Section 75 W Modification
MP 06_0089 - Modification 2

ENVIRONMENTAL ASSESSMENT

Vopak Terminals Sydney Pty Ltd

Site B Bulk Liquids Storage Terminal

1-9 and 20 Friendship Rd

Port Botany

23 November 2016

PlanCom
PLANNING FOR COMMUNITIES

Statement of Validity

This Environmental Assessment has been prepared and submitted under Part 3A of the Environmental Planning and Assessment Act 1979 (as amended) by:

Name	Julian Ardas
Qualifications	BSc (Applied Economic Geography) Hons, Master of Urban & Regional Planning, MPIA, CPP, MEIANZ
Company	PlanCom Consulting Pty Ltd
Address	Suite 13, 12A Springfield Mall, Potts Point, NSW 2011
In respect of	Modification 2 to Project Approval MP 06_0089
Environmental Assessment	An Environmental Assessment (EA) is attached

Application to Modify Project Approval

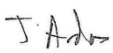
Applicant	Vopak Terminals Sydney Pty Ltd
Address	1-9 and 20 Friendship Rd Port Botany
Land to be developed	As Above
Modification	Various works to increase throughput of petroleum product at the existing Site B facility at Port Botany

Environmental Assessment

An Environmental Assessment (EA) is attached

Certificate — I certify that I have prepared the content of this Environmental Assessment and to the best of my knowledge:

- It is in accordance with the Environmental Planning and Assessment Act and Regulation.
- It is true in all material particulars and does not, by its presentation or omission of information, materially mislead.

Signature 

Name Julian Ardas

Date 23 November 2016

Executive Summary

This Environmental Assessment (EA) has been prepared by PlanCom Consulting Pty Ltd (PlanCom) on behalf of Vopak Terminals Sydney Pty Ltd (Vopak) for the Site B Bulk Liquids Storage Facility at 1-9 & 20 Friendship Road Port Botany. The EA considers the environmental impacts associated with the proposal to modify Project Approval (06_0089) for the Vopak Site B Bulk Liquids Storage Facility and Associated Infrastructure dated 28 February 2007 in accordance with Section 75 W of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The purpose of this EA is to:

- Describe the existing site and its surrounding context
- Present the project need, its justification and alternatives considered
- Identify and evaluate all matters affecting or likely to affect the environment
- Consider the relevant statutory framework as required under Section 75 W of the EP&A Act and other relevant legislation
- Consider and respond to matters raised by Department of Planning and Environment (DP&E) in the Secretary's Environmental Assessment Requirements (SEARs)
- Consult with NSW Ports, Randwick City Council, Environment Protection Authority, WorkCover NSW and Roads and Maritime Services
- Assess the environmental impacts of the modification to the Bulk Liquids Storage Facility
- Develop environmental management and mitigation measures to minimise potential environmental impacts identified for the proposed modification.

The proposed site is located at 1-9 Friendship Road (Lot 21 in DP 1045324) and 20 Friendship Road, Port Botany (Lot 10 DP 1126332).

Property details forming the proposed western entry lease extension include Lot 21 DP 1126332 (Elgas Cavern site) and Lot 52 DP 1182618 (Fishburn Road and the intersection of Simblist Road and Friendship Road).

Vopak holds a 20-year lease with an extension option over the current site from NSW Ports.

The capital costs of the proposed modification are of the order of $25 million.

The approved Site B facility operates as an integrated bulk liquids storage and supply facility.

There are range of ancillary services that complement the facility, including control rooms, workshops, road tanker loading gantry, waste water treatment plant, connections to NSW Ports and petroleum industry infrastructure and staff amenities.

The existing Site B Terminal is adjacent to the Bulk Liquids Berths (No.1 and No.2 which was completed in 2013) so that petroleum products can be imported and exported from/to sea tankers.

The original Application in 2007 assumed that almost 50% of the Terminal throughput would be by pipeline export but this has not been the case in practice. The majority (approximately 70%) has been by Road Tanker export.

There is however a trend to increase output through the Jet Fuel and Caltex Transfer Pipeline (CTP) pipeline systems.

The original 2007 Application also contained a very low expectation of export to coastal shipping which is now subject to natural growth as well as a further increase anticipated as Sydney is becoming a fuel hub (not only an end-destination) with Australia's refineries closing. This means

larger vessels will discharge fuels in Port Botany which will be re-exported from Vopak to smaller vessels to be redistributed to ports along the East Coast or into New Zealand. The proposed growth in exports to 2,000ML/y is likely to occur gradually over the next 15 years.

At present the total approved product throughput is 3,950,000 m³ (3,950 ML) per year and it is proposed to increase the total product throughput to 7,800,000 m³ (7,800 ML) per year comprising the following breakdown by delivery mode:

	Output by Road Tanker (m³)	Output by Pipeline (m³)	Output by Sea (m³)	Total Throughput (m³)
Future Total Site B Output	3,700,000 (47%) (Includes Jet by road)	2,100,000 (27%)	2,000,000 (26%)	7,800,000 (100%)
***Existing Approved Total Site B Output**	1,897,500 (48%) (Also includes 150,000 m³ of jetfuel by Road Tanker)	1,867,500 (47%)	185,000 (5%)	3,950,000 (100%)

*Refer to Section 5.2.8 Modification to Conditions of Approval

The changes to the Site B Facility include the following:

- West Entry Northern Approach Roadways - requiring the need to lease an additional 2,870 m² of land from NSW Ports to the north and west of Site B plus the modification to the Simblist Road intersection with Friendship Road.
- Construction of Three New Road Tanker Loading Bays (Bays 7, 8 & 9).
- Installation of additional transfer pumps and product supply pipelines to existing RT Pump Manifolds.
- Construction of One Road Tanker Unloading Bay for Biofuels, Additives and other ancillary products together with RT unloading pumps.
- Construction of a New Drivers' Amenities Building at Fishburn Road entrance.

- Construction of a steel framed awning (19m x 1.9m wide) on the northern side of the existing Control Room Building.
  - Vapour Recovery Unit - this would be required when the current Vapour Recovery Unit reaches capacity. The Vapour Recovery Capability can be increased by upgrading the existing VRU, replacing the existing VRU or installing a second VRU alongside the existing unit or a combination of these.
  - Ship Import debottlenecking of inlet manifolds, tank import pipelines and tank inlets, inclusive of tank-to-tank and tank recirculation piping and pump facilities as well as instrumentation for quantity and quality control to increase flowrates.
  - Ship Export debottlenecking of tank outlets, tank export pipelines and transfer pumps as well as instrumentation for quantity and quality control to increase flowrates.
  - Civil, Structural, Piping, Electrical and Instrumentation Works for the above.
  - Increase in the size of the approved Warehouse (8m x 12m) near the Fire Pump House. The proposal is to extend the Warehouse to be 12m x 20m.
  - Modification of several conditions of Project Approval (06_0089).
  - Clarification of Vopak's ability to change products.

The work would be staged in the following manner:

Stage 1

Stage 1 is scheduled to commence construction over a period of 6 months and is likely to involve the following activities:

- Construction of Road Tanker Loading Bay 7 and additional RT pumps and supply pipelines
- Vapour Recovery Unit Project
- Construction of a steel framed awning (19m x 1.9m wide) on the northern side of the existing Control Room Building.
- Maintain existing Road Tanker entry from Friendship Road
- Maintain existing Road Tanker exit to Friendship Road
- Construction of Road Tanker Unloading Bay and RT unloading pumps
- Progressive Ship Import debottlenecking of inlet manifolds, tank import pipelines and tank inlets, inclusive of tank-to-tank and tank recirculation piping and pump facilities as well as installation of tank mixers. Upgrades will be prioritised and subject to tank maintenance outages
- Progressive Ship Export debottlenecking of tank outlets, tank export pipelines and transfer pumps. Upgrades will be prioritised and subject to tank maintenance outages
- Civil, Structural, Piping, Electrical and Instrumentation Works for the above
- Increase the size of the warehouse.

Stage 2

Stage 2 is scheduled to commence construction over a period of 12 months and is likely to involve the following activities:

- Construction of Road Tanker Loading Bays 8 & 9 and additional RT pumps and supply pipelines
- Construction of a new Road Tanker entry from Fishburn Road via an easement adjacent to Elgas (Elgas Road) from Friendship Road and modification to the Simblist Road/ Friendship Road intersection
- New Drivers' Amenities Building at Fishburn Road entrance
- Progressive Ship Import debottlenecking of inlet manifolds, tank import pipelines and tank inlets, inclusive of tank-to-tank and tank recirculation piping and pump facilities as well as installation of tank mixers. Upgrades will be prioritised and subject to tank maintenance outages
- Progressive Ship Export debottlenecking of tank outlets, tank export pipelines and transfer pumps. Upgrades will be prioritised and subject to tank maintenance outages
- Civil, Structural, Piping, Electrical and Instrumentation Works for the above.

Ongoing maintenance and enabling works will be undertaken, as required, throughout the life of the project for the entire site. This includes the construction, installation, and the ongoing maintenance, repair, replacement and / or removal of:

- fittings, fixtures and infrastructure
- truck parking areas (for full and empty trucks), car parking areas, and other paving works
- landscaping, lighting, utilities and service facilities, security cameras and devices
- temporary uses
- change of products within tanks, and other minor works such as installation of pipelines between tanks and loading / unloading facilities
- Works for the purposes of pollution control, work health and safety measures, and environmental protection will also be carried out to ensure the site operates in a safe and environmentally responsible manner.

The EA has found the modification to not have a potentially significant impact on the environment. Appropriate safeguards and mitigation measures were developed to minimise potential impacts during construction and operation. Where relevant, amendments were made to the consolidated Statement of Commitments.

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Acronyms and Abbreviations

AQIA	Air Quality Impact Assessment
BLB	Bulk Liquids Berth
CASA	Civil Aviation Safety Authority
CO	Carbon Monoxide
CTMP	Construction Traffic Management Plan
dB(A)	Decibels (A-weighted)
DG	Dangerous Goods
DP	Deposited Plan
DP&E	Department of Planning and Environment
DWT	Deadweight Tonnage
ENCM	Environmental Noise Control Manual
EP&A Act	Environmental Planning and Assessment Act
EPBC Act	Environment Protection Biodiversity and Conservation Act
ESD	Ecologically Sustainable Development
GHG	Greenhouse Gases
ha	Hectares
INP	Industrial Noise Policy
JORTL	Jointly Operated Road Tanker Loading Facility (for LPG)
km	Kilometre
kW	Kilowatts
$L_{A\ number}$	Level of noise at maximum sound power levels for only brief stages during a measured period
L_{A90}	Level of noise exceeded for 90% of the sample time; it represents the background level of noise experienced during the measurement period.
LPG	Liquefied Petroleum Gas
m	Metres
m^3	Cubic metres
m^3/hr	Cubic metres per hour
mg/L	Milligram per litre
mg/m^3	Milligram per cubic metre
ML	Megalitre (1,000,000 litres)
mm	Millimetres

NO_x	Oxides of Nitrogen
NSW Ports	NSW Ports
OEH	NSW Office of Environment and Heritage
PHA	Preliminary Hazard Analysis
POEO Act	Protection of the Environment Operations Act
PULP	Premium Unleaded Petroleum
QRA	Quantitative Risk Assessment
RL	Reduced Level
RNP	Road Noise Policy
RTA	Roads and Traffic Authority (now Roads and Maritime Services)
RMS	Roads and Maritime Services
RT	Road Tanker
RTL	Road Tanker Loading facility
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
Site A	Relates to Vopak Site A Terminal at 49 Friendship Road Port Botany for storage and distribution of Bitumen
Site B	Relates to Vopak Site B Terminal at 1-9 and 20 Friendship Road Port Botany for storage and distribution of petroleum bulk liquids
SPC	Sydney Ports Corporation
The Code	Generic term to mean the appropriate applicable Australian Standard / Act / Regulation or Recognised Code of Practice as the basis for design and equipment requirements.
TSC Act	Threatened Species Conservation Act
µg	Micrograms
ULP	Unleaded Petroleum
VOC	Volatile Organic Compounds
VRU	Vapour Recovery Unit
WWTP	Waste Water Treatment Plant

1. Introduction

This Environmental Assessment (EA) has been prepared by PlanCom Consulting Pty Ltd (PlanCom) on behalf of Vopak Terminals Sydney Pty Ltd (Vopak) for the Site B Bulk Liquids Storage Facility at 1-9 and 20 Friendship Road Port Botany. The EA considers the environmental impacts associated with the proposal to modify the Project Approval (06_0089) for the Stage B3 Vopak Site B Bulk Liquids Storage Facility and Associated Infrastructure dated 28 February 2007 in accordance with Section 75 W of the Environmental Planning and Assessment Act 1979 (EP&A Act).

1.1. EA Purpose and Structure

The purpose of this EA is to:

- Describe the existing site and its surrounding context
- Present the project need, its justification and alternatives considered
- Identify and evaluate all matters affecting or likely to affect the environment
- Consider the relevant statutory framework as required under Section 75 W of the EP&A Act and other relevant legislation
- Consider and respond to matters raised by Department of Planning and Environment (DP&E) in the Secretary's Environmental Assessment Requirements (SEARs)
- Consult with NSW Ports, Randwick City Council, Environment Protection Authority, SafeWork NSW and Roads and Maritime Services
- Assess the environmental impacts of the modification to the Bulk Liquids Storage Facility.

Develop environmental management and mitigation measures to minimise potential environmental impacts identified for the proposed modification. These points are addressed in the following key sections of the EA which are listed below in Table 1.1.

Table 1.1 Sections in the EA

Section	Issues Addressed
Section 1	Introduction
Section 2	Existing Site Location and Setting
Section 3	Statutory Framework and Consultation
Section 4	Project Need, Justification and Alternatives
Section 5	Description of the Project
Section 6	Environmental Assessment
Section 7	Environmental Management
Section 8	Conclusion
Section 9	References

Section	Issues Addressed
Appendix A	Secretary's Environmental Assessment Requirements
Appendix B	Port Botany Development Code (2013) & Green Ports Checklist
Appendix C	Traffic Impact Assessment – Samsa Consulting (2016)
Appendix D	Site B Quantitative Risk Assessment – Sherpa Consulting (2015)
Appendix E	Site B Dangerous Goods Transport Risk Assessment – Sherpa Consulting (2016)
Appendix F	Transport Quantitative Risk Assessment – Systra Scott Lister (2016)
Appendix G	Air Quality Impact Assessment - AECOM (2016)

1.2. The Proponent

1.2.1. Vopak Terminals Sydney Pty Ltd

Vopak is a company that provides bulk liquid services (storage, transport, bulk handling, packaging and distribution) and access to distribution facilities to independent operators and large corporations. These bulk liquids include fuel-based products used for energy and transport functions throughout NSW. Vopak operates two bulk liquid storage terminals in Port Botany located at:

- Bitumen (previously Site A) – 49 Friendship Road, Port Botany (Gate B33)
- Site B – 1-9 and 20 Friendship Road, Port Botany. (Petroleum Fuels, Gate B47).

Both site locations are shown in Figure 1.1.

Figure 1.1 Vopak Terminals Sydney Pty Ltd Site A and Site B

Source: Google Earth 2014

The first facility, formerly known as the Site A Terminal, is located at 49 Friendship Road. The Site A Terminal was established in 1979 to serve an identified need for an independent bulk liquid chemical distribution facility in the greater Sydney Region. The facility catered for the distribution of bulk liquid chemicals to chemical manufacturers, oil companies, and chemical traders who sold into the local markets.

However, Vopak has made a strategic decision to withdraw from this particular market to concentrate on its core business, Aviation and Ground Fuels Storage and Distribution. The former Site A Terminal has now been subdivided and a Bitumen Storage and Distribution Terminal (shown in Figure 1.2) has been constructed and is now operational (January 2014). The remainder of the Site A Terminal has been decommissioned and the facility has been taken over by a new tenant (Terminals Pty Ltd).

Figure 1.2 Location of Vopak Site A Terminal – 49 Friendship Road, Port Botany

Source: Google Earth 2014

The second facility, known as the Site B Petroleum Terminal, is located at 1-9 and 20 Friendship Road and has been storing petroleum products since 1996 (shown in Figure 1.3).

Figure 1.3 Location of Vopak Site B Terminal – 1-9 and 20 Friendship Road, Port Botany

Source: Google Earth 2014

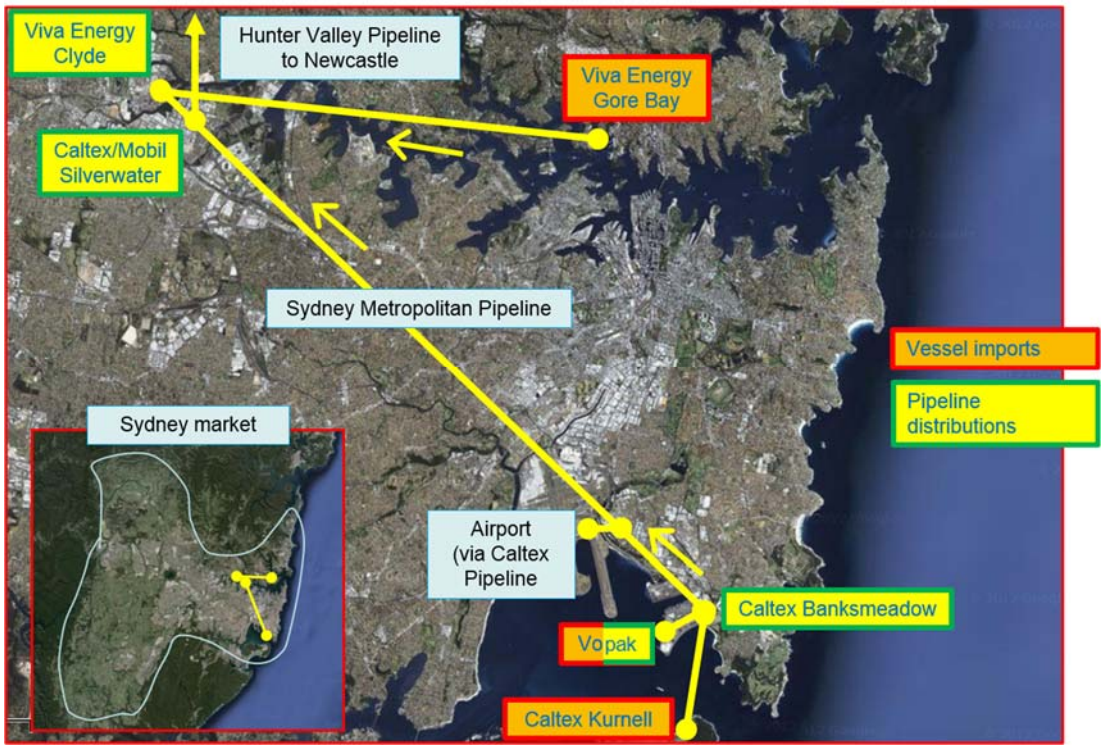
The Site B facility is also integrated into a wider network of petroleum and liquid fuels transport infrastructure with other Vopak facilities (Vopak Bitumen), oil industry corporations including Caltex Banksmeadow, Caltex Kurnell, Sydney Airport, (MOBIL) Silverwater Terminal, Terminals Pty Ltd, and NSW Ports Bulk Liquids Berths.

Consequently, Vopak's infrastructure is a critical part of an oil industry network that ensures other bulk liquid and cargo distribution facilities in the immediate area operate in an efficient and environmentally safe manner (shown in Figure 1.4).

Pipelines are represented by the yellow lines in Figure 1.4. Pipelines are all owned and controlled by different fuel market players. Therefore physical access to any of these pipelines is subject to agreement on commercial terms and conditions. Pipeline ownership is as follows:

- Kurnell to Banksmeadow pipelines are Caltex owned and operated.
- The pipeline from Vopak to Banksmeadow is Vopak owned and operated.
- The pipeline from Banksmeadow to Silverwater is called the Sydney Metropolitan Pipeline. It is owned by Caltex (60%) and Mobil (40%).
- The jet fuel pipeline from Banksmeadow to the Airport is owned and operated by Caltex.
- The pipeline from Gore Bay into Clyde is owned and operated by Viva Energy.
- The pipeline from Silverwater to Newcastle is owned and operated by Caltex.

Figure 1.4 Vopak Site B well connected to Sydney Infrastructure



Source: Vopak

Vopak - with its headquarters in Rotterdam, the Netherlands - is the world's largest independent tank storage provider, specialized in the storage and handling of liquid chemicals, gasses and oil products. Vopak operates 67 terminals with a combined storage capacity more than 34 million cubic meters in 28 countries. The terminals are strategically located for users along the major shipping routes. The majority of customers is active in the chemical and oil industry, for which Vopak stores a large variety of products destined for a wide range of industries.

Vopak Terminals Sydney Pty Ltd is a component of the international network providing logistic services to the chemical and petroleum industries in the form of bulk liquid storage facilities leased to customers at strategic Australian port locations at Port Botany and Darwin East Arm Port (Northern Territory).

Vopak´s annual turnover in 2015 was EUR 1.4 billion. Vopak is a publicly-traded company with a listing on NYSE Euronext Amsterdam (ticker symbol: VPK). At end 2013, Vopak had a market capitalisation of EUR 5.4 billion. Including our joint ventures, Vopak employs an international workforce of more than 6,000 people.

1.3. Location of the Proposal

The proposed site is located on Site B at 1-9 and 20 Friendship Road Port Botany approximately 13 km south of the Sydney CBD. The total site area is nine hectares.

The proposed site is located at 1-9 Friendship Road (Lot 21 in DP 1045324) and 20 Friendship Road, Port Botany (Lot 10 DP 1126332). Various land sections within Port Botany have been re-surveyed in recent years and new Lot Numbers/DPs have been issued. Previously, the property details for Vopak Site B, as documented in the Project Approval 06_0089 (dated 28th February 2006), were Lot 1 DP 806558 (1-9 Friendship Road) and Lot 21 DP 1045323 (20 Friendship Road).

Property details forming the proposed western entry lease extension include Lot 21 DP 1126332 (Elgas Cavern site) and Lot 52 DP 1182618 (Fishburn Road and the intersection of Simblist Road and Friendship Road).

NSW Ports became the custodian of these public Port Botany assets following its successful purchase of the 99 year lease rights from the NSW Government.

Port Botany Lessor Pty Ltd (which is part of the NSW Treasury) is the Landowner.

A photograph taken from the north looking south at Site B and the BLBs is shown in Figure 1.5.

Figure 1.5 Photograph of Site B taken from the north

Source: NSW Ports - Five Year Port Development Plan 2014

1.4. The Modification

The existing Site B Terminal is adjacent to the Bulk Liquids Berths (No.1 and No.2) so that petroleum products can be imported and exported by sea tankers.

The total product throughput is expected to be 3,950,000 m^3 (3,950 ML) in 2016 and it is predicted to increase the total product throughput to 7,800,000 m^3 (7,800 ML) per year comprising the following breakdown by delivery mode:

	Output by Road Tanker (m^3)	Output by Pipeline (m^3)	Output by Sea (m^3)	Total Throughput (m^3)
Total Site B Output	3,700,000 (47%) (Includes Jet by road)	2,100,000 (27%)	2,000,000 (26%)	7,800,000 (100%)

The changes to the Site B Facility include the following:

- West Entry Northern Approach Roadways - requiring the need to lease an additional 2,870 m^2 of land from NSW Ports to the north and west of Site B plus the modification to the Simblist Road intersection with Friendship Road.
- Construction of Three New Road Tanker Loading Bays (Bays 7, 8 & 9).
- Installation of additional transfer pumps and product supply pipelines to existing RT Pump Manifolds.

- Construction of One Road Tanker Unloading Bay for Biofuels, Additives and other ancillary products together with RT unloading pumps.
- Construction of a New Drivers' Amenities Building at Fishburn Road entrance.
- Construction of a steel framed awning (19m. x 1.9m. wide) on the northern side of the existing Control Room Building to provide weather protection for Drivers entering/exiting the Customer Print cubicles.
- Vapour Recovery Unit - this would be required when the current Vapour Recovery Unit reaches capacity.
- Ship Import debottlenecking of inlet manifolds, tank import pipelines and tank inlets, inclusive of tank-to-tank and tank recirculation piping and pump facilities as well as instrumentation for quantity and quality control to increase flowrates.
- Ship Export debottlenecking of tank outlets, tank export pipelines and transfer pumps as well as instrumentation for quantity and quality control to increase flowrates.
- Civil, Structural, Piping, Electrical and Instrumentation Works for the above.
- Increase in the size of the approved Warehouse (8m x 12m) near the Fire Pump House. The proposal is to extend the Warehouse to be 12m x 20m.
- Modification of several conditions of Project Approval (06_0089).

The work would be staged in the following manner:

Stage 1

Stage 1 is scheduled to commence construction over a period of 6 months and is likely to involve the following activities:

- Construction of Road Tanker Loading Bay 7 and additional RT pumps and supply pipelines
- Vapour Recovery Unit Project
- Maintain existing Road Tanker entry from Friendship Road
- Maintain existing Road Tanker exit to Friendship Road
- Construction of Road Tanker Unloading Bay and RT unloading pumps
- Construction of a steel framed awning (19m x 1.9m wide) on the northern side of the existing Control Room Building
- Progressive Ship Import debottlenecking of inlet manifolds, tank import pipelines and tank inlets, inclusive of tank-to-tank and tank recirculation piping and pump facilities as well as installation of tank mixers. Upgrades will be prioritised and subject to tank maintenance outages
- Progressive Ship Export debottlenecking of tank outlets, tank export pipelines and transfer pumps. Upgrades will be prioritised and subject to tank maintenance outages
- Civil, Structural, Piping, Electrical and Instrumentation Works for the above
- Increase the size of the warehouse.

Stage 2

Stage 2 is scheduled to commence construction over a period of 12 months and is likely to involve the following activities:

- Construction of Road Tanker Loading Bays 8 & 9 and additional RT pumps and supply pipelines
- Construction of a new Road Tanker entry from Fishburn Road via an easement adjacent to Elgas (Elgas Road) from Friendship Road and modification to the Simblist Road/ Friendship Road intersection
- New Drivers' Amenities Building at Fishburn Road entrance
- Progressive Ship Import debottlenecking of inlet manifolds, tank import pipelines and tank inlets, inclusive of tank-to-tank and tank recirculation piping and pump facilities as well as installation of tank mixers. Upgrades will be prioritised and subject to tank maintenance outages
- Progressive Ship Export debottlenecking of tank outlets, tank export pipelines and transfer pumps. Upgrades will be prioritised and subject to tank maintenance outages
- Civil, Structural, Piping, Electrical and Instrumentation Works for the above.

Ongoing maintenance and enabling works will be undertaken, as required, throughout the life of the project for the entire site. This includes the construction, installation, and the ongoing maintenance, repair, replacement and / or removal of:

- fittings, fixtures and infrastructure
- truck parking areas (for full and empty trucks), car parking areas, and other paving works
- landscaping, lighting, utilities and service facilities, security cameras and devices
- temporary uses
- change of products within tanks, and other minor works such as installation of pipelines between tanks and loading / unloading facilities.

Works for the purposes of pollution control, work health and safety measures, and environmental protection will also be carried out to ensure the site operates in a safe and environmentally responsible manner.

2. Existing Site Location and Setting

This section outlines the existing regional and local setting of the Port Botany site with particular reference to neighbouring businesses, access, land use and socio-economic characteristics of the area.

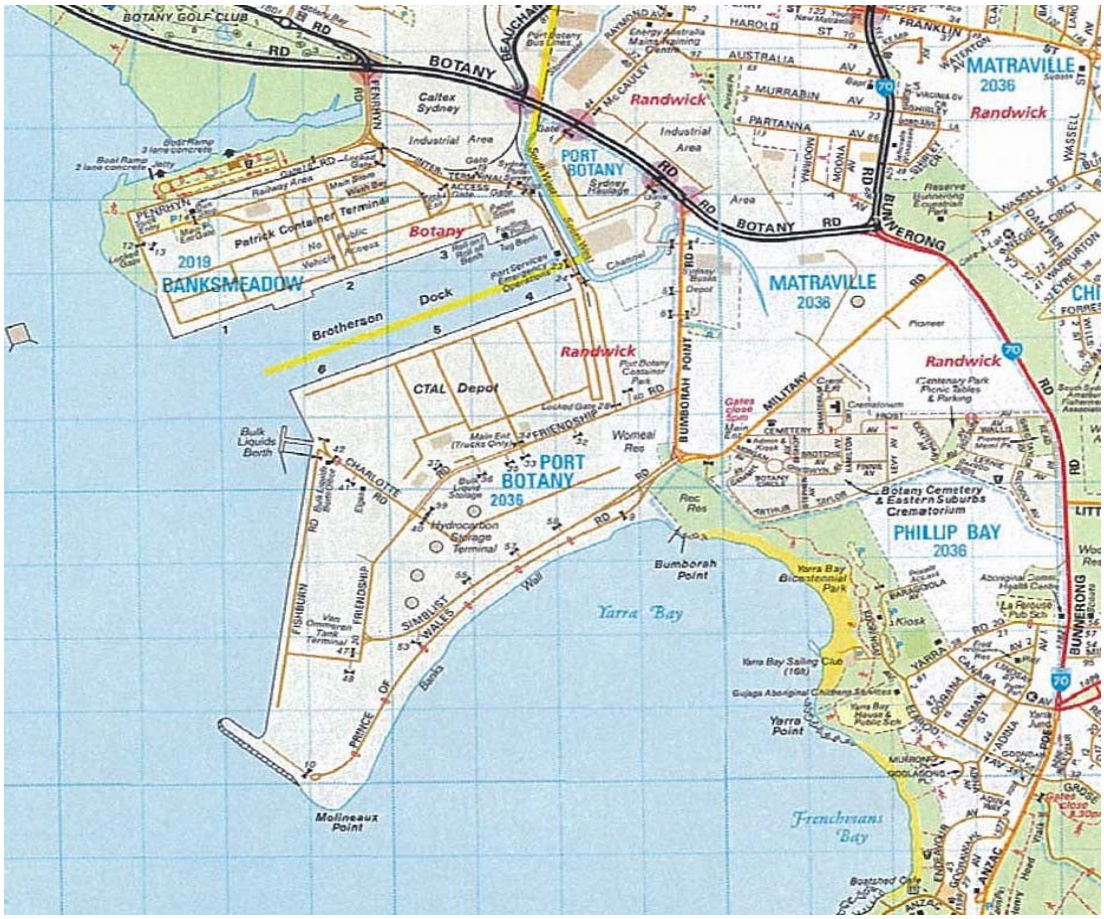
2.1. Regional Setting

The proposed site is located at Port Botany, approximately 13 km south of the Sydney CBD. Port Botany is heavily industrialised due to port operations including the Brotherson Dock, a container dock facility where DP World, Patrick Stevedores and Port Botany Container Park, amongst others, are located.

The suburbs to the northeast and east of Port Botany include Banksmeadow, Port Botany, Matraville, Phillip Bay, Little Bay and Chifley. The suburb of La Perouse is located to the southeast (refer to Figure 2.1).

The nearest residential area is located at Phillip Bay approximately 1500 metres to the east of the site across Yarra Bay. Other residential areas, slightly further away (approximately two kilometres), are Matraville/Chifley to the north-east, Little Bay to the east, La Perouse to the south-east and Botany to the north-west. Botany cemetery is located 800 metres to the east.

Figure 2.1 Regional setting



2.2. Local Setting

The Vopak Site B Terminal is located on relatively flat, stable reclaimed land with few undisturbed natural features.

There are two distinct types of cargo handling and storage trades that have established a presence in Port Botany. These two trades include import and export of container and bulk products (liquids and gas).

Industries located adjacent to Vopak Site B include:

- Elgas (The Sydney LPG Cavern Project) (LPG gas)
- Qenos Hydrocarbon Terminal (Ethylene)
- DP World Sydney Ltd (container trade)
- Patrick Port Services (container trade)
- Austate Logistics (container trade)
- QUBE Logistics (container trade)
- NSW Ports Pipeline Corridor.

The built form of the adjacent suburbs of Banksmeadow and Port Botany is characterised by a mix of port related and industrial land uses. Matraville and Phillip Bay are more diverse in built form and include industrial, commercial, residential and open spaces dedicated to recreation.

The surrounding area is primarily characterised by industrial activity neighbours. There are no significant commercial spaces, no retail centres or similar developments that routinely have a large number of people occupying them.

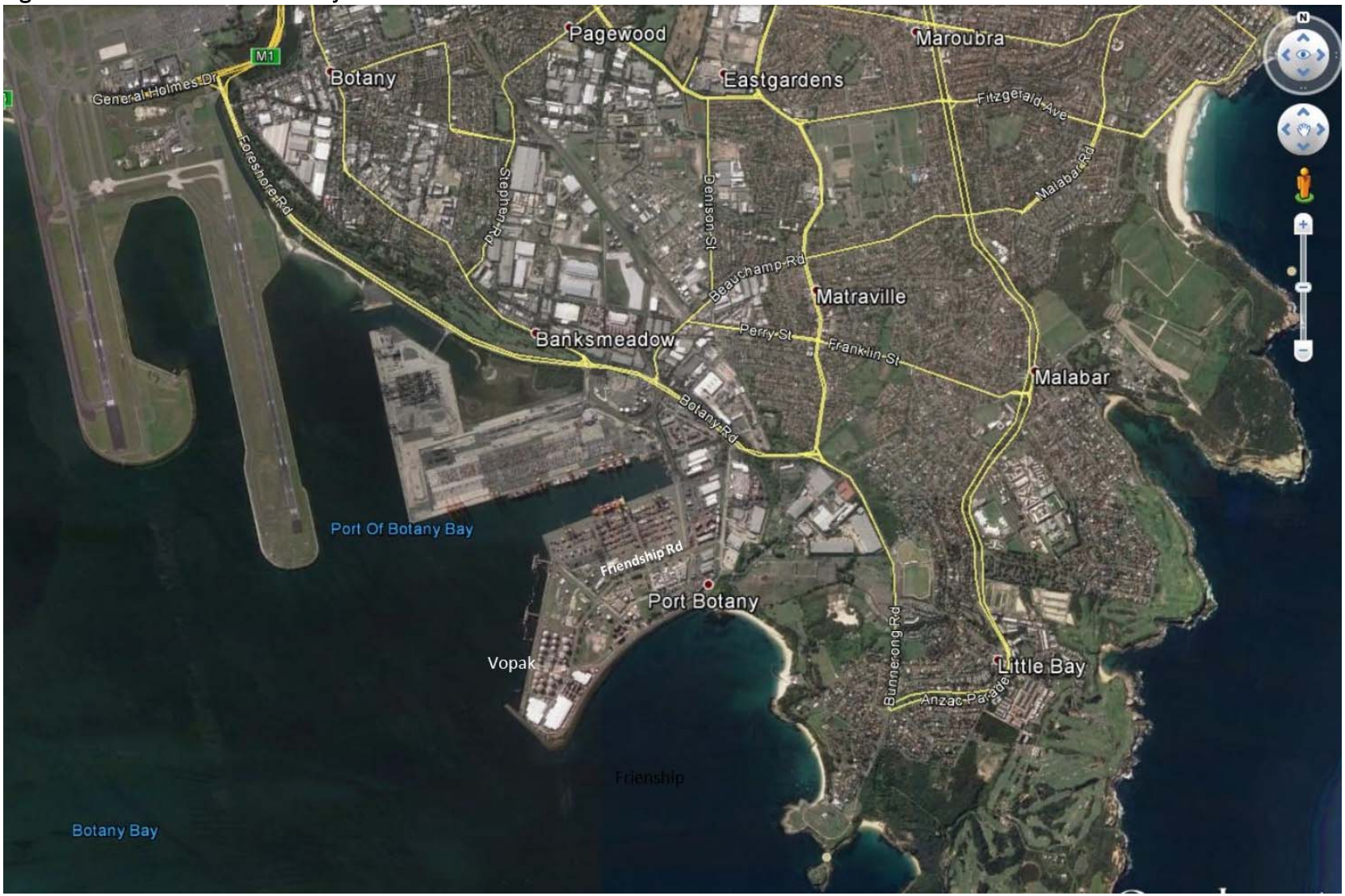
2.3. The Site

The Site B Terminal is located at 1-9 and 20 Friendship Road, Port Botany (shown in Figure 2.2) comprises:

- Lot 21 in Deposited Plan 1045324
- Lot 10 in Deposited Plan 1126332
- Property details forming the proposed western entry lease extension include Lot 21 DP 1126332 (Elgas Cavern site) and Lot 52 DP 1182618 (Fishburn Road and the intersection of Simblist Road and Friendship Road).

Vopak holds a 20-year lease with an extension option over the site from NSW Ports.

Figure 2.2 Site Location - Port Botany



Source: Google Earth

2.3.1. Context and Setting

For the purpose of this report, 'the site' refers to the Vopak Site B Terminal together with the NSW Ports pipeline corridor from Vopak Bitumen Terminal to BLB1 and BLB2.

In addition, the site includes the NSW Ports pipeline corridors to Vopak Bitumen Terminal and to the Caltex Banksmeadow facility, located in Bayside Council (formerly Botany Bay City Council).

Friendship Road bounds the site to the east and south, Fishburn Road to the west and the Sydney LPG Cavern (Elgas) site to the north.

2.3.2. Socio-economics

The Port Botany area provides a dedicated area for bulk liquids storage and handling and is of important strategic significance to the Sydney and NSW economy. The industrial and commercial enterprises in the Port Botany area provide significant employment opportunities for the local and regional population, rate levy generation for local authorities and subsequent contributions to local social infrastructure.

The document "A Plan for Growing Sydney" dated December 2014 identifies Port Botany Precinct's priorities for transport gateways as follows:

- Identify and protect strategically important industrial zoned land in and near Port Botany Precinct.
- Protect Port Botany's function as an international gateway for freight and support port-related land uses and infrastructure in the area around the port.
- Support the land use needs of freight movement to increase the proportion of container freight transported by rail.
- Investigate a corridor for an enhanced road link from Port Botany to WestConnex.

The Trade Report by NSW Ports for the 2012/13 financial year dated provides details of the trade through the port facilities under the control of NSW Ports. The following key points are of relevance:

- Trade through Port Botany is dominated by the Asia region which represents almost 65% of total volume. East Asia, our largest trading region, accounted for over 44% of Port Botany's total container trade with South East Asia representing 21% of total trade.
- Oil trade through Port Botany's bulk liquids berth reached over 2.3 million mass tonnes in 2012/13, which is an increase of 30.8% from 2011/12. The increase in volume is attributed to an increase in refined oil products, due largely to the closures of the Shell oil refinery at Clyde in September 2012 and the scheduled closure of the Caltex oil refinery at Kurnell in mid 2014 which has led to an increase in the volume of refined oil products through the BLB at Botany.
- The BLB at Port Botany is vital to the supply of various liquids and gases in NSW. Currently the BLB handles 88% of the state's consumption of liquefied petroleum gas (LPG), 90% of bulk chemical products, 28% of jet fuel and 100% bitumen products.

Based on the NSW Ports Five Year Port Development Plan dated March 2014 the following key points in relation to bulk liquids are of relevance:

- Port Botany plays a critical role in the supply of refined petroleum to NSW, including the supply of aviation jet fuel. Port Botany has the only import and export facility in NSW for LPG and also handles bulk chemicals.
- Bulk liquid trade grew at a compound average annual growth rate of 5.8 per cent between the 1996 and 2013 financial years.
- Changes to the operation of the oil refineries at Clyde and Kurnell have resulted in imports through the bulk liquids berth increasing, in particular with bitumen and LPG. Further increases are expected as changes continue in the petroleum products supply chain.

3. Statutory Consultation and Framework

This section provides a summary of the consultation and planning context of the modification proposal. It includes a consideration of the relevant provisions of the EP&A Act, the Environmental Planning Instruments (EPI) applying to it and other approval requirements. Consultation occurred with the following organisations:

- Department of Planning and Environment
- Sydney Ports Corporation and NSW Ports
- Randwick City Council
- NSW Environment Protection Authority
- SafeWork NSW
- NSW Roads and Maritime Services.

3.1. Statutory Consultation

3.1.1. Secretary's Environmental Assessment Requirements (SEARs)

On 7 November 2014, the DP&E issued the Secretary's Environmental Assessment Requirements (SEARs) for Modification 2 to project approval 06_0089. A copy of the SEARs can be found in Appendix A. Table 3.1 below identifies the SEARs and where they are addressed in the EA.

Table 3.1 SEARs and EA Responses

Application Number	MP 06_0089 MOD 2	Where issue has been addressed in the EA
General Requirements	The Environmental Assessment of the proposed modification must include:	
	▪ an executive summary	Executive Summary
	▪ a description of the following within the site and any associated areas:	Sections 1.2 to 1.4, 4.1
	- existing and approved operations/facilities; and	
	- a description of the proposed modifications in relation to any existing environmental management plans that may need to be updated.	
	▪ a detailed description of the project, including:	Chapters 4 and 5
	- need for the modification;	
	- alternatives considered; and	
	- plans of any proposed building works.	
	▪ a detailed assessment of the following, and any other significant issues identified in the Environmental Risk Assessment (see 'Key Issues'):	Chapter 6

Application Number	MP 06_0089 MOD 2	Where issue has been addressed in the EA
	- a description of the existing environment, using sufficient baseline data; - an assessment of the potential impacts of the project, including any cumulative impacts, taking into consideration any relevant guidelines, policies, plans and statutory provisions - a description of the measures that would be implemented to avoid, minimise, mitigate, rehabilitate/remediate, monitor and/or offset the potential impacts of the project, including detailed contingency plans for managing any significant risks to the environment. ▪ a consolidated statement of commitments, outlining all the proposed environmental management and monitoring measures; ▪ a conclusion justifying the project, taking into consideration whether the project is consistent with the objects of the Environmental Planning & Assessment Act 1979; and ▪ a signed statement from the author of the Environmental Assessment, certifying that the information contained within the document is neither false nor misleading.	Chapter 7 Chapter 8 Statement of Validity
Key Issues	Hazards and Risk – including: ▪ updating the risk assessment for the subject site to include the proposed modification. The risk assessment should be updated in accordance with *Hazardous Industry Planning Advisory Paper No. 6 – Hazards Analysis*; and ▪ address all recommendations of the Department's *Port Botany Land Use Safety Study Overview Report* relevant to the modification. Traffic and Access – including: ▪ accurate predictions of the traffic volumes likely to be generated during construction and operation; ▪ a detailed traffic impact study of the project; and ▪ detailed plans of the proposed layout of the internal road network and parking on site in accordance with the relevant Australian Standards (including swept path diagrams and details to demonstrate that the facility will not result in queuing off-site).	Section 6.3 Section 6.2

Application Number	MP 06_0089 MOD 2	Where issue has been addressed in the EA
	Soil and Water – including: ▪ consideration of the potential for contaminated soil and water to be encountered during construction and its management in accordance with the relevant guidelines. Air Quality – including: ▪ details of any air quality control and management measures for the modification. Waste Management – including: ▪ identification of the volume, type and classification of all waste/s generated during the construction of the project; and ▪ details of all waste treatment (e.g. contaminated soil) and disposal measures undertaken in accordance with the relevant guidelines. Greenhouse Gas – including an assessment of the potential greenhouse gas emissions of the project.	Sections 6.5 and 6.6 Section 6.4 Section 6.7 Section 6.4
Consultation	During the preparation of the Environmental Assessment, you should consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups or affected landowners. In particular you must consult with the: - NSW Ports; - Randwick City Council; - Environment Protection Authority; - WorkCover NSW; and - Roads and Maritime Service. The consultation process, and the issues raised during this process, must be described in the Environmental Assessment.	Section 3.1

3.1.2. Sydney Ports Corporation & NSW Ports

A Planning Application Meeting was held with Sydney Ports Corporation on 16 April 2013 in relation to the proposed modification at Site B. A summary of the issues raised by Sydney Ports Corporation during the Planning Application Meeting and where they have been addressed in the EA is provided in Table 3.2. Ongoing discussions and meetings have been undertaken with NSW Ports since its inception on 31 May 2013.

Table 3.2 Sydney Ports Corporation Issues and EA Responses

Sydney Ports Corporation Issue	Where issue has been addressed in the EA
▪ Based on the information provided, the development assessment process is likely to be a modification to DA 06_0089 dated 28 February 2007. ▪ The EA is to consider existing approvals for the site. Specifically that those approvals for the B1 and B2 site have been previously surrendered and that the site B3 project approval conditions apply to the B1 site.	Section 3.2
▪ The EA is to include an assessment of all works that will be undertaken as part of the proposal.	Described in Chapter 5 and assessed in Chapter 6
▪ The EA is to include an assessment of any construction and operational impacts as required and how the works will be managed to mitigate any impacts on the environment, specifically in relation to traffic, risk management, and spills management (including any potential water quality impacts).	Chapters 6 and 7
▪ A traffic impact assessment should be prepared and include: - from the construction of the gantry and pipeline including numbers of vehicles required during construction (i.e. maximum vehicle numbers / movements per day and hour). - An assessment of traffic impacts from the operation of the facility given proposed new throughputs and new gantry. ▪ An assessment of the crane to be used in the installation of the pipeline and gantry including the height of the crane.	Section 6.2
▪ The EA is to include a Preliminary Hazard Analysis given the proposed throughput modifications at the site. ▪ A risk assessment prepared in accordance with the Port Botany Land Use Safety Study including demonstrating that the development: - will not contribute to any increase in cumulative risk as shown in Figure 2 of the *Port Botany Land Use Safety Study Overview Report 1996* (Overview Report); - will not result in any propagation of risks to neighbouring facilities; - will not result in a significant increase in the number of people (including both construction and operational staff) exposed to risk inside the residential contour as shown in Figure 2 of the Overview Report; and - will identify and implement risk reduction and safety management measures as required.	Section 6.3
▪ The EA is to include an assessment of any other relevant construction and operational impacts. This should include any temporary operational impacts whilst construction works are being undertaken. ▪ The EA should also include any cumulative impacts with approved developments in proximity to the site.	Chapter 6

Sydney Ports Corporation Issue	Where issue has been addressed in the EA
▪ Airports Act 1996 (specifically Section 182 and 183 of Division 4 – Protection of Prescribed Airspace)	Section 3.5.2
▪ Airports (Protection of Airspace) Regulations 1996 (to determine if the proposed development, including construction activities, is a 'controlled activity' and any necessary approvals / referrals required in regards to lighting).	Section 3.5.2
▪ Civil Aviation Act 1988 and the Civil Aviation (Building Control) Regulations 1988	Section 3.5.3
▪ CASA Manual of Standards Part 139 – Aerodromes (specifically Section 9.21 - Lighting in the Vicinity of Aerodromes)	Section 3.5.4
▪ Protection of the Environment Operations Act 1997	Section 3.5.1
▪ State Environmental Planning Policy (Major Development) 2005 (specifically Part 20 of Schedule 3 in relation to zone objectives and permissibility)	Section 3.3.1
▪ State Environmental Planning Policy (State and Regional Development) 2011	Section 3.3.2
▪ State Environmental Planning Policy No. 55 (Remediation of Land)	Section 3.3.3
▪ Port Botany Land Use Safety Study Overview Report 1996.	Section 6.3
▪ Port Botany Development Code 2013	Appendix B
▪ Green Port Checklist	Appendix B
DGR Request (1st stage) ▪ Draft documentation requesting DGRs from the Department of Planning and Infrastructure for SPC review prior to lodgement PTL Application (2nd stage) ▪ Permission to Lodge Application Form ▪ http://www.sydneyports.com.au/__data/assets/pdf_file/0008/10997/SPC10222_Form_Y_-_Permission_to_Lodge_Editable.pdf ▪ Plans / architectural drawings of the site and proposal. ▪ Development application ▪ Environmental Assessment and all relevant appendices ▪ Port Botany Development Code Checklist ▪ Green Port Checklist ▪ http://www.sydneyports.com.au/corporation/publications/operations/green_port_guidelines	Provided prior to request for SEARs. Other information to be submitted for PTL Application

3.1.3. Randwick City Council

Liaison with Council occurred as part of the preparation of the Modification. This included liaison regarding the proposed modification and the traffic impact assessment. Council correspondence was provided on 28 November 2014. Details and responses are provided below:

Noise impacts on local residents during construction and operation

As Council understands that the original noise assessment was completed in 2007, Council recommends that this Environmental Assessment for the modification should consider the following issues:

- Increased noise sensitivities over recent years within receiving community
- Increased Port Botany cumulative vehicles movements with final construction components and operation of SICTL/Patricks terminal 3 facility
- Potential increased noise impacts of the proposed modification due to expansion of the Vopak facility to the north which is closer to identified sensitive residential areas
- Recent Port wide commitment to minimisation of vehicle and equipment reversing alarms i.e. Configuration of new tanker loading bays to forward direction loading drive in drive out and where alarms are necessary utilisation of squawkers.

Consideration and Application of relevant guidelines

- DECCW Interim Construction Noise Guidelines; and
- The NSW EPA Industrial Noise Policy requirements.

Response

- A noise assessment was not a requirement of the SEARs issued by DP&E. The Statement of Commitments recommend appropriate control to manage noise during construction and operation. The Environment Protection Licence (EPL) 6007 for Site B, contains provisions to control operational noise and would be updated as a result of the modification.

Traffic and transport considerations

- Assessment of the proposed trucks processing procedures, terminal management system to avoid truck queuing and delays.
- Onsite construction vehicle queuing capacity to prevent offsite impacts from construction vehicles.
- Onsite vehicle parking capacity during operation to prevent offsite queuing or circling of trucks within residential areas prior to allocated time slots.
- Construction vehicle routes to and from the site along Foreshore Road are strongly supported.
- How operational fuel transport heavy vehicles will adhere to Dangerous Goods route and prevented from using local roads.

Response

- A traffic assessment was conducted as part of the EA. A summary of the assessment can be found in Section 6.2. A full copy of the assessment can be found in Appendix C.

Emergency Response

- Capacity of existing leak detection and auto shutoff systems to cope with increased throughput.
- Assessment of adequacy of emergency response procedures to address any potential loss of containment or similar emergency event given issues associated recent Caltex fuel spill event in July this year and the required update to emergency management plans including pollution incident management plans (PIRMP) Operational Environmental Management Plan (OEMP) and Incident Response Plan (IRP).

Response

- A quantitative risk assessment was conducted as part of the EA. A summary of the assessment can be found in Section 6.3. A full copy of the assessment can be found in Appendix D.

Soil, Water and Air Quality Management

- Impact on and monitoring of discharges to air, water and soil during construction and operation activities to ensure compliance with the *Protection of the Environment Operations Act 1997* (POEO Act) and Licence requirements.
- Confirmation that new works and increased throughput will not compromise compliance with facility load limits as specified in POEO licence.

Response

- The Environment Protection Licence (EPL) 6007 for Site B, contains monitoring requirements and would be updated as a result of the modification.

3.1.4. Environment Protection Authority

Liaison with the Environment Protection Authority (EPA) occurred as part of the preparation of the Modification. Correspondence from the EPA was received on 27 November 2014. Details and responses are provided below:

Based on the information provided the EPA is satisfied with the broad requirements of the SEARs. However, the EPA recommends that the Environmental Assessment (EA) include comprehensive consideration of the Vapour Recovery Unit (VRU) upgrade, specifically:

- The capacity of the current VRU and the predicted capacity required for the VRU following the increase in petroleum product throughput as a result of the proposed site modifications; and
- A timeframe in which the current VRU would be upgraded to meet the predicted increase in petroleum product throughput to ensure vapours are not released to the atmosphere.

Response

- Sections 5.2.5, 5.2.7 and 6.7 of the EA address these issues raised by the EPA.

3.1.5. SafeWork NSW

Liaison with Safework NSW occurred as part of the preparation of the Modification. Correspondence from Safework NSW was received on 8 December 2014. Details and are provided below:

> Given that there will ultimately be three additional road tanker loading bays to meet the approximate doubling in site throughput, the risks from the site are likely to increase due to the increase in loading operations and also usage time of the Marine Loading Arms in addition to tank, pump and other related activities. The number of shipping tankers and presence time will also increase. Therefore, the Safety Case for the site will need to be reviewed under the provisions of the Work Health and Safety Regulation 2011 (WHS regulation). Please refer to Clauses 555, 556, 559 and 563 of the WHS Regulation in particular and the SafeWork Australia guidance documents.

Although a Preliminary Hazard Analysis (PHA) would normally address only the off-site risks, the Safety Assessment required for the safety case must address both on-site and off-site risks. The PHA prepared for the proposal (copy sent to Safework NSW) only addressed off site risk and that a QRA addressing on and off site risks would be carried out separately for the Safety case.

Since the PHA is likely to include risk contours to demonstrate compliance with HIPAP4, Safework NSW recommend that all hazards likely to contribute to on and off site risks are included in the Quantitative Risk Assessment (QRA) for the Safety Case and that the risk contours for whole of site risks are developed at least to the 50 in a million per year contour. It is also recommended that an assumptions register be prepared and either included in the PHA or made available to Safework NSW on request. The assumptions register should include, but not be limited to, the source of any failure frequencies used and justification for any modifiers applied.

Safework NSW has noted the comment at item 6 of table 2.1 in the QRA dated 25 September 2014, that the Major Hazard Facility Safety Case will be updated by Vopak prior to commencement of the proposed operations. Vopak should consult with Safework NSW with regard to the timing and specific requirements for the review of the Safety Case under clause 563 of the WHS Regulation. This will be independent of the Planning approval process, but is likely to be included as a condition of planning approval.

Response

- Vopak would address these requirements raised by Safework NSW as part of the Major Hazard Facility Safety Case review.

3.1.6. Roads and Maritime Service

Liaison with Roads and Maritime Services in relation to the traffic impact assessment occurred as part of the preparation of the EA. A summary of the assessment can be found in Section 6.2. A full copy of the assessment can be found in Appendix C.

3.2. Environmental Planning and Assessment Act 1979

The EP&A Act establishes the system of environmental planning and assessment in NSW.

Vopak Site B was approved for a Bulk Liquids Storage Facility and Associated Infrastructure via Project Approval (06_0089) dated 28 February 2007 under Part 3A of the EP&A Act. Condition 4 of the project approval states:

> "Prior to the commencement of any construction activities associated with Application No.06_0089, the Proponent shall surrender the following development consents in accordance with the EP&A Regulation:
>
> (a) the Minister's consent for DA 38/94, dated 16 January 1995; and
>
> (b) the Minster's consent for DA 549/97, dated 30 June 1998."

On 10 August 2007, Vopak issued a letter to the former Department of Planning to formally surrender the two approvals.

This modification is subject to the environmental impact assessment and planning approval requirements under Section 75W of the EP&A Act.

75W Modification of Minister's approval

(1) In this section:

Minister's approval means an approval to carry out a project under this Part, and includes an approval of a concept plan.

Modification of approval means changing the terms of a Minister's approval, including:

(a) revoking or varying a condition of the approval or imposing an additional condition of the approval, and

(b) changing the terms of any determination made by the Minister under Division 3 in connection with the approval.

(2) The proponent may request the Minister to modify the Minister's approval for a project. The Minister's approval for a modification is not required if the project as modified will be consistent with the existing approval under this Part.

(3) The request for the Minister's approval is to be lodged with the Director-General. The Director-General may notify the proponent of environmental assessment requirements with respect to the proposed modification that the proponent must comply with before the matter will be considered by the Minister.

(4) The Minister may modify the approval (with or without conditions) or disapprove of the modification.

Although Part 3A was repealed by the *Environmental Planning and Assessment Amendment (Part 3A Repeal) Act 2011,* Section 75W continues to be the applicable modification provision for the Vopak Site B Bulk Liquids Storage Facility and Associated Infrastructure Project Approval (06_0089) dated 28 February 2007. This is due to Schedule 6A of the EP&A Act, having the effect of making the approval a "transitional Part 3A project", states that provisions in the repealed Part 3A, such as Section 75W, continue to apply to and in respect of a "transitional Part 3A project".

Further, DP&E advised Vopak and NSW Ports in a meeting held on 8 July 2014 to submit an application to modify Project Approval (06_0089) under Section 75W of Part 3A of the EP&A Act. The Secretary's Environmental Assessment Requirements were received from DP&E on 7 November 2014 (A copy can be found in Appendix A).

3.2.1. Section 5A

Section 5A of the EP&A Act titled "Significant effect on threatened species, populations or ecological communities, or their habitats".

An extract of the legislation is provided in *italics* below. Responses are provided below where relevant.

(1) For the purposes of this Act and, in particular, in the administration of sections 78A, 79B, 79C, 111 and 112, the following must be taken into account in deciding whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats:

(a) each of the factors listed in subsection (2),

(b) any assessment guidelines.

(2) The following factors must be taken into account in making a determination under this section:

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

Response

- The proposed action is contained wholly within an already developed area of the site and is devoid of any flora or fauna species. It is unlikely to have an adverse effect on the life cycle of any threatened species or place a threatened species at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

Response

- The proposed action is contained wholly within an already developed area of the site and is devoid of any flora or fauna species. It is unlikely to have an adverse effect on the life cycle of any endangered species or place any endangered species at risk of extinction.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Response

- The proposed action is contained wholly within an already developed area of the site and is devoid of any flora or fauna species. It is unlikely to have an adverse effect on an endangered ecological community or critically endangered ecological community so as to place any species at risk of extinction or substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality

Response

- The proposed action is contained wholly within an already developed area of the site and is devoid of any flora or fauna species. It is unlikely to have an adverse effect on habitat of a threatened species, population or ecological community so as to substantially and adversely modify the composition the habitat. In relation to the habitat of a threatened species, population or ecological community, no habitat is proposed to be removed, or habitat fragmented from other areas of habitat to threaten the long term survival of any species.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

Response

- The proposed action is unlikely to have an adverse effect on critical habitat (either directly or indirectly).

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

Response

- The proposed action does not constitute part of a recovery plan or threat abatement plan for critical habitat.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Response

- The proposed action does not constitute or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

3.3. State Environmental Planning Policies

3.3.1. State Environmental Planning Policy (Major Development) 2005

State Environmental Planning Policy (State Significant Precincts) 2005 (SSP SEPP) is a key environmental planning instrument.

A number of amendments to the SSP SEPP have been made by the commencement of the Three Ports SEPP. Notwithstanding those amendments, numerous clauses of the SSP SEPP are of relevance to the proposal and are described below.

The site of the B3 development (MP06_0089) was identified and determined as a Part 3A project as it was development of a kind described in clause 10(2)(a) of Schedule 1 of the SSP SEPP (or the *State Environmental Planning Policy (Major Projects) 2005* as it was called at that time). The site is located on land previously identified on the Land Application Map as detailed in Schedule 3 of the SEPP, Part 20 – Three Ports Site. The site was zoned SP1 Special Activities under Schedule 3 of the SSP SEPP, Part 20 – Three Ports Site.

Relevant extracts include the following:

(1) The objectives of Zone SP1 Special Activities are as follows:

(a) to provide for special land uses that are not provided for in other zones,

(b) to provide for sites with special natural characteristics that are not provided for in other zones,

(c) to facilitate development that is in keeping with the special characteristics of the site or its existing or intended special use, and that minimises any adverse impacts on surrounding land,

(d) to maximise the use of waterfront areas to accommodate port facilities and industrial, maritime industrial and bulk storage premises that benefit from being located close to port facilities,

(e) to enable the efficient movement and operation of commercial shipping, and to provide for the efficient handling and distribution of freight from port areas through the provision of transport infrastructure,

(f) to facilitate development that by its nature or scale requires separation from residential areas and other sensitive land uses,

(g) to encourage employment opportunities.

(2) Development for any of the following purposes is permitted without development consent on land within Zone SP1 Special Activities:

community facilities; environmental facilities; environmental protection works.

(3) Development for any of the following purposes is permitted only with development consent on land within Zone SP1 Special Activities:

boat launching ramps; depots; food and drink premises; freight transport facilities; heavy industries; navigation and emergency response facilities; port facilities; roads; transport depots; warehouse or distribution centres.

(4) Except as otherwise provided by this Part, development is prohibited on land within Zone SP1 Special Activities unless it is permitted by subclause (2) or (3).

In accordance with Clause 2A, Application of Policy - transitional Part 3A projects, Clause 1 states "On the repeal of Part 3A of the Act, this Policy is subject to Schedule 6A to the Act." It also specifies the following: "Note. Schedule 6A of the Act sets out those projects

which will continue as Part 3A projects (transitional Part 3A projects) and revokes the declaration of any other Part 3A project."

Since the Site B Bulk Liquids Berth was approved under the now repealed Part 3A of the EP&A Act, the project is classified as a "transitional Part 3A project".

3.3.2. State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (State and Regional Development) 2011 (State and Regional Development SEPP) commenced on 1 October 2011.

The State and Regional Development SEPP forms part of an assessment system for projects of State significance in New South Wales. The State significant assessment system establishes two separate assessment pathways known as State significant development (SSD) and State significant infrastructure (SSI). Projects that fall into these categories are assessed by the Department of Planning and Environment.

The proposed development is a modification to a transitional Part 3A Project Approval and therefore it is not a SSD or SSI development under this SEPP.

3.3.3. State Environmental Planning Policy 55 – Remediation of Land

According to clause 7(1) of SEPP 55 - Remediation of Land (SEPP 55), a consent authority must not consent to the carrying out of any development on land unless:

a) it has considered whether the land is contaminated, and

b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and

c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.

As part of Environment Protection Licence (EPL) 6007 for Site B, Vopak is required to, inter alia, conduct groundwater sampling, analysis and reporting for existing groundwater monitoring wells at the site.

3.3.4. State Environmental Planning Policy 33 – Hazardous and Offensive Development

State Environmental Planning Policy No.33 – Hazardous and Offensive Development (SEPP 33) requires specific matters to be considered for proposals that are 'potentially hazardous' or 'potentially offensive' as defined in the policy.

The proposed development is classified as 'potentially hazardous industry' which is defined as:

A development for the purposes of any industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would pose a significant risk in relation to the locality:

(a) to human health, life or property, or

(b) to the biophysical environment,

and includes a hazardous industry and a hazardous storage establishment.

A Quantitative Risk Assessment (QRA) has been prepared and is submitted with the EA as the proposal comprises development that is classified as potentially hazardous industry.

3.3.5. State Environmental Planning Policy (Three Ports)

State Environmental Planning Policy (Three Ports) 2013 repealed the provisions of Part 20, Schedule 3 of the SSP SEPP.

The following key clauses of the Policy relevant to the proposed modification have been presented and considered below.

Clause 3 provides the aims of the Policy as follows:

a) *to provide a consistent planning regime for the development and delivery of infrastructure on land in Port Botany, Port Kembla and the Port of Newcastle,*

b) *to allow the efficient development, re-development and protection of land at Port Botany, Port Kembla and the Port of Newcastle for port purposes,*

c) *to identify certain development within the Lease Area as exempt development or complying development,*

d) *to specify matters to be considered in determining whether to grant consent to development adjacent to development for port purposes,*

e) *to provide for development at Port Botany that does not, by its nature or scale, constitute an actual or potential obstruction or hazard to aircraft,*

f) *to identify certain development as State significant development or State significant infrastructure,*

g) *to ensure that land around the Lease Area is maintained for port-related and industrial uses, including heavy industry on land around Port Kembla.*

The land use zone of the site under the Policy is SP1 - Special Activities. This is the same land use zone that was in place when the Part 3A project was assessed. The provisions of the zoning are as follows:

1 Objectives of zone

- *To provide for special land uses that are not provided for in other zones.*
- *To provide for sites with special natural characteristics that are not provided for in other zones.*
- *To facilitate development that is in keeping with the special characteristics of the site or its existing or intended special use, and that minimises any adverse impacts on surrounding land.*
- *To maximise the use of waterfront areas to accommodate port facilities and industrial, maritime industrial, freight and bulk storage premises that benefit from being located close to port facilities.*
- *To enable the efficient movement and operation of commercial shipping and to provide for the efficient handling and distribution of freight from port areas through the provision of transport infrastructure.*
- *To provide for port related facilities and development that support the operations of Port Botany, Port Kembla and the Port of Newcastle.*
- *To facilitate development that by its nature or scale requires separation from residential areas and other sensitive land uses.*
- *To encourage employment opportunities.*

2 Permitted without consent

Jetties; Moorings; Roads

3 Permitted with consent

Capital dredging; Environmental facilities; Environmental protection works; Maintenance dredging; Navigation and emergency response facilities; Neighbourhood shops; Port facilities; Wharf or boating facilities; Any other development not specified in item 2 or 4

4 Prohibited

Bulky goods premises; Business premises; Caravan parks; Cemeteries; Child care centres; Crematoria; Educational establishments; Entertainment facilities; Function centres; Funeral homes; Garden centres; Hardware and building supplies; Medical centres; Office premises; Places of public worship; Recreation facilities (indoor); Registered clubs; Residential accommodation; Respite day care centres; Restricted premises; Shops; Tourist and visitor accommodation; Vehicle sales or hire premises.

Under the zoning provisions the proposed modification is not prohibited under item 4 and is not permitted without consent under item 2. It would therefore be permitted with consent under item 3.

The development is consistent with the current land use zone objectives and is permissible with consent.

3.4. Commonwealth EPBC Act

Under the Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) the following matters of national environmental significance (NES) under Part 3 of the EPBC Act need to be considered:

- a declared World Heritage Property
- a National Heritage place
- a declared Ramsar wetland
- Commonwealth listed migratory species
- Commonwealth listed threatened species or endangered community
- Commonwealth marine areas
- Commonwealth land.

It is considered that the proposed modification will not have (and is not likely to have) a significant impact on these matters.

A Referral under the EPBC Act to the Commonwealth Department of Sustainability, Environment, Water, Population and Communities is therefore not required.

3.5. Other Legislation

Other key legislation includes the Protection of the Environment Operations Act 1997 and the Airports Act 1996 which are detailed below.

3.5.1. Protection of the Environment Operations Act 1997

The Protection of the Environment Operations Act 1997 aims to protect, restore and enhance the:

- quality of the environment in New South Wales, having regard to the need to maintain ecologically; and
- sustainable development and is administered by the Environment Protection Authority (EPA).

Petroleum products storage is listed in Schedule 1 of the Act and therefore is declared to be a scheduled activity.

Clause 47 of the Act states that an Environment Protection License is required for development of a premise for the purpose of a scheduled activity, meaning the proposal requires such a license.

Vopak has approached EPA and been advised they would amend the existing EPL (6007) for Site B to cover the modification.

3.5.2. Airports Act 1996

Under Section 182 of the *Airports Act 1996* (Cth), 'controlled activities' in relation to a 'prescribed airspace' includes, "constructing a building, or other structure that intrudes into the prescribed airspace…".

A prescribed airspace for an airport is,

- "the airspace above any part of either an OLS or PANS-OPS surface for the airport; and
- airspace declared in a declaration, under regulation 5, relating to the airport".

Under section 183 of the *Airports Act 1996* (Cth), approval is required for a proposed *'controlled activity'.*

The proposed construction of the modification does require approval from the Sydney Airport Corporation Ltd as during construction the crane elevation will be up to 47m AHD and accordingly intrudes into 'prescribed airspace'.

Vopak Terminals Sydney Pty Ltd will ensure that approval is sought and obtained prior to the commencement of any construction works for all structures and construction equipment (including cranes) from Sydney Airports Corporation Limited/Civil Aviation Safety Authority pursuant to the Airports Act 1996.

3.5.3. Civil Aviation (Buildings Control) Regulations 1988

The Civil Aviation (Buildings Control) Regulations 1988 made under the Civil Aviation Act 1988 are administered by the Commonwealth Department of Infrastructure and Development.

Vopak Site B appears to fall within the vertical cross hatching shown in Plan 6 of Schedule 5 of the Civil Aviation (Buildings Control) Regulations 1988. The site therefore falls within the provisions of Regulation 5 which states that: "A person may construct, within an area to which this regulation applies, a building or structure having a greater height above the ground than 50 feet only in accordance with an approval given under these Regulations."

Vopak Terminals Sydney Pty Ltd will, if required, ensure that approval is sought and obtained prior to the commencement of any construction works from the Commonwealth Department of Infrastructure and Development.

3.5.4. CASA Manual of Standards Part 139 – Aerodromes

Section 9.21 - Lighting in the Vicinity of Aerodromes in the CASA Manual of Standards Part 139 – Aerodromes is another relevant consideration.

Section 9.21 provides advice to those involved in the design or provision of lighting systems for use at or in the vicinity of an aerodrome. The intention is to minimise the potential hazard to aircraft operations from the lighting systems.

The Civil Aviation Safety Authority (CASA) has the power through regulation 94 of the Civil Aviation Regulations 1988, to require lights which may cause confusion, distraction or glare to pilots in the air, to be extinguished or modified. Ground lights may cause confusion or distraction by reason of their colour, position, pattern or intensity of light emission above the horizontal plane.

Advice for the guidance of designers and installation contractors is provided for situations where lights are to be installed within a 6 km radius of a known aerodrome. Lights within this area fall into a category most likely to be subjected to the provisions of the regulation 94 of Civil Aviation Regulations 1988.

Vopak Terminals Sydney Pty Ltd would consult with CASA to ensure that any proposed changes to lighting systems do not pose a potential hazard to aircraft operations.

3.5.5. Other

The proposed operations have considered the applicability of the following legislation and the applicable licences or approvals have been obtained. The proposal satisfies the requirements of:

- Water Management Act 2000
- Work Health and Safety Regulation 2011.

The Pipelines Act 1967 is not applicable to any of the new pipelines associated with the proposed Road Tanker Loading/Unloading Bays referred to in this modification.

Further, Vopak Terminals Sydney Pty Ltd will be notifying SafeWork NSW of the proposed modification under the Dangerous Goods notification requirements and keep SafeWork NSW notified of any potential changes when relevant.

3.6. NSW Ports Guidelines and Policies

The EA has considered the relevant guidelines and policies developed by NSW Ports. Details and comments are listed below.

3.6.1. Port Botany Development Code 2013

The EA has considered the NSW Ports Port Botany Development Code 2013 and the proposal complies with the applicable criteria. A compliance table is provided as Appendix B.

3.6.2. Green Port Checklist

A checklist has been completed that addresses the relevant criteria and requirements of the Green Port Checklist and is attached as Appendix B.

3.6.3. Port Botany Overarching Traffic Management Plan 2014

The NSW Ports Port Botany Overarching Traffic Management Plan 2014 has been considered as part of the proposal and an assessment of traffic and transport implications is provided in Section 6.1.

4. Project Need, Justification and Alternatives

4.1. Existing Vopak Operations

Existing Operations

The primary function of the Terminal is the importation, storage and distribution of bulk Ground/Aviation Fuels from Ship Tankers via the Site B Storage Tanks. The Terminal operates on a 24hr per day/7day per week (24/7) basis for all operations including Shipping Imports/Exports, Road Tanker Loading and Pipeline Exports (CTP and Jet Fuel).

Site B is serviced by two (2) specialised cargo berths in Botany Bay, known as Bulk Liquids Berths No.1 and No. 2 (BLB1 and BLB2). These berths are operated by NSW Ports and Vopak has installed pipelines and related infrastructure on both berths to facilitate the transfer of fuels from/to ships to/from the Site B Storage Tanks.

There are currently two (2) Marine Loading Arms (MLA) with pipelines connected to Vopak Site B on each of the berths (BLB1 and BLB2). Product unloading is performed by pumps on board the ship. Generally, the product flow-rate is 1200m^3/hour to 1750 m^3 /hour per MLA depending upon the capacity of the ship pump and MLA piping. Product flow is directed from the ship via the associated Vopak MLA and wharf pipeline to one of the two Inlet Manifolds in the Terminal. From the manifolds, the product is then directed to the nominated storage tanks.

The Inlet manifolds are a series of valved and adjustable pipe-work interchanges that provide operational flexibility to accommodate separate products being delivered to specific tank(s) and to avoid cross-contamination of one product with another. In addition, these and related transfer manifolds can discharge product from each storage tank to the Road Tanker Loading Gantry (RTL), Pipeline Exports systems (CTP and Jet), Tank-to-Tank Transfers and Export to ships at either BLB via the wharf lines.

Periodically, commercial markets require that storage tanks are re-allocated to different products because of the change in Customer requirements (product volumes, shipping parcel sizes, inventory management changes, legislative changes and product quality changes). These manifolds are designed to cater for such tank/product changes by having moveable sections of pipework that can be removed and re-positioned for the new requirements and with spare provisions for new connections to be made.

When a ship has completed a discharge or receipt operation the MLA and wharfline (to the Terminal) is cleared of product by a combination of nitrogen purging (the MLA) and pigging the wharfline empty from the BLB to the Terminal Inlet Manifold area. The term "pigging' refers to the displacement device which is propelled through the pipeline. Hence, between shipping operations, the wharflines can be maintained empty of product and are inerted with nitrogen.

There are also Outlet (Pump) Manifolds in the Terminal that are also re-configurable to cater for the various process flows such as the Road Tanker Loading Gantry (RTL), Pipeline Exports systems (CTP and Jet), Tank-to-Tank Transfers and Export to ships at either BLB via the wharflines.

Figure 4.1 describes the Site B product storage & distribution process

Road Tanker Operations

Road Tankers enter the site from the Simblist Road/ Friendship Road Intersection via dual entry gates (with an automatic security system) on the southern side of the Office/Control Room Building. Road Tankers exit the site via dual gates on the northern side of the Office/Control Room Building.

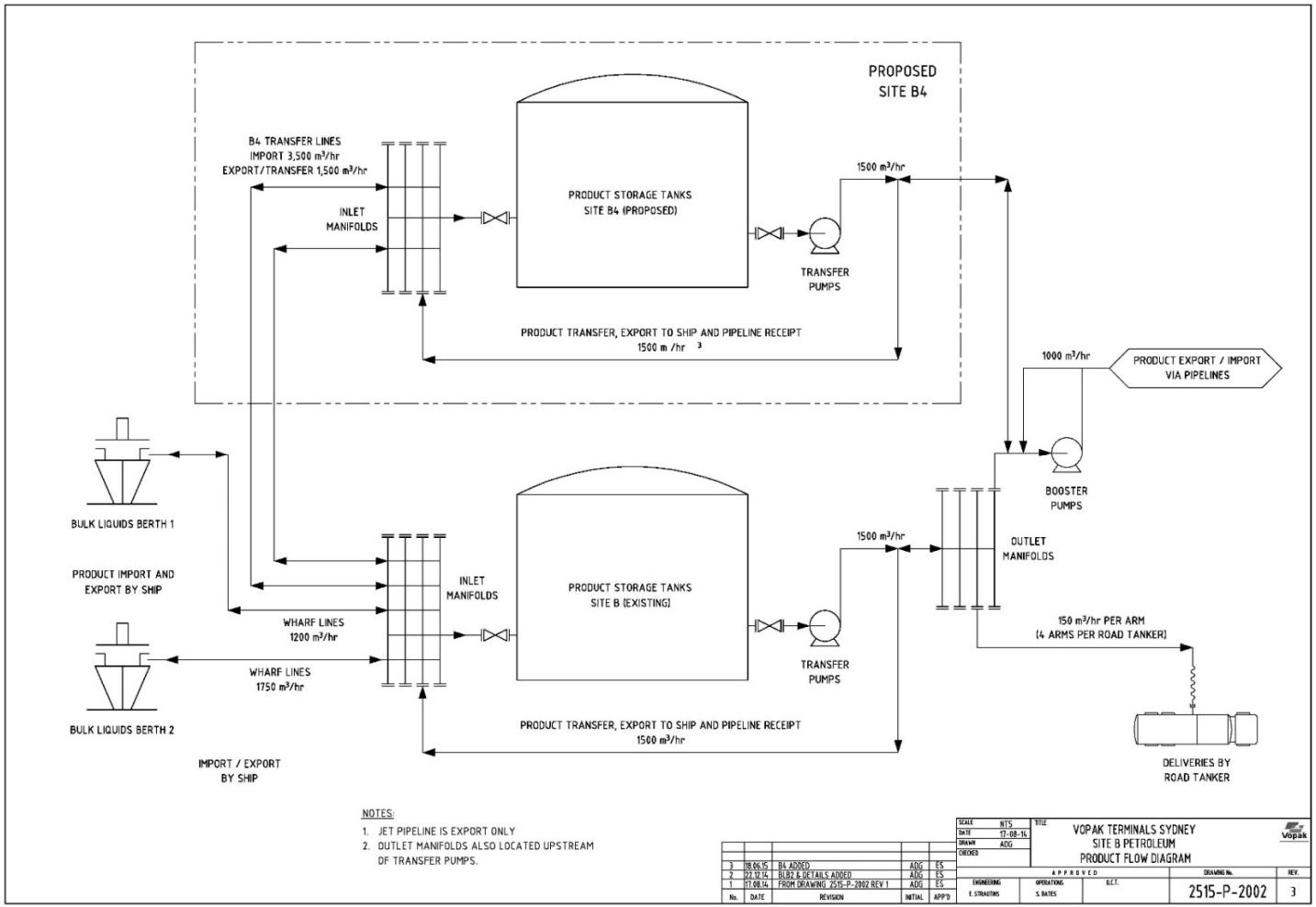
After entering the site, Road Tankers traverse the site in a clockwise direction heading west (towards Botany Bay) and then turn 180 degrees right to approach the Loading Gantry (currently 6 Bays). This allows the drivers to easily manoeuvre the road tanker into any one of the 6 bays. When loading operations are complete, the road tanker drives straight ahead from the loading bay towards the exit gates and halts at a second holding line. The driver can then leave the vehicle and go to Amenities and the Driver Printing Room where the Loading Documentation can be printed and then return to the vehicle prior to leaving the Terminal.

Because of the peak nature of the transport distribution process, road tankers do not arrive on a regular basis throughout the day. Peak arrival period is early morning (0300 hours to 0700 hours) and therefore on-site queuing is mandatory when all 6 loading bays are occupied during this peak period of activity. Road Tankers can queue on site starting at a holding line near the loading bay entrance ways. This holding line area allows for 3 road tankers abreast and 2 deep (total of 6 vehicles). The queue then extends back along the entrance way path towards the Entry Gates. A total of 18 road tankers can be accommodated on site in the queue (with 6 more road tankers in the loading bays).

This on-site parking facility is adequate for the current and near future road tanker throughputs but may not be sufficient when the road tanker throughput approaches 3,000ML per year. Hence, this application includes the provision of 3 extra loading bays to cater for this proposed road tanker traffic increase. However, when Bays 8 and 9 are constructed the on-site queuing capacity will be significantly reduced and hence the proposed Western Entry through the Elgas facility/Fishburn Road which will both restore and increase the on-site queuing capacity from the present level.

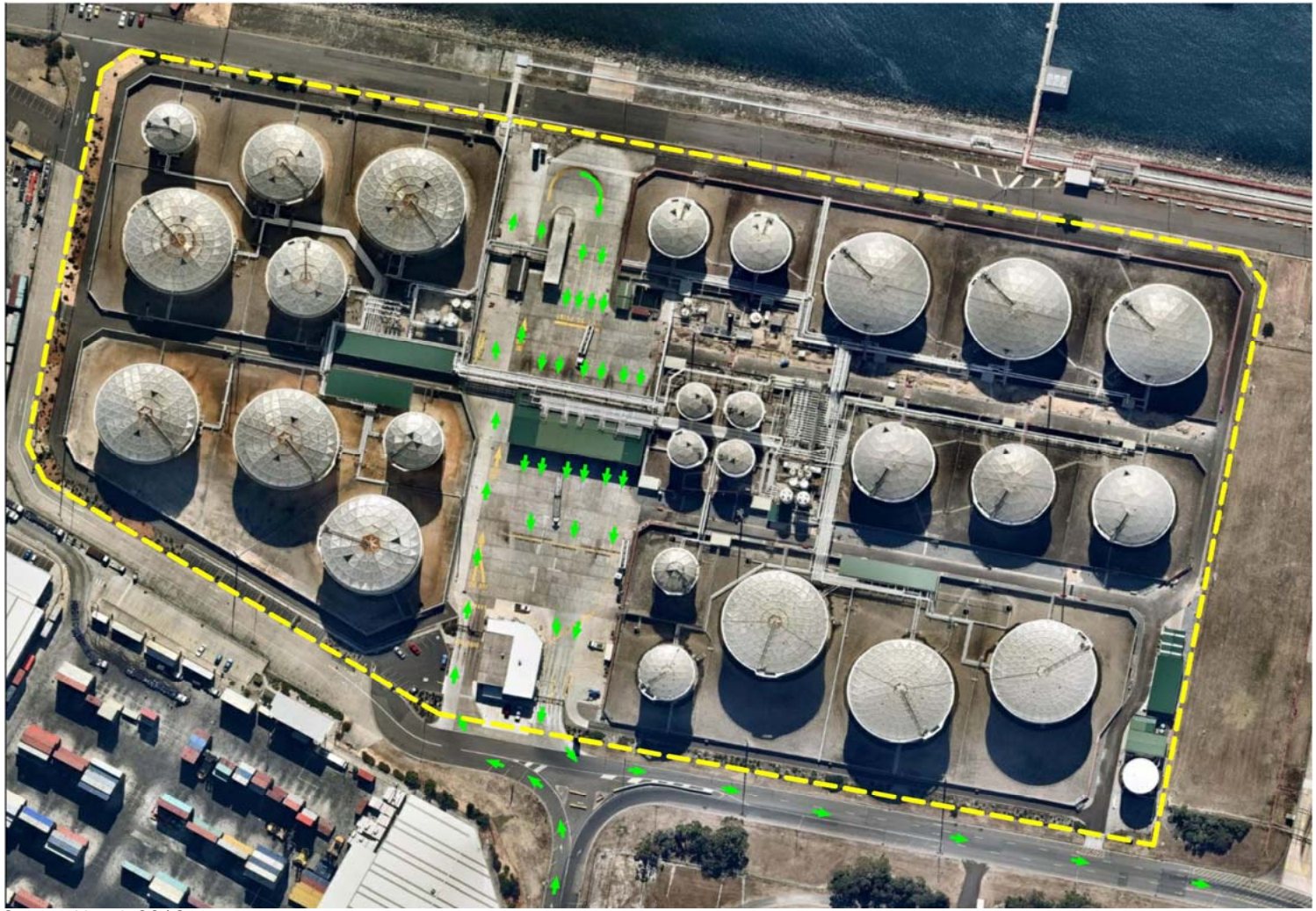
Figure 4.2 describes existing road tanker operations.

Figure 4.1 – Vopak Site B Product Storage & Distribution Process



Source: Vopak 2016

Figure 4.2 – Existing Road Tanker Traffic Flows (Green Arrows)



Source: Vopak 2016

4.2. Changes to Petroleum Market

With a population of 7.3 million, NSW represents the largest market for fuel demand in Australia, requiring a total of around 14,000 Million Litres (ML) of refined product per year, representing 6,000 ML of Gasoline, 4,700 ML of Diesel and 3,400 ML of Jetfuel.

Market projections by government agencies and oil majors all indicate an increase in demand for Diesel and Jetfuel, whereas demand for Gasoline will be relatively stable. The expected growth rate for Diesel and Jetfuel is around 2-3% p.a. While Gasoline demand is believed to remain stable, within this category demand for premium products (Premium Unleaded Petroleum (PULP) 95 and PULP 98) is expected to grow at the expense of ULP.

Historically, the majority of demand for petroleum products is found in Sydney. This market is divided into 'East' and 'West', with approximately 30% of the market being in the eastern suburbs and 70% in the western suburbs. Product is transported from import terminals to the market by road tankers as well as pipelines to inland Terminals. This means that the location of the distribution terminal is important, as it affects the time and distance required to reach the market.

To date, the majority of this demand was met by the Shell Clyde and Caltex Kurnell refinery production. However, both refineries have ceased production and NSW is now fully dependent on imports.

There are three key players for distributing product to the Sydney market:

- Vopak (350,000 m^3 storage) – located in the east of the city.
- Caltex (post conversion: 750,000 m^3 storage) – Kurnell is located in the east and is connected to the Caltex Banksmeadow terminal and Silverwater terminal in the west (a Joint Venture with Mobil) via pipeline.
- VIVA Energy (formerly Shell) (post conversion: 264,000 m^3 storage) – Clyde is adjacent to the Parramatta distribution terminal, run by Viva and used jointly with BP.

The main difference between these market players is that Vopak offers independent storage services. This means Vopak hosts other parties: making the market a more competitive place, whilst also improving security of supply.

All players are connected to the airport via pipelines.

From a commercial and strategic perspective, expanding Site B throughput is necessary for two key reasons:

1. Meet customer and market demand. Vopak needs to be able to offer customers room to grow, something that is currently not possible as Site B is at 100% occupancy.
2. Improve operational economies of scale as higher throughputs reduce overall unit operating costs.

As such Vopak seeks to modify operational elements of their existing Site B facility to increase the throughput of petroleum product in response to these changes to the petroleum market.

The existing Site B facility is located adjacent to the BLBs so that petroleum product can be imported and also exported by sea tankers via the existing Site B facility.

The Site B Terminal has the space to accommodate the changes necessary to receive and supply the projected additional throughput and contains infrastructure and services to support its operation.

The NSW Ports plan titled *Navigating the Future: NSW Ports' 30 year Master Plan (October 2015)*, provides a forecast growth for the next 30 years and indicates that the growth rate of liquid fuel will increase by around 80% from 2015 to 2045 (Page 40 of the Master Plan shows an increase from 3,150,000 kL to 5,670,000kL). When the growth rate for every 10 years is calculated, it results in a 21% growth rate every 10 years. When this growth rate is applied to the Vopak the throughput in 2025 is estimated to be approximately 2,904,000 m^3/yr. This projection does not align with Vopak's predicted throughput in 2023 and the reason for the mis-alignment is as follows:

The NSW Ports' 30 Year Master Plan trade volumes reflect the collective volume of all bulk liquid terminal operators in Port Botany. Volume forecasts, market share projections and growth rates of individual terminal operators vary over this period. NSW Ports' trade volume forecasts were based on factors such as industry demands, population growth and the closure of refineries and therefore may be considered somewhat conservative. Trade forecasts in the Master Plan are presented in 10-year intervals, but a gradual growth rate should not be assumed for the purposes of forecasting the bulk liquids trade growth through Port Botany. Vopak's approach to assess the 'worst' case scenario which includes assuming a higher market share of petroleum / liquid fuels trade through its facility is an appropriate approach for the purposes of obtaining a development approval for Vopak Site B.

Under the 2007 Vopak B project approval (MP 06_0089), it was assumed that 50% of the Terminal throughput would be exported by pipeline but this has not eventuated. Project Approval MP 06_0089 included the installation and operation of a new pipeline (known as the Caltex Transfer Pipeline - CTP), on behalf of Mobil Oil Australia, to connect Vopak Site B with the Caltex Banksmeadow Terminal (BMT). Mobil's intended purpose of this CTP pipeline was to receive product from the Caltex Kurnell Refinery into Vopak Site B as well as the capability to transfer products from Vopak Site B via the Sydney Metropolitan Pipeline (SMP) which is located within Caltex Banksmeadow Terminal, to the Mobil Terminal at Silverwater.

Vopak was originally advised that this CTP pipeline was expected to carry significant fuel volumes (which Vopak anticipated may reach 2000 ML per year, ie. approximately 50% of the Terminal throughput). Over the last 8 years since the pipeline's installation, this has not been the case to date.

The Vopak CTP pipeline system (Vopak Site B to Caltex Banksmeadow) has ample pumping capacity to achieve at least 2000ML per year throughput. There are two key factors that limit the use of pipelines from Vopak Site B:

1. Customers need to agree on pipeline access arrangements with the owners of the Sydney Metropolitan Pipeline/ Caltex JUHI Jet Fuel Transfer pipelines to pump product through these pipelines and/or lift product from their Road Tanker Loading Facilities.
2. The physical loading capacity (Road Tankers) must be available at other Fuel Distribution Terminals (connected to Vopak Site B by pipeline).

It should be noted that the current Vopak CTP and Jet Fuel Pipeline systems accounts for more than 20% of the Vopak Site B Terminal Throughput. Both Vopak systems have ample spare capacity but the limitations are downstream in the existing pipeline network systems.

4.3. Site B Road Tanker Loading Options

TFA Project Group were appointed by Vopak to prepare an options study is to assist in the master planning of the Vopak Site B terminal and to confirm the location and establish the quantity of new road tanker loading bays that can be installed.

Five options were considered:

- Eastern entry option from Friendship Road using the existing Entry/Exit Gates
- Four western entry options from Fishburn Road (two northern approach options and two southern approach options).

All five options are feasible, except however, the lease boundary for the internal access options does not provide enough room for road tankers to manoeuvre.

The western entry, northern approach option from Fishburn Road is the preferred design for the following reasons:

- Road tanker (RT) loading bay 7 located on the southern end of the existing road tanker loading bays 1-6 is feasible for this option and not feasible with the East Entry.
- Two new island road tanker loading bays (8 and 9) positioned obliquely between the control room and the existing road tanker loading bays is feasible for this option.
- This option has the benefit of more offsite queuing to the north and west of the site on a dedicated access/queuing roadway lease.
- The option does not require crossing to the right hand side of Fishburn Road for queuing.
- The traffic flow enables a new unloading bay to be situated south-east of the transformer building up against the tank bund.

4.3.1. Construction Implementation

The Road Tanker Loading work would be staged in the following manner:

Stage 1.

Stage 1 is scheduled to commence construction over a period of 6 months and would involve the following activities:

- Construction of Road Tanker Loading Bay 7 and additional RT pumps and supply pipelines
- Construction of a steel framed awning (19m. x 1.9m. wide) on the northern side of the existing Control Room Building to provide weather protection for Drivers entering/exiting the Customer Print cubicles.
- Vapour Recovery Unit project
- Maintain existing Road Tanker entry from Friendship Road
- Maintain existing Road Tanker exit to Friendship Road
- Construction of Road Tanker Unloading Bay and RT unloading pumps
- Civil, Structural, Piping, Electrical and Instrumentation Works.

Stage 2

Stage 2 is scheduled to commence construction over a period of 12 months and would involve the following activities:

- Construction of Road Tanker Loading Bay 8 & 9 and additional RT pumps and supply pipelines
- Construction of a new Road Tanker entry from Fishburn Road via an easement adjacent to Elgas (Elgas Road) from Friendship Road and modification to the Simblist Road/ Friendship Road intersection
- New Drivers' Amenities Building at Fishburn Road entrance
- Civil, Structural, Piping, Electrical and Instrumentation Works for the above.

The summary table below details the key operational features of the preferred option.

Table 4.1 Key Operational Features of the Preferred Option (based on B-Doubles)

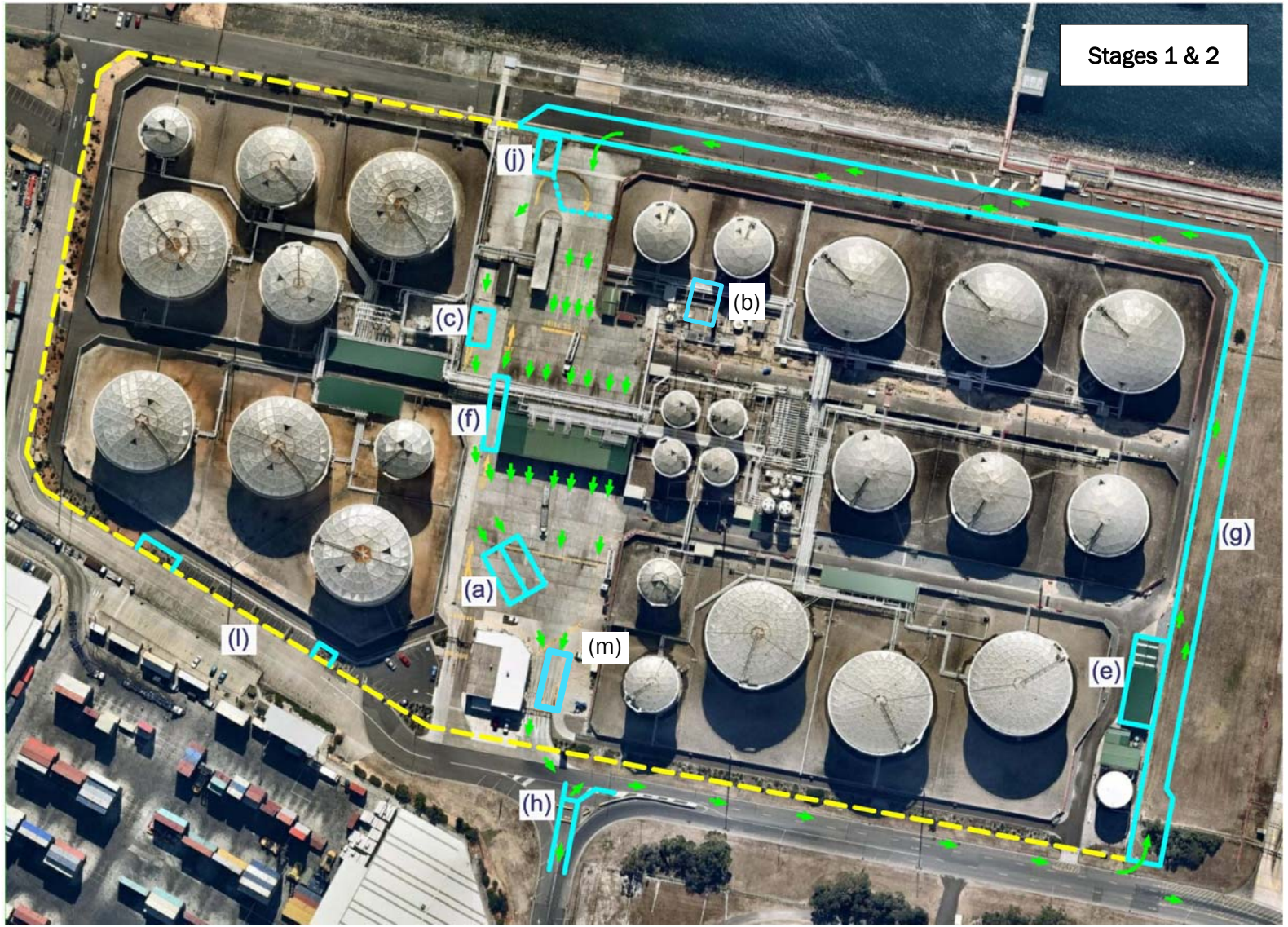
Operational Features	Existing	Proposed
Loading Bays	6	9
Unloading Bays	nil	1
Onsite Queuing	12	7
Onsite Holding	6	4
Offsite Queuing (on dedicated road lease)	nil	12

Details of the proposed works are provided below and an overall illustration particularly of the Road Tanker upgrades are shown in Figure 4.3.

Note that Figure 4.3 does not show:

- Details of Export debottlenecking of tank outlets, tank export pipelines and transfer pumps as well as instrumentation for quantity and quality control.
- Details of VRU project.
- Changes to specific conditions of Project Approval.
- Ability to change products.
- Details of Civil, Structural, Piping, Electrical and Instrumentation Works for the above.

Figure 4.3 – Proposed Works



4.4. Shipping Options

With refineries closing all over Australia, fuel product flows are expected to change considerably. An increase in output by sea for all products as Sydney is more and more becoming a fuel hub (not only an end-destination) with Australia's refineries closing. Sydney has shifted from being self-sufficient through its refineries to relying entirely on imports. Furthermore, with Sydney becoming a fuel hub, in addition to Road Tanker and Pipeline distributions from Site B, this means larger vessels up to LR Class will discharge fuels in Port Botany which will then be redistributed to smaller ports along the East Coast or into New Zealand using smaller Coastal Tankers. The Port Botany BLB1 and BLB2 are the two largest Australian common-user bulk liquid product berths (in vessel deadweight tonnage (DWT) - handling capacity). Economies of scale can be achieved using Port Botany as a hub.

Site B currently exports to ships approximately 360,000 cbm each year to Australian coastal shipping. The proposed growth in exports to 2,000ML/y is likely to occur over the next fifteen years. This product throughput across all petroleum product grades will have no impact on road traffic. It does imply that there could be an increase of vessel movements in Port Botany.

To facilitate this increase, Vopak will improve the Export capability of the Terminal (by increasing the pumping capacity) to ensure efficient discharge operations at the BLB's for the proposed increases in Export volumes.

Similarly, Site B currently imports from ships approximately 3,000ML/y. The proposed growth to 7,800ML/yr is likely to occur over 15 years. This product throughput across all petroleum product grades also implies an increase of vessel movements in Port Botany.

To facilitate this increase, Vopak will improve the Import capability of the Terminal (by increasing the pumping and line capacities) to ensure efficient discharge operations at the BLB's for the proposed increases in Import volumes.

The alternative of not upgrading infrastructure would mean that the berth occupancies would rise significantly due with the current average export and import flowrates being an average 300 and 1,100 cbm/hr respectively. This will become a constraint on the use of the berths both for Vopak and the Other Users (TPL, Elgas, Qenos, etc) who share the use of the berths as occupancy would increase and delay or block other shipping. Such delays will cause offshore ship queues as well as extra demurrage costs to the users. Upgrades to an average export flowrate of 1,200cbm/hr (1,500cbm/hr peak) by the installation of larger pumps, piping manifolds and various debottlenecking will be completed progressively to cater for demand. Similarly, upgrades to an average import flowrate of 2,500cbm/hr by the installation of an additional ship connection and piping debottlenecking will be completed progressively.

The further alternative of not upgrading would be not to substantially increase exports to ship nor Vopak throughput. This would cause the local Australian market to miss the cost benefits of the new fuel hub and proposed higher throughputs at Port Botany.

4.4.1. Berths Occupancy Modelling

Vopak has carried out a study of its ship imports and exports to determine the effects on the existing NSW Ports shared user berths Bulk Liquids Berths No 1 and No 2 (BLB1 & BLB2).

The study incorporated the following approaches:

- Site B only model begun with 2014 actual data.
- No allowance for other port users or Vopak bitumen.
- Using proposed Throughputs (import + export).
- Import flowrate per ship currently 1200m3/hr average from current data and future plan to be 1600m3/hr average with debottlenecking upgrades.
- Export flowrate currently 300m3/hr average from current data, rising to 1200m3/hr average when we upgrade export pumps.
- Slowly Increasing cargo sizes from part or small MR Class loads towards more large MR Class or part/small LR Class vessels 45,000t parcel discharges.
- Ship non-pumping time "Deadtime' included as per NSW Ports definition of Ship's at Port Entry Pilot Station to Port Exit Pilot Station reduced from current 12 to 8 hours progressively.

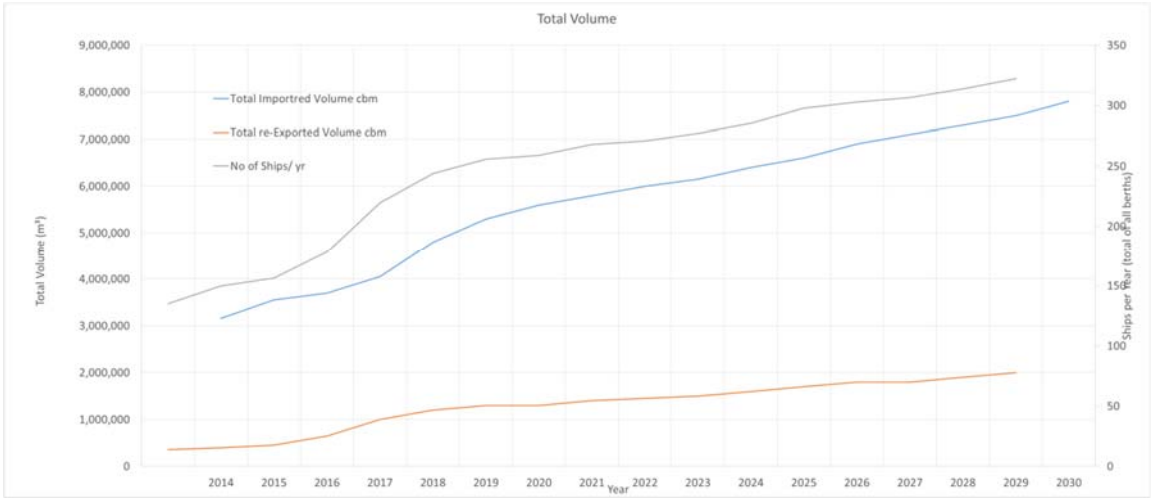
The study used the throughputs for the table below.

Table 4.2: Site B Throughput and Shipping

Vopak Sydney forecasted export	Unit	2015	2020	2025	2030
Total Site B Exports – Ship	BL	0.4	1.3	1.6	2
Total Site B Export (Road Tanker, Ship and Pipe)	BL	3.55	5.6	6.6	7.8

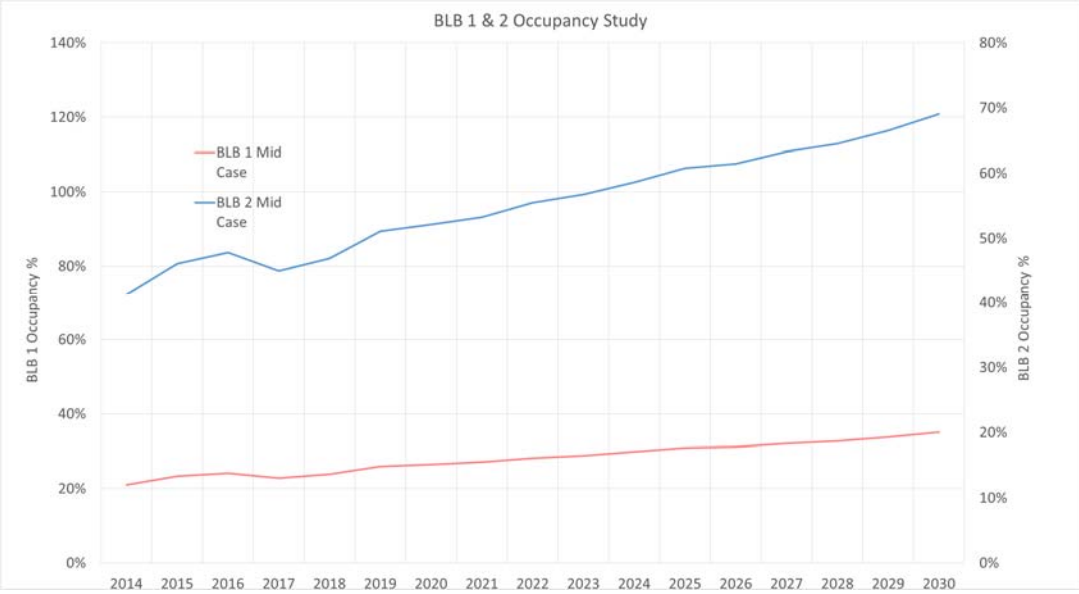
Using current and expected parcel sizes and numbers per ship, the total number of ships visiting Port Botany for fuel despatches (imports) or fuel receipts (exports) from Vopak Site B were calculated. These results are tabulated below.

Figure 4.4: Site B Throughput and Shipping



From the throughputs, number of ships, assumed deadtimes (non-pumping times) and Berth Occupancies:

Figure 4.5: Occupancy at BLB1 and BLB2



5. Description of the Proposed Modification

5.1. Introduction

The approved Site B facility operates as an integrated bulk liquids storage and supply facility.

There are range of ancillary services that complement the facility, including control rooms, workshops, road tanker loading gantry, waste water treatment plant, connections to NSW Ports and petroleum industry infrastructure and staff amenities.

At present the total product throughput is 3,950,000 m^3 (3,950 ML). It is proposed to modify operational elements of the facility to facilitate the total product throughput to 7,800,000 m^3 (7,800 ML) in response to market changes detailed in Chapter 4. Details of the current Site B product throughput and predicted product throughput are shown in Table 5.1 below.

Table 5.1 Current and Projected Product Throughput

	Annual Output by Road Tanker (m^3)	Annual Output by Pipeline (m^3)	Annual Output by Sea (m^3)	Annual Total Throughput (m^3)
2013 Total Site B Output	1,860,000 (60,000 vehicles)	790,000	60,000	2,710,000
***Approved Total Site B Output**	1,897,500 (48%) (Also includes 150,000 m^3 of jet fuel by Road Tanker) (61,000 vehicles)	1,867,500 (47%)	185,000 (5%)	3,950,000 (100%) 180-200 Ships/year (estimated)
Forecast Total Site B Output	3,700,000 (47%) (including jet fuel export by road) (92,500 vehicles)	2,100,000 (27%)	2,000,000 (26%)	7,800,000 (100%) 300-350 Ships/ year (estimated)

***Refer to Section 5.2.8 Modification to Conditions of Approval**

The main changes are:

- An increase in output by truck for all products. The main increase would come from a planned increase of the terminal capacity in ground fuels. However also expected is a substantial increase of jet fuel trucks as pipeline availability to Sydney Airport is limited and jet output by truck to supply NSW Regional Airports and to the planned Badgerys Creek Airport may be required.
- An increase in the net average shipping flowrates and number of simultaneous ship import and export operations for all fuel product types.

To achieve this required throughput a number of changes are required to the Site B facility which are detailed below.

5.2. Required Changes to the Site B Facility

The changes to the Site B Facility include the following:

- West Entry Northern Approach Roadways - requiring the need to lease an additional 2,870 m^2 of land from NSW Ports to the north and west of Site B plus the modification to the Simblist Road intersection with Friendship Road.
- Construction of Three New Road Tanker Loading Bays (Bays 7, 8 & 9).
- Installation of additional transfer pumps and product supply pipelines to existing RT Pump Manifolds.
- Construction of One Road Tanker Unloading Bay for biofuels, additives and other ancillary products together with RT unloading pumps.
- Construction of a New Drivers' Amenities Building at Fishburn Road entrance.
- Construction of a steel framed awning (19m x 1.9m wide) on the northern side of the existing Control Room Building to provide weather protection for Drivers entering/exiting the Customer Print cubicles.
- Vapour Recovery Unit project.
- Ship Import debottlenecking of inlet manifolds, tank import pipelines and tank inlets, inclusive of tank-to-tank and tank recirculation piping and pump facilities as well as instrumentation for quantity and quality control to increase flowrates.
- Ship Export debottlenecking of tank outlets, tank export pipelines and transfer pumps as well as instrumentation for quantity and quality control to increase flowrates.
- Civil, Structural, Piping, Electrical and Instrumentation Works for the above.
- Increase in the size of the approved Warehouse (8m x 12m) near the Fire Pump House. The proposal is to extend the Warehouse to be 12m x 20m.
- Modification of several conditions of Project Approval (06_0089).
- Clarification of Vopak's ability to change products.

The capital costs of the proposed modification are of the order of $25 million.

Figure 5.1 illustrates the proposed modification.

Figure 5.1 - Details of Proposed Modification

Legend:

a) Road tanker loading bays 8 and 9

b) VRU project

c) Road tanker unloading bay

d) Operational debottlenecking (i.e. increasing pump & pipeline sizes by replacement)

e) Warehouse extension

f) Road tanker loading bay 7

g) Road tanker west entry road

h) Simblist Road/Friendship Road intersection works

j) Amenities block

l) Car parking spaces)

5.2.1. West Entry Northern Approach

New Road North of Vopak Terminal

Major upgrade works for the western entry, northern approach option (the preferred option) will be required. There is a 12m wide NSW Ports roadway easement through the Elgas site to the north of the Vopak Site B terminal. Construction of a new road through this easement will allow road tankers to approach the west entry from the north allowing queuing on the left hand side of the road.

The proposed new road allows for a 3.5m queuing lane and a passing 3.5m lane and a footpath along the Vopak boundary. The road will be complete with drainage and street lighting.

Fishburn Road Upgrade

To permit the addition of a queuing and passing lane to Fishburn Road it will necessary to widen the road into the landscaping on the eastern side. This will allow 2 x 3.5m Fishburn Road Port traffic lanes, a 0.5m wide divider island with fence, and for Vopak trucks a 3.5m wide passing lane and a 3.5m wide queuing lane. The traffic and queuing lanes will be separated by a 0.5m wide concrete island with a 2.2m high fence. A security gate will be required at the end of the queuing/passing lanes to enable tankers to exit onto Fishburn Road in the event of an emergency. A new footpath is required along the outside of the Vopak fence for tanker drivers to access the amenities building when their truck is parked in the queue. This will require a retaining wall to be installed under the fence from Friendship Road to the new driveway entrance.

All of these upgrade requirements are applicable to the section of Fishburn Road between the new driveway and the northwest corner of the site.

Traffic Control

Due to the restricted visibility from the queue on the new road to Fishburn Road, traffic lights may be required at the end of the new road queue to inform the drivers when there is space available in the onsite queue.

West Entry Entrance

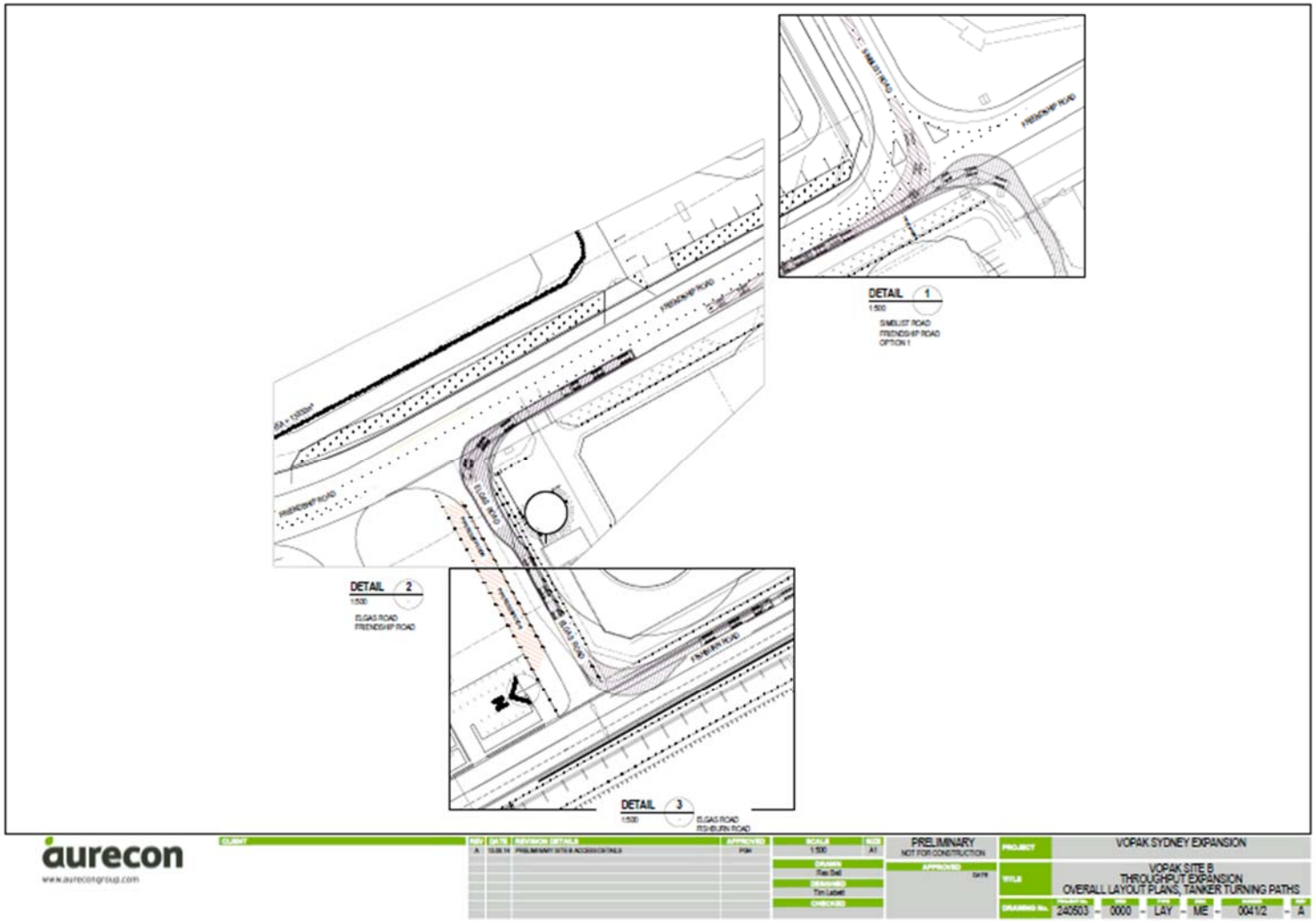
Automated gates (similar to the existing at Friendship Road) will be installed complete with the relevant truck setback from Fishburn Road.

Simblist Road- Friendship Road Intersection

The intersection will be modified to enable a third (middle) lane right hand turn into Friendship Road.

Details of the proposed intersection changes are shown in Figure 5.2.

Figure 5.2 - Proposed Intersection Changes



Additional Lease Area from NSW Ports

The West Entry Northern Approach option will require Vopak to lease/licence additional land from NSW Ports as described in Table 5.2 below.

Table 5.2 Total Additional Lease Areas from NSW Ports

Additional Lease Areas	Approximate Area
New Road north of terminal tanker queuing area	815 m^2
New Road Intersections from Vopak boundary	-40 m^2
Fishburn Road queuing and bypass lane area	2,095 m^2
Total Additional Lease Area from NSW Ports	2,870 m^2

5.2.2. New Loading Bays

The existing Road Tanker Loading Systems can operate at up to 2,400 L per minute per truck compartment with up to three compartments per truck simultaneously. Generally, loading (of a five-compartment road tanker) takes less than 20 minutes for an average size tanker volume (33,300 L). The proposed new loading bays will have the same operating capabilities.

Vopak anticipates that the current maximum practical gantry capacity (six bays) could be achieved in 2017. A significant volume change is expected in 2016 (refer Table 5.3 below in BL (billion litres)) whereby the existing gantry capacity may potentially be exceeded hence extra Loading Bays will be required.

Table 5.3 Vopak Sydney Forecasts

Forecasted export volumes	Unit	2013	2014	2015	2016	2030
- Total Site B Exports – Truck	BL	1.9	2.3	1.9	2.4	3.7
- Total Site B Exports – Pipe	BL	0.8	0.8	0.8	1.3	2.1
- Total Site B Exports – Ship	BL	0.4	0.4	0.4	0.5	2.0
Total Site B Export	BL	3.1	3.5	3.1	4.2	7.8

The expected increase of exported volumes by truck determines the expected number of trucks in the future.

Consideration has been given to multiple locations for the new loading bays and are outlined below:

Bay 7 - Immediately South of Bay 5

This location is suitable for a single new loading bay with the west entry in operation after Stage 2.

Bay 8 & 9 Positioned Obliquely in Front of the Control Room

The proposed location for the new two bay island loading gantry (bays 8 & 9) in this option is between the existing tanker loading bays and the control building. The new loading gantry will be oriented on a 40° angle to the rest of the terminal to provide smooth entry and exit to the bays and minimise the effect on traffic from bays 1-7. The position of bays 8 & 9 will reduce the number of tanker holding positions to 4.

The existing Friendship Road entrance will remain unaltered and used for delivery vehicles and emergency services vehicles. In addition, there will be no changes required to the existing parking in front of the control building or the triangular car park to the south of the control building. Pipe work to the island bay will require a pipe bridge. The existing Exit gates to Friendship Road will also remain unaltered.

As detailed in Section 4.2, Bay 7 may be constructed in Stage 1 prior to Bays 8 & 9 (Stage 2) and whilst still utilising the existing Friendship Road entrance.

5.2.3. Unloading Bay

A new unloading bay for Biofuels/Additives/Ancillary products truck unloading to bulk tanks will be required for future blending into fuel, e.g., E10 petrol or B20 Biodiesel.

The proposed new unloading bay is positioned south-east of the transformer bay. In this position, it can only be an unloading bay. A 6m hazardous zone from the tanker is created by loading (refer

Figure 5.3), and extends to the transformer building which has louvred ventilation (refer Figure 5.4). It is necessary to keep the transformer building out of any hazardous zones. The unloading bay is unable to be moved further east as it will conflict with tanker paths bypassing bays 1 to 7.

Figure 5.3 – AS 60079-10-1 Figure ZA.32 - Road or Rail Tanker Loading with Vapour Recovery

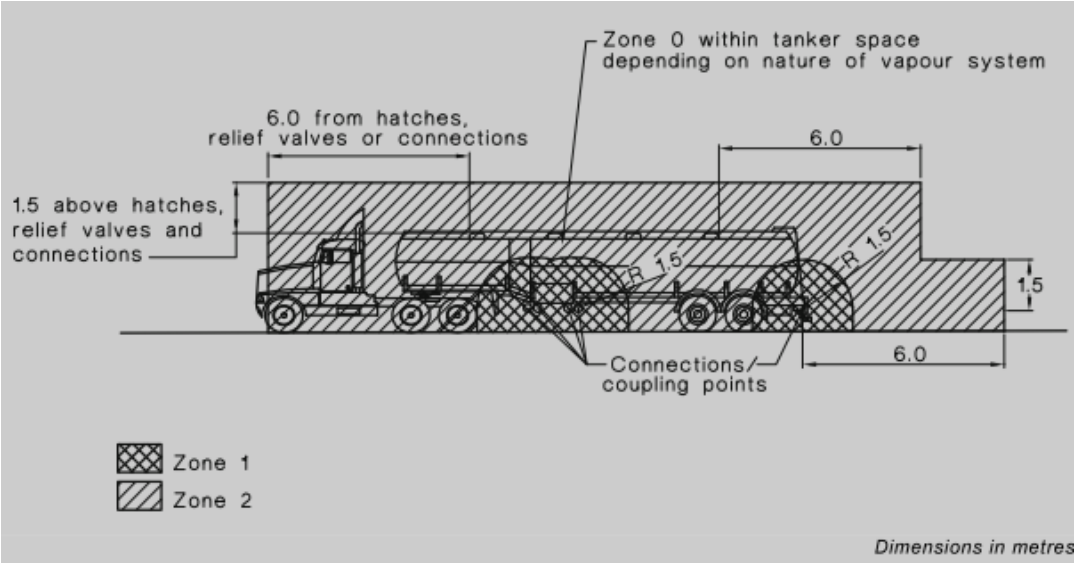


Figure 5.4 – Transformer Building with Louvred Ventilation

The unloading connection points and pumps will be on the northern side of the new bay and piped via a pipe bridge in the gantry shelter structure to the southern side. There is an electrical easement that will run through the new unloading bay. No footings will be required in the easement area however the shelter structure will go over it.

Approval will be required from Ausgrid to build over the easement prior to finalising its position.

5.2.4. New Amenities Building

Currently the control room and amenities are located on the eastern side of the terminal. To provide assistance and amenities for tanker drivers when the Fishburn Road Western Entry is constructed in Stage 2, a new amenities building will be required with provision for the following:

- 3 x male toilet cubicles
- 1 x separate female/disabled toilet
- 1 x induction Training Room for 10 people
- 1 x Meal Room
- 1 x Office for Operator with window to driver entry
- 4 x driver cubicles for secure paperwork.

The amenities building will require a sewage pump station to pump to the nearest sewer inlet which is approximately 100m away.

Consideration has been given to the suitability of its location in relation to the heat radiation levels predicted for a tank top fire and a full surface bund fire. A QRA has indicated the position will be acceptable with egress to both the north and south along Fishburn Rd. The building will be designed on a 4 hour fire rating. The size of the building is also limited by the Ausgrid electrical easement.

5.2.5. Vapour Recovery Unit

The existing VRU has sufficient capacity to ensure compliance with clause 64(2)(d)(ii) of the *Protection of the Environment Regulations Operations (Clean Air) Regulation 2010 (NSW)* (Clean Air Regulation) for the current number of Loading Bays (i.e., current status) and the existing throughput.

However, to continue to ensure compliance with clause 64(2)(d)(ii) of the Clean Air Regulation under the scenarios envisaged in this EA it may be required to increase the Vapour Recovery Capability prior to further substantial rise in throughput. The Vapour Recovery Capability can be increased by upgrading the existing VRU, replacing the existing VRU or installing a second VRU alongside the existing unit or a combination of these.

5.2.6. Proposed Warehouse Expansion & Control Room Building Awning

The approved Warehouse dimensions are approximately 12m x 8m and consists of a concrete slab with a steel framed structure clad in Colorbond sheeting.

The proposed Warehouse dimensions once extended will be approximately 20m x 12m and will also consist of a concrete slab with a steel framed structure clad in Colorbond sheeting to match the existing warehouse.

Construction of a steel framed awning (19m x 1.9m. wide) on the northern side of the existing Control Room Building to provide weather protection for Drivers entering/exiting the Customer Print cubicles. The structures have been designed in accordance with the relevant standards:

- BCA AS/NZS 1170 Parts 0.1.2, AS2870-2011 Residential Slabs and Footings, AS/NZS 4100-1998 Steel Structures, AS/NZS 4600 -2005 Cold Formed steel structures and AS 3600 -2009 Concrete structures.

The awning will be designed such that no part extends beyond the existing Road Tanker Exit lane kerbing in order to eliminate any risk of impact.

The awning is of pre-fabricated construction and will only take 1-2 days for installation and will be contained wholly within the site.

5.2.7. Ship Import/Export Debottlenecking

Progressively as throughputs increase, the following works will be completed:

- Ship Import debottlenecking of inlet manifolds, tank import pipelines and tank inlets, inclusive of tank-to-tank and tank recirculation piping and pump facilities as well as instrumentation for quantity and quality control to increase flowrates. Specific infrastructure will include: additional receipt headers in B1 and B3 Inlet manifolds complete with all tank connecting actuated double-block-and-bleed valves; diameter increases in bottlenecked piping; new flow and in-line product quality instrumentation (density, flashpoint, colour, etc); larger pumps; new tank nozzles and mixing equipment to quicken the process of homogenisation within storage tanks; etc.
- Ship Export debottlenecking of tank outlets, tank export pipelines and transfer pumps as well as instrumentation for quantity and quality control to increase

flowrates. Specific infrastructure will include: larger size and number of pumps used for export at B1 tanks, B2 and B3 pump manifolds; increased piping diameters and suction connections to the upgraded pumps; export valved non-return valve bypass piping at B1 Transfer Manifold and at BLB1 Wharf Manifolds; etc.

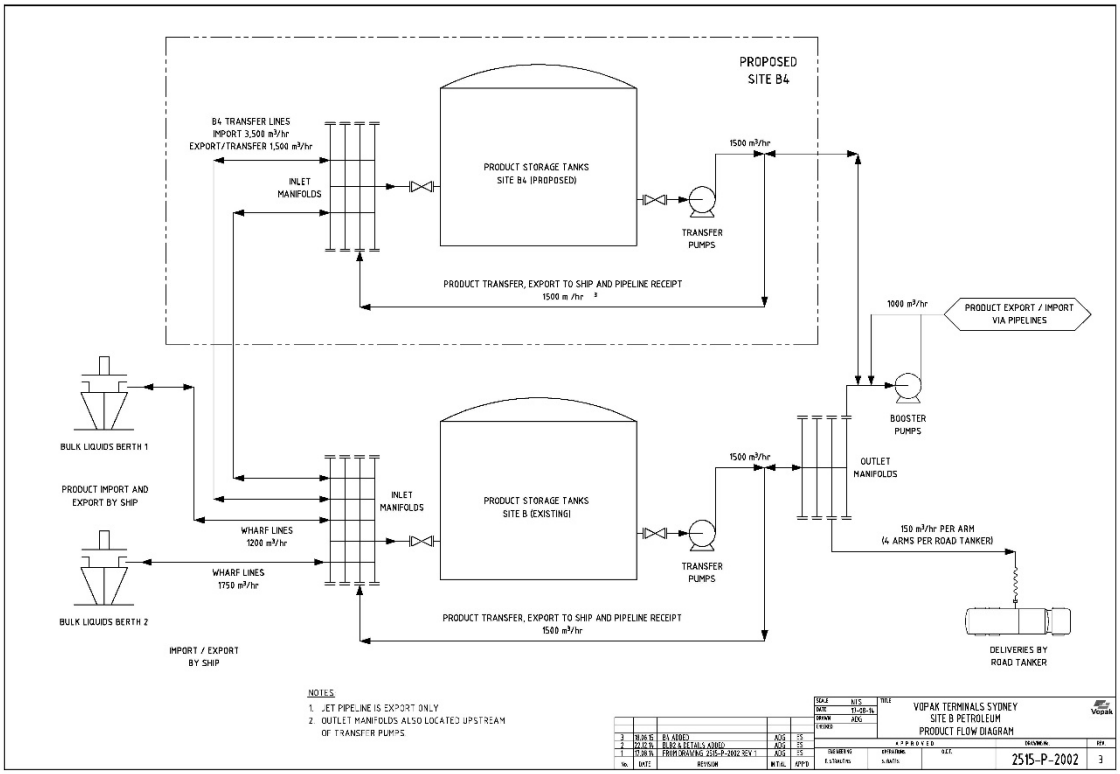
- Civil, Structural, Piping, Electrical and Instrumentation Works for the above.

Additional to the capital works improvements, Vopak will undertake General Efficiency Improvements where possible, including:

- Improving coordination of customer ship planning.
- Streamlined product quality chemical testing procedures.
- Safe operational procedural modifications dealing with higher throughputs, including higher velocity flowrate.
- Coordination with NSW Ports and other port users regarding general shipping and berth management issues.

The flowsheet included in Vopak's B3 EA has been updated showing the upgraded flowrates as below (see Figure 5.5).

Figure 5.5: Site B Petroleum Product Flowrates



Source: Vopak 2016

5.2.8. Modifications to Conditions of Approval

A number of modifications to the conditions forming part of the Vopak Site B Bulk Liquids Storage Facility and Associated Infrastructure Project Approval (06_0089) dated 28 February 2007 are being sought as described below.

Schedule 2 (Administrative Conditions) Conditions 9, 10 & 11 - Restrictions on Throughput

"Condition 9. The Proponent shall ensure that the throughput at the site does not exceed 3,950,000 m³ of bulk liquids a year."

"Condition 10. The proponent shall not receive more than 192,500 m³ of bulk liquids a year by road tanker."

"Condition 11. The proponent shall not dispatch more than 1,897,500 m³ of bulk liquids a year by road tanker, including a maximum of 15,000 m³ of Jet Fuel."

It is noted that section 32 of the *Ports Assets (Authorised Transactions) Act 2012* (NSW) (Ports Assets Act) states that "*A planning control is of no effect to the extent that it would operate to impose a cargo throughput limit for Port Botany."* The phrase "cargo throughput limit" is defined in section 32(2) as "*any direct or indirect limit or other restriction on the amount of cargo that can be received or handled at or transported from Port Botany*". "Planning approval" is defined to include a consent, approval, permission or other authority under the EP&A Act. Since Conditions 9, 10 and 11 are "planning controls" as they are contained within the Project Approval, the limits imposed under those conditions are of no effect.

Since the Ports Assets Act removes any throughput limit imposed in a planning consent, increased limits will also be of no effect and there will be no practical consequences which arise from increasing the limits specified in the Project Approval. Without prejudice to this position, Vopak has conducted a comprehensive environmental assessment of increased throughputs (and the additional infrastructure required to facilitate this increase) so that future impacts can be assessed.

Although the Ports Asset Act operates to render any throughput limitations imposed in the Project Approval invalid, modification of conditions 9, 10 and 11 will make Vopak's operations more transparent to stakeholders by unambiguously authorising the increased throughput limits.

Vopak projects Road Tanker Throughputs (including Jet Fuel) will reach 3,700,000 m³ per year by 2030 because of the issues described in Section 4.

The original Application in 2007 assumed that almost 50% of the Terminal throughput would be by pipeline export but this has not been the case in practice. The majority (approximately 70%) has been by Road Tanker export.

There is however a trend to increase output through the Jet Fuel and Caltex Transfer Pipeline (CTP) pipeline systems.

Whilst the majority of Sydney Airport Jet Fuel is supplied by pipeline, there are foreseeable occasions when transfers by road are necessary. Vopak also can supply NSW Regional Airports (Canberra and Bankstown) by road. Also as Badgerys Creek Airport is expected to become operational it will be supplied by road initially until a new Jet fuel supply pipeline is approved, constructed and commissioned.

Schedule 3 (Specific Environmental Conditions) Condition 6 - Ongoing Management Hazard

Schedule 3, Condition 6 of the Project Approval currently states that:

> *"During the life of the project, the Proponent shall notify Sydney Ports Corporation in writing on each occasion that flexible hoses are used for the project. This notification shall occur prior to the use of hoses, and shall state the reasons for the use of hoses, the intended duration of use and the quantity of product to be transferred."*

This condition emanated from an earlier project involving the construction and operation of a Methanol pipeline that interconnected with Marine Loading Arm (MLA) No. 1 at BLB1. The pipeline was constructed to allow a dedicated transfer system from BLB1 to the dedicated Methanol Tank (T625) as the Methanol was sensitive to any cross contamination from petroleum products. Hence, the application also included the use of flexible hoses at BLB1 to by-pass the MLA itself and thereby avoid extensive pre discharge cleaning of the MLA.

The other reason for the (limited) use of flexible hoses was to allow petroleum product discharges to proceed in the (rare) event that the electro-hydraulic systems associated with the MLA were to fail. Now that BLB2 is in operation, the same situation could arise whereby the MLA systems fail and a flexible hose arrangement could be used to continue the operation (either discharge or export).

Vopak submits that this condition be rescinded on the basis that hoses are not used for ship import/export activities.

Schedule 3 (Specific Environmental Conditions), Condition 27 - Air

Schedule 3, Clause 27 of the Project Approval currently states that:

> *"During the life of the project, the Proponent shall monitor the vapour recovery units on the site to ensure that they are operating at least 99% efficiency at all times. The Proponent shall implement a shutdown procedure if the Vapour Recovery Unit is operating at less than 99% efficiency at any time."*

The Site B VRU is a Liquid Ring Vacuum Pump based Hydrocarbon unit. The unit is used to recover Volatile Organic Compounds (VOCs – consisting mostly of hydrocarbon vapours) resulting from truck loading operations of different grades of gasoline. However, due to the fact that the same trucks are used for gasolines and automotive diesel, gases low in hydrocarbon vapours (e.g. originating from trucks that previously transported diesel) also are displaced into the piping system during the road tanker loading process. This leads to an overall dilution of gasoline vapours in the system. With this in mind, the unit is designed for an inlet hydrocarbon concentration of 40% and an output after processing at 30mg/L of VOC to atmosphere (on average). This is well within the 110 milligrams per litre of volatile organic liquid (per 4 hour period) limit prescribed by clause 64(2)(d)(ii) of the *Protection of the Environment Regulations Operations (Clean Air) Regulation 2010* (NSW) (Clean Air Regulation).

The Site B EPL imposes the same limit as prescribed in the Clean Air Regulation. The Site B EPL and Clean Air Regulation emission requirements are, in the manufacturer's terms, an EMISSION GUARANTEE (110mg/L), whereas Schedule 3 Clause 27 of the Project Approval requires a PERCENTAGE RECOVERY EFFICIENCY only (99%).

The VRU manufacturer has made the following statements in relation to the VRU at Site B at design capacity:

> *"At 40% inlet hydrocarbon concentration it is not possible to consistently stay within emission limits of 110mg/L and achieve a 99% recovery efficiency."*
>
> *"It is to be noted that at zero loading, 99% recovery efficiency is impossible."*

Performance guarantees by the supplier are generally provided as an "Emission Guarantee" **OR** a "Percentage Recovery Efficiency Guarantee" but not as an "Emission Guarantee **AND** a Percentage Recovery Efficiency Guarantee". Thus, the emission guarantee contained in Vopak's EPL and the percentage recovery condition contained in the Project Approval are not mutually compatible. The NSW EPA have also confirmed that clause 64(2)(d)(ii) of the Clean Air Regulation applies to the Project (i.e emission guarantee only).

Because the requirements of the Project Approval and Vopak's EPL (and the Clean Air Regulation), Vopak requests that Schedule 3 Clause 27 of the Project Approval be rescinded. The conditions of the Clean Air Regulation and Vopak's EPL will continue to be met.

5.3. Construction

A six month construction period is proposed for Stage 1.

The main construction activities envisaged include:

- Site preparation
- Excavation
- Road works
- Concrete placement
- Installation of additional pumps to existing pump manifolds
- Erection of road tanker loading bay No. 7, Amenities building, VRU and pipe support structures
- Modifications to Inlet/Outlet Manifolds and Tank appurtenances
- Fire Protection system installation (including cross- connection to the NSW Ports BLB Fire Protection system)
- Commissioning.

The bulk of the construction works would be conducted during daytime hours (nominally 7.00am to 6.00pm).

Vehicular access to the site would be provided via Fishburn Road and Friendship Road.

The Stage 2 component of the project is scheduled to commence construction when the Road Tanker Throughput reaches 2600ML per year (approximately) and is proposed to last 12 months.

The main construction activities envisaged include:

- Erection of road tanker loading bays, road tanker unloading bay, pipe support structures, product delivery pipework, additive injection systems, instrumentation, control systems, fire protection systems and Control Room Building awning.
- Site preparation

- Excavation
- Road works
- Concrete placement
- Commissioning.

The bulk of the construction works would be conducted during daytime hours (nominally 7.00am to 6.00pm).

Construction vehicular access to the site would be provided via Fishburn Road and Friendship Road as required.

5.3.1. Terminal Operation During Construction

Stage 1 Construction will require considerable detailed planning to minimise any interference to normal road tanker movements through the terminal. Construction work areas will need to be fenced off from road tanker traffic lanes within the terminal. Construction personnel access will need to be tightly controlled as they will be working within / near to Hazardous Area locations within the operating terminal.

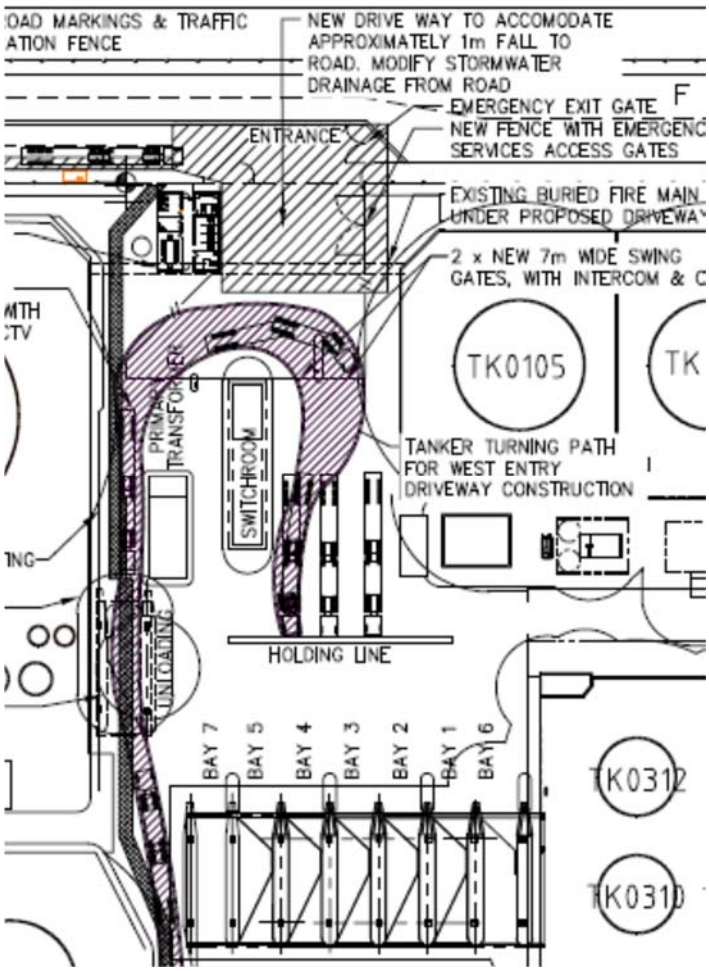
Normal shipping operations are expected to continue during the construction period without any significant interference.

There will need to be planned (usually on a weekend when the road tanker loading is generally reduced) terminal shutdowns to affect the product pump pipeline tie-ins for the new road tanker bays (8 & 9) for Stage 2.

The Vopak Safety Management system will be applicable to all work areas (specifically Work Permit controls).

During the construction of the West Entry driveway (Stage 2), road tankers will still be able to turn within the remaining area between the switch room and the driveway construction (see Figure 5.6 below). This enables road tankers to still access the loading gantries using the existing east entry path.

Figure 5.6 Road Tanker Access during West Entry Driveway Construction



Installing the new Fishburn Road gates and associated fencing (during Stage 2) however will block this path. Therefore, to enable tanker access to the gantries the upgrades to Friendship and Fishburn Roads, as well as the installation of the driveway, will need to be completed prior to installing the new entry gates. Access to the terminal will then come from the west and traffic will need to be appropriately managed during the installation of the gates and fencing. Stage 2 Construction (of the new loading bays 8 & 9) would need to occur after the commissioning of the west entry in order to prevent interruption of tanker traffic paths and minimise impact on the operation of the terminal.

The new Amenities Building will also be constructed within Stage 2.

5.4. Operational Requirements

5.4.1. During Construction

The key consideration for operations is the control of contractors during the various construction stages and the recognition of clear delineation of construction work areas from operational areas. Constant communication between contractors and Vopak operations will be critical to maintaining safety during this period.

5.4.2. Bunded Areas

Containment of liquid within bunds would meet AS 1940 and NSW Ports Development Code requirements.

The new Road Tanker gantry facilities would have sumps for the collection of rainwater and possible spills and would be directed to the waste storage tanks prior to disposal offsite to an approved EPA waste treatment facility.

5.4.3. Petroleum Product Receipt and Delivery

The Site B Terminal will receive petroleum products via ship from BLB1 and/or BLB2 during the construction stage in accordance with existing operations.

Petroleum products would be imported on vessels of up to 50,000 m³ tanker size and the typical parcel size would be 10,000 - 50,000 m³ per shipment.

In 2015 approximately 117 ships per annum were required to deliver 2,900ML of petroleum product to Site B. There is a trend towards larger ships (MR type) being utilised, together with an increased average parcel size. For example, in 2013 there were approximately 145 ships for 2,600ML of throughput.

The projected increase in throughput to 7,800,000 m³ would result in approximately – 300-350 ships per annum to deliver the petroleum product across BLB1 and BLB2. With a trend towards larger ships (including LR type) being utilised, together with an increased average parcel size and number of products.

Table 5.4 below provides a comparison of existing deliveries and projected deliveries of petroleum product.

Table 5.4 Comparison of Existing Versus Proposed Petroleum Product Deliveries

	Annual Output by Road Tanker (m³)	Annual Output by Pipeline (m³)	Annual Output by Sea (m³)	Annual Total Throughput (m³)
Historic (2013) Total Site B Output	1,860,000 (60,000 vehicles)	790,000	60,000	2,710,000
***Approved Total Site B Output**	1,897,500 (48%) (Also includes 150,000 m³ of jet fuel by Road Tanker) (61,000 vehicles)	1,867,500 (47%)	185,000 (5%)	3,950,000 (100%) 180-200 Ships/year (estimated)
Projected Total Site B Output	3,700,000 (47%) (including jet fuel export by road) (92,500 vehicles)	2,100,000 (27%)	2,000,000 (26%)	7,800,000 (100%) 300-350 Ships/ year (estimated)

***Refer to Section 5.2.8 Modification to Conditions of Approval**

5.4.4. Road Tanker Loading and Unloading Bays

A general description of the Road Tanker Loading Bays and the Unloading Bay construction and features are as follows:

Civil Works

- Site preparation, earthworks and final grading/cleanup
- Demolition and cutting of existing concrete as required
- Spoil removal as required
- Concrete island/plinth extension
- Kerb/bund
- Earthworks and concrete testing
- Loading skid bunding.

Loading Skid

The following requirements shall apply for the loading skid design:

- Design maximum loading flow rate 2,400 litres per minute (LPM)
- 8 loading arms per bay
- Ethanol blending
- Biodiesel blending
- Additive blending
- Vapour recovery
- Earthing and overfill protection
- Emergency Stops
- Detonation arrestor
- Lighting & Maintenance platform.

Safety Provisions

The facility design and spacing allowances shall be in accordance with AS1940 and AIP CP8 for Bottom Loading. The system shall have shutoffs for each loading arm as follows:

- An actuated ball valve plus flow control valve as the primary shutoff system, High-level road tanker shutoff system to prevent overfill, Emergency electrical shutdown (ESD) system.
- Minimum conditions that shall prevent a transfer from starting and also immediately stop a transfer in progress shall include the following; Ground not verified, ESD activated, Loss of power, Stop button on preset, Overfill detected, Loading arm not connected, Low/Low level alarm on product storage tank, Deadman button not depressed after 3mins , Driver identification error, Flow meter fault detected, Fatal fault in the load computer detected, Local stop button, Requested transfer amount is reached, No flow detected after defined time delay.
- Instrumentation for each Loading Bay (7, 8 & 9) will be fitted out with an 8 arm RT Loading Module, complete with Flow Control, Additive Injection systems and Safety Interlock systems consistent with the existing infrastructure.

- All pipework would be designed and constructed in accordance with the appropriate piping classes (AS4041 and/or ANSIB13.9). Pipework design would consider variations in operating temperatures (including start up and shut down) and the corresponding impact on product viscosity. A pipework stress analysis study will be completed to ensure that only acceptable stresses are developed in pipework systems and transferred to equipment nozzles. The stress analysis will consider start up, shut down and operating conditions.

Fire Protection

- Foam Deluge system
- Flame Detection
- ESD system integration.

General

Load controls where custody transfer occurs at the loadout includes the following:

- For volume measurement – volume meter, temperature sensing, flow computer, Preset or flow computer, Flow control valve, Grounding and ground verification system and ground interlock, Overfill sensing and interlock, Pump controls for products and additives.

Drivers Hut

Provision for the supply of a driver's hut on the skid frame, similar to existing Bays.

Unloading Bay

Civil Works

- Site preparation, earthworks and final grading/cleanup
- Demolition and cutting of existing concrete as required
- Spoil removal as required
- Concrete island/plinth extension
- Topping slab, Kerb/bund, Concrete joints, Earthworks and concrete testing.

Mechanical

- Unloading Pumps (for each product)
- Pipework/Valves
- Unloading Hose/ Manifold
- Electricals (suitable for Hazardous Area) including truck earthing.
- PLC/SCADA Controls
- ESD system integration.

5.4.5. Power, Lighting, Utilities

Sufficient power supply is already available on site to cater for the new Amenities Building, Warehouse, Bays 7, 8 & 9 and the Unloading Bay.

Additional pumps are required to provide for an increase in demand for flowrates created by the extra loading bays. These additional pumps will be similar to existing units and will be located in the existing pump manifolds which have been designed for this future

expansion. The pumps will be installed complete with piping, valves, electrical equipment and controls. In some cases, additional pump capacity may also be provided by upgrading existing pumps (eg. by exchanging with larger pumps complete with electrical cabling and electrical switchboard modifications.

Water and Sewerage connections are to be provided for the proposed Amenities Building.

Extra lighting under the roof structures of the Loading Bays (7, 8 & 9) and the Unloading Bay will be provided. Lighting will be provided to the new Amenities Building and the Warehouse Extension.

Additional street lighting for the new Elgas/Fishburn Road truck access path and entranceways may also be required.

5.4.6. Fire Protection

An extension of the existing Foam Deluge system to RT Loading Bays 8 and 9 will remain within the existing system's performance capability and will comply with the requirements of AS1940.

When Bay 7 is built (Stage 2 together with the Fishburn Road entrance way and new Amenities Building) an upgrade of the Foam Deluge and site fire/foam system may be necessary when details of the newly built Bays 8 and 9 are determined.

Road Tanker Unloading Bay Fire Protection systems also be added and will comply with AS1940 and NFPA11.

5.4.7. Change of product

Need for modification

Vopak Site B is a fuel storage and distribution terminal owned, designed and operated by Vopak on behalf of its storage clients which include the both the oil majors and various independents. Hence, the provision of services is very much client driven and changes in their market requirements can have a significant impact on the Terminal's day to day operations. Changes in product per storage tank (both type and quantity), new additives (which can include Combustible, Class 3 or Class 9 products) for inline injection to road tanker filling, storage tank and/or road tanker blending requirements (e.g., ethanol and biodiesel) and (off-site) pipeline transfer systems for jet fuel, diesel and petrol are commonplace in the industry and often occur at short notice.

The Terminal development occurred in four stages from the initial (B1) stage in 1996 through B2, B3A and finally B3B in 2010. The Terminal capacity has essentially tripled over this development period to 345,000 m^3 and now supplies approximately 20% of Sydney's fuel requirements (including via road tankers, Jet Fuel to Sydney Airport by pipeline/road tanker and petrol/diesel to Mobil Silverwater via pipeline).

When the Terminal first commenced operations in 1996 there were only two products stored (Diesel and ULP 91 Petrol) but the original design philosophy had incorporated a key requirement that the future product storage profile for the terminal would be highly diverse and therefore the tanks, manifold and pipeline systems needed to be highly flexible and easily adaptable to such future client requirements.

This operational flexibility requirement was acknowledged in both the original EIS (Stage B1 1994) and the subsequent EIS (Stage B2 1997) both with the following statement:

> *"The storage philosophy allows for any of the major products to be stored in any of the tanks on site. As a worst case scenario it will be assumed, for the purpose of this study, that the products on site are Packaging Group II materials (flammable liquids with a flash point less than 23C)."*

The EIS for Stage B3 (2006) also noted that the new tanks constructed following the grant of the Part 3A Approval could store a range of fuel products. It stated that the new tanks:

> *"... may initially store the following types of fuel products:*
>
> - *Petroleum products, e.g. premium unloaded petrol, unleaded petrol, diesel and jet fuel'*
> - *Ethanol; and*
> - *Biodiesel.*
>
> *Petroleum products are Class 3 flammable liquids. Ethanol is soluble in water."*

Now in 2016, this design flexibility has proved invaluable. There are now eight different petroleum products stored together with various individual client additives (for road tanker injection) together with ethanol and biodiesel blending for road tankers.

The Part 3A Approval notes that the project is to be carried out:

> *"generally in accordance with the:*
>
> *a) EA;*
> *b) DA 38/94;*
> *c) DA 549/97; and*
> *d) conditions of this approval."*

The "EA" is the Stage B3 EIS (2006), DA 38/94 is defined to include the EIS for Stage 1 (1994), and DA 549/97 is defined to include the EIS for Stage 2 (1997). Thus, these documents are all incorporated into the Part 3A Approval. Under s75W(2) of the EP&A Act (which continues to apply to the Vopak project), the Minister's approval is not required if modifications to the project are consistent with the existing Part 3A Approval. Since the three EIS documents incorporated into the Part 3A approval specifically contemplate changes of products, changes to products stored in tanks (and minor physical changes necessary to effect a change of product) are permitted without the need for further approval (provided that the changes are carried out in accordance with the hazards and other plans which are required under the Part 3A Approval).

Although it is Vopak's position that no further approvals are required to carry out these changes, Vopak wishes to clarify this position and make clear that these minor changes are specifically authorised under the Part 3A Approval. Vopak commits to carry out any such changes in accordance with the Management of Change protocols detailed in section 5.4.7.5 below, including submitting any necessary revisions to the Hazard Analysis or Fire Safety Study to the Secretary for approval prior to the change being made.

Relevant policies and procedures

The Terminal is a registered NSW Major Hazard Facility (MHF) and operates under the relevant NSW Work Health and Safety Regulations requiring a safety case regime to be implemented and maintained. One of the critical Major Incident Controls within the Vopak Management system is the Management of Change (MOC) procedure. All changes are reviewed using the MOC process and all major changes undergo a Hazard and Operability Study (HAZOP) to identify hazards and to implement appropriate controls.

One of the key reference benchmarks in the Vopak MOC process is to review any proposed changes against the Terminal Quantitative Risk Assessment (QRA) and subsequently the 1996 Department of Urban Affairs Planning (DUAP) Land Use Safety Guidelines (Risk Contours) to ensure that there is no significant change in risk and that compliance with the relevant conditions of consent is maintained.

From the initial design concept in 1995 for the first stage (B1) of the Terminal, a key feature of the operational capability has been to maximise flexibility of storage tanks and pipeline distribution systems for both import and export transfers to cater for (future) client requirements. Hence, all storage tanks and pipeline distribution systems have been designed and licensed by SafeWork NSW for the highest risk (Class 3 Flammables) to allow for any petroleum product to be stored in any tank (except T621 which is currently reserved for Diesel storage only), plus ethanol in a series of tanks. A full Site QRA was been prepared in 2014 to demonstrate current (and future) compliance with the 1996 DUAP Land Use Safety Guidelines (Risk Contours) for the above case of all tanks being capable of storing Class 3 Flammables (including Ethanol in some storage tanks).

The critical areas for such operations are the *storage tanks*, *transfer manifolds* and the *road tanker loading facilities*. Inlet, Outlet and pump manifolds are designed for this future flexibility including flowrate changes (by increasing the number of duty pumps).

For the reasons described above, Vopak considers that the sequence of staged approvals had always intended to include these future change of products, minor additional products, and associated pipework, including flowrate increases up to the maximum approved.

Any changes would be managed within the defined limits of existing Planning Approvals and QRA's together with the individual project risk reviews which are inherent in Vopak's Major Hazard Facility Management systems.

Further details on these critical areas are provided below.

5.4.7.1 STORAGE TANKS

All of the bulk storage tanks have been designed, constructed and operated in accordance with AS1940 on the basis that each can store Class 3 Flammable products and hence presents the terminal operations with maximum flexibility.

The 25 Bulk Storage Tanks on the site are designed to store Class 3 Flammables, 1 Bulk Storage Tank on site is designed to store Class 3 Flammables but is only used for C1 Combustibles, with fire protection upgrade this could be used to store Class 3.,

However, the current product allocation (as required by customers) is as follows:

- 20 store Class 3 Flammables (Petrol – various Octane grades, Jet Fuel, Ethanol)
- 6 store C1 Combustibles (Diesel, Biodiesel, AVCAT).

All tanks are fitted with the following identical features:

- High Level, High-High Level and ESD systems
- Radar Level controls
- Tank Recirculation facilities
- Separate Inlet and Outlet Manifolds complete with Remotely Actuated Tank Valves
- Dewatering facilities (for removing free water settling out from product at the tank bottoms)
- Dedicated Transfer Pump.

Once a Storage Tank has been emptied and cleaned, it is a relatively routine task to convert the tank to another product service. Generally, Manifold changes, Road Tanker Facility changes (loading arm allocations) and Computer Control systems (PLC/SCADA) updates are all that are required in the field. Safety Management systems (Emergency

Plans, Logistics and Signage) are also updated prior to refilling the Storage Tank with the new product.

There are also occasions when minor modifications to existing pipework systems or additional pipework is required to affect the change of product service.

Furthermore, existing approvals allow for additional Slops and Additive Tanks, and associated piping, which Vopak are progressively adding as Client/ Market demands arise.

Also, a minimum number of pumps were installed in the Terminal despite the original design approval and related QRA anticipating additional pumps and piping to be added as capacity rises up to design rates and / or product-tank allocation changes to add pre-approved products into a specific pump bay.

Vopak submits that these changes, i.e. change of product and related piping, are consistent with (and therefore permitted under) the Part 3A Approval for the reasons described above. Vopak merely wishes to have this position clarified under the modification, and commits to following the Management of Change procedure outlined in section 5.4.7.5 below.

5.4.7.2 TRANSFER MANIFOLDS

The Transfer Manifolds are both tank specific (for the B1 and B2 Tank Farms) and Product Specific (for the B3A and B3B Tank Farms).

When a vessel discharges product to the Terminal it does so via a Vopak MLA (Marine Loading Arm) on the Bulk Liquids Berth (No. 1 or 2), through a wharfline to the Terminal Manifold system. The Manifold systems are designed such that removable spool pieces allow a variety of cross-connections to enable product to be delivered to the nominated Storage Tank(s). The system is designed such that future commercial, customer and operational requirements such as a change of product/tank, can be realised relatively simply by:

- Re-arrangement
- Additions (to pipework)
- Modifications
- Improvements (by any of the above).

This is a standard Vopak operation and any proposed change to the infrastructure is managed safely by the Vopak Management of Change (MOC) Procedure. These changes can be relatively frequent, i.e., several times per year.

Vopak submits that these changes, i.e. manifold/piping changes, are consistent with (and therefore permitted under) the Part 3A Approval for the reasons described above. Vopak merely wishes to have this position clarified under the modification, and commits to following the Management of Change procedure outlined in section 5.4.7.5 below.

5.4.7.3 ROAD TANKER GANTRY FACILITIES

The Road Tanker Gantry Facility (which includes Filling Arms, Additive Injections systems, Blending systems, Computer Controls, Loading Pumps) is designed for maximum flexibility in being able to change product / loading arms via removable spool pieces on the Product Header Pipelines which travel overhead of each Loading Bay.

The system is designed such that future commercial, customer and operational requirements such as a change of product/tank, can be realised relatively simply by:

- Re-arrangement
- Additions (to pipework)
- Modifications
- Improvements (by any of the above).

Similarly, for blending of Fuel Additives or Biofuels such as Ethanol and Biodiesel using standardised minor additions to the existing loading arm skids.

This is a standard Vopak operation and any proposed change to the infrastructure is managed safely by the Vopak Management of Change (MOC) Procedure. These changes can be relatively frequent, i.e., several times per year.

Vopak submits that these changes, i.e. change or addition of product, are consistent with (and therefore permitted under) the Part 3A Approval for the reasons described above. Vopak merely wishes to have this position clarified under the modification, and commits to following the Management of Change procedure outlined in section 5.4.7.5 below.

5.4.7.4 ADDITIVE STORAGE TANKS (associated with Road Tanker Gantry Facilities)

The Road Tanker Gantry Facility (which includes Additive Injection Systems, Blending Systems, Computer Controls, Additive Loading Pumps) is designed for maximum flexibility in being able to change Additive products in each Loading Bay. The system is designed such that future commercial, customer and operational requirements such as a change of Additive product/Additive Storage Tank, can be realised relatively simply by:

- Re-arrangement: (Emptying/Cleaning the Additive Storage Tanks (30 m^3 capacity) of the residual Combustible, Class 3 or Class 9 product and refilling the tank with the new additive)
- Additions (to pipework)
- Modifications
- Improvements (by any of the above).

In addition to the above, minor quantities of other fuel additives (antistatic “Stadis 450”or fuel colouring dyes) are also handled via portable transportable containers (20L pails, 200L drums or 1,000L Intermediate Bulk Containers (IBCs)).

This is a standard Vopak operation and any proposed change to the infrastructure is managed safely by the Vopak Management of Change (MOC) Procedure. These changes can be relatively frequent, i.e., several times per year.

Vopak submits that these changes, i.e. change or addition of product, are consistent with (and therefore permitted under) the Part 3A Approval for the reasons described above. Vopak merely wishes to have this position clarified under the modification, and commits to following the Management of Change procedure outlined in section 5.4.7.5 below.

5.4.7.5 MANAGEMENT OF CHANGE

Vopak commits to the following in circumstances where a change in product allocation related to storage tanks, transfer manifolds, increase in flow rates, road tanker loading facilities (loading arms and pipelines) or additive storage tanks is required:

1. Execute the change using the Vopak Management of Change procedure;
2. As part of the Management of Change procedure, execute Appendix E E1.3 Checklist to determine if update to Hazard Analysis (Vopak Site B QRA Doc Ref 20940-RP-001, prepared by Sherpa Consulting Pty Ltd) and FSS (Vopak B3 Expansion Project Port Botany Condition of Consent Study Fire Safety Study Doc Ref 20294-007 Rev 0 Aug 2009, prepared by Sherpa Consulting Pty Ltd) is required as prepared by Sherpa Consulting (refer to note below),
3. Where it is identified that an update to the Hazard Analysis and FSS is not required, carry out the change as per the EA and QRA or where it is identified that an update to the Hazard Analysis and FSS is required make the necessary changes via review, update or addendum to the Hazard Analysis and FSS and submit this document to the Secretary for approval before commencing with the change.

6. Environmental Assessment

6.1. Introduction

This chapter addresses the key issues required to be addressed by the SEARs. For each of the key issues it describes the existing environment, assesses potential impacts during construction and operations and develops measures to mitigate risks to the environment.

6.2. Traffic and Transport

Vopak expects that the trend of trucks arriving at Site B will continue to show two peaks throughout the day (as shown in Figure 6.1). It shows that the maximum truck peak is on Friday morning between 5:00 am and 6.00 am with an average of 13 trucks arriving within one hour.

Furthermore, it can be seen that there are effectively two peak road tanker arrival periods each day:

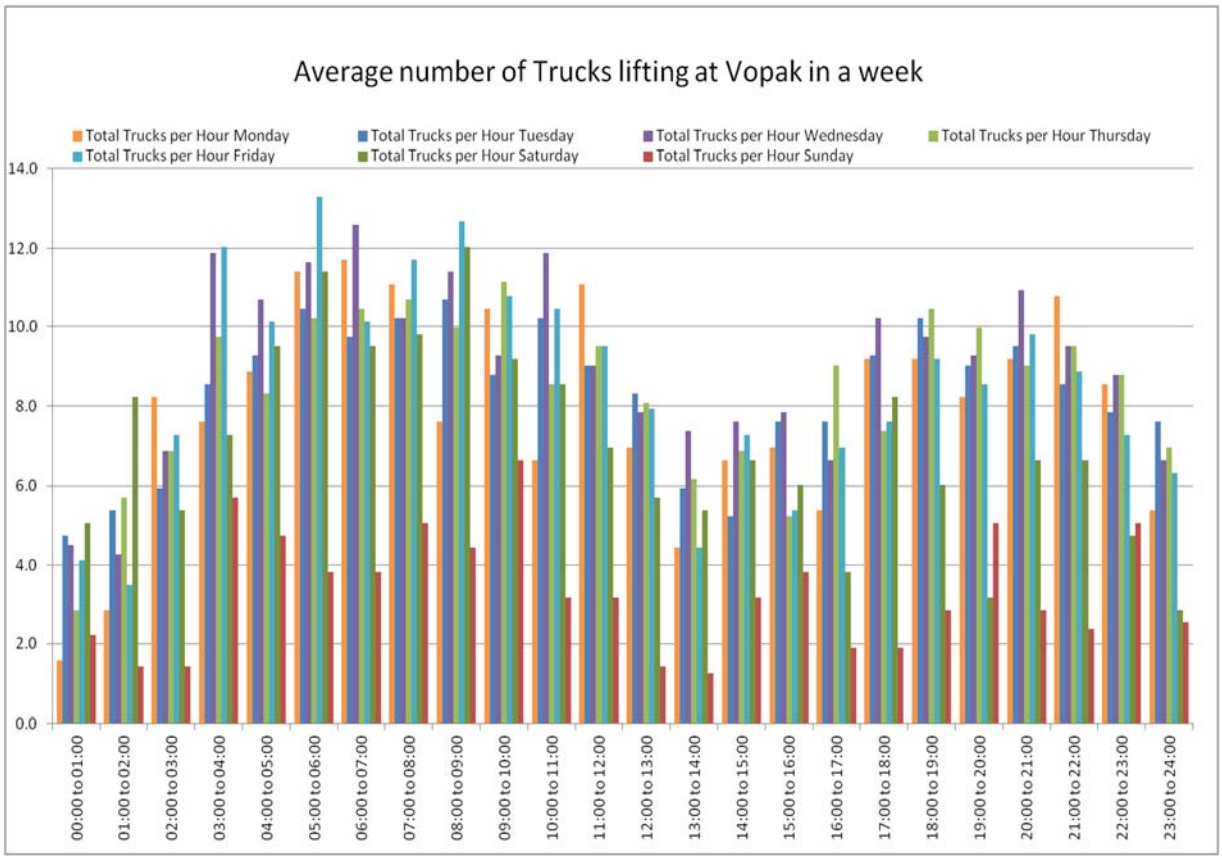
- 03:00 to 11:00 hours (maximum at approximately 06:00 hours)
- 14:00 to 22:00 hours (maximum at approximately 20:00 hours).

Vopak expects the peak pattern to flatten out in time as customers become aware of the benefits of lifting during off-peak hours, i.e., reduced waiting times to load.

Another factor affecting road traffic is the growing tendency of transport companies / customers to improve their delivery logistics by better utilisation of their truck fleets, specifically the increasing usage of B-doubles where practicable. This increases the average road tanker volume and consequently decreases the number of road tanker vehicles (for a given throughput).

To date the average B-double use at Vopak Site B is in the order of 25%, i.e. one B-double vehicle for every three rigid road tankers. This ratio is anticipated to steadily increase over the next decade from 25% to 50% B-double vehicles. Consequently, this change would be reflected in the gradual increase in the average road tanker volume, which will in turn reduce the total number of road tanker vehicle trips for a given throughput volume. However, for the purposes of a conservative assessment, it has been assumed that the proportion of B-double road tankers will remain at the current 25%.

Figure 6.1 – Road Tanker Lifting (Daily/Hourly)



Based on historical road tanker data from Site B (current year 2016), the average volume load per road tanker was 36.3 kL. This volume has been adopted as a 'worst case' scenario for future road tanker generation, shown in Table 6.1 below.

It should be noted that the average loaded volume adopted for the assessment (36.3 kL) is less than the approximate 43 kL average capacity that is potentially available[1]. This is because a proportion of road tankers at Site B are not fully loaded. Therefore, the 36.3 kL average load used in the assessment is potentially conservative when future strategies to improve efficiency are implemented, e.g., utilisation of a greater proportion of B-double vehicles and improvement of logistics planning to reduce the 'dead' capacity (almost 10 kL) per trip.

The table shows the historical average road tanker traffic generation up to the present of 182 per day and 7.6 per hour. In reality, there is some peaking that occurred for the hourly traffic generation. Conservatively, this has been approximately 1.7 times the average volume, which resulted in peak traffic generation of some 13 road tankers per hour (as shown in Figure 6.1).

[1] Based on the current proportion of one B-double road tanker (57.4 kL capacity) and three single road tankers (38.2 kL capacity each)

Table 6.1 Road Tanker Transport

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Projected Throughput (ML/year)	2,200	2,230	2,000*	2,400	3,200	3,200	3,200	3,300	3,300	3,300	3,700
Average Road Tanker Volume (kL)	35.1	37.5	38.4	36.3	36.3	36.3	36.3	36.3	36.3	36.3	36.3
Road Tankers per year	62,678	59,467	52,084	66,116	88,155	88,155	88,155	90,909	90,909	90,909	101,982
Road Tankers per day (average)	172	163	143	182	242	242	242	249	249	249	280
Road Tankers per hour (average)	7.2	6.8	6.0	7.6	10.1	10.1	10.1	10.4	10.4	10.4	11.7

* 2015 yearly throughput decreased from the previous year (2014) due to a customer leaving Vopak, who has since re-joined in 2016.

Assuming a similar peaking for future hourly traffic generation, results in some 20 road tankers per hour during future operations in 2023. This equates to an additional 7 road tankers or 14 road tanker trips per hour – this is considered to be conservative (high) as most road tankers will not arrive at the Vopak site, fill and then depart the site within an hour.

The daily traffic generation peaks at 280 road tankers per day in 2023, once full throughput is reached. This equates to an additional 98 road tankers or 196 road tanker trips per day over and above the current (2016) average road tanker traffic.

Road tanker routes to/from the Vopak site will follow a similar distribution to that which currently occurs. This is estimated to be 85% to/from the west, south and north via Foreshore Road, 10% to/from the north and east via Beauchamp Road and 5% to/from the east via Botany Road / Bunnerong Road.

As per existing operations, road tanker routes will adhere to Dangerous Goods routes and avoid restricted routes such as the Airport Tunnel and M5 East tunnel. They will be prevented from using local roads as per existing operations, e.g., via toolbox talks, professional driver conduct codes or similar.

As required by the SEARs a detailed Traffic Impact Assessment was undertaken by Samsa Consulting. The information provided below in Section 6.2.1 is a summary of the key findings of the assessment. A copy of the report can be found in Appendix C.

6.2.1. Existing Environment

6.2.1.1 Road Network Conditions

The Vopak site is custom-served by the existing port road network, which provides access to the Sydney's major road network and is subject to significant volumes of heavy vehicle traffic on a daily basis.

Vehicular access between the site and the surrounding major road network is via the one-way loop of Simblist Road / Friendship Road. This connects to Bumborah Point Road at priority controlled T-junctions.

Bumborah Point Road connects to Botany Road at a signalised junction. Botany Road extends east to Bunnerong Road and west to Foreshore Road, past Beauchamp Road. Foreshore Road provides the main western route to Sydney's arterial road network at General Holmes Drive / Southern Cross Drive (part of the major M1 route serving Sydney) while the Beauchamp Road / Denison Street route (north off Botany Road) provides a secondary route for travel to/from the north.

Bumborah Point Road, Simblist Road and Friendship Road are purpose-built roads serving heavy vehicles accessing the port area. They all have wide carriageways to allow multiple heavy vehicle movements and allow for adequate swept turning paths. They all have a 60 km/h speed limit and suitable street lighting.

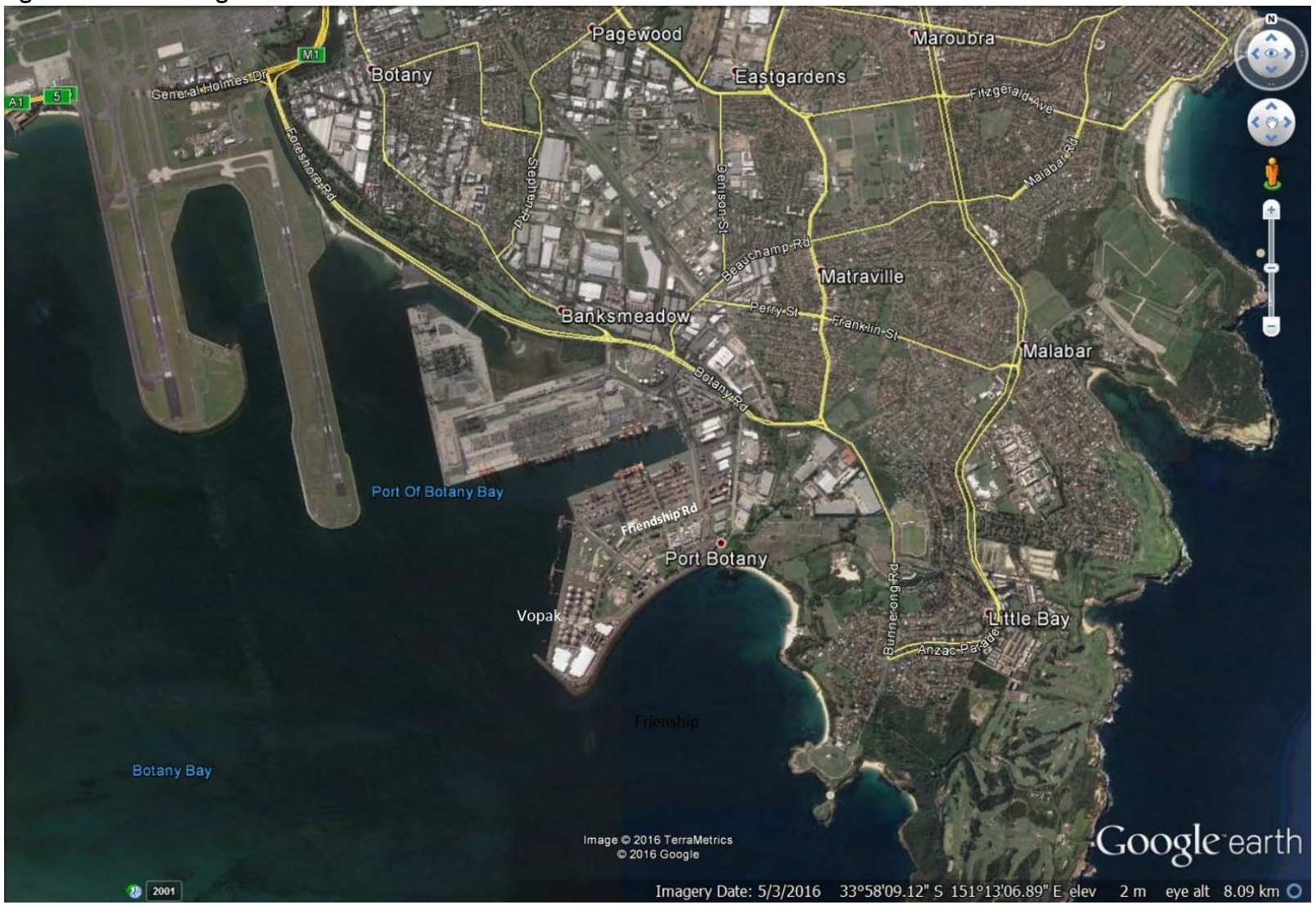
Botany Road distributes port traffic to the east and west. Eastbound travel towards Bunnerong Road is restricted for Vopak road tanker traffic unless there is a local destination in the eastern suburbs. Between Bunnerong Road and the Penrhyn Road / Foreshore Road intersection, Botany Road is a six-lane divided road with additional turning lanes at the signalised intersections with Bumborah Point Road, Gate 2 container holding yard, McCauley Street, Beauchamp Road, and Penrhyn Road / Foreshore Road.

Although Botany Road continues to the north from the Penrhyn Road / Foreshore Road intersection, this section has vehicle restrictions necessitating Vopak road tanker traffic to continue west into Foreshore Road.

Foreshore Road is a controlled access route functioning primarily as a high-volume and dedicated heavy vehicle link between the Port Botany precinct and General Holmes Drive / Southern Cross Drive (part of Sydney's M1 arterial route). Foreshore Road is a four-lane divided road with limited access points. The most significant access is the signalised intersection to the recently constructed third container terminal.

Figure 6.2 shows the local and regional road network in the surrounding area.

Figure 6.2 - Surrounding Road Network.



Source: Google Earth

From the General Holmes Drive / Southern Cross Drive junction, road tankers carrying bulk liquids are restricted from travelling via the Airport and M5 tunnels due to dangerous goods (DG) restrictions. Therefore, they need to turn north and travel around the northern airport perimeter to access areas to the west and south of Sydney.

The section of Botany Road / Foreshore Road between Bunnerong Road and Penrhyn Road has a 70 km/h speed limit, which increases to 80 km/h west to General Holmes Drive.

Average annual daily traffic (AADT – from 2005 RMS traffic counts) and daily traffic volumes (2016 projections [2]) for the surrounding major road network are shown below.

Table 6.2 - Average annual daily traffic (AADT – from 2005 RMS traffic counts) and daily traffic volumes (2016 projections)

Road	Location	AADT (RMS 2005)	Projected (2016)
Botany Road	West of Beauchamp Road	39,342	45,080
Botany Road	East of Beauchamp Road	24,266	28,500
Foreshore Road	East of General Holmes Drive	33,454	40,420
Beauchamp Road	North of Botany Road	20,848	23,840
Southern Cross Drive	North of General Holmes Drive	78,383	89,370

6.2.1.2 Traffic Operations

NSW RMS has intersection traffic data available for all their signalised intersections controlled by the SCATS (Sydney Coordinated Adaptive Traffic Signal) system. SCATS vehicle detections were obtained from RMS for the following pertinent signalised intersections during the week starting 1st September 2014:

- TCS 1528: Signalised intersection of Bumborah Point Road / Botany Road
- TCS 1526: Signalised intersection of Botany Road / Beauchamp Road
- TCS 1525: Signalised intersection of Botany Road / Penrhyn Road / Foreshore Road.

The peak turn movements were determined as follows:

- AM and PM peak periods were determined by identifying the hour of day (for the highest average weekday between 1st September and 7th September 2014) that exhibited the highest total volume of traffic entering each intersection.
- Where detectors on turn movements to the intersection were not available (eg. at left-turn slip lanes) or were combined (eg. dual left-turn and through movements), manual intersection counts were undertaken to determine the turn movement.

The above SCATS data was corroborated by manual intersection turn counts undertaken at the three intersections during the week of 15th September 2014. The turn movements

[2] From Hyder "*Banksmeadow Waste Transfer Terminal: Traffic and Transport Impact Assessment*", November 2013 and adjusted for 2016 assuming 1.2% compound annual growth adopted from *Bureau of Transport Statistics' Sydney Transport Model*

for the morning and afternoon peak periods at each of these intersections were adjusted for 2016 volumes3

From observations during several site visits, it is acknowledged that traffic operations for the routes to/from the port area can deteriorate somewhat during peak periods with significant queuing / congestion resulting in an increase in delay and consequent reduction in level of service.

Of particular note are the following:

- Foreshore Road westbound queues accessing General Holmes Drive / Southern Cross Drive – significant queues in PM peak
- Foreshore Road eastbound queues at Botany Road / Penrhyn Road – moderate queues in PM peak
- Botany Road southbound queues at Foreshore Road / Penrhyn Road – moderate queues at various times
- Botany Road eastbound queues turning right at Bumborah Point Road – moderate queues at various times.

Typically, the congestion tends to fluctuate and dissipate relatively quickly (within half an hour) and is confined to the background commuter peak periods. The Foreshore Road westbound queuing is an exception, which can last for lengthy periods during the afternoon. This is partly attributable to the congestion on General Holmes Drive / Southern Cross Drive and M5 East as well as from traffic generated by the port area and associated land uses.

6.2.1.3 Road Safety

In general, based on site observations and anecdotal evidence, road safety is considered to be adequate under current operating conditions. As discussed previously the road system caters specifically for heavy vehicles / port traffic.

6.2.1.4 Parking

There are some 49 parking spaces for the Vopak site in four areas.

Limited on-street parking is available with some feral (informal) parking observed on the verge areas along Friendship Road. In general, there are 'No Stopping' restrictions that prevent on-street parking along both Friendship Road and Simblist Road.

There are no available off-street public parking facilities in the nearby area that would benefit the subject site.

6.2.1.5 Site Access

Existing vehicular access to the subject site is via two separate driveways off the western side of Friendship Road. The driveways are separated by the site offices and provide entering and exiting vehicle movements dedicated for road tanker vehicles, contractor and minor maintenance traffic.

Pedestrian and cyclist access to the subject site is restricted beyond the security gates.

[3] Assuming 1.2% compound annual growth adopted from *Bureau of Transport Statistics' Sydney Transport Model*

6.2.1.6 *Public Transport/Pedestrian and Cycling Facilities*

There is no public transport closer than Bumborah Point Road that directly serves the subject site.

There are no formal pedestrian paths along Friendship Road or Simblist Road in the vicinity of the Vopak site.

There are no on-road cycle facilities along the restricted roads within the port area, i.e., Simblist Road and Friendship Road.

6.2.1.7 *Current Site Operations*

At present (2016 projected) the total annual product throughput is some 3,900,000 m^3 (3,900 ML). Of the total existing throughput, road tanker transport is used for almost two-thirds with approximately 2,400 ML currently being transported by road.

Vopak have 45 full-time office staff who typically work from 8:30 am to 5:00 pm, Monday to Friday. Staff generally travel to/from work during background peak traffic periods.

In addition, there are operations staff who work on a two-shift basis over a 24-hour period. The 6:00 am to 6:00 pm shift has three operators, while the 6:00 pm to 6:00 am shift has two operators. There are an additional two to three casual operations staff deployed (on the same shift arrangements as above) when there are shipping discharges, which occur approximately 150 days per year (say, every second day).

Total peak staff traffic generation currently is approximately 110 trips per day or up to 50 trips per hour during each peak period (assuming some overlap between office staff and operations staff). In addition, there is approximately 10 additional trips per day from visitors, maintenance contractors to the facility, eg. deliveries, meetings, etc. These are generally spread out over the course of a day and as a worst case will generate some four vehicle trips in any given hour.

6.2.2. Potential Impacts

6.2.2.1 *Traffic Impacts*

Section 6.2 describes road tanker bay utilisation, arrival frequencies and loading times for the proposed modification.

In assessing potential traffic impacts, the additional Vopak expansion generated traffic was compared with existing traffic volumes along the adjacent road network routes and at the major intersections. Existing traffic volumes, additional Vopak expansion generated traffic volumes (staff and road tankers) and future combined total traffic volumes are summarised in Table 6.3 below.

Table 6.3: Additional Vopak Traffic Generation

Road Section / Intersection		Existing Traffic	Additional Staff Trips	Additional Road Tanker Trips	Total Future Traffic	% Increase
Botany Road (east)	Hourly	942 vph [1]	1 vph	1 vph	944 vph	0.2 %
	Daily	10,220 vpd [2]	2 vpd	10 vpd	10,232 vpd	0.1 %
Bumborah Point Rd	Hourly	1,413 vph [1]	5 vph	14 vph	1,432 vph	1.3 %
	Daily	15,320 vpd [2]	10 vpd	196 vpd	15,516 vpd	1.3 %

Road Section / Intersection		Existing Traffic	Additional Staff Trips	Additional Road Tanker Trips	Total Future Traffic	% Increase
Bumborah Point Rd / Botany Rd intersection	Hourly	2,111 vph [1]	5 vph	14 vph	2,130 vph	0.9 %
	Daily	-	10 vpd	196 vpd	-	NA
Botany Road (central)	Hourly	1,989 vph [1]	4 vph	13 vph	2,006 vph	0.9 %
	Daily	28,500 vpd [3]	8 vpd	186 vpd	28,694 vpd	0.7 %
Beauchamp Road	Hourly	1,345 vph [1]	1 vph	2 vph	1,348 vph	0.2 %
	Daily	23,840 vpd [3]	2 vpd	20 vpd	23,862 vpd	0.1 %
Beauchamp Rd / Botany Rd intersection	Hourly	2,954 vph [1]	4 vph	13 vph	2,971 vph	0.6 %
	Daily	-	8 vpd	186 vpd	-	NA
Botany Road (west)	Hourly	2,810 vph [1]	3 vph	11vph	2,824 vph	0.5 %
	Daily	45,080 vpd [3]	8 vpd	166 vpd	45,254 vpd	0.4 %
Botany Road (north)	Hourly	910 vph [1]	1 vph	0 vph	911 vph	0.1 %
	Daily	9,620 vpd [2]	2 vpd	0 vpd	9,622 vpd	< 0.1 %
Foreshore Road	Hourly	2,911 vph [1]	2 vph	11 vph	2,924 vph	0.4 %
	Daily	40,420 vpd [3]	6 vpd	166 vpd	40,592 vpd	0.4 %
Foreshore Rd / Botany Rd intersection	Hourly	3,467 vph [1]	3 vph	11 vph	3,481 vph	0.4 %
	Daily	-	8 vpd	166 vpd	-	NA

1 *Greater of AM or PM peak period*
2 *Estimated from hourly traffic being between 8% and 10% of daily traffic*
3 *Projected 2016 AADT (refer to Section 6.2.1.1 above)*

Existing traffic and intersection operations on the surrounding road network are constrained at certain periods of the day with significant queuing / delays and consequent reduced levels of service. However, it is considered that the addition of a maximum of 5 light vehicle and 14 heavy vehicle trips per hour (10 light vehicle and 196 heavy vehicle trips per day) will be readily absorbed into the existing traffic flows on the surrounding road network.

While any additional traffic may result in cumulative impacts by potentially increasing queuing / delay and reducing levels of service on the surrounding road network, it is considered that the additional traffic generation attributable to Vopak's expanded operations will at most contribute to a maximum of one to two heavy vehicles (at any one time) to any queues during any particular signal cycle. This will have minimal traffic impacts and an insignificant effect on intersection and road network operations.

Significantly, the level of traffic increase attributable to Vopak's expanded operations will be well within any daily variations that currently exist along the surrounding road network, e.g., there is a maximum of approximately 1.3% of daily traffic and peak hourly traffic along Bumborah Point Road and less than 1% or significantly less of daily or peak hourly traffic along the remainder of the surrounding road network.

Therefore, traffic impacts from Vopak's future expanded operations are considered to be minimal and will have an insignificant effect on road network and intersection operations.

The following points should also be noted, which will further reduce any road tanker impacts:

- Vopak pipeline transfer volumes will increase proportionately, thus having the effect of reducing the average road tanker numbers per day.
- With the partial consolidation of fuel delivery operations to Vopak's site from other sites around Sydney (in the longer term), there will likely be the positive impact of a reduction in traffic at other sites less suited to heavy vehicle transport.

6.2.2.2 Denison Street Usage

The use of Denison Street as a heavy vehicle and dangerous goods route for Vopak road tanker traffic (as part of the overall Port Botany generated traffic that uses Denison Street) has been investigated due to concerns with respect to traffic generation from future land use development on Denison Street, specifically a proposed Bunnings store.

The Beauchamp Road / Denison Street / Wentworth Avenue route is an authorised B-Double and dangerous goods route for heavy vehicles. It is identified as a 'secondary freight road' under the NSW Freight & Port Strategy 2013 and is utilised by Port Botany generated heavy vehicles, including Vopak road tankers, as a preferred access route when accessing Port Botany to / from the north.

Denison Street is also used as an alternative route to bypass the General Holmes Drive airport tunnel and travel around the airport precinct via Qantas Drive / Airport Drive / Marsh Street to access the south-western / southern areas of Sydney.

Current Vopak traffic generation along Denison Street varies considerably depending largely on the operations of Foreshore Road and the ability to exit the Port Botany area onto General Holmes Drive. Peak usage of the Beauchamp Road / Denison Street / Wentworth Avenue route is during the afternoon between approximately 2 pm to 6 pm, which coincides with the peak afternoon traffic period along Southern Cross Drive / General Holmes Drive. During this peak period, there is often congestion for Port Botany traffic to efficiently exit the port precinct via Foreshore Road.

Current peak traffic generation could be up to 13 Vopak road tanker loads per hour using Denison Street. This assumes the worst-case scenario of all Vopak road tanker traffic utilising the Denison Street route.

Based on future traffic generation when Vopak's Site B Expansion project is operational, it is estimated that up to seven additional Vopak road tanker loads per hour could potentially use Denison Street. Again, this is a worst-case (conservative) scenario in that it assumes that all additional Vopak traffic generation uses the route via Denison Street in any given hour.

It is evident however, that Vopak road tankers only account for approximately 14% of heavy vehicles travelling northbound along Denison Street during the afternoon peak period (assuming that there were the maximum 13 Vopak road tanker loads per hour using Denison Street during the survey period). It is unclear where the majority of the other heavy vehicles originate from but it is surmised that most would come from the Port Botany precinct and its surrounding industrial land uses.

While the Vopak road tankers constitute a not insignificant proportion of the heavy vehicles using Denison Street, their impact on road capacity and operations is considered to be minimal. This is because they are less than 2% of the total traffic volumes, which would be within any daily or seasonal variation that currently exists along the surrounding road network.

For future year traffic impacts, it is assumed that the background light and heavy vehicle traffic would increase due to various proposed developments in the area including the Bunnings, Qenos and Orica developments nearby as well as future developments within the Port Botany precinct to the south. Therefore, it is considered reasonable to assume that any increase in Vopak traffic would be commensurate with other heavy vehicle increases.

Similarly, it is considered that the proportion of Vopak traffic would remain low in comparison to total traffic volumes and this proportion would likely fall within any daily or seasonal traffic variation that would exist in future along the surrounding road network.

In conclusion, it is evident that Vopak road tankers only account for a minority of heavy vehicles travelling along Denison Street with the majority of heavy vehicles originating from other land uses in the Port Botany precinct and its surrounding industrial land uses. Moreover, the impact of Vopak road tankers on road capacity and operations along Denison Street is considered to be minimal. This is anticipated to continue during future year operations.

6.2.2.3 Parking Assessment

The future site layout proposes parking for some 59 cars, which is an additional 10 spaces over and above the existing 49 parking spaces. The proposed parking satisfies the guideline requirements of the "*Port Botany Development Code*", which requires 58 parking spaces.

The approximate eight bicycle parking spaces currently on site satisfy the requirements of the "*Port Botany Development Code*".

6.2.2.4 Site Access

Vehicular access to the subject site will remain unchanged during Stage 1 operations with access to/from Friendship Road at the current access location for all vehicles.

During Stage 2 operations, the vehicular access will be via Fishburn Road for road tanker entries and Friendship Road for road tanker exits. All internal (on-site) road tanker movements would have adequate manoeuvring space (swept paths) to enable travel in a forward direction only with no need for multi-point turn manoeuvres.

Once the new western access is operational (Stage 2), on-site road tanker queuing (storage) will be available for approximately 18 B-double size vehicles. This storage will predominantly be located within the dedicated lanes along the New 'Link' Road and along Fishburn Road.

Light vehicle access will remain unchanged from current operations.

In order to separate Vopak road tanker movements from through vehicle movements travelling along Simblist Road and turning right into Friendship Road, it is proposed that an additional central right-turn lane be provided on the Simblist Road approach to Friendship Road. The through movements (Simblist Road into Friendship Road) will be prevented from veering right across Friendship Road by maintaining the existing length of concrete safety barrier thus eliminating conflicts with northbound vehicles travelling along Friendship Road.

Appropriate advance warning / guidance signage and delineation will be provided on the Simblist Road approach to Friendship Road to provide suitable guidance for all vehicle movements.

Pedestrian access will be maintained as per current arrangements. Although traffic volumes will increase into the Vopak site and there will be amendments to the road tanker

access during Stage 2, it is considered that there will be no significant increase in impacts to any existing pedestrian and cyclist access.

6.2.2.5 Terminal Operations During Construction

Stage 1 Construction will maintain normal road tanker movements through the terminal. Construction work areas will be fenced off from road tanker traffic lanes within the terminal and construction personnel access will be tightly controlled.

Normal shipping operations are expected to continue during the construction period without any significant interference.

During the construction of the Stage 2 western entry driveway off Fishburn Road, road tankers will still be able to turn within the remaining area between the switch room and the driveway construction, enabling road tankers to use the existing eastern entry path.

The upgrades to Friendship Road and Fishburn Road, as well as the installation of the western driveway, will need to be completed prior to installing the new entry gates to enable tanker access to the gantries. Access to the terminal will then come from the west (Fishburn Road) and traffic will be appropriately managed during the installation of the gates and fencing. Stage 2 construction of the new loading Bays 8 & 9 will need to occur after the commissioning of the western entry in order to prevent interruption of tanker traffic paths and to minimise impact on the operation of the terminal.

6.2.3. Management and Monitoring Measures

In order to mitigate the potential impacts of the proposal, the following measures for traffic management are recommended:

- Appropriate signage / delineation and linemarking should be provided for the proposed central right-turn lane from Simblist Road into Friendship Road, prior to Stage 2 operations. This is required to reinforce the route / travel path for road tankers approaching the site, separate unrelated traffic movements (i.e., Vopak traffic from through traffic) and reduce lane changes.
- Provide a warning sign to be located on the bend at the southern end of Friendship Road to advise northbound vehicles travelling around the corner to be aware of cars reversing out of the proposed southern end parking spaces.
- It is recommended that a road safety audit be undertaken on any proposed road amendments and site access arrangements.
- Preparation of a detailed Construction Traffic Management Plan (CTMP) will be undertaken by the chosen contractor. This will be developed in consultation with NSW Ports and approved prior to the commencement of construction. The CTMP will cover all temporary warning, guidance and information signage as well as appropriate traffic control devices.

6.3. Hazards and Risk

Sherpa Consulting Pty Ltd (Sherpa) was appointed by Vopak to prepare an updated Quantitative Risk Assessment (QRA) for the Site B operations (Site B QRA) in order to show that the development will meet the relevant land use planning risk criteria. The QRA covers both the current and projected future cases and supersedes previous QRA studies for Site B.

Extracts of the QRA are provided below. A full copy of the report is contained in Appendix D.

The DP&E requested the preparation of a Transport Risk Assessment be prepared to assess the potential impact of increased road transport of Dangerous Goods (DG) associated with the S75 W project. The Transport Risk Assessment was also prepared by Sherpa.

Extracts of the Transport Risk Assessment are provided below. A full copy of the report is contained in Appendix E.

Scott Lister (now Systra Scott Lister) previously performed a QRA for the transport of Dangerous Goods (Transport QRA) along Denison St, Hillsdale. This report was prepared on behalf of the DP&E and City of Botany Bay Council as part of the risk assessment review of the Bunnings development and issued on the 12th of February, 2015. This study was subsequently updated and an addendum was issued on the 18th of May 2015. These studies quantified the risk from the transport of DG along Denison St. The majority of these movements are associated with either the Botany Industrial Park (BIP) or Port Botany.

Vopak is proposing to expand exports from its Port Botany Terminal and as a result, an increase in DG traffic along Denison St can be expected. Systra Scott Lister has updated the previous studies undertaken for Denison St to assess the risk posed by the increase in petroleum fuels associated with the Vopak proposal. The QRA model has also been updated to account for the incremental population growth in the vicinity since the 2015 Transport QRA was prepared. This report should be read in conjunction with the February 2015 and May 2015 Addendum.

Extracts of the Transport QRA are provided below. A full copy of this report is contained in Appendix F.

6.3.1. Site B (Sherpa) QRA - Existing Environment

The Vopak Site B terminal is contained within the NSW Ports precinct.

Site B is located in the same precinct as the nearby Major Hazard Facilities (MHF) operated by Elgas, Qenos and Origin.

Vopak Site B terminal receives, stores and transfers a variety of liquid petroleum products owned by its various customers. These products include gasoline, jet fuel, automotive diesel fuel (ADO), biodiesel and fuel grade ethanol. Products can be directed to selected tanks by interconnections made at the transfer manifold. Depending on the nature of the products, they can be stored in various tanks of different capacities, in localities suited to product type and flash point. Tank product allocation subject to change will be carried forward under the Vopak management of change process.

The surrounding area is primarily characterised by industrial activity neighbours. There are no significant commercial spaces, no retail centres or similar developments that routinely have a large number of people occupying them.

The industrial facilities land near to the Site include:

- North - Elgas
- East - Qenos
- South - Austate Logistics
- West - NSW Ports Pipeline Corridor.

The nearest residential area is located at Phillip Bay approximately 1500 metres to the east of the site across Yarra Bay. Other residential areas, slightly further away (approximately two kilometres), are Matraville/Chifley to the north-east, Little Bay to the

east, La Perouse to the south-east and Botany to the north-west. Botany cemetery is located 800 metres to the east.

6.3.2. Site B (Sherpa) QRA - Potential Impacts

The QRA was carried out in accordance with the NSW Department of Planning HIPAP 6 Hazard Analysis guidelines. The QRA covered hydrocarbon loss of containment scenarios for operations within the Site B boundary, and also for Vopak ship import and export activities within NSW Ports BLB areas as follows:

- NSW Ports area (Vopak operations only) at BLB1 and BLB2/Wharf Areas and associated pipelines from BLB1 and BLB2 to Site B
- Storage tanks, manifolds, pumps and piping, and road tanker export/import activities within Vopak Site B.

Import and export pipelines (Jet Fuel Line and Caltex Transfer Pipeline) once outside the boundary of Site B, were not included in the QRA.

The QRA included consequence and frequency analysis. Scenarios considered were:

- Pool fires (spills into bunded areas, manifold areas, tanker loading bay)
- Tank top fires
- Spray fires (pumped liquid systems)
- Flashfires resulting from large overfills of gasoline from storage tanks ("the Buncefield scenario").

TNO Riskcurves were used to generate risk contours for both the current and future increased throughput case. Individual fatality and property damage risk were then assessed against the land use planning risk criteria outlined in the HIPAP 4 Risk Criteria for Land Use Planning guidelines.

Injury risks from heat radiation and/or explosion overpressure were not evaluated in this study as injury risk criteria are applicable only for residential and sensitive uses which are not present in the Port Botany precinct. (These areas are also well outside the worst case consequence impact area as identified in the QRA).

A summary of findings is as follows:

6.3.2.1 Individual Fatality Risk

A comparison was made of the risk against the HIPAP 4 risk criteria and the risk contours for the existing and future increased throughput operations were developed. (See Figure 6.3 and Figure 6.4). These risk contours show that:

- The risk criteria for all offsite land uses are met for both current and the increased throughput operations.
- The site boundary target risk level (50×10^{-6} per year) is met for both existing and increased throughput operations.
- In general, there is an increase in risk for all risk contour levels for the increased throughput case. This is due to:
    - The addition of several new facilities around the Site B terminal which introduces more leak sources around the terminal. These include addition of BLB2 and additional pipelines for hydrocarbon import to Site B, as well as provision of four new road tanker bays (product export and ethanol unloading).

- Increase in the overall terminal throughput, which increases the frequency at which hydrocarbon can be released from terminal equipment and operation.

Major risk contributors to the individual fatality risk (future case) are as follows:

- At the 50 x 10^{-6} per year contour (within the Site B boundary)

  Gasoline fires (jet and flash fires) from the new proposed road tanker loading gantry bays and pool fires in bunded areas are the major risk contributors to the offsite risk at the 50 x 10^{-6} per year contour. However, the risk contour at this level remains within the site boundary for the both the current and projected future case operation.

- At the1 x 10^{-6} per year contour

  Flash fires due to the gasoline tank overfill incidents ('Buncefield' scenario) are the major risk contributors to the offsite risk at the 1 x 10^{-6} per year contour. The same contributors apply for the 0.5 x 10^{-6} per year contour.

- Southern limit of 5 x 10^{-6} per year contour

  Pool fires (including bund fires) are the major risk contributors to the offsite risk at the 5 x 10^{-6} per year contour. These events are generally close to the site in regards to the consequence distance.

Figure 6.3 – Individual Risk Contour (Current Operation)

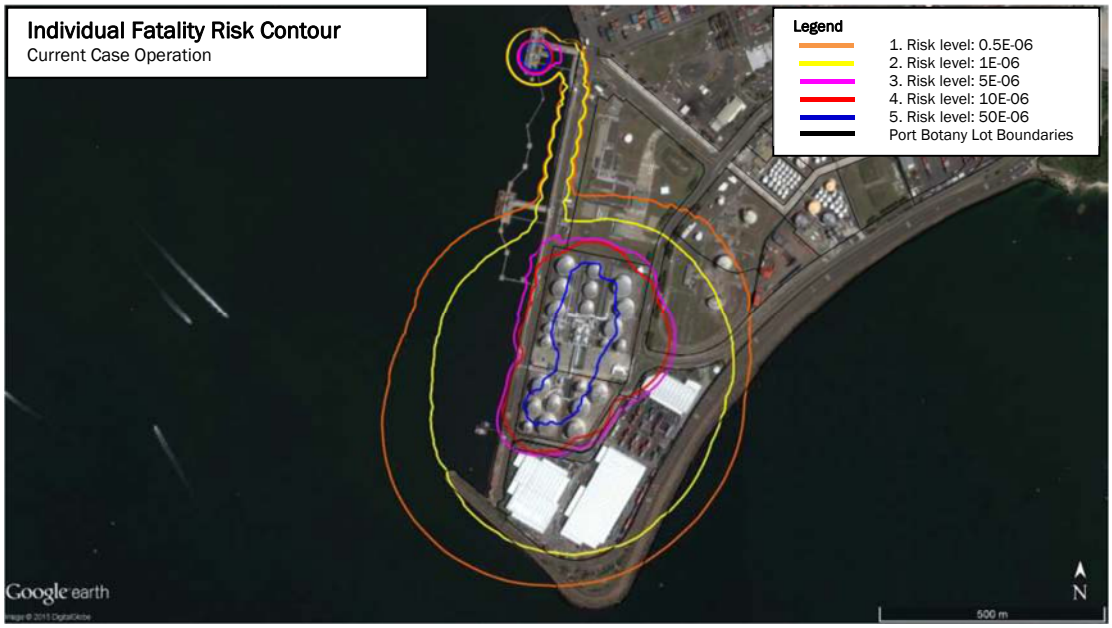
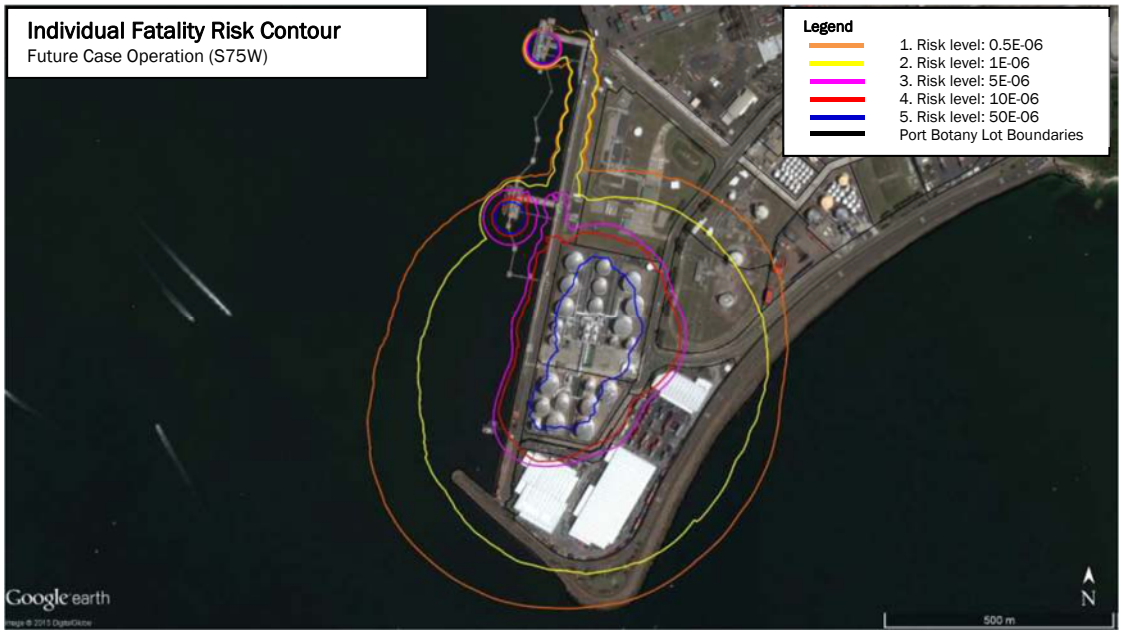


Figure 6.4 – Individual Risk Contour (Projected Future Operation)



Source Figure 6.3 and 6.4: Site B Proposed Throughput Increase, S75W Application for Expansion, Quantitative Risk Assessment, Port Botany, Sherpa Consulting, June 2015

6.3.2.2 Damage and Propagation Risk

The risk criterion for damage and propagation risk is complied with for both current and future operations. Incident heat flux radiation (23 kW/m2) at neighbouring potentially hazardous installations or at land zoned to accommodate such installations does not exceed a risk of 50 in a million per year.

6.3.2.3 Risk Contours Comparison with the Vopak Site B Stage 3 Final Hazard Analysis

Prior to this QRA study, the Final Hazard Analysis (FHA, 2007) report for the previous Site B expansion ("the B3 expansion"), presented the most recent cumulative risk contours for the Site B operations. Comparison with the previous FHA results indicated that both the 50×10^{-6} and 1×10^{-6} per year risk contours generated for this updated QRA study (current case which is representative of the same case as the FHA, i.e., B3 expansion) are larger than the contours produced in the FHA.

This is due to:

- Differences in study scope

  The updated QRA included release scenarios from the BLB and the import pipeline to site, as well as releases from manifolds, pumps and pipework on site, whereas the FHA included equipment within the Site B boundary only.

- Level of detail assessed

  The FHA mainly assessed large tank terminal fire scenarios (eg. tank fires and road gantry releases). The QRA assessed in detail the potential leak sources (i.e., parts count) for all equipment with hydrocarbon inventories.

- Inclusion of gasoline tank overfill ('Buncefield') scenario

  The QRA included the Buncefield scenario tank overfill scenarios and associated flammable vapour clouds which may ignite. In the past, the industry has previously

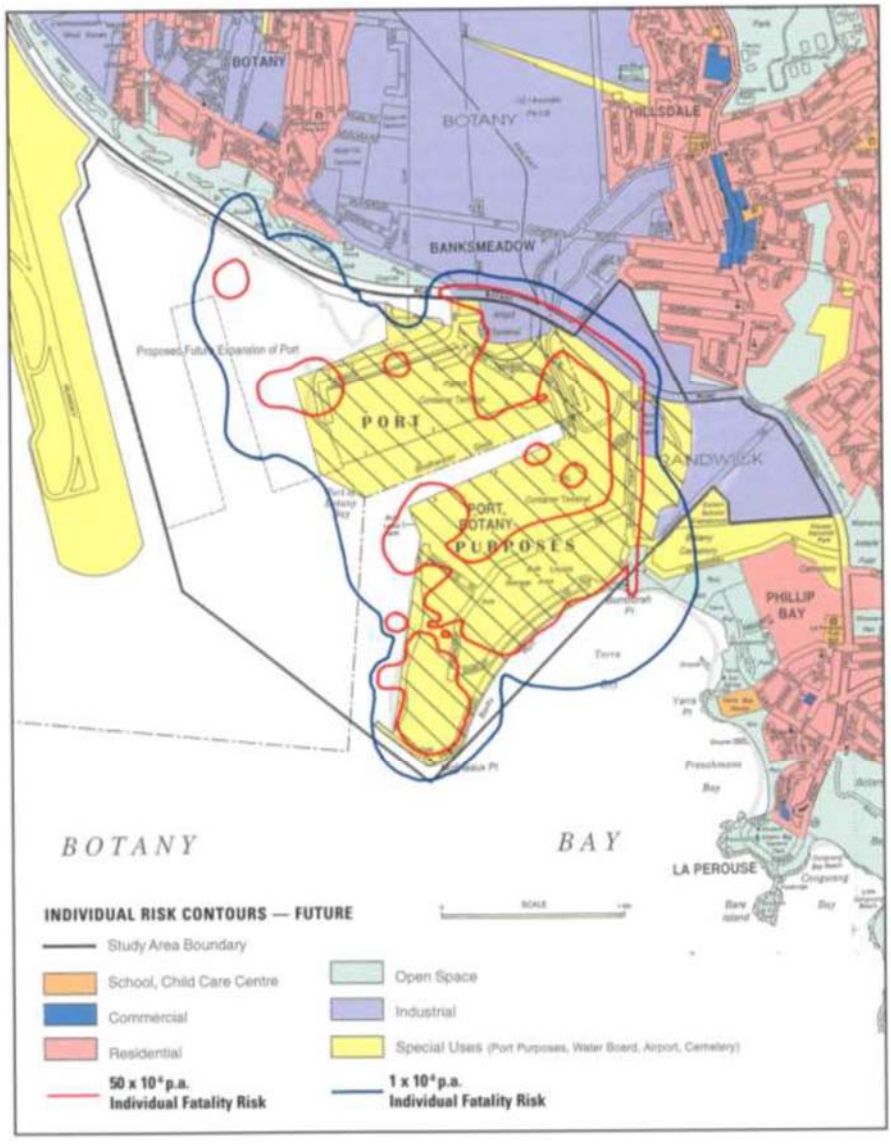
considered these scenarios to be unlikely and they have been excluded from hydrocarbon tank farm consequence assessment (such as the 2007 FHA).

6.2.3.4 *Risk Contours Comparison with the Port Botany Land Use Study (Future Case)*

There will be no significant effect on the cumulative risk as shown in the Port Botany Land Use Safety Study future use case (see Figure 6.5) based on the following:

- The 1 x 10^{-6} per year risk contour for Site B future case operation will be within the projected future case use overall risk contour (1 x 10^{-6} per year as shown on Figure 2/Figure 8, *Port Botany Land Use Safety Study Overview Report 1996*).
- The 50 x 10^{-6} per year risk contour for Site B future case operation is contained within the Site B boundary and hence, it will be within the projected Port Botany future case use overall risk contour (50 x 10^{-6} per year).

Figure 6.5 – Port Botany Land Use Study – Cumulative Individual Risk Contours included Postulated Future Development (1996)



6.3.3. Site B (Sherpa) QRA - Management and Monitoring Measures

The QRA is intended primarily as a risk profile comparing the current and proposed expansion cases against HIPAP 4 criteria. While the QRA identifies existing risk control measures and safeguards, it does not provide a detailed demonstration of the adequacy of the control measures in place to control risks to levels considered "As Low As Reasonably Practicable" (ALARP). This demonstration will be included as an update to the MHF Safety Report. Hence no specific recommendations have been made as part of the QRA.

6.3.4. Site B Dangerous Goods Transport Risk Assessment

After submission of the S75W EA for Adequacy Review, the DP&E requested that a Transport Risk Assessment be prepared to assess the potential impact of increased road transport of DG associated with the project.

The majority of road tanker traffic associated with Vopak Site B would travel on Foreshore Rd which is a dedicated heavy vehicle link. The most sensitive area with respect to risk is the northern route from Port Botany which runs via Beauchamp Rd and Denison St. This is an authorised B double route and is also adjacent to residential and commercial areas.

The scope of the Transport Risk Assessment included:

- Provision of additional information regarding the estimated DG road traffic generated from the proposal and the likely route leaving the Port Botany area. This is based on the predicted overall road tanker numbers in the updated 2016 Traffic Impact Assessment by Samsa Consulting 2016, together with estimates from Vopak operational data relating to the quantities of different fuel types likely to be exported via the road tanker export facilities for the future growth case, and distribution of full tankers to the different routes leaving the Port Botany area.
- A quantitative assessment of the effect of the potential increase in Class 3 DG traffic along Denison St on risk levels to the residential and commercial land uses. As an existing transport QRA covering Denison St is available (Scott Lister in 2015), Scott Lister was retained to prepare an update to the Denison Transport QRA study covering the potential increase in Class 3 traffic from the Vopak proposal.

The total number of road tankers exporting fuels from Site B is predicted to increase from approximately 182 per day (2016 volume) to 280 per day (2023 volume) at an average tanker load size of 36.3 m^3 (assumed to be unchanged over the entire period).

Approximately 70% of road tanker exports from Site B are Class 3 DGs (primarily gasoline, and some jet fuel), the balance are combustible products (diesel, biodiesel). This ratio is not expected to change substantially for the future growth case.

From Site B and after leaving the Port Botany area, the updated 2016 traffic assessment estimated that 85% of road tanker exports head west along Foreshore Rd, a further 10% north along Beauchamp Rd and Denison St, with the remaining 5% heading east to Bunnerong Rd. This corresponds to an increase in predicted Class 3 full road tanker traffic heading north along Denison St from Vopak Site B to around 6,600 Class 3 road tankers per year in 2023, from an estimated 2016 volume of approximately 4,300 tankers per year.

The following conclusions have been drawn from the Transport Risk Assessment and the Scott Lister Vopak Port Botany Expansion - Denison St Transport QRA study:

- The basis for total full Class 3 tanker traffic in the southern portion of Denison St in the Scott Lister Transport QRAs prepared in relation to the Bunnings development is approximately 4,400 per year (based on 2012 traffic count data). Not all Class 3

tankers heading north along Denison St are from Vopak Site B, although the majority are likely to be as Vopak is the highest Class 3 throughput site in the Port area.

- The operational data for 2016 from Vopak Site B suggests that there has been a 40% increase in total Site B road tanker export throughput since 2012, most likely due to external factors such as refinery closures in Sydney and an increase in imported finished fuel products imported via Port Botany. Therefore the Class 3 road tanker numbers included in the existing Scott Lister transport DG QRA for Denison St are likely to be an underestimate of the 2016 Class 3 tanker numbers. A future growth case was not included in the original Scott Lister Transport QRAs.
- The Class 3 tanker numbers heading north from Vopak Site B were estimated to be approximately 4,300 (2016 basis) increasing to approximately 6,600 (2023 basis). This assumes 10% of all tankers travel north up Denison St from Site B and an average tanker volume of 36.3 m^3.
- The Scott Lister Denison St Transport QRA and associated 75W update accounting for increase in Class 3 tankers associated with the Vopak 75W proposal show clearly that the risks from Class 3 tanker transport for both the current (2016) case and future growth (2023) case are small compared to the total cumulative risk in Denison St from existing road tanker transport of all relevant DG classes.

Overall, DG road transport risk levels will necessarily increase with an increase in DG traffic. However, the available information regarding the Vopak Site B Class 3 road traffic increase, put into context of the existing quantitative Denison St DG Transport risk assessments, indicates that the additional Class 3 traffic would have a very small effect on the existing predicted individual fatality risk levels in Denison St.

As the effect areas for accidents involving Class 3 tankers are relatively small, the contribution to cumulative societal risk in the area due to Class 3 tanker accidents is also extremely small, falling below the negligible societal risk criteria for the Site B Class 3 contribution for both the 2016 and future growth 2023 Case, and the increase is not perceptible in the cumulative societal risk profile for DG road transport in the Denison St area.

There is no information publicly available regarding the amount of DG traffic in areas apart from Denison St. However the change in risk to surrounding land uses due to DG transport on other routes is not likely to be significant as Foreshore Rd (which will take most of the traffic increase) is a heavy vehicle route and the tanker numbers heading east to Bunnerong Rd from Site B are likely to be very small.

Overall it is concluded that the 75W proposal will have a very small impact on existing DG transport risk levels in the area when compared to previously published risk estimates.

6.3.5. Transport QRA – Methodology

The Systra Scott Lister Transport QRA was an update of the Scott Lister Dangerous Goods Transport QRA, Denison St, Hillsdale issued 12 February 2015. Only two parameters have been changed from that study:

- Incremental population growth.
- Number of Class 3 road tankers heading north along Denison St that are not associated with the BIP.

All other parameters such as weather, DG truck movements associated with BIP or other land uses, crash rates and release frequencies and risk criteria are unchanged.

Consistent with the original Denison Street study, the risk acceptability criteria used for this update are those detailed in the DP&E's Hazardous Industry Planning Advisory Paper No.4, Risk Criteria for Land Use Safety Planning. The DP&E does not have any formal published criteria for transport risk but for the original Denison Street report, the HIPAP4 criteria for fixed installations were accepted by DP&E as providing a reasonable basis to inform planning decisions.

The risk model is presented for three cases:

- Base Case, which is based on 2015 Denison St DG Transport Addendum QRA with traffic based on the 2012 ROAR traffic data count. This case includes an increase in the surrounding residential population due to incremental developments that have occurred or are proposed in the Denison St area, i.e., the populations are higher than the 2015 Addendum QRA, but the truck movements are the same as the 2015 Addendum Case.
- Vopak 2016 Case, which is the Base Case above, with an increased number of Vopak Class 3 movements based on Vopak operational data.
- Vopak 2023 Case, which is the Base Case above, with expanded Vopak Class 3 movements predicted for 2023.

6.3.6. Transport QRA – Potential Impacts

Individual Risk

The increased number of tanker movements results in small increases in individual risk, but only very close to the road. There is no increase in individual risk at distances of more than approximately 30m from the road.

Around the road intersections, the risk in the existing 2015 Denison St Transport QRA reports is noted to exceed $1x10^{-5}$ per year risk contour. With the projected increase in Class 3 tanker movements, this localised risk is predicted to increase very slightly in the vicinity of intersections.

The DP& E does not have any firm individual risk criteria for transport movements so it is hard to assess the acceptability of this small increase.

Societal Risk

As shown on the FN Curves, under all three cases modelled, the risks from Class 3 DG movements associated with Vopak alone are very low and well below the yellow 'Negligible' line. It is noted that the recent increased populations in the area are more significant in pushing the FN curve closer to the limit of acceptability, not the estimated increase in Class 3 tankers from Vopak. Vopak's contribution (in fact Class 3 road tankers generally) to societal risk lies at the 'lower fatalities' end of the FN curve, i.e., 1 to 4 fatalities, and does not contribute to the portion of the FN curve approaching the limit of acceptability.

In the words of HIPAP4: "Below the negligible line……societal risk is not considered significant" and "Provided the incremental societal risk lies within the negligible region, development should not be precluded". It is therefore concluded that the societal risk of the Vopak expansion in the vicinity of Denison Street is low. Whilst it is the responsibility of government authorities to determine the acceptability of the risk in this situation, the risk would appear to be acceptable according to the principles of HIPAP4.

6.4. Air Quality & Greenhouse Gas

An Air Quality Impact Assessment (AQIA) was prepared by AECOM Australia Pty Ltd (AECOM) to support the Environmental Impact Statement (EIS) prepared on behalf of Vopak for the Stage B4 Expansion Project. The expansion project consists of the construction and operation of a petroleum tank farm at Port Botany, NSW, which would consist of seven storage tanks with a total nominal capacity of 200 ML. The assessment has been undertaken with consideration of the cumulative impacts of other Vopak operated facilities in Port Botany, and also addresses the emissions and impacts from the existing Site B Terminal as proposed under this Section 75W Modification.

The main potential sources of air emissions associated with the proposed development are vapour emissions (volatile organic compounds, or VOCs) from the storage and transfer of fuels. The purpose of this assessment was to estimate the emissions of VOCs from the facility and the resultant concentrations of these pollutants at sensitive receptor locations. The AQIA provides details of the methodology and results of the dispersion modelling of VOC emissions.

The report was reviewed by the EPA and a response was provided to the DP&E dated 14 June 2016. The EPA was satisfied that the AQIA addressed most of the issues previously raised.

Extracts of the report are provided below and a full copy can be found in Appendix F.

6.4.1. Existing Environment

The pollutants of prime interest in NSW are ozone and particulates, with levels of these pollutants approaching or exceeding the national standards prescribed in the National Environment Protection Measure for Ambient Air Quality (NEPM) on occasion. The Vopak facility is not expected to generate significant levels of ozone or particulates.

Port Botany is the major NSW port for the handling of containers, bulk liquids and petrochemicals. The international and domestic airport terminals are located nearby, as are major arterial roads and the botany Freight Rail line. Industrial uses dominate the surrounding area, including the sections of Banksmeadow and Matraville abutting Port Botany.

No local monitoring of VOCs was identified at the time of preparation of this report. Despite this lack of relevant monitoring data, a cumulative assessment utilising predicted local VOC concentrations (including adjacent VOC sources) was undertaken.

The Bureau of Meteorology (BOM) records long-term meteorological data at a number of automatic weather stations around the country. The station that best represents the site is located at Sydney Airport, approximately 4.5 kilometres northwest of the site. A summary of the long-term data recorded at this station is provided below.

The warmest temperatures occur between November and March, with the warmest average maximum temperatures occurring in January (26.5°C). The coldest temperatures are recorded in the winter months, with the lowest average minimum temperature occurring in July (7.2°C).

The highest average rainfall is recorded in June (122.8 mm), while September is the driest month (60.2 mm). Humidity in the area is typically between 50 and 74 %. Average wind speeds range from 12.6 – 25.3 kilometres per hour, and are typically higher at 3 pm compared to 9 am. Winds are predominantly from the northwest at 9 am, with also frequent winds from the western direction. At 3 pm, the winds swing around to predominantly blow from the northeast and southeast. Southerly winds are common both in the morning and afternoon.

6.4.2. Potential Impacts

6.4.2.1 Construction

The primary emissions during construction will be dust and particulate matter. The majority of the particulate matter (PM) generated from construction will be in the coarse size fractions, generally referred to as PM_{10}. Particulate matter (PM) emissions in the fine size fractions, generally referred to $<PM_{2.5}$ are typically associated with combustion sources and are not considered significant for this assessment.

Dust emissions from construction vary substantially from day to day, depending on the intensity of particular activities (i.e., tonnes of material handled) as well as the temporal and spatial distribution for various emission sources and location. It is therefore very difficult to confidently estimate emissions on a day-to-day basis. Typically, impacts will be relatively short lived across different areas of the site and generally manageable through commonly applied dust control measures.

The principal emissions sources from the construction phase will be dust and particulate matter, occurring from the following activities:

- Bulk earthworks including topsoil removal and stockpiling, trenching, cut and fill;
- Handling of material;
- Movement of heavy plant and machinery within the site; and
- Wind erosion from exposed surfaces.

There would be some minor emissions as a result of construction vehicles (exhaust emissions) and potential on-site power generation (diesel generators) which would include oxides of nitrogen (NOx), carbon monoxide (CO), sulfur dioxide (SO_2), organic compounds and GHG emissions (primarily CO_2). However, the contribution of these emissions would not be significant enough to compromise air quality goals at nearby receptors.

6.4.2.2 Operation

In areas where significant pollutant levels may be expected due to emissions beyond that contributed by the project seeking approval, a cumulative assessment may be required. The primary pollutants of concern in relation to the Project are VOCs. A review of operations in Port Botany identified that Vopak is likely to be a primary contributor of VOCs in the immediate area.

In order to look at the cumulative impact of the entire Vopak Petroleum Site B facility and associated infrastructure, emissions from the BLB pipe losses, storage tanks from Site B (at the proposed 75W throughput), tanker loading gantry emissions from the existing Site B gantry (at the proposed 75W modification design), and storage tanks from the proposed site B4 have been included in the dispersion model. In addition, the Vopak Bitumen emissions have been included in the model as it is also operated by Vopak.

In order to look at the cumulative impact of the entire Vopak Petroleum Site B facility, directly associated infrastructure, and Vopak Bitumen Facility, the following operations were included in the air dispersion model:

- Proposed Site B4 storage tank emissions;
- Bulk Liquids Berth 1 and 2 fugitive emissions;
- Existing Site B storage tank emissions (inclusive of B1, B2 & B3) and the proposed 75W modification design and throughput of 7,800ML per year;

- Existing Site B tanker loading gantry emissions with the modifications as proposed in the 75W modification, specifically the operation of 9 loading bays with the existing Vapour Recovery Unit (VRU) system;
- Vopak Bitumen vapour combustor unit; and
- Vopak Bitumen storage tank breathing losses.

The NSW EPA's assessment criteria for the assessed pollutants apply to the 99.9th percentile for site-specific assessments, such as this AQIA. The data are presented for principle air toxics, individual air toxics and individual odorous air pollutants assessed at or beyond the plant boundary. Although individual odorous air pollutants are generally assessed at the nearest sensitive receptor, given the proximity of industrial receptors, at or beyond the boundary was conservatively assessed.

An additional assessment of the residential sensitive receptors has been provided to clarify any impact the Project may have on the local residential community.

The predicted maximum cumulative ground level concentrations for typical maximum operations at or beyond the site boundary, including residential receptors, resulting from the dispersion model are summarised in Table 6.4.

Table 6.4 - Maximum Cumulative Predicted Ground Level Concentrations at or Beyond the Site Boundary 99.9th Percentile (µg/m³)

Pollutant	Criteria (µg/m³)	Cumulative (*)	Site B4	Site B	Vopak Bitumen & Bulk Liquids Berth 1&2	Background	Cumulative % of Criteria
Benzene	29	25.41	0.414	19.96	<0.0001	5.04	88%
Cumene	21	15.7	0.0005	0.0003	0.08	15.81	75%
Cyclohexane	19,000	23.06	0.197	18.61	<0.0001	4.25	<1%
Ethylbenzene	8,000	15.66	<0.0001	15.20	<0.0001	0.46	<1%
n-Hexane	3,200	73.53	0.496	62.89	0.0081	10.14	2%
Toluene	360	197.92	0.537	190.95	<0.0001	6.43	55%
Xylenes	190	42.19	0.452	39.75	<0.0001	1.99	22%

(*) Cumulative concentrations are the sum of contemporaneous impacts from Site B4, Site B, Vopak Bitumen and Bulk Liquids Berths 1 & 2.

The predicted maximum cumulative pollutant concentrations were all below their respective assessment criteria. The following observations can be made:

- The cumulative contribution predicts that benzene would have the highest contribution of the EPA criteria representing 88%;

- The Site B4 contribution to this maximum cumulative benzene value is 1.4% of the EPA criterion, with the Site B contributing the highest proportion; and
- As shown in the figures provided, the maximum cumulative impact for all pollutants except cumene was located at the boundary of Site B adjacent to the VECS; and
- The maximum cumene impact occurred at the boundary of Site B4. Cumene is present at higher levels in diesel than gasoline, resulting in the highest cumene emissions occurring adjacent to the cumene storage tanks at site B4.

In order to further clarify the predicted cumulative impacts at the residential receptors, the cumulative maximum 99.9th percentile Ground Level Concentrations (GLC) values were provided. The predicted pollutant concentrations were all well below the assessment criteria. The maximum cumulative contribution to the EPA criteria was for benzene at Receptor 12 (Elaroo Avenue, Yarra Point) at 20%. Note that of this 5.3 ug/m^3 maximum, 4.6ug/m3 is from background emissions not related to Vopak operations. Subsequently, the modelled Vopak impacts at this maximum residential receptor location represent 2% of the benzene criterion.

The data show that the GLCs met the relevant assessment criteria at all residential receptors for all pollutants.

Assessment of the air quality impacts from stationary sources of oxides of nitrogen (NOx) and VOCs needs to consider the potential generation of ground-level ozone. A Level 1 assessment – screening procedure was conducted. The calculated Vopak cumulative tonnes/day (previously provided as 0.236 t/day VOC) was entered into the model and the incremental and cumulative ozone values calculated by the tool. The results of the tool calculation are provided below:

- Maximum 1-hr Ozone Increment = 0.080 ppb (threshold is 1 ppb); and
- Maximum 4-hr Ozone Increment = 0.054 ppb (threshold is 1 ppb).

The results of the tool show that the designated thresholds are not exceeded and therefore no further ozone assessment is required.

6.4.3. Management and Monitoring Measures

The mitigation measures recommended for inclusion for the construction period are as follows:

- All vehicles and plant/equipment should be fitted with appropriate emission control equipment and be serviced and maintained in accordance with the manufacturers' specifications. Smoke from vehicles/plant should not be visible for more than ten seconds;
- Trucks entering and leaving the premises that are carrying loads of dust-generating materials must have their loads covered at all times, except during loading and unloading;
- Hard surfaces or paving should be used where possible, as unpaved routes can account for a significant proportion of fugitive dust emissions, particularly during dry/windy conditions. Routes should be inspected regularly and repaired when necessary, and roads should be swept and watered as required to limit dirt/dust build up and potential dust generation during windy conditions;
- Any areas on site that are not covered with hard surfaces should be vegetated wherever possible to minimise wind erosion and associated dust generation;

- All vehicles should be switched off when not in use for extended periods;
- Use of water carts and/or road sweeping to minimise dust generation. The frequency of operation is to be increased during dry windy conditions which create a higher potential for dust generation;
- Wetting and covering of stockpiles where hazardous material has been encountered;
- Active excavation area works are wet down with hoses; and
- Housekeeping is maintained to keep exposed areas to a minimum.

Operational mitigation measures focus on undertaking of specific activities in a manner designed to minimise environmental impacts.

An Air Quality Management Plan (AQMP) should be prepared in accordance with conditions of consent and the Environment Protection Licence for Project. The following information should be included:

- Sensitive receptors in proximity to the site;
- The legislative framework and standards applicable to the operation;
- Potential contributors to off-site pollutant impacts, including the pollutants that are of concern;
- Mitigation measures required to minimise the operation's effects on local air quality;
- Contingency plans for complaints and pollution incidents; and
- Review and reporting protocols.

The modelling has assumed a stack venting 10m above ground level with vertical momentum i.e. no witches' hat, T-junctions or other units that may limit the stacks vertical velocity. Vopak has confirmed that the approved and built Site B 75W modification design would meet this stack height and orientation requirement.

6.5. Hydrology and Soils

6.5.1. Existing Environment

The site forms part of an area of reclaimed land, which was formed from hydraulic landfill during the early 1970s.

The proposal study area is situated within the central coastal portion of the Sydney Basin, and comprises a sequence of Permo-Triassic sandstone and shales, overlain in part by Cainozoic sediments. Diatremes, dolerite dykes and dolerite sills varying in age from Jurassic to Tertiary intrude the gently-deformed sedimentary sequence.

Investigations within the vicinity of the site were undertaken by Geolight in two stages in 1991 and 1992 as part of the Sydney LPG Cavern project. These investigations found that the material immediately below the surface, ranging to a depth of 10 m - 14 m, comprises gravel, cobble and boulder size fragments of dolerite and sandstone with minor amounts of masonry fragments, demolition rubble and steel reinforcement. The bulk of the material consists of light grey, very loose, fine to medium grained, subangular to subrounded, moderately sorted quartzose sand containing minor amounts of clay, organic matter and shell fragments.

It is noted that Fluor Daniel GHT undertook an environmental audit for contamination on Part of Lot 1 DP 1009870 and Lot 2 DP 877387 on behalf of SPC in June 1998 and land remediation of the site was undertaken. Fluor Daniel GTI consequently concluded in July

1998 that no further environmental investigations or management was required prior to leasing the site for industrial purposes.

An acid sulphate soils assessment for the Port Botany expansion identified the area as disturbed land. Geolight undertook investigations within the vicinity of the site in two stages in 1991 and 1992 as part of the Sydney LPG Cavern project. The Geolight investigations found that potential acid sulphate soils are unlikely within the top two metres of the surface soil.

Botany Bay is the nearest waterway from the site. There are no streams or creeks near the site. Stormwater generated in the Port Botany area would eventually discharge into Botany Bay.

Roads, driveways, car parks etc are identified as a prominent source of stormwater pollutants including suspended solids and hydrocarbons. The site is likely to be at higher risk to hydrocarbon and chemical contamination due to the operation of the site as a Bulk Liquids Storage Terminal.

6.5.2. Potential Impacts

6.5.2.1 Construction

Construction phase impacts have potential to lead to erosion, sediment transport, siltation and contamination of offsite waters. Typical activities and sources of potential impacts amongst others include:

- Earthworks undertaken immediately prior to rainfall periods;
- Work areas that have not been stabilised;
- Stripping of topsoil, particularly in advance of construction works;
- Bulk earthworks and construction of pavements;
- Stockpiling of excavated materials;
- Storage and transfer of oils, fuels, fertilisers and chemicals; and
- Maintenance of plant and equipment.

Minimal demand on potable water during the construction phase is expected and no changes to potable water quality are likely as a result of the construction works.

Mitigation and management measures have been identified to manage potential impacts to off-site waters and such measures would significantly decrease the likelihood of adverse environmental impacts.

6.5.2.2 *Operation*

Stormwater

Site B has adopted a stormwater management approach to separate stormwater runoff into the following four streams:

1. Potentially contaminated stormwater, associated with the tank bund areas
2. The road tanker loading bay
3. Onsite paving/ general hardstand runoff, associated with the balance of the site
4. New Elgas Link Road and Fishburn Road.

Potentially contaminated stormwater

The storage tank areas are bunded, draining to sump pits and directed to the wastewater treatment plant prior to inspection/testing and release from the Final Interceptor Pit.

Existing Vopak Stormwater management procedures require that samples and field testing be carried out at this point prior to release. If the stormwater quality is less than required there are several options available to the operations personnel. The water can be diverted to a slops tank for disposal off-site to a licensed waste facility.

Sludge, product spills and other waste streams generated from the wastewater treatment plant would still be removed off-site to a licenced Waste Facility.

Road tanker loading bay

Stormwater and spillages from the road tanker loading bay area drain to a sump arrangement. This runoff is transferred to the waste storage facility (Slop Tanks) and then off-site by road tankers to a licenced Waste Facility.

Onsite Paving / general hardstand runoff

The site is designed to manage flows up to the 10-year average recurrence interval event, Road / general hardstand runoff would be routed to the Final Interceptor Pit, from where it is discharged to the stormwater network via a normally closed actuated valve after inspection/testing.

The Site EPL has a daily stormwater discharge limit however operational experience has shown that this limit may potentially restrict safe operation of tank bunds especially during or directly after high rainfall events. Vopak will approach the EPA for a licence variation to ensure both operational safety, environmental protection and EPL compliance.

New ELGAS Link Road & Fishburn Road

These new areas will be drained to existing public roadway stormwater drainage systems extended to suit.

6.5.3. Management and Monitoring Measures

Construction phase impacts can be managed by implementation of a Construction Soil and Water Management Plan detailing construction phase stormwater management strategies in accordance with the Landcom Soil and Construction, Managing Urban Stormwater (Landcom, 2004). These would include amongst others:

- General site practices and responsibilities;
- Material management practices;
- Stockpile practices;
- Topsoil practices; and
- Erosion control practices (earth sediment basins, straw bales, sediment fences, turbidity barriers, stabilised site accesses, diversions and catch drains).

During operations monitoring is undertaken to ensure that stormwater and management measures prior to release are working effectively. Monitoring would rely primarily on visual inspections and sampling prior to release. Visual inspections will be undertaken of bunded areas, pits, diversion and catch drains and all other stormwater conveyance structures. Grab samples should be taken for untreated and treated bunded stormwater. This monitoring would be undertaken in accordance with the conditions of the EPL.

New roadway drainage in the tanker queuing areas on the Elgas Link Road and widened Fishburn Road will be largely be unmonitored as the road tankers in these areas are empty (awaiting filling within the terminal).

6.6. Groundwater

6.6.1. Existing Environment

The site is located within the boundaries of Botany Sands Aquifer. The general pattern of groundwater flow is south westerly towards Botany Bay with higher levels west of Botany Industrial Park, attributed to a reduction in extraction rates and higher rainfall in that area (URS: 2003: pp17-2). Groundwater occurs and moves in both the shallow sand sediments and deeper sandstone under the site due to the primary and secondary permeability of underlying rocks. The shallow sand sediments of the Botany Bay deposits (the Botany Sands) are an important local aquifer in numerous areas around Botany Bay.

The reclaimed Port area is relatively flat, with minimal slope to enable surface water to flow into Port Botany. Given the existing nature of the fill material immediately below the surface of the site, a relatively high rate of rainfall infiltration is anticipated in areas without impervious surfaces. However, the proposed site will consist of large areas of impervious paving and bunded surfaces.

If any excavations intercept the groundwater during construction or new bores or wells are required for dewatering purposes, a licence under Part 5 of the Water Act 1912 would be sought.

Based on the Draft Water Sharing Plan for Greater Metropolitan Region prepared by the NSW Office of Water in May 2010 the Botany Sands aquifer has approximately 80 existing licenses in the groundwater resource.

The Elgas underground LPG storage facility is located to the north of the subject site. To enable this facility to function effectively an acceptable hydrostatic pressure is required to be maintained within the aquifers at all times during the operational phase. In particular, the underground storage environment requires protection against:

- Water table drawdowns of limited extension but of large amplitude, which may be generated by water production wells in the immediate vicinity of the caverns;
- A general decrease of the water table level which may be generated by new water extraction, even from remote areas, but adversely located or too large; and
- Any new subsurface construction or development that may adversely affect the facility's hydrogeological environment. This includes quarrying, tunnelling, mining, etc.

There are two zones associated with the Elgas LPG Caverns located on the western side of Friendship Road to the north of Site B:

- "Groundwater Management Zone (A) (GMZ A)" extending to the boundaries of privately owned Fishburn Road, Charlotte Road and Friendship Road and to the southern boundary of the Skymill (Elgas) site; and
- "Groundwater Management Zone (B) (GMZ B)" extending from the boundaries of Zone (A) to a distance of not less than 500 metres from any cavern.

The proposal is located within GMZ A and GMZ B.

6.6.2. Current Environmental Status

In July 2014 a report was prepared by WSP who was engaged by Vopak to conduct groundwater sampling, analysis and reporting for existing groundwater monitoring wells at Site B to demonstrate compliance with Environment Protection Licence (EPL) 6007 which Vopak holds for the site.

To comply with the EPL, groundwater sampling was required from five monitoring wells and the samples required analysis for EPL specified contaminants of concern (benzene, toluene, ethylbenzene, xylene (BTEX), total petroleum hydrocarbons (TPH) and polycyclic aromatic hydrocarbons (PAH).

Groundwater sampling works were conducted on 10 and 11 June 2014 and comprised gauging, purging, sampling and analysis of groundwater from each specified well. WSP also assessed historical data trends from groundwater monitoring events completed at the site over the period 2003 – 2012.

On the basis of this groundwater monitoring event, WSP concluded that:

- Concentrations of BTEX, TPH and PAH were reported below Laboratory detection limits in all wells with the exception of MW2
- Benzene, ethylbenzene and xylene were reported in MW2, below the respective adopted groundwater criteria
- TPH (C68C9) was detected in MW2. There are no EPA endorsed criteria for TPH (C68C9) in groundwater for the protection of aquatic ecosystems
- TPH (C108C36) was detected in MW2 below the adopted screening criteria
- BTEX, TPH and PAH concentrations were not detected in groundwater monitoring wells MW1, MW2, MW4S and MW4D (down-gradient site boundary). However, based on the inferred ground water flow direction and the location of MW2, there is a potential for contaminants to migrate beyond the western site boundary at concentrations below the adopted assessment criteria.

6.6.3. Potential Impacts

The extent of excavations during construction would be relatively shallow (approximately 1,200mm) for new roads and foundations. Vibrocompaction for road construction will also be minimal. Heavy vibration activities are not expected.

The Site B design incorporates best practice design and is operating in accordance with the requirement of the EPL 6007. Overall, the potential impacts upon groundwater during construction and operations would be minimal.

6.6.4. Management and Monitoring Measures

The proposal is located within GMZ A and GMZ B. Vopak will be required to submit to the NSW Ports details as required by the Groundwater Management Zone Deed, May 1994 including:

- Proposed construction methods
- The likely impact of the water table
- The likely impact on the LPG storage development.

During operations groundwater monitoring would continue to be undertaken in accordance with the conditions of the EPL.

6.7. Waste

6.7.1. Existing Environment

Bulk liquids at Vopak Site B do not require special packaging or processing that result in large quantities of waste generation. The low staff requirements for unloading and loading bulk liquids result in low staff waste generation in comparison with other high staff industries. The waste currently generated at the site is low as existing operations are relatively static in waste generation.

The nature of the existing operations results in the following waste generation:

General maintenance waste

To operate the facility effectively, general maintenance of tanks, pumps, pipes etc is required and this results in generation of wastes. Most waste generated from maintenance operations is general workshop waste such as rags, gloves, general packaging material, and empty chemical drums, steel off-cuts and machinery spare parts.

Other general workshop waste includes liquid waste, such as paints, waste oils and lubricants, solvents, generated by production and maintenance processes within the site.

The site does not house trees, garden beds or large expanses of grass for outdoor visual amenity purposes. Therefore the site produces very little green waste such as grass clippings, leaves or plant/garden bed refuses.

General office / staff waste

Office waste such as paper and other consumables such as printer cartridges are generated in the main Site B office. Newspapers, food scraps and soiled packaging, glass and plastic drinking containers are also generated in the staff rooms.

General operational waste

Wastewater is generated from existing operations. Sludges are generated from wastewater are disposed of in accordance with the EPL. Sludges generated would include oily sludges and water treatment sludges with hydrocarbon residuals.

Airborne wastes, such as vapours generated at the road tanker loading bay and from tank losses, are directed to the Vapour Recovery Unit(VRU) where the vapours are captured by a vacuum regenerated activated carbon system and then via a recirculating Petrol stream and returned as liquid to a bulk Petrol Storage Tank.

Spills generated on the site are directed to slops tanks. These tanks are used mainly to collect oil effluent and drainage sumps in the road tanker loading bays. All oily water, sludges etc. Are transported via dedicated road tankers licenced to transport such wastes to licenced disposal facilities.

6.7.2. Potential Impacts

Construction Waste

The modification has the potential to generate a number of different types of waste, which would require appropriate management and disposal in accordance with relevant state legislation and government policies.

Waste generated during construction of the proposal would include:

- Construction/demolition waste including excavation materials such as rock and topsoil, and other materials that are to be replaced
- Surplus materials used during site establishment such as safety fencing and barriers which may include plastics and metals

- Wastewater including site run-off and water used to control dust
- Domestic waste including food scraps, aluminium cans, glass bottles, plastic and paper containers and putrescible waste generated by site construction personnel
- Ablution waste including waste from toilets and basins; and
- Waste oil and fuels.

Operational Waste

Waste generated during the operation of the proposal would include:

- All systems would be sealed; product used/recycled and would not generate any waste product
- Bottom loading (with Dry-Break Couplings on the loading arms) would be used in the new truck fill bays to reduce spillage, leaks and waste
- All water, essentially rain water, collected from the new road tanker loading bays would be collected and pumped to the Slop Tank facility for off-site disposal to a licenced Waste Facility; and
- Generally, water falling on open areas (roadways etc) is directed to the (Final Interceptor Pit) for inspection/testing prior to release to Botany Bay or, if necessary, diversion to the Waste Water Treatment Plant (WWTP).

6.7.3. Management and Monitoring Measures

- Waste generation would be considered as part of the Construction Environment Management Plan that would be prepared and reviewed in the existing Operational Environment Management Plan for the site. This would focus on minimising the volumes of waste generated through careful planning of works. The plan would also focus on waste minimisation according to the hierarchy of avoidance, reuse, recycle, and finally disposal
- A sufficient number of suitable receptacles for general waste and recyclable materials would be provided for waste disposal on site, including sufficient bins to allow separation of wastes for recycling and conform with OEH guidelines for construction waste
- Surplus soil material (spoil) created as a result of the proposal would be reused in landscaping and rehabilitation works as a first priority. Any waste material unable to be re-instated would be transported to land that can lawfully receive that waste
- All waste would be securely stored to ensure that any pollutants are prevented from escaping
- Construction vehicles would be securely covered to prevent spilling and loss of waste during transportation
- The work site would be left clean and free of any debris and other rubbish at the end of the works
- Where feasible, suitable construction and operational waste would be recycled in accordance with the NSW Waste Avoidance and Resource Recovery Strategy 2003; and
- All waste to be managed in accordance with EPA Environmental Guideline: Assessment, Classification and Management of Liquid and Non-Liquid Waste (2004 edition).

6.8. Cumulative Impacts

Cumulative environmental impacts arise when the proposal is considered in conjunction with existing or ongoing development, and the potential negative impacts and positive benefits that the proposal would create when considered in this form. All development projects have potential negative and positive cumulative impacts.

An example of a potential positive cumulative impact of the modification includes increased economic activity and hence additional jobs and general economic productivity.

Examples of potential negative cumulative impacts include:

- Increased risks in hazardous goods handling.
- Increase traffic due to additional vehicular movements to and from the site.
- Increase in handling of flammable goods outside of the proponent's control, such as road tanker transport once filled with petroleum product, which may result in adverse impacts, such as product spillages, either by the road tanker driver or a third party.
- Increased emissions.

Where the proponent has direct control over potential negative cumulative impacts, it is considered that the proponent has identified measures to manage such impacts to best practice standards.

Potential indirect negative cumulative impacts, such as the increase in handling of flammable goods outside of the proponent's control, which may result in adverse impacts either by the road tanker driver or a third party, are considered to be outside the scope of proponent responsibility. However, the proponent would influence such impacts where it can reasonably do so and is expected to, for example by ensuring appropriate procedures are followed for filling of road tankers and a duty of care to ensure third party road tanker's safety and maintenance is kept up to date by routine inspections, audits and industry programs such as Safe Load Pass.

Where the proponent has direct control over potential negative cumulative impacts, measures have been taken, or would be taken, to minimise such impacts. Where there exists indirect impacts, and the proponent is not entirely responsible for such impacts, measures would be taken by the proponent to ensure impacts are managed to best practice standards for those elements directly associated with the proposal.

7. Environmental Management

This chapter describes how the proposal will be managed, via environmental management plans and specific safeguards, to reduce the potential environmental impacts throughout detailed design, construction and operation.

Section 7.1 includes a comprehensive list of safeguards and mitigation measures including general measures commonly adopted for similar proposals and those specific to the impacts of this proposal as described in Chapter 6.

7.1. Safeguards and mitigation measures

The following table provides a consolidated summary of the mitigation measures recommended in the EA for MP_0089 (i.e. the B3 development) and timing of mitigation measures. These measures form the proponent's draft Statement of Commitments for environmental mitigation, management and monitoring for this modification. New commitments are presented with text underlined.

Table 7.1 Draft Statement of Commitments

Draft Statement of Commitments	Timing
General Management Plans	
▪ A Construction Environmental Management Plan, incorporating: - Construction Soil and Water Management Plan; - Construction Traffic Management Plan; - Acid Sulphate Soil procedure; and - Mitigation and management measures identified in this EA and any subsequent approval conditions as issued by the Minister	Before construction
▪ Development of a construction staging report (Stage 1 and Stage 2).	Before each stage of construction
▪ Operational environment management plan incorporating: - An Air Quality Management Plan. - A waste management plan in accordance with the EPA Environmental Guideline: Assessment, Classification and Management of Liquid and Non-Liquid Waste (2004 edition). - Mitigation and management measures identified in this EA and any subsequent approval conditions as issued by the SPC.	Update existing Terminal OEMP

Draft Statement of Commitments	Timing
Traffic	
▪ Appropriate signage / delineation and linemarking should be provided for the proposed central right-turn lane from Simblist Road into Friendship Road, prior to Stage 2 operations. This is required to reinforce the route / travel path for road tankers approaching the site, separate unrelated traffic movements (i.e., Vopak traffic from through traffic) and reduce lane changes. ▪ Provide a warning sign to be located on the bend at the southern end of Friendship Road to advise northbound vehicles travelling around the corner to be aware of cars reversing out of the proposed southern end parking spaces.	Before Stage 2 operations
▪ It is recommended that a road safety audit be undertaken on any proposed road amendments and site access arrangements.	Before and during construction. During operations
Hazards & Risks	
▪ The proposal will be reviewed via the HAZOP methodology	Before construction
▪ Effective procedures be developed for adequate containment and disposal of ethanol spills in the unloading bay given that it is soluble in water and there exists the possibility of off-site impact via water / ethanol releases	Before operation
▪ Review radiant heat protection for the new Amenities building, particularly if it serves critical functions during an emergency, due to the radiant heat received from a bund fire for Tank Tk 0726.	Before construction
▪ The QRA is intended primarily as a risk profile comparing the current and proposed expansion cases against HIPAP 4 criteria. While the QRA identifies existing risk control measures and safeguards, it does not provide a detailed demonstration of the adequacy of the control measures in place to control risks to levels considered “As Low As Reasonably Practicable” (ALARP). This demonstration will be included as an update to the MHF Safety Report. Hence no specific recommendations have been made as part of the QRA.	Before construction
Air Quality	
▪ Trenching and pipe laying would be undertaken progressively along the route to minimise the area that is disturbed at any single point in time	During construction
▪ Disturbed surfaces would be stabilised as soon as practicable	During construction
▪ Equipment to be well maintained and limit instances of fuel combustion processes	During construction

Draft Statement of Commitments	Timing
▪ Where material stockpiles are necessary, the stockpile would be covered or watered down to prevent movement and disturbances from wind.	During construction
Noise	
▪ All combustion engine plant, such as generators, compressors and welders will be checked to ensure they produce minimal noise with particular attention to residential grade exhaust silencers	During construction and operation
▪ Vehicles to be kept properly serviced and fitted with appropriate mufflers. The use of exhaust brakes should be eliminated, where practicable	During construction
▪ Where practical, all vehicular movements to and from the construction site must be made only during normal working hours	During construction
▪ Where practical, machines to be operated at low speed or power and should be switched off when not being used rather than left idling for prolonged periods	During construction
▪ Machines found to produce excessive noise compared to industry best practice should be removed from the site or stood down until repairs or modifications can be made	If required
▪ Where practical, impact wrenches should be used sparingly with hand tools or quiet hydraulic torque units preferred	During construction
Water Quality	
▪ Construction phase impacts managed by implementation of a Construction Phase Soil and Water Management Plan in accordance with Landcom Soil and Construction, Managing Urban Stormwater (Landcom, 2004). These would include: - General site practices and responsibilities; - Material management practices; - Stockpile practises; - Topsoil practices; and - Erosion control practices (earth sediment basins, straw bales, sediment fences, turbidity barriers, stabilised site accesses, diversions and catch drains).	Before construction
▪ Monitoring undertaken to ensure that stormwater management measures are working effectively. Monitoring would rely primarily on soil and groundwater bores, visual inspections and sampling. Visual inspections should be undertaken of bunded areas, pits, diversion and catch drains and all other stormwater conveyance structures. ▪ Spill kits on new access roads	During construction and operation

Draft Statement of Commitments	Timing
Visual	
▪ All worksites to be left clean and tidy and the contractor shall maintain the site in an orderly manner	During and after construction
▪ Construction works would be completed within the shortest possible timeframe	During construction
▪ All work equipment and materials would be contained within the designated boundaries of the work site	During construction
▪ On completion of the works all equipment, materials and refuse relating to construction of the works would be removed from the work areas	During and after construction
▪ All waste generated during the course of the works would be removed from the work area as soon as practicable and disposed in accordance with DEC waste management guidelines (*Assessment, Classification and Management of Liquid and Non-Liquid Waste 1995*)	During construction
▪ The detailed design of the proposal is to comply with the visual provisions of Molineux Point Masterplan (2002) as far as practicable.	Before construction
Topography, Geology and Soils	
▪ Disturbed areas would be stabilised as soon as possible following completion of works	During and after construction
▪ Stockpiles would be covered or stabilised to prevent transport of sediment from the work site	During construction
▪ Sediment control devices such as silt fences would be installed on all drainage lines downstream in the vicinity of the work area	During construction
▪ At the completion of construction and stabilisation of the land surface, all stormwater control devices would be removed	After construction
▪ Outdoor construction works would not take place during or immediately after high intensity or prolonged rainfall	During construction
▪ All roads and footpaths affected by construction would be kept free of all waste, loose sand, soil, aggregates and clay deposits	During construction
▪ In the event that contaminated groundwater is discovered, a groundwater management plan would be developed by Vopak Environmental Consultants	If required
▪ Appropriate disposal of any contaminated soil or water in accordance with DEC waste management guidelines as recommended by Vopak Environmental Consultants.	If required
▪ The proposal is located within GMZ A and GMZ B. Vopak will be required to submit to the NSW Ports details as required by the Groundwater Management Zone Deed, May 1994 including: - Proposed construction methods - The likely impact of the water table	Before construction

Draft Statement of Commitments	Timing
- The likely impact on the LPG storage development - A letter to the effect that the applicant agrees to submit any dispute regarding the submissions to arbitration in accordance with Clause 4.8 of the Deed. ■ During operations groundwater monitoring would continue to be undertaken in accordance with the conditions of the EPL.	
Socio-economic	
■ The general community will have the opportunity to register interest, view the EA and write a submission through the Department of Planning and Environment 30-day submission period	Before EA determination
■ Nearby industries and NSW Ports will be provided with targeted information in relation to the construction timetable and identification of potential impacts	During construction
Waste minimisation and management	
■ A sufficient number of suitable receptacles for general waste and recyclable materials would be provided for waste disposal on site, including sufficient bins to allow separation of wastes for recycling and conform with EPA guidelines for construction waste	Before construction
■ All waste would be securely stored to ensure that any pollutants are prevented from escaping	During construction and operation
■ The work site would be left clean and free of any debris and other rubbish at the end of the works	During construction
■ All waste to managed in accordance with EPA Environmental Guideline: Assessment, Classification and Management of Liquid and Non-Liquid Waste (2004 edition)	During construction and operation
Utilities and Services	
■ Liaison with NSW Ports and relevant utility and service providers regarding timing of connections to the services, location of services and utilities on the site	During construction
■ Liaison with relevant petroleum distributors that could potentially be impacted in regards to timing of connections with the integrated bulk liquids pipe distribution network	During construction
■ Liaison with utility and service providers to confirm the location of services and utilities prior to construction commencing	Before construction

8. Conclusion

The proposed modifications to the Vopak Site B Bulk Liquids Facility is subject to Section 75W of the EP&A Act.

An assessment was made in accordance with the SEARs prepared by DP&E.

The EA assessed the following factors:

- Traffic and transport
- Hazard and risk
- Air Quality and Greenhouse Gas
- Hydrology and soils
- Groundwater
- Waste.

The EA found that the proposed modification to the Vopak Site B Bulk Liquids Facility does not have a potentially significant impact on the environment.

The proposed modification to the Vopak Site B Bulk Liquids Facility should be allowed to proceed subject to the safeguards and mitigation measures developed to minimise potential impacts during construction and operation.

9. References

Atkins Acoustics Pty Ltd (2011) "Vopak Bitumen Facility – Noise Assessment", report prepared for PlanCom Consulting Pty Ltd.

Scott Lister (2015) "Dangerous Goods Transport QRA, Denison St, Hillsdale" dated 12 February 2015.

Don Fox Planning Pty Ltd (2007) "Statement of Environmental Effects for a 24-hour Container Depot at Part Lot 1 DP 735037, Simblist Road, Port Botany for Tyne Container Services" dated September 2007.

GHD Pty Ltd (2006) "Environmental Assessment for Proposed Expansion to Site B Bulk Liquids Storage Terminal" dated November 2016.

GHD Pty Ltd (2007) "Environmental Assessment for a Proposed Sydney Biodiesel Terminal" for Vopak Terminals Sydney Pty Ltd and Natural Fuels Australia Ltd dated January 2007.

Pacific Environment Limited (2015) "Amended S75W Modification Report for Vopak Facility (Site B3) - Air Quality Aspects (Letter Report 27 October 2015)

PAE Holmes Pty Ltd (2011) "Air Quality Assessment – Port Botany Bitumen Storage Facility" dated November 2011.

SKM Pty Ltd (2007) "Environmental Assessment for Bulk Liquids Berth No. 2 – Port Botany" prepared Sydney Ports Corporation and Vopak Terminals Sydney Pty Ltd dated 9 November 2007.

Urbis Pty Ltd (2011) "Review of Environmental Factors for a Proposed Bitumen Importing and Dispatch Facility" Port Botany for Terminals Pty Ltd dated April 2011.

Appendix A

Secretary's Environmental Assessment Requirements (SEARs)

Appendix B

Port Botany Development Code 2013 & Green Ports Checklist

Appendix C

Traffic Impact Assessment

Appendix D

Site B Quantitative Risk Assessment

Appendix E

Site B Dangerous Goods Transport Risk Assessment

Appendix F

Transport Quantitative Risk Assessment

Appendix G

Air Quality Impact Assessment