenzene (Surrogate)	µg/L	-	10.5	10.2	30	2

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE225000.004	LB235509.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.1	7.3	30	11
			d8-toluene (Surrogate)	mg/kg	-	8.0	7.0	30	13
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.2	6.4	30	12
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE225001.006	LB235509.023		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	7.3	7.8	30	8
			d8-toluene (Surrogate)	mg/kg	-	7.1	7.7	30	8
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.1	7.5	30	6
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE225123.004	LB235818.021		TRH C6-C10	µg/L	50	<50	<50	200	0
			TRH C6-C9	µg/L	40	<40	<40	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.8	9.7	30	0
			d8-toluene (Surrogate)	µg/L	-	10.0	11.1	30	11
			Bromofluorobenzene (Surrogate)	µg/L	-	10.5	10.2	30	2
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	<0.5	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	200	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB235842.002	Mercury	mg/kg	0.05	0.21	0.2	70 - 130	104

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB235833.002	Arsenic, As	mg/kg	1	340	318.22	80 - 120	105
	Cadmium, Cd	mg/kg	0.3	3.6	4.81	70 - 130	74
	Chromium, Cr	mg/kg	0.5	36	38.31	80 - 120	94
	Copper, Cu	mg/kg	0.5	310	290	80 - 120	106
	Nickel, Ni	mg/kg	0.5	180	187	80 - 120	97
	Lead, Pb	mg/kg	1	90	89.9	80 - 120	100
	Zinc, Zn	mg/kg	2	270	273	80 - 120	99

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB235459.002	Arsenic, As	µg/L	1	20	20	80 - 120	99
	Cadmium, Cd	µg/L	0.1	22	20	80 - 120	108
	Chromium, Cr	µg/L	1	21	20	80 - 120	106
	Copper, Cu	µg/L	1	21	20	80 - 120	105
	Lead, Pb	µg/L	1	20	20	80 - 120	100
	Nickel, Ni	µg/L	1	21	20	80 - 120	105
	Zinc, Zn	µg/L	5	23	20	80 - 120	114

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB235500.002		TRH C10-C14	mg/kg	20	45	40	60 - 140	113
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	110
		TRH C29-C36	mg/kg	45	48	40	60 - 140	120
	TRH F Bands	TRH >C10-C16	mg/kg	25	47	40	60 - 140	118
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	118
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	105

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB235810.002		TRH C10-C14	µg/L	50	1200	1200	60 - 140	101
		TRH C15-C28	µg/L	200	1300	1200	60 - 140	107
		TRH C29-C36	µg/L	200	1400	1200	60 - 140	119
	TRH F Bands	TRH >C10-C16	µg/L	60	1300	1200	60 - 140	107
		TRH >C16-C34 (F3)	µg/L	500	1500	1200	60 - 140	124
		TRH >C34-C40 (F4)	µg/L	500	730	600	60 - 140	122

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB235509.002	Monocyclic Aromatic	Benzene	mg/kg	0.1	3.8	5	60 - 140	76
		Toluene	mg/kg	0.1	3.9	5	60 - 140	78
		Ethylbenzene	mg/kg	0.1	4.1	5	60 - 140	82
		m/p-xylene	mg/kg	0.2	9.2	10	60 - 140	92
		o-xylene	mg/kg	0.1	4.5	5	60 - 140	89
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.3	10	70 - 130	93
		d8-toluene (Surrogate)	mg/kg	-	9.2	10	70 - 130	92
		Bromofluorobenzene (Surrogate)	mg/kg	-	8.4	10	70 - 130	84

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB235818.002	Monocyclic Aromatic	Benzene	µg/L	0.5	52	45.45	60 - 140	115
		Toluene	µg/L	0.5	50	45.45	60 - 140	111
		Ethylbenzene	µg/L	0.5	48	45.45	60 - 140	105
		m/p-xylene	µg/L	1	99	90.9	60 - 140	108
		o-xylene	µg/L	0.5	49	45.45	60 - 140	108
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.1	10	60 - 140	101
		d8-toluene (Surrogate)	µg/L	-	10.2	10	70 - 130	102
		Bromofluorobenzene (Surrogate)	µg/L	-	9.5	10	70 - 130	95

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Volatile Petroleum Hydrocarbons in Soil — Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB235509.002		TRH C6-C10	mg/kg	25	72	92.5	60 - 140	78
		TRH C6-C9	mg/kg	20	64	80	60 - 140	80
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.3	10	70 - 130	93
		Bromofluorobenzene (Surrogate)	mg/kg	-	8.4	10	70 - 130	84
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	46	62.5	60 - 140	74

Volatile Petroleum Hydrocarbons in Water — Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB235818.002		TRH C6-C10	µg/L	50	1100	946.63	60 - 140	114
		TRH C6-C9	µg/L	40	920	818.71	60 - 140	112
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.1	10	60 - 140	101
		d8-toluene (Surrogate)	µg/L	-	10.2	10	70 - 130	102
		Bromofluorobenzene (Surrogate)	µg/L	-	9.5	10	70 - 130	95
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	780	639.67	60 - 140	122

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE224994.001	LB235542.004	Mercury	mg/L	0.0001	0.0014	<0.0001	0.008	72

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE224981.001	LB235842.004	Mercury	mg/kg	0.05	0.23	<0.05	0.2	99

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE224981.001	LB235833.004	Arsenic, As	mg/kg	1	41	6	50	70
		Cadmium, Cd	mg/kg	0.3	36	<0.3	50	72
		Chromium, Cr	mg/kg	0.5	48	13	50	70
		Copper, Cu	mg/kg	0.5	56	20	50	72
		Nickel, Ni	mg/kg	0.5	46	10	50	72
		Lead, Pb	mg/kg	1	44	8	50	71
		Zinc, Zn	mg/kg	2	62	29	50	66 ⑨

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE224978.006	LB235459.030	Arsenic, As	µg/L	1	26	<1	20	128
		Cadmium, Cd	µg/L	0.1	24	<0.1	20	117
		Chromium, Cr	µg/L	1	24	<1	20	119
		Copper, Cu	µg/L	1	43	20	20	113
		Lead, Pb	µg/L	1	21	<1	20	105
		Nickel, Ni	µg/L	1	25	2	20	116
		Zinc, Zn	µg/L	5	140	120	20	127

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE224999.001	LB235500.004		TRH C10-C14	mg/kg	20	48	<20	40	120
			TRH C15-C28	mg/kg	45	46	<45	40	115
			TRH C29-C36	mg/kg	45	49	<45	40	123
			TRH C37-C40	mg/kg	100	<100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	140	<110	-	-
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	-	-
		TRH F Bands	TRH >C10-C16	mg/kg	25	50	<25	40	125
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	50	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	40	125
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	-	-

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE224999.001	LB235509.004	Monocyclic Aromatic	Benzene	mg/kg	0.1	3.2	<0.1	5	63
			Toluene	mg/kg	0.1	3.3	<0.1	5	65
			Ethylbenzene	mg/kg	0.1	3.5	<0.1	5	70
			m/p-xylene	mg/kg	0.2	7.9	<0.2	10	79
			o-xylene	mg/kg	0.1	3.9	<0.1	5	77
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.4	8.3	10	84
			d8-toluene (Surrogate)	mg/kg	-	8.3	8.3	10	83
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.6	8.0	10	76
		Totals	Total Xylenes	mg/kg	0.3	12	<0.3	-	-
			Total BTEX	mg/kg	0.6	22	<0.6	-	-

VOCs in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE224999.007	LB235818.022	Monocyclic Aromatic	Benzene	µg/L	0.5	<0.5	45.45	108
			Toluene	µg/L	0.5	<0.5	45.45	119
			Ethylbenzene	µg/L	0.5	<0.5	45.45	114
			m/p-xylene	µg/L	1	<1	90.9	113

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE224999.007	LB235818.022	Monocyclic	o-xylene	µg/L	0.5	<0.5	45.45	112
		Polycyclic	Naphthalene	µg/L	0.5	<0.5	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.9	-	62
			d8-toluene (Surrogate)	µg/L	-	10.0	-	95
			Bromofluorobenzene (Surrogate)	µg/L	-	10.6	-	96

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE224999.001	LB235509.004		TRH C6-C10	mg/kg	25	62	<25	92.5	67
			TRH C6-C9	mg/kg	20	56	<20	80	69
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.4	8.3	10	84
			d8-toluene (Surrogate)	mg/kg	-	8.3	8.3	10	83
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.6	8.0	-	76
		VPH F	Benzene (F0)	mg/kg	0.1	3.2	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	40	<25	62.5	64

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE224999.007	LB235818.022		TRH C6-C10	µg/L	50	980	<50	946.63	104
			TRH C6-C9	µg/L	40	860	<40	818.71	105
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	0.0	9.9	-	62
			d8-toluene (Surrogate)	µg/L	-	0.0	10.0	-	95
			Bromofluorobenzene (Surrogate)	µg/L	-	0.0	10.6	-	96
		VPH F	Benzene (F0)	µg/L	0.5		<0.5	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	670	<50	639.67	105

MATRIX SPIKE DUPLICATES

SE224999 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the

No matrix spike duplicates were required for this job.

id samples expressed on a dry weight basis.

criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found he
ps://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service .
**	Indicative data, theoretical holding time exceeded.
***	Indicates that both * and ** apply.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.
①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to relevant report comments for further information.