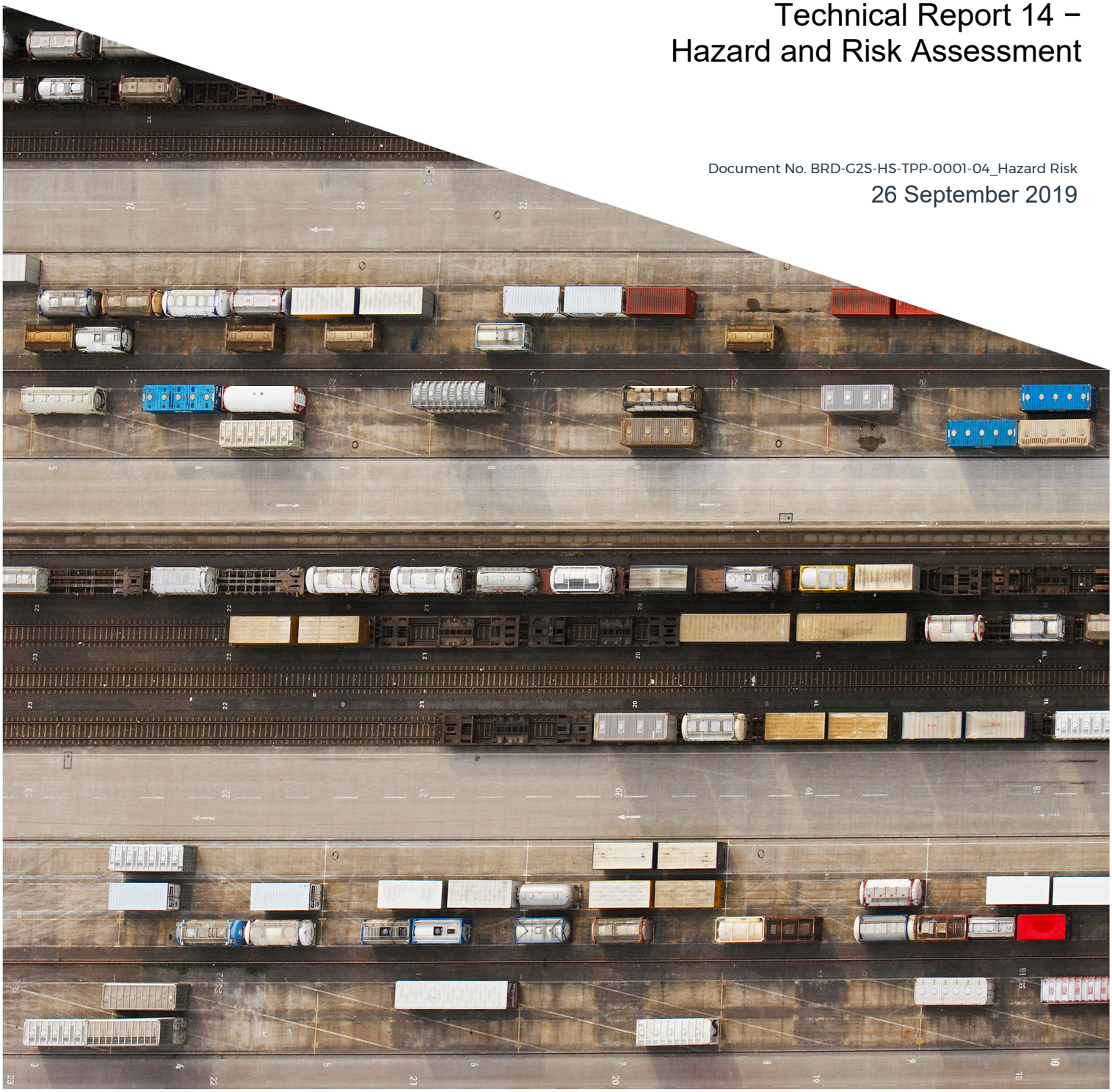
# BOTANY RAIL DUPLICATION

## TECHNICAL REPORT

**Technical Report 14 -**
Hazard and Risk Assessment

# Botany Rail Duplication - Environmental Impact Statement

## Technical Report 14 – Hazard and Risk Assessment



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# Glossary and abbreviations

| | |
|---|---|
| ARTC | Australian Rail Track Corporation (the proponent) |
| Botany Line | A dedicated freight rail line (operated by ARTC) that forms part of the Metropolitan Freight Network. The line extends from near Marrickville Station to Port Botany. |
| construction ancillary facilities | Temporary facilities during construction that include, but are not limited to, construction work areas, sediment basins, temporary water treatment plants, pre-cast yards and material stockpiles, laydown areas, parking, maintenance workshops and offices, and construction compounds. |
| construction compound | An area used as the base for construction activities, usually for the storage of plant, equipment and materials, and/or construction site offices and worker facilities. |
| Council, the | Bayside Council |
| DBYD | dial before you dig |
| detailed design | The stage of design where project elements are design in detail, suitable for construction. |
| DG | Dangerous Good |
| EIS, the | Botany Rail Duplication environmental impact statement |
| existing rail corridor | The corridor within which the existing rail infrastructure is located. In the study area, the existing rail corridor is the Botany Line. |
| HV | high voltage |
| impact | Influence or effect exerted by a project or other activity on the natural, built and community environment. |
| LGA | local government area |
| LV | low voltage |
| Metropolitan Freight Network | A network of dedicated railway lines for freight in Sydney, linking NSW's rural and interstate rail networks with Port Botany. The Metropolitan Freight Network is managed by ARTC. |
| PHA | preliminary hazard analysis |
| pipeline SMS | pipeline safety management study as per AS 2885.6 |
| possession | A period of time during which a rail line is closed to train operations to permit work to be carried out on or near the line. |

| | |
|---|---|
| project site, the | The area that would be directly affected by construction (also known as the construction footprint). It includes the location of operational project infrastructure, the area that would be directly disturbed by the movement of construction plant and machinery, and the location of the storage areas/compounds etc, that would be used to construct that infrastructure. |
| project, the | The construction and operation of the Botany Rail Duplication |
| Secretary's environmental assessment requirements (SEARs) | Requirements and specifications for an environmental assessment prepared by the Secretary of the Department of Planning and Environment under section 115Y of the *Environmental Planning and Assessment Act 1979* (NSW). |
| SFAIRP | so far as is reasonably practical |
| SEPP33 | Department of Planning (DoP), NSW, 2011, Applying State Environmental Planning Policy 33: Hazardous and Offensive Development Application Guidelines |
| State significant infrastructure | Major transport and services infrastructure considered to have State significance as a result of size, economic value or potential impacts. |
| study area, the | The study area is defined as the wider area including and surrounding the project site, with the potential to be directly or indirectly affected by the project (e.g. by noise and vibration, visual or traffic impacts). The actual size and extent of the study area varies according to the nature and requirements of each assessment and the relative potential for impacts but which is sufficient to allow for a complete assessment of the proposed project impacts to be undertaken. |
| SWMS | safe working method statement |

# Executive summary

Australian Rail Track Corporation proposes to construct and operate a new second track predominately within the existing Botany Line rail corridor between Mascot and Botany. This project will increase freight rail capacity to and from Port Botany.

This report assesses the key hazards and risks associated with the use of dangerous goods and transportation of dangerous goods through high pressure pipelines during construction and operation of the project, and will accompany the environmental impact statement.

During the initial stages of the project, identification of key utilities was undertaken to understand areas where utilities could be impacted. This early mapping allowed consultation with key utility stakeholders to begin. A key aspect of the project was the need to minimise impact on major utilities. Consultation with utility stakeholders will continue as the project progresses.

This report includes a preliminary risk screening of the project in accordance with the requirements of *State Environment Planning Policy No. 33 – Hazardous and Offensive Development* (SEPP 33). The results indicate that the screening thresholds for dangerous goods storage and transportation are not exceeded during construction and operation. As a result, the project is not deemed a 'potentially hazardous industry' and there is no requirement for a preliminary hazard analysis.

Additionally, the project is not considered to be 'potentially offensive'.

The hazard identification process indicates that there are a number of risk scenarios during construction of the project that could result in a detrimental impact. The majority of these risks can be managed to tolerable levels (a medium or low risk) provided safeguards are enacted. However, risks associated with utilities that transport flammable dangerous goods require further investigation to ensure that the risk is reduced to So Far As Is Reasonable Practical. The completion of an AS 2885.6 SMS (Safety Management Study) workshop during the next stages of the project will provide input to this investigation.

Overall the hazards and risk assessment demonstrates that the project could be designed, constructed and operated safely and in a manner that will meet the relevant regulations, standards and policies associated with that major utility infrastructure.

# 1. Introduction

## 1.1 Overview

### 1.1.1 Background

Australian Rail Track Corporation (ARTC) proposes to construct and operate a new second track within the existing Botany Line rail corridor between Mascot and Botany. “The project” (Botany Rail Duplication) will increase freight rail capacity to and from Port Botany. The location of the project is shown in Figure 1.1.

The project is State Significant Infrastructure in accordance with Division 5.2 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). As State Significant Infrastructure, the project needs approval from the NSW Minister for Planning and Public Spaces.

This report has been prepared to accompany the environmental impact statement (EIS) to support the application for approval of the project, and address the Secretary of the Department of Planning and Environment’s environmental assessment requirements (the SEARs), issued on 21 December 2018.

### 1.1.2 Overview of the project

The project will involve the following:

- Track duplication – constructing a new track predominately within the rail corridor for a distance of about three kilometres.
- Track realignment (slewing) and upgrading – moving some sections of track sideways (slewing) and upgrading some sections of track to improve the alignment of both tracks and minimise impacts to adjoining land uses.
- New crossovers – constructing new rail crossovers to maintain and improve access at two locations (totalling four new crossovers).
- Bridge works – constructing new bridge structures at Mill Stream, Southern Cross Drive, O’Riordan Street and Robey Street (adjacent to the existing bridges), and re-constructing the existing bridge structures at Robey Street and O’Riordan Street.
- Embankment/retaining structures – construction of a new embankment and retaining structures adjacent to Qantas Drive between Robey and O’Riordan streets and a new embankment between the Mill Stream and Botany Road bridges.

Further information on the key elements of the project is provided in the EIS.

Ancillary work would include bi-directional signalling upgrades, drainage work and protecting/relocating utilities.

Subject to approval of the project, construction is planned to start at the end of 2020, and is expected to take about three years for the main construction works to be undertaken. Construction is expected to be completed in late 2023 with commissioning activities undertaken in early 2024.

It is anticipated that some features of the project would be constructed while the existing rail line continues to operate. Other features of the project would need to be constructed during programmed weekend rail possession periods when rail services along the line cease to operate.

The project would operate as part of the existing Botany Line and would continue to be managed by ARTC. ARTC is not responsible for the operation of rolling stock. Train services are currently, and would continue to be, provided by a variety of operators. Following the completion of works, the existing functionality of surrounding infrastructure would be restored.

Key features of the project are shown on Figure 1.2.


Figure 1.1 Botany Rail Duplication location

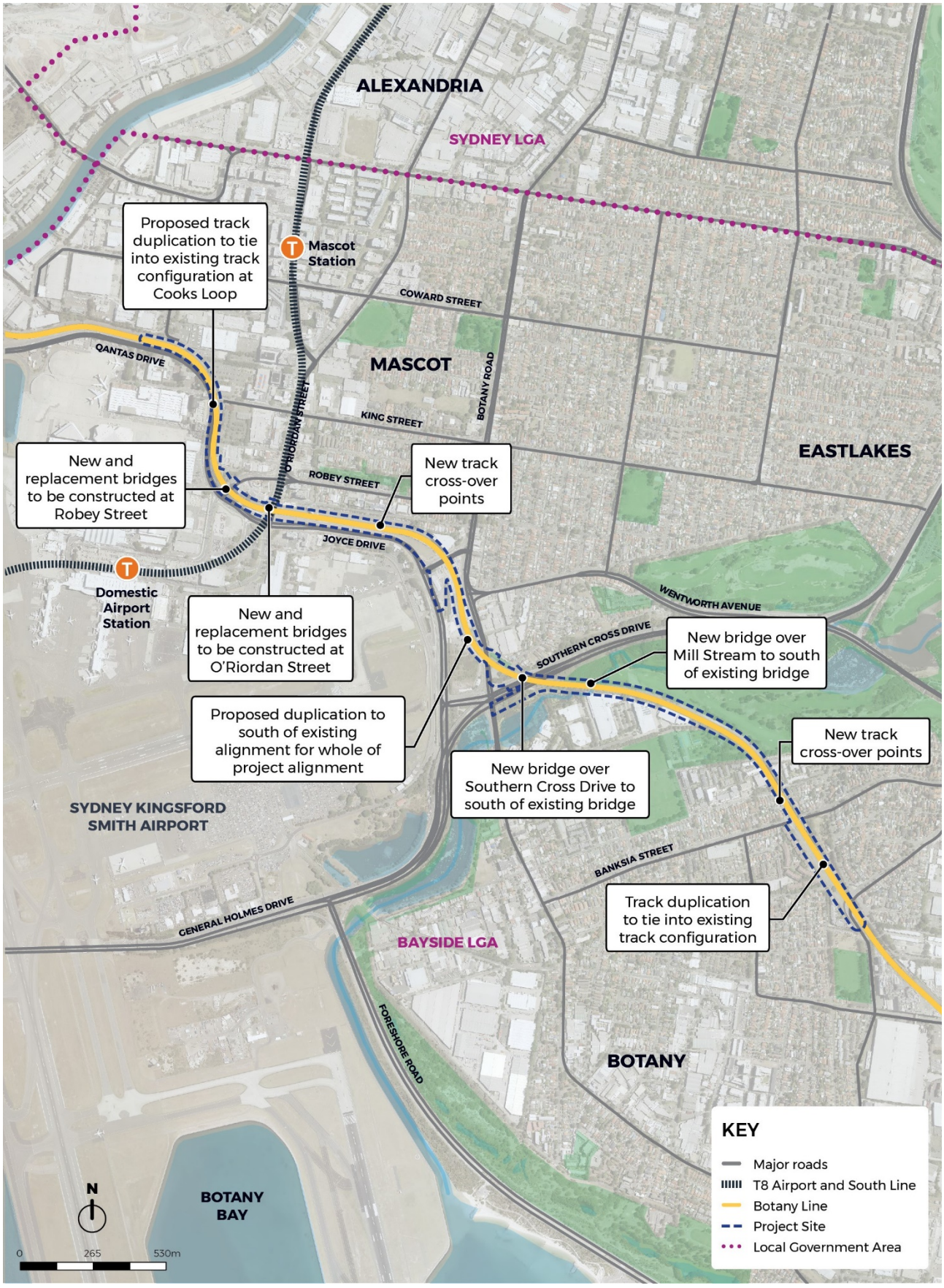



Figure 1.2 Botany Rail Duplication project overview

## 1.2 Purpose and scope of this report

The purpose of this report is to assess the impact of key potential hazards associated with the use of dangerous goods and the transportation of dangerous goods through high pressure pipeline, that may arise during the construction and operation of the project. This assessment addresses the relevant SEARs for the EIS, as outlined in Table 2.1.

The report:

- describes the existing environment with respect to the project in relation to existing utility services, including high pressure dangerous goods transport pipelines
- assesses the impacts of construction and operation of the project specific to dangerous goods and utility services
- recommends measures to mitigate the impacts identified.

*State Environment Planning Policy No. 33 – Hazardous and Offensive Development* (SEPP 33) does not strictly apply to a State Significant Infrastructure project, Nevertheless, SEPP 33 provides a process of identifying a potentially hazardous development by identifying storage and transport screening thresholds. The thresholds in applying SEPP 33 represent the maximum quantities of hazardous materials that can be stored or transported without causing a significant off-site impact.

## 1.3 Structure of this report

The structure of the report is outlined below.

- Section 1 Introduction – provides an introduction to the report.
- Section 2 Legislative and policy context – describes the legislative and policy context for the assessment, and relevant guidelines.
- Section 3 Methodology – describes the methodology for the assessment.
- Section 4 Existing environment – describes the existing environment as relevant to the assessment.
- Section 5 Impact assessment – describes the impacts as relevant to the assessment.
- Section 6 Management of impacts – describes the management of impacts as relevant to the assessment.
- Section 7 Conclusion – provides the conclusions of the report.

# 2. Legislative and policy context

This section summarises the legislation, guidelines and/or policies driving the approach to the assessment.

## 2.1 Relevant legislation, policies and guidelines

The assessment was undertaken with reference to the following:

### 2.1.1 *Department of Planning, NSW, 2011, Applying SEPP 33: Hazardous and Offensive Development Application Guidelines*

*Department of Planning (DoP), NSW, 2011, Applying SEPP 33: Hazardous and Offensive Development Application Guidelines* (SEPP 33*)*. SEPP 33 provides the process for assessing if developments are potentially hazardous or offensive, including threshold levels that trigger the potentially hazardous or offensive status. SEPP 33 is the main guidance document that has been followed for this assessment in accordance with the SEARs.

As State Significant Infrastructure, the project needs approval from the NSW Minister for Planning and Public Spaces. *State Environment Planning Policy No. 33 – Hazardous and Offensive Development* (SEPP 33) does not strictly apply to State Significant Infrastructure projects. Nevertheless, SEPP 33 provides a process of identifying a potentially hazardous development by identifying storage and transport screening thresholds.

### 2.1.2 *Department of Planning, NSW, 2011, Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Land Use Safety Planning*

*Department of Planning, NSW, 2011, Hazardous Industry Planning Advisory Paper No 4– Risk Criteria for Land Use Safety Planning* (HIPAP No 4). HIPAP No 4 sets out risk criteria for industries that are considered hazardous. This document is only used if SEPP 33 indicates a development is potentially hazardous.

### 2.1.3 *Department of Planning, NSW, 2011, Hazardous Industry Planning Advisory Paper No 6 – Guidelines for Hazard Analysis*

*Department of Planning, NSW, 2011, Hazardous Industry Planning Advisory Paper No 6 – Guidelines for Hazard Analysis* (HIPAP No 6). HIPAP No 6 lists the process required for preliminary hazard analysis (PHA). This document is only used if SEPP 33 indicates a development is potentially hazardous.

### 2.1.4 *Standards Australia, 2018, AS/NZS 2885.6, Pipelines – gas and liquid petroleum, part 6: Pipeline safety management*

*Standards Australia, 2018, AS/NZS 2885.6, Pipelines – gas and liquid petroleum, part 6: Pipeline safety management* (AS/NZS 2885.6) describes how an owner of a dangerous goods transport pipeline should design, operate and maintain a pipeline in a safe manner. Without compliance to AS/NZS 2885.6, a pipeline owner cannot obtain a licence to operate. This document is relevant to the project, as AS/NZS 2885.6 indicates that any development in the vicinity of a pipeline is considered a threat and requires management through completion of a safety management study. A safety management study must be done on the design prior to construction commencing.

## 2.2 Secretary's environmental assessment requirements

The SEARs relevant to hazards and risk, together with a reference to where they are addressed in this report, are outlined in Table 2.1.

Table 2.1 SEARs relevant to this assessment

| Requirements | Where addressed in this report |
|---|---|
| **3. Assessment of Key Issues**<br>(2) For each key issue the Proponent must: | |
| **a)** describe the biophysical and socio-economic environment, as far as it is relevant to that issue; | Section 4 |
| **b)** describe the legislative and policy context, as far as it is relevant to the issue; | Section 2.1 |
| **c)** identify, describe and quantify (if possible) the impacts associated with the issue, including the likelihood and consequence (including worst case scenario) of the impact (comprehensive risk assessment), and the cumulative impacts; | Section 5 |
| **d)** demonstrate how options within the project potentially affect the impacts relevant to the issue; | Section 4 |
| **e)** demonstrate how potential impacts have been avoided (through design, or construction or operation methodologies); | Section 4 |
| **f)** detail how likely impacts that have not been avoided through design will be minimised, and the predicted effectiveness of these measures (against performance criteria where relevant); and | Section 4 |
| **g)** detail how any residual impacts will be managed or offset, and the approach and effectiveness of these measures. | Section 6 |
| **12. Hazards and Risk**<br>(1) The Environmental Impact Statement must:<br>(a) report on the consultation outcomes with all operators of high pressure dangerous goods (HPDG) pipelines within or in the vicinity of the proposal with regards to Australian Standard AS 2885 Pipelines – Gas and liquid petroleum; | Section 4.1 |
| (b) demonstrate that, during construction and operation phases of the proposal, the proposal would not lead to non-compliance of the existing HPDG pipelines with the current edition of AS 2885 - Pipelines—Gas and liquid petroleum; and, | Section 6 |
| (c) include a preliminary risk screening completed in accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development and Applying SEPP 33 (DoP, 2011), with a clear indication of class, quantity and location of all dangerous goods and hazardous materials associated with the proposal during construction and operation phase. Should preliminary screening indicate that the development is "potentially hazardous," during construction and or operation phase, a Preliminary Hazard Analysis (PHA) must be prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 - Guidelines for Hazard Analysis (DoP, 2011) and Multi-Level Risk Assessment (DoP, 2011). | Section 5 |
| (2) The Environmental Impact Statement must outline the impacts to the operation of the airport, including encroachment into the prescribed airspace, potential impacts to airport Communication, Navigation and Surveillance Systems, light spill and landscaping associated with the construction and operation of the project. | Refer *Botany Rail Duplication EIS, Technical Report 15 – Airport Operations Assessment* |

# 3. Methodology

This section describes the methodology used to undertake the hazard and risk assessment.

## 3.1 Study area

For the purpose of the EIS, the study area is the three kilometres of existing ARTC rail corridor and land adjacent to the rail corridor where relevant services and construction compounds exist between Mascot and Botany. The blue dotted line in Figure 1.2 graphically represents this study area.

## 3.2 Approach to assessment

### 3.2.1 SEPP 33 screening

SEPP 33 applies to any proposal which falls under the policy's definition of 'potentially hazardous industry' or 'potentially offensive industry'. If not controlled appropriately, some activities within these industries may create an offsite risk or offence to people, property or the environment thereby making them potentially hazardous or potentially offensive. The purpose of this report is to determine if the project is potentially hazardous using the SEPP 33 risk screening process or potentially offensive considering expected discharge requirements. If the screening indicates that the project is potentially hazardous, then a PHA is required.

The overall risk screening process, as outlined in SEPP 33 (Figure 1 in DoP, NSW, 2011) is reproduced in Figure 3.1.

If the project is potentially offensive, after giving consideration for the quantity and nature of any discharges and the significance of the offence likely to be caused, having regard to surrounding land use and the proposed controls, then additional controls are required.

The risk screening process typically concentrates on the storage of specific dangerous goods classes that have the potential for significant offsite effects. Specifically, the assessment involves the identification of classes and quantities of all dangerous goods to be used, stored or produced on site with an indication of storage locations. The quantities of dangerous goods is then assessed against the SEPP 33 threshold quantities.

For development proposals classified as 'potentially hazardous industry', a PHA is completed to determine the risk to people, property and the environment at the proposed location and in the presence of controls. Criteria of acceptability are used to determine if the development proposal is classified as a 'hazardous industry'. If this is the case, the development proposal may not be permissible within most industrial zonings in NSW.

If a PHA is required, the methodology is outlined in HIPAP No 4 and HIPAP No 6 (NSW Department of Planning, 2011).

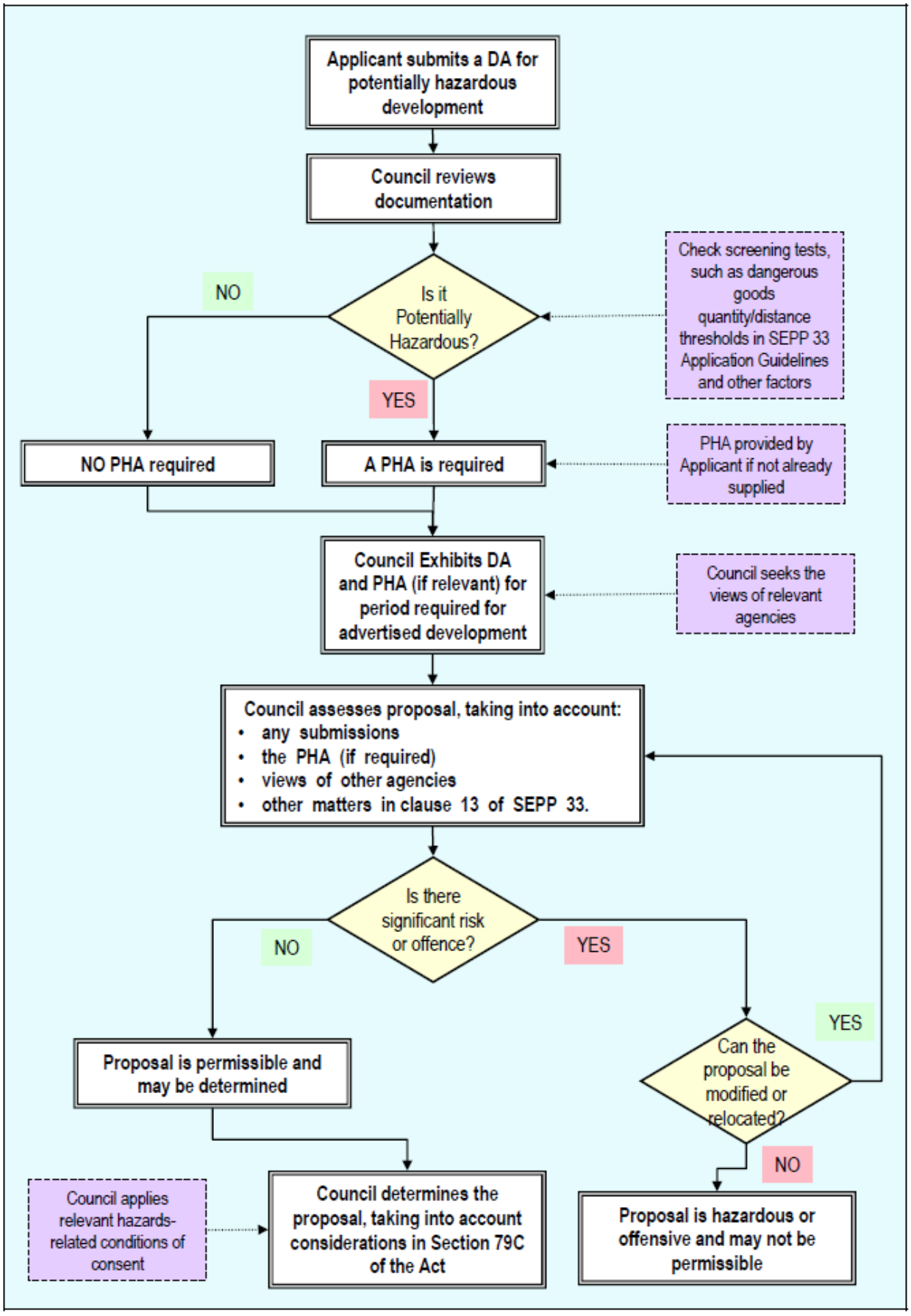



Figure 3.1 SEPP 33 risk screening process

### 3.2.2 Hazard identification

Hazard identification highlights any risks associated with the interaction of the project (construction and operation) with the surrounding environment i.e. a systematic process to identify any potential off-site impacts. The aim of the hazard identification process is to show the proposal does not pose any significant risk or offence.

The hazard identification is a desktop qualitative assessment, and involves documenting possible events that could lead to a possible off-site incident. The assessment then lists all potential causes of the incident, as well as identification of operational and organisational safeguards to prevent the incidents from occurring, or mitigate their impact.

The hazard identification is conducted for both construction and operation of the project.

The project does include major utility infrastructure and dangerous goods pipeline routes which, if impacted could result in significant off-site impacts. Therefore, the project must assess the potential for major hazardous incidents on site as a result of construction and operation activities. The risk assessment considers Clause 66C of the *State Environmental Planning Policy (Infrastructure) 2007* which lists requirements for high pressure pipelines used for the transport of dangerous goods. These pipelines have a level of risk which must be assessed when considering development near the pipelines, to ensure that risks to people, property and the pipelines are within acceptable levels. For development adjacent to land in a pipeline corridor, the consent authority must refer the proposal to the pipeline operator. Consultation would be coordinated by the Department of Planning and Environment through the State significant infrastructure consultation process.

# 4. Existing environment

## 4.1 Existing utilities within the study area

The key risk and hazard aspects to consider for the rail duplication are utility and dangerous goods transport services and associated infrastructure. This can include liquid or gas and high or low pressured pipelines. Operational aspects of the project have been designed or positioned, where possible, to avoid existing utilities.

The utilities that have been identified within the study area are provided in Table 4.1. The location of the utilities in relation to the project are in Figure 4.1.

Table 4.1 Utilities within the study area

| Company name | Utility type | Dangerous good transporter or safety / environmental impact potential | Location |
|---|---|---|---|
| APA | Ethane Gas Pipeline (Moomba to Sydney Pipeline) | Yes – dangerous good transporter (high pressure ethane gas) | Banksia Street to Southern Cross Drive |
| Qenos | Ethylene Gas Pipeline (Nitrogen charged) | Potentially – dangerous good transporter (high pressure ethylene gas), although pipeline not currently in use | Banksia Street to King Street |
| Jemena | Natural Gas (Multiple services; 100 mm DIA sub-main, 550 mm DIA primary main, 100 mm DIA, 32 mm DIA) | Yes – dangerous good transporter (high pressure natural gas) | Multiple locations – local service |
| AusGrid | Electricity (Multiple services; LV 415 V, auxiliary, HV 11 kV, 33 kV, 132 kV) | Yes – potential safety impact | Banksia Street to King Street |
| Sydney Water | Stormwater (Multiple services) | Yes – environmental impact | Banksia Street to King Street |
| Sydney Water | Sewer (Reinforced concrete box culverts) | Yes – environmental and health impact | Banksia Street to King Street |
| Sydney Water | Potable Water (Iron, steel pipe) | Yes – environmental impact | Banksia Street to King Street |
| Bayside Council | Stormwater (Multiple services) | Yes – environmental impact | Banksia Street to King Street |
| Roads and Maritime Services (RMS) | Intelligent Traffic Systems (ITS) – Electrical, telecommunications | Yes – potential safety impact | O'Riordan Street to Robey Street |
| Sydney Airport | Electricity (Multiple services) | Yes – potential safety impact | O'Riordan Street to King Street |
| Telstra | Telecommunications (Optical fibre and copper telecommunications) | No | Banksia Street to King Street |
| Optus | Telecommunications (Optical fibre and telecommunications) | No | Banksia Street to Bay Street |

## 4.2 Consultation

Initial consultation with key utility stakeholders regarding route alignment, access tracks and preliminary design has already occurred with the aim to limit impact to utility services. This process will continue throughout the remaining project phases.

Consultation with the following key utility stakeholders has commenced, and is ongoing:

- APA
- Qenos
- Jemena
- AusGrid
- Sydney Water.

For the remaining key service providers, consultation is set to commence to identify relocation/protection scope, and will be ongoing throughout the design development.

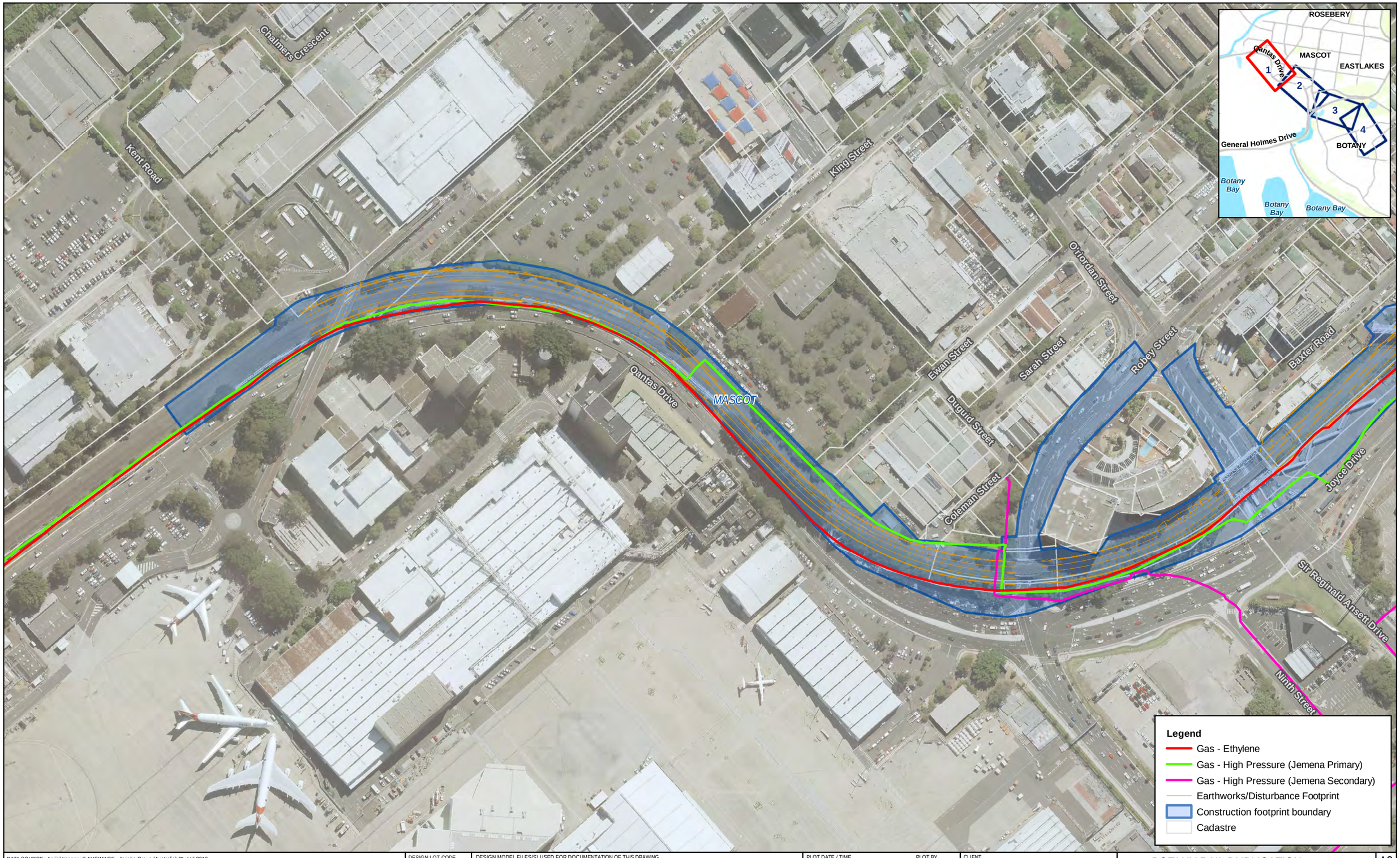
Consultation with key utilities providers will inform the next stages of design. The current design for the project has adopted a risk-based approach to avoiding and/or minimising impacts associated with the relocation and/or adjustment of public utilities affected by the project. The framework approach including a hierarchy of:

- avoiding impacts
- protecting utilities in their current location
- utilities relocation/adjustment.

Ongoing consultation will include carrying out and completion of the AS 2885.6 safety management study (SMS) workshops with each high pressure pipeline owner and the construction contractor. The SMS workshops will be conducted once design has reached a level that enables completion of a compliant AS 2885.6 process. This level is considered to be detailed design and will be completed before construction relating to the relevant utilities commence.

Some works to utilities are considered to be potentially temporary during construction only, whereas some would be permanent.

As part of the project, existing agreements and deeds with utilities providers will be utilised where relevant to manage the interface between utilities and ensure the design, construction and ongoing maintenance of the utilities can be undertaken effectively and efficiently.

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# BOTANY RAIL DUPLICATION

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| A2 | 27/06/2019 | High Pressure Gas Pipelines in the Vicinity of the Rail Duplication | | |
| A3 | 28/06/2019 | High Pressure Gas Pipelines in the Vicinity of the Rail Duplication | | |



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| DRAWN | | J GREAVES | 27/06/2019 |
| DRG CHECK | | K YALE | 27/06/2019 |

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Figure 4.1
High Pressure Gas Pipelines in the Vicinity of the Rail Duplication

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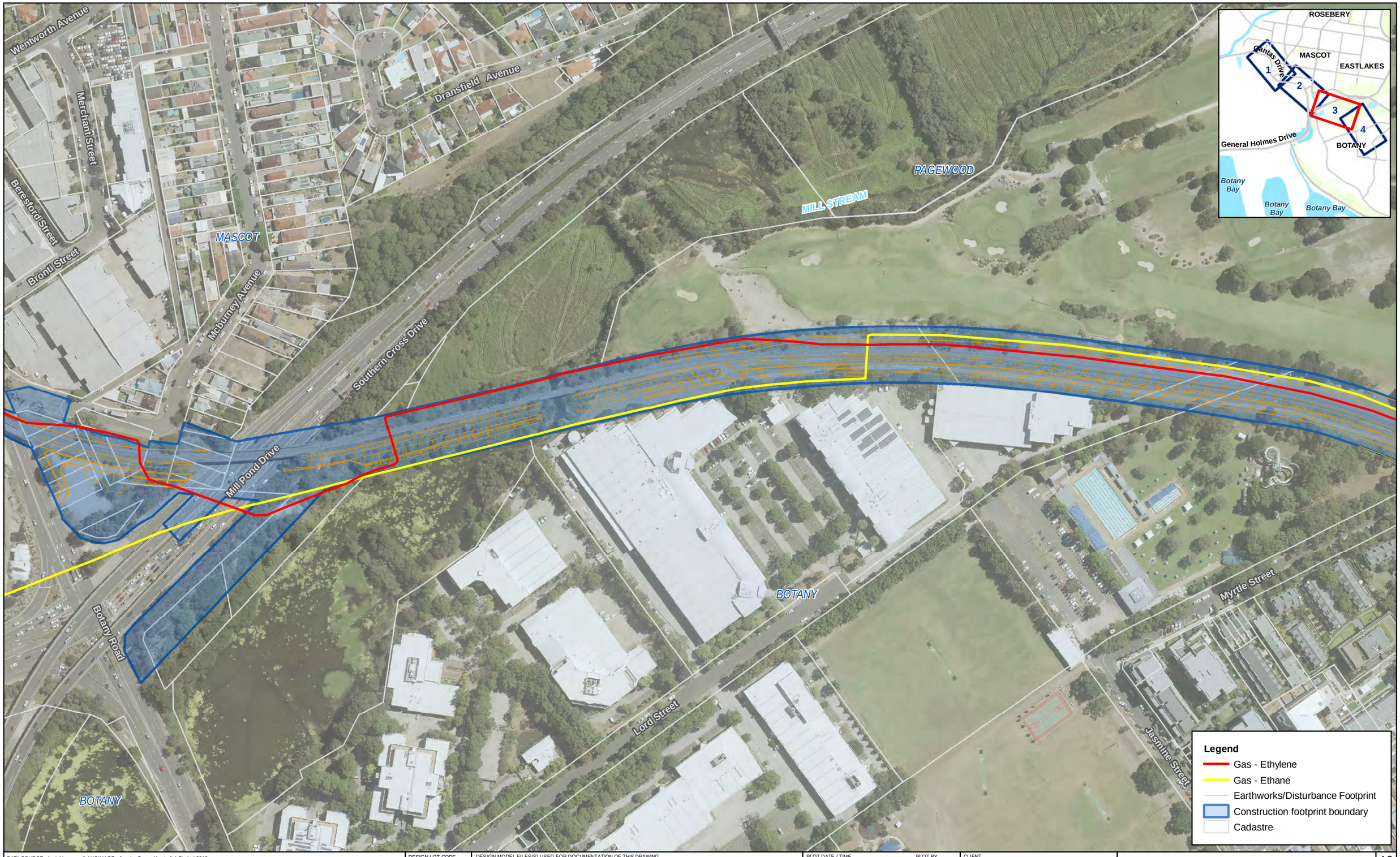


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| DRAWN | J GREAVES | 27/06/2019 |
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PREPARED FOR

High Pressure Gas Pipelines in the Vicinity of the Rail Duplication

RMS REGISTRATION No.

PART

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# 5. Impact assessment

The impact assessment was considered for construction and operation, as well as the cumulative impacts of the project.

For the project, the key risk and hazard aspects to consider are utility and dangerous goods transport services/pipelines and associated infrastructure. Dangerous goods are defined by the Australian Dangerous Goods Code as determined by the National Transport Commission. Utility services in the project include water / sewer, communications, gas and electricity supplies.

## 5.1 Impacts during construction

### 5.1.1 Overview of construction activities

Early and enabling works would be required to be undertaken prior to the main civil and track work associated with the duplication of the rail line. The enabling works comprise:

- track realignment/slewing track
- utility service relocation and/or protection
- billboard removal
- general site establishment including clearing vegetation, site compound set up and property adjustments.

The main construction works would involve the installation of new track, upgrade of existing track (including some minor slewing of existing track), installation of new crossovers, construction of a series of new bridges and associated signalling and electrical work.

Further detail of construction methodology is provided in Chapter 7 of the EIS.

### 5.1.2 Main construction materials

The main construction materials required for the project are:

- structural/embankment fill material
- capping material
- concrete sleepers
- ballast
- rail
- turnouts
- steel – reinforcing steel and structural steel
- concrete
- pre-cast elements
- reinforced concrete drainage pipes and pits.

None of these materials are dangerous goods.

In addition to the main construction materials, a number of dangerous goods may be required during construction of the project. Dangerous goods used and stored on the project construction compound would be those typically expected for a civil/rail construction site. The expected dangerous goods to be used during construction are outlined in Table 5.1, along with the proposed storage quantities. The intent during construction is that there would be low volumes of dangerous goods stored in construction compounds adjacent to the rail corridor, using a just-in-time usage regime and not stockpiled.

Screening thresholds for each of the dangerous goods classes as per SEPP 33 are also outlined in Table 5.1.

Table 5.1 Summary of construction hazardous materials

| Construction material | Dangerous goods class | Expected maximum storage quantity | Combined SEPP 33 storage threshold |
|---|---|---|---|
| Spray paint, marker paint | 2.1 – flammable gas (pressurised) | 20 kg | |
| **COMBINED CLASS 2.1 (pressurised) QUANTITY (excluding LPG)** | | 20 kg | 100 kg |
| Acetylene gas for metal/rail cutting and welding | 2.1 – flammable gas (liquefied) | 200 kg | |
| **COMBINED CLASS 2.1 (liquefied) QUANTITY (excluding LPG)** | | 200 kg | 500 kg |
| Liquid propane gas (LPG) | 2.1 – flammable gas | 200 kg | |
| **COMBINED CLASS 2.1 QUANTITY (LPG only)** | | 200 kg | 10 tonnes |
| Fuels (petrol, 2-stroke) | 3-II – flammable liquid | 1,000 kg | |
| **COMBINED CLASS 3-II QUANTITY** | | 1,000 kg | 5 tonnes |
| Epoxy and resin based concrete repair and adhesives | 3-III – flammable liquid | 500 kg | |
| Mechanical fluids for plant and equipment (oils, lubricants, grease, degreaser, coolants, etc.) | 3-III – flammable liquid | 500 kg | |
| **COMBINED CLASS 3-III QUANTITY** | | 1000 kg | 5 tonnes |
| Oxygen gas for metal/rail cutting and welding | 5.1 - oxidisers | 200 kg | |
| **COMBINED CLASS 5.1 QUANTITY** | | 200 kg | 5 tonnes |
| Cleaning products | 8-II– corrosives | 50 kg | |
| **COMBINED CLASS 8 QUANTITY** | | 50 kg | 25 tonnes |
| Safe-working rail detonators (for worksite protection) | 1.4S – Explosives Division | 20 kg | None |
| Rail weld kits (Thermit igniters) | 1.4S – Explosives Division | 500 kg | None |
| Fuels (diesel) | C1-III – combustible liquid | 2,000 kg | None provided it is not stored with class 3 flammable liquids. It defaults to class 3-III if it is stored with class 3 flammable liquids. |
| Cement, grout, ready-mix concrete | Non dangerous goods | | |
| Concrete curing compounds and formwork de-bonding | Non dangerous goods | | |
| Sealants and joint fillers | Non dangerous goods | | |

The transportation of the construction dangerous goods would be in quantities below the SEPP 33 transport screening thresholds. Given the number of traffic movement of these dangerous goods would also be low, the potential risk during transportation is not considered to be significant.

According to SEPP 33, if any of the screening thresholds are exceeded then the proposed development would be considered a 'potentially hazardous industry' and a PHA is required. The results of the dangerous goods and transport screening indicate that the project would not result in any of the thresholds being exceeded. As a result, the project is not considered to be 'potentially hazardous' and a PHA is not required.

An assessment of the air quality, noise and vibration of the project has been completed as part of the EIS (refer to the *Botany Rail Duplication EIS, Technical Report 2 – Noise and Vibration Impact Assessment* and *Technical Report 3 – Air Quality Impact Assessment*). These assessments determined that the project would meet air quality, noise and vibration requirements throughout the life of the project with the implementation of appropriate management measures.

On this basis, the project is not considered to be 'potentially offensive'.

### 5.1.3 Construction hazard identification

Utility service relocation and/or protection works would be undertaken during the enabling works. A description of the methodology for utilities works is provided in Chapter 7 of the EIS.

Treatment for each of the impacted utilities listed in Table 4.1 would be coordinated with the relevant utility owner. Treatments may include conducting works under surveillance from utility representative, protection (temporary or permanent) or relocation. Initial dial before you dig (DBYD) and pothole surveys have been conducted, however further investigations may be undertaken to support design development where required.

The results of the hazard identification are provided in Table 5.2. This includes events associated with construction such as the use of rail detonators within a working rail corridor (small charge explosives used as a second layer of protection to workers for the notification of an approaching training). The hazard identification study did not identify any hazards with the potential for significant off-site impact that would not be suitably controlled. Safeguards (also outlined in Table 5.2) are required to ensure the risk scenarios that were identified are contained or at least controlled to an acceptable level. The scenarios were assessed using the ARTC project risk criteria (criterion provided in Appendix A).

Table 5.2 Construction hazard identification

| Event | Cause(s) | Potential Result(s) | Consequence | Likelihood | Risk | Safeguards |
|---|---|---|---|---|---|---|
| Telecommunication Utility Strike | Impact during construction | 1. Telecommunication service disruption, including customer complaints | 1. Minor | 1. Unlikely | 1. Low | Construction Management Plan |
| Water Utility Strike – water and sewer | Impact during construction | 1. Flooding, including environmental damage/ sink holes | 1. Minor | 1. Unlikely | 1. Low | Construction Management Plan |
| | | 2. Health / personal injury | 2. Minor | 2. Possible | 2. Medium | |
| | | 3. Service disruption, including customer complaints | 3. Minor | 3. Unlikely | 3. Low | |
| Power Utility Strike – gas | Impact during construction | 1. Flammable gas release, no ignition but area evacuation. | 1. Moderate | 1. Unlikely | 1. Medium | Construction Management Plan |
| | | 2. Flammable gas release, immediate ignition and multiple fatalities | 2. Extreme | 2. Rare | 2. Medium | AS 2885.6 SMS (Safety Management Study) workshop with pipeline owner |
| | | 3. Flammable gas release, delayed ignition and multiple fatalities | 3. Extreme | 3. Rare | 3. Medium | |
| | | 4. Property damage | 4. Major | 4. Rare | 4. Medium | |
| | | 5. Gas service disruption, including customer complaints | 5. Minor | 5. Unlikely | 5. Low | |
| Power Utility Strike – dangerous goods transport pipelines | Impact during construction | 1. Flammable liquid release, no ignition but area evacuation. | 1. Moderate | 1. Unlikely | 1. Medium | Construction Management Plan |
| | | 2. Flammable liquid release, immediate ignition and multiple fatalities | 2. Extreme | 2. Rare | 2. Medium | AS 2885.6 SMS workshop with pipeline owner |
| | | 3. Property damage | 3. Major | 3. Rare | 3. Medium | |
| | | 4. Soil contamination | 4. Moderate | 4. Possible | 4. Medium | |
| | | 5. Fuel service disruption, including customer complaints | 5. Minor | 5. Unlikely | 5. Low | |
| Power Utility Strike – electricity (below ground) | Impact during construction | 1. Electrocution and single fatality | 1. Extreme | 1. Rare | 1. Medium | Construction Management Plan |
| | | 2. Electricity service disruption, including customer complaints | 2. Minor | 2. Unlikely | 2. Low | |

| Event | Cause(s) | Potential Result(s) | Consequence | Likelihood | Risk | Safeguards |
|---|---|---|---|---|---|---|
| Power Utility Strike – electricity (above ground | Impact during construction | 1. Electrocution and single fatality<br>2. Electricity service disruption, including customer complaints | 1. Extreme<br>2. Minor | 1. Rare<br>2. Unlikely | 1. Medium<br>2. Low | Construction Management Plan |
| Exposure to dust | Dust generated during construction | 1. Health impacts<br>2. Third party complaints | 1. Moderate<br>2. Minor | 1. Unlikely<br>2. Possible | 1. Medium<br>2. Medium | Construction Management Plan |
| Train interactions | Train movements in vicinity of personnel | 1. Single fatality | 1. Extreme | 1. Unlikely | 1. High | Construction Management Plan<br>Safe work in rail corridor training |
| Vehicle interactions | Interaction with public road traffic in vicinity of personnel | 1. Single fatality | 1. Extreme | 1. Unlikely | 1. High | Construction Management Plan<br>Safe work in road corridor |
| Fall from heights | Working at height, working adjacent to drops | 1. Personal injury | 1. Major | 1. Unlikely | 1. Medium | Construction Management Plan<br>Safe working method statements (SWMS) |
| Manual handling | Inappropriate lifting of objects or repetitive work activities | 1. Personal injury | 1. Major | 1. Unlikely | 1. Medium | Construction Management Plan<br>SWMS |
| Loss of containment of chemicals | Damage to storage (external impact), wear & tear, spill | 1. Environmental damage<br>2. Personal injury | 1. Minor<br>2. Moderate | 1. Possible<br>2. Unlikely | 1. Medium<br>2. Medium | Storage and bunds compliant with Australian Standards |

| Event | Cause(s) | Potential Result(s) | Consequence | Likelihood | Risk | Safeguards |
|---|---|---|---|---|---|---|
| Dropped load / objects | Incorrect lifting operations or Unbalanced / unstable load | 1. Personal injury/fatality | 1. Extreme | 1. Unlikely | 1. High | Construction Management Plan<br>SWMS |
| Unauthorised Access to Work Site | Lack of site security or no defined work area | 1. Personal injury<br>2. Asset damage/theft | 1. Major<br>2. Moderate | 1. Unlikely<br>2. Unlikely | 1. Medium<br>2. Medium | Construction Management Plan<br>Construction/site fencing |
| Unexpected explosion | Use of detonators | 1. Personal injury | 1. Major | 1. Unlikely | 1. Medium | Construction Management Plan<br>Licensed users |
| Noise | Excessive noise during construction | 1. Health impacts<br>2. Third party complaints | 1. Moderate<br>2. Minor | 1. Unlikely<br>2. Possible | 1. Medium<br>2. Medium | Construction Management Plan |
| Interaction with flora & fauna | Snake / insect bites or allergies | 1. Personal injury | 1. Moderate | 1. Possible | 1. Medium | Construction Management Plan |
| Drowning | Working in proximity to Mill Stream | 1. Single fatality | 1. Extreme | 1. Rare | 1. Medium | Construction Management Plan<br>Safe work in road corridor |
| Natural hazards | Flooding, earthquake, lightning, high winds | 1. Personal injury<br>2. Asset damage | 1. Moderate<br>2. Moderate | 1. Unlikely<br>2. Unlikely | 1. Medium<br>2. Medium | Construction Management Plan |

## 5.2 Impacts during operation

The number of traffic movements to transport dangerous goods to the project site for maintenance activities, would be low and would be in quantities below the SEPP 33 transport screening thresholds. Given the traffic movement of these dangerous goods would also be low, the potential risk during transportation is not considered to be significant. As the infrastructure provider, there would be no use or storage of dangerous goods during the operation and maintenance of the project and therefore, there are no operational or maintenance impacts to be considered.

Management of the rolling stock and goods transported would continue to be managed by the rail operators, as is currently done.

An assessment of the air quality, noise and vibration of the project has been completed as part of the EIS. These assessments determined that the project would meet the relevant amenity criteria throughout the life of the project with the implementation of appropriate management measures.

The key risk and hazard aspects to the project are related to the utility services. Utility protection due to a potential train derailment or maintenance activities during operation would be considered in the Pipeline Safety Management Study (SMS) during the detailed design phase of the project once design has reached a level that enables completion of a compliant AS 2885.6 process.

## 5.3 Cumulative impacts

There are a number of other projects in the vicinity of the rail duplication, which are either currently being completed or planned to begin at a similar time and location to this project. These other projects include:

- Sydney Gateway road project
- Qantas Flight Training Centre
- WestConnex New M5
- WestConnex New M4-M5
- F6 Extension Stage 1
- Airport East and Airport North road projects.

Dangerous goods cumulative impacts could occur if large quantities of dangerous goods are located in close proximity.

Due to the small quantity of dangerous goods expected to be associated with all listed projects, it is not anticipated that there are any cumulative impacts from dangerous goods storage or use.

Due to the co-location of some project areas, a cumulative impact associated the Sydney Gateway road project exists. This cumulative impact is associated with the disturbance of utility services. Co-ordination of utility relocations should be considered as some utilities have relocation requirements for both projects.

# 6. Management of impacts

## 6.1 Approach

### 6.1.1 Construction management

The current design for the project has adopted a risk-based approach to avoiding and/or minimising impacts associated with the relocation and/or adjustment of public utilities affected by the project. The framework approach including a hierarchy of:

- avoiding impacts
- protecting utilities in their current location
- utilities relocation/adjustment.

Mitigation measures would be managed through the following:

- ARTC's Site environmental management plans (EMP(s) for enabling works
- project specific CEMP for main construction works
- community and stakeholder engagement plan
- ARTC's environmental management system for operation of the project.

Utility service relocation and/or protection will be carried out during the enabling works for the project. Prior to construction of enabling works starting, a site environmental management plan will be completed by the construction company. The purpose of this management plan is to describe how the construction company will manage, and verify the safety compliance and risk aspects of the project works for the construction and completion phases of the project, including a construction hazard assessment.

The construction hazard assessment will identify the proposed methodology of the site construction and/or installation for hazardous situations. The detailed methodology will indicate the potential hazards and the control measures required to mitigate risks to as low as reasonably practicable during the construction stage.

The construction hazard assessment will update and confirm the risk register, which will be treated as a live document to be regularly reviewed during the construction phase. Any information considered to be relevant to the operational phase will be carried forward in the risk register.

### 6.1.2 Detonator management

A small number of warning detonators will be used on site, where required, for train operator notification that personnel are working in the rail corridor during construction.

Detonators would be stored in a non-ferrous receptacle clearly marked 'Explosives' that is kept closed and locked (except during use by authorised personnel) and stored in the original containers which are securely sealed. The store should be a well-ventilated magazine licenced for IMCO Class 1.4S explosives, which protects the explosives from the weather, contamination, sources of ignition and access from unauthorised individuals. Storage should be isolated from other dangerous good stores and the area free of debris, waste and combustibles. The detonator containers should be protected against physical damage and regularly checked for spills and leaks.

At the storage area and during use there should be no smoking, naked light, heat or ignition source present. The detonator stock should be rotated to prevent ageing (use on first in-first out basis).

### 6.1.3 Chemical and spill management

Where required during construction, any hazardous materials and dangerous goods would be appropriately stored in dedicated storage locations in accordance with Australian Standards. The storage locations would be within designated construction compounds in the project work area. All chemicals stored on site would also have the appropriate labelling, bunding, separation where necessary and be disposed of in accordance with Australian Standards. Access to a material safety data sheet (MSDS) library to cover all chemicals that are located on site would occur.

Additionally, appropriate safe work procedures should be implemented for the safe handling of all chemicals including transfer, storage, spill prevention and clean up requirements.

### 6.1.4 Utility Infrastructure

In most circumstances the project and utility infrastructure can co-exist with no major impact, however there are some periods when the risk to the project and utility infrastructure is increased. These periods can occur during construction or during maintenance (after construction is complete).

Utility infrastructure that transports high pressure dangerous goods, such as fuels or natural gas, have the largest risk, as a release of said materials, if ignited, could result in a fire or explosion that impacts areas well beyond the study area. In order to manage this risk, a series of AS 2885.6 safety management study (SMS) workshops with impacted pipeline owners to demonstrate threats to each pipeline can be appropriately managed during construction and operation should be conducted. The SMS workshops will be conducted once design has reached a level that enables completion of a compliant AS 2885.6 process.

## 6.2 List of mitigation measures

The mitigation measures that would be implemented to address potential hazard and risk impacts are listed in Table 6.1 and would be incorporated into the relevant management plans.

Table 6.1 Mitigation measures

| Stage | Impact | Measure |
|---|---|---|
| Design | High pressure flammable material released from pipeline | Independently facilitated AS 2885.6 SMS workshops will be completed with each high pressure pipeline owner and the construction contractor. The SMS workshops will be conducted once design has reached a level that enables completion of a compliant AS 2885.6 process. This level is considered to be detailed design and will be completed before construction relating to the relevant utilities commence. |
| | Disruption of utility services | The location of key utility infrastructure which relate to the project site and proposed construction works will be identified and documented in the relevant design drawings and reports, prior to construction works commencing. |
| | Disruption of utility services | Details of proposed works for key utilities, such as relocate or protect will be confirmed prior to construction works commencing. |
| | Cumulative impacts to utility services (Sydney Gateway road project) | Co-ordination of utility relocations will occur before enabling works commence as some utilities have relocation requirements for both projects. |

| Stage | Impact | Measure |
|---|---|---|
| Construction | Risks to infrastructure from utility works during enabling works | The site EMPs will include a section specific to utility management and utility protection. |
| | Disruption of rail services from general construction activities | Construction-related risks will be incorporated into the relevant management plans. |
| | Chemical and explosive management | Ensure that management of all chemicals and explosives used during construction complies with the relevant Australian Standard. |
| | Dangerous goods use and storage quantities exceeded | The relevant management plan will include a review of the required dangerous goods quantities to be used and stored during construction to validate EIS SEPP 33 screening assessment. If the SEPP 33 thresholds levels are not exceeded, no further work is needed. If the SEPP 33 thresholds are exceeded, a PHA will be completed and provided to the Department of Planning, Infrastructure and Environment the for reference. |
| Operation | Disruption of utility services or rail services | Communication with utility service providers during maintenance (both rail and utility) will be undertaken in accordance with the ARTC Safety Management System. |
| | Personal injury (within the community) relating to maintenance activities around utilities | Utility maintenance works will be undertaken in accordance with safety protocols prescribed in ARTC's Safety Management System, ARTC's Safety Management System includes requirements for safe work method statements, which will be prepared as required for utility maintenance works. |

# 7. Conclusion

This report includes a preliminary risk screening of the project in accordance with the requirements of SEPP 33. The results indicate that the screening thresholds for dangerous goods storage and transportation are not exceeded by any of the dangerous goods expected to be stored during construction. No dangerous goods are expected to be stored during operation. As a result, the project is not deemed a 'potentially hazardous industry'. Therefore, there is no requirement for a PHA.

The intent during construction is that there would be low volumes of dangerous goods stored in construction compounds adjacent to the rail corridor, using a just-in-time usage regime and not stockpiled. Additionally, as the project is predicted to meet the relevant amenity criteria throughout the life of the project, the project is not considered to be 'potentially offensive'.

While a PHA is not required, potential off-site impacts, particularly during construction, are systematically identified by completion of a qualitative hazard identification study. The hazard identification process indicates that there are a number of risk scenarios during construction of the project that could result in a detrimental impact to the either the project infrastructure and/ or utility service providers, which could then flow onto the general public. Safeguards are required to ensure the risk scenarios that were identified are controlled to an acceptable level.

The majority of these risks can be managed to tolerable levels (a medium or low risk) provided safeguards are enacted. However, risks associated with utilities that transport flammable dangerous goods require further investigation to ensure that the risk is reduced to So Far As Is Reasonable Practical. The completion of an AS 2885.6 SMS (Safety Management Study) workshop during the next stages of the project will provide input to this investigation.

The hazard identification study demonstrates that the project could be designed, constructed and operated in a manner that will meet the relevant regulations, standards and policies associated with that major utility infrastructure.

# 8. References


- Department of Planning, NSW, (2011a), *Applying SEPP 33: Hazardous and Offensive Development Application Guidelines.*
- Department of Planning, NSW, (2011b), *Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Land Use Safety Planning.*
- Department of Planning, NSW, (2011), *Hazardous Industry Planning Advisory Paper No 6 – Guidelines for Hazard Analysis.*
- Standards Australia, (2018), AS/NZS 2885.6, *Pipelines – gas and liquid petroleum, part 6: Pipeline safety management.*

# Appendix A
ARTC risk matrix

## ARTC Project Risk Criterion

| | Consequence | | | | |
|---|---|---|---|---|---|
| **Safety** | Injury or illness with no impairment (may or may not require treatment) | Injury or illness with short-term impairment | Injury or illness with moderate but recoverable impairment | Injury or illness with long term to permanent impairment | One or more fatalities |
| **Assets: Network Performance** | Immaterial disruption to non-critical track section | Material disruption to non-critical track section or Immaterial disruption to critical track section | Material disruption to a critical track section recoverable in the short-term | Material disruption to critical track section not recoverable in the short term | Material disruption to critical track section not recoverable in the short term with significant long term impacts on customers |
| **Assets: Organisational Capability** | Manageable impact to internal operations, which may or may not require internal reallocation of existing resources | Missing short-term targets which may or may not require use of additional resources | Reduced ability to achieve business goals with some business impact | Material failure to achieve business goal(s) with significant business impact | Failure to achieve business goals with lasting impacts |
| **Assets: Programme/Project Objectives** | Minor impact on a programme / project objective | Minor impact on more than one programme / project objective | Significant impact on a programme / project objective | Severe impact on a programme / project objective or significant impact on more than one objective | Severe impact on more than one programme / project objective |
| **Financial** | Minor cost impact, that is able to be absorbed within existing project budget* | Minor cost impact to project budget* | Moderate cost impact to project budget* | Major cost impact to project budget* | Significant cost impact to project budget* |
| **Environment** | Minimal environmental impact | Limited and recoverable environmental impact | Significant and recoverable environmental impact | Permanent impact to area of less than high environmental significance | Permanent impact to area of high environmental significance |
| **Regulatory** | Expected to prompt regulatory interest | Increased oversight by regulator | Limited fine, official caution and / or direction to act | Formal regulatory action impacting on operating activities and / or material fine | Prosecution of the company and / or its office holders |
| **Reputation** | Short term loss of confidence from other than key stakeholders | Sustained loss of confidence from other than key stakeholders | Short-term loss of confidence from a key stakeholder | Sustained loss of confidence from a key stakeholder | Loss of Shareholder support |
| **Schedule** | *Schedule milestone exceeded with no significant impact on business objectives &/or cost | Schedule milestone exceeded with minor impact on business objectives &/or cost* | Schedule milestone exceeded with moderate impact on business objectives &/or cost* | Schedule milestone exceeded with major impact on business objectives &/or cost* | Schedule milesotne exceededwith severe impact on business objectives &/or cost* |

| Likelihood | | | | Not Significant | Minor | Moderate | Major | Extreme |
|---|---|---|---|---|---|---|---|---|
| | | | | 1 | 2 | 3 | 4 | 5 |
| | Almost Certain | Once per month (Is expected to occur in most circumstances) | A | MEDIUM 1A | MEDIUM 2A | HIGH 3A | VERY HIGH 4A | VERY HIGH 5A |
| | Likely | Between once a month and once a year (Will probably occur in most circumstances) | B | LOW 1B | MEDIUM 2B | HIGH 3B | VERY HIGH 4B | VERY HIGH 5B |
| | Possible | Between once a year and once in five years (Might occur at some time) | C | LOW 1C | MEDIUM 2C | MEDIUM 3C | HIGH 4C | VERY HIGH 5C |
| | Unlikely | Between once in 5 years and once in 20 years (Could occur at some time) | D | LOW 1D | LOW 2D | MEDIUM 3D | MEDIUM 4D | HIGH 5D |
| | Rare | Once in more than 20 years (May occur in exceptional circumstances) | E | LOW 1E | LOW 2E | LOW 3E | MEDIUM 4E | MEDIUM 5E |

* parameters to be defined by project

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