7.0 Environmental assessment

7.17 Hazards and risk

This section assesses the potential hazards and associated risks of the proposed modification during construction and operation.

7.17.1 Introduction

There were no specific requirements set out in the SEARs to address potential hazards and the risks that they may pose. Nonetheless an assessment of hazards associated with the proposed modification is provided below.

7.17.2 Method of assessment

Legislation and policy

The hazards and risk assessment has been prepared with reference to local, state and national legislation, policy and guidance that is endorsed or accepted by Australian health and environmental authorities. This includes, but is not limited to:

- Legislation and policy:
  - *Work Health and Safety Act 2011* (NSW)
  - *Rural Fires Act 1997* (NSW)
  - *Dangerous Goods (Road and Rail Transport) Act 2008* (NSW)
  - *Dangerous Goods (Road and Rail Transport) Regulation 2014* (NSW)
  - *State Environmental Planning Policy (Resilience and Hazards) 2021* (NSW)
  - *Australian Dangerous Goods Code* (National Transport Commission, 2020)
- Guidelines:
  - *Environmental Health Risk Assessment: Guidelines for Assessing Human Health Risks from Environmental Hazards: 2012* (enHealth, 2012)
  - *Health Impact Assessment Guidelines* (enHealth, 2017)
  - *Health Impact Assessment: A Practical Guide* (NSW Health & UNSW, 2007)
  - *Planning for Bush Fire Protection* (NSW Rural Fire Service, 2019).

Assessment methodology

A qualitative assessment of potential hazards and risk was undertaken for the proposed modification. The assessment identified potential hazards and assessed the risk based on those experienced on the existing Westlink M7 and other recent NSW road projects. Inputs from several other assessments undertaken for the proposed modification have been utilised, including:

- **Section 7.1** (Traffic and transport)
- **Section 7.2** (Noise and vibration)
- **Section 7.3** (Air quality)
- **Section 7.4** (Hydrology and flooding)
- **Section 7.11** (Soils and contamination)
- **Section 7.14** (Climate change)
- **Section 7.16** (Waste).

7.17.3 Study area

The study area for this assessment includes both the operational and construction footprints as described in **Chapter 4** (Proposed modification) and shown on Figure 4-1 to Figure 4-5.

7.17.4 Existing environment

The Westlink M7 is a four-traffic lane motorway (two lanes in each direction) which operates 24 hours a day seven days a week for a range of vehicles travelling northbound and southbound. The relevant land zones within the study area include Infrastructure (SP2), Environmental Conservation (C2), Primary Production (RU1), General Industrial (IN1), Light Industrial (IN2), Heavy Industrial (IN3), Neighbourhood Centres (B1), Local Centre (B2), Business Development (B5), Enterprise Corridor (B6), High Density Residential (R4), Low Density Residential (R2), Public Recreation (RE1), Private Recreation (RE2), Primary Production Small Lots (RU4), Medium Density Residential (R3). Land use is addressed further in **Section 7.9** (Land use and property).

The existing key hazards associated with the operation of the Westlink M7 are outlined and described in Table 7-118.

Table 7-118 Existing hazards associated with operation of Westlink M7

Existing hazards	Description
Transportation of dangerous goods	The Westlink M7 is used to transport dangerous goods and hazardous materials. Common types of hazardous materials transported through the area include contaminated soils, industrial waste and fuel in tankers. Other potentially hazardous materials which are generally transported by road include a range of chemicals associated with agriculture and other industries, and liquid wastes such as sludges, grease trap wastes and sewage effluent. Road users transporting dangerous goods and hazardous materials within the surrounding road network are required to do so in accordance with the *Dangerous Goods (Road and Rail Transport) Act 2008* and the *Dangerous Goods (Road and Rail Transport) Regulation 2014*.
Storage of dangerous goods	Westlink M7 passes through areas used for both commercial and industrial activities and therefore it is likely that dangerous goods could be stored on land adjacent and close to the road corridor. Minor quantities of fuel for fleet vehicles and hand-held tools, paint for graffiti treatment and lubricants and other cleaning products are stored within the Westlink M7 lease area by the operator.
Natural hazards	The Westlink M7 provides a fire break within the landscape. Mapped bushfire prone vegetation adjacent to the Westlink M7 within the study area is predominantly located within Western Sydney Parklands at the intersection of the Westlink M7 with Elizabeth Drive, within parts of Cecil Park and vegetated riparian zones around Hinchinbrook Creek through Cecil Hills (refer to Figure 7-). A flooding assessment is provided in **Section 7.4** (Hydrology and flooding). The main carriageways of the existing Westlink M7 within the extent of the proposed modification are not impacted by mainstream flooding or major overland flow during a 1% (1 in 100) Annual Exceedance Probability (AEP) design storm event, which is consistent with the original design of the motorway. However, areas surrounding the proposed modification are currently impacted by both mainstream flooding and major overland flow during periods of heavy rainfall. Sections of the shared path adjacent to the Westlink M7 can also be inundated which can be hazardous to pedestrians and cyclists. Bird species can create a hazard for vehicles travelling on the motorway and surrounding road network, however the Westlink M7 has limited

Existing hazards	Description
	potential to attract bird species. Drainage basins have been designed to release captured runoff within a 24 to 48 hours period, which limits the duration of ponded water and the potential to attract birds. None of the vegetation present along the Westlink M7 is considered to provide quality habitat to fauna such as birds (refer **Appendix H** (Biodiversity development assessment report) for further information.
Public safety	Road users are subject to direct road-related safety risks such as vehicle collision. Road users and nearby communities are also indirectly subject to existing road noise impacts as described in **Section 7.2** (Noise and vibration), and air quality impacts as described in **Section 7.3** (Air quality). The shared path is separated from the Westlink M7, therefore limiting road-related risks to pedestrians or cyclists, however, pedestrians and cyclists are subject to their own safety risks such as cyclist / pedestrian collision. Road maintenance workforce would also encounter safety risks associated with required maintenance works which would be similar to the public safety impacts described above. This workforce is also required to complete maintenance activities near railways and potentially in the rail corridor which may present additional risks. Note that the health and safety of the workforce is dealt with separately under the *Workplace Health and Safety Act 2011* (NSW) (WHS Act) and the *Work Health and Safety Regulation 2017* (NSW) (WHS Regulation).

7.17.5 Impact assessment

This section provides an assessment of the potential hazards associated with the construction and operation of the proposed modification.

Construction

Potential hazards associated with the construction of the proposed modification would include natural hazards such as flooding and bushfire risk at construction sites, storage and transport of dangerous goods, the potential rupture of, or interference with, underground services as well as the potential to disturb contaminated land.

Public and construction worker safety

Construction workplace hazards would be limited to the construction footprint which includes the proposed construction ancillary facilities and accesses, and the existing Westlink M7. Potential workplace safety risks to the construction workforce would be associated with falls, explosions, exposure to contaminants, manual handling injuries, electrocution, accidents with machinery. These risks would be managed in accordance with the WHS Act and the WHS Regulation. Compliance with WHS Act and WHS Regulation requirements and the implementation of the mitigation measures detailed in Table 7-120 would help manage risks associated with workplace hazards to an acceptable level. These measures and requirements would be accounted for in the construction contractor's work health and safety management plans.

Secure fencing would be installed to prevent unauthorised access to the construction footprint and therefore access for the general public would be avoided. However, health risks to the general public could occur from exposure to construction noise and air emissions (including dust) without appropriate mitigation, and interaction with construction vehicles including heavy vehicles on local roads and construction ancillary facility access roads. These potential impacts and relevant mitigation measures are addressed further in **Section 7.1** (Traffic and transport), **Section 7.2** (Noise and vibration), and **Section 7.3** (Air quality).

Most of the construction activities that require traffic disruptions would be undertaken outside of standard construction hours. This would reduce the public's exposure to changed traffic conditions along the motorway and nearby local roads, which is likely to improve safety. It would also support the safety of construction workers (and the general public) by minimising the risk of working in proximity to live traffic, road and shared path users.

Construction of the proposed modification would require temporary detours from the existing Westlink M7 shared path, disrupting access for users. Potential disruptions to local amenity from construction activities, presence of construction activities and increased construction traffic may also impact on the use and enjoyment of the shared user path and perceptions of safety for some users. This may deter some people from using this facility during the construction phase. Pedestrian and cyclist management plans would be implemented during construction to manage potential impacts and risks to path users (refer to **Section 7.1.6**).

Flood hazard

Construction activities have the potential to change flood behaviour and impact on the surrounding environment, due to the proposed clearing of vegetation and topsoil, earthworks, re-shaping of waterways/embankments for bridge works and establishment of temporary crossings, and establishment of ancillary facilities. Changes in flood behaviour can present risks to the community by causing disruption and exacerbating the impact of flooding to nearby property and infrastructure. Further investigation would be undertaken during detailed design and construction planning, as layouts and staging diagrams are further developed. In addition, flooding also has the potential to impact on construction areas within and near the construction footprint (i.e. potential inundation of the construction footprint). Inundation of the construction footprint by floodwater has the potential to cause damage to the proposed modification works and delays in construction programme, and pose a safety risk to construction workers. Further assessment of flooding and mitigate measures to address the risk to and from flooding are provided in **Section 7.4** (Hydrology and flooding).

Potential rupture of utilities and drainage

The proposed modification would require the relocation and/or protection of various utilities during construction. This activity presents the risk of potential rupture of, or interference with, underground services during construction. This could give rise to hazards in the form of electrocution, gas or water leaks, or fire if not appropriately managed. The likelihood of impacts associated with these hazards would be minimised by undertaking utility searches, and consulting with the relevant utility providers. Further information on utility providers and proposed utility works is provided in **Section 4.3.8**. Table 7-120 sets out appropriate mitigation measures to manage the risk of services interference.

Storage, handling and transportation of dangerous goods

The storage, handling and transportation of dangerous goods and hazardous materials for construction of the proposed modification may include diesel fuels, oils, greases and lubricants, gases, bitumen, paints and epoxies, herbicides and cement and concrete. The types of dangerous goods and hazardous substances that would be stored and used within individual construction ancillary facilities would be confirmed by the construction contractor. Potential unintended impacts from the handling, storage and transportation of dangerous goods and hazardous materials may adversely impact human safety, either directly through contact, or indirectly through damage to the local environment. However, the storage, handling and use of dangerous goods and hazardous substances would be carried out in accordance with the WHS Act, the *Storage and Handling of Dangerous Goods Code of Practice* (WorkCover NSW, 2005) and relevant Australian Standards and the environmental management measures described in Table 7-120. Adherence to these requirements would reduce the potential for incidents to occur and reduce the likelihood of incidents occurring to acceptable levels.

Excavation, handling, and stockpiling of contaminated spoil and water

The potential for contaminants to be exposed or distributed by construction activities such as excavation and ground disturbing works also poses a potential health risk. Impacts due to excavation works, including excavation and disposal of contaminated soils and Asbestos Containing Materials (ACM), is described further in **Section 7.11** (Soils and contamination) and **Section 7.16** (Waste).

Natural hazards and risks

As described above and in **Section 7.4** (Hydrology and flooding), potential flooding hazards could be experienced during construction activities. Mitigation measures related to flooding events are further detailed in **Section 7.4.6**.

Mapped bushfire prone vegetation from the State Government of NSW and NSW Rural Fire Service for the study area is shown on Figure 7-129. Vegetation categories for bushfire prone land are outlined in Table 7-119.

Table 7-119 Bushfire prone land vegetation categories (NSW RFS, 2015)

Vegetation category	Description
Vegetation Category 1	Considered to be the highest risk for bushfire
Vegetation Category 2	Considered to be a lower fire risk than Category 1 and 3 (but higher than excluded areas)
Vegetation Category 3	Considered to be medium bush fire risk vegetation - higher in bush fire risk than Category 2 (and the excluded areas) but lower than Category 1
Excluded Area	Considered to be lowest risk for bushfire - excluded for a range of reasons outlined in *Guide for Bush Fire Prone Land Mapping* (NSW RFS 2015)

Sections of the proposed modification would be adjacent to bushfire prone land, which has the potential to increase bushfire risk from accidental ignition from presence and use of construction equipment, vehicles, fuel and chemical storage, materials and waste. Bushfire risk may increase on work days classified as ‘high fire risk’.

Measures to address potential impacts related to natural hazards are detailed in Table 7-120.

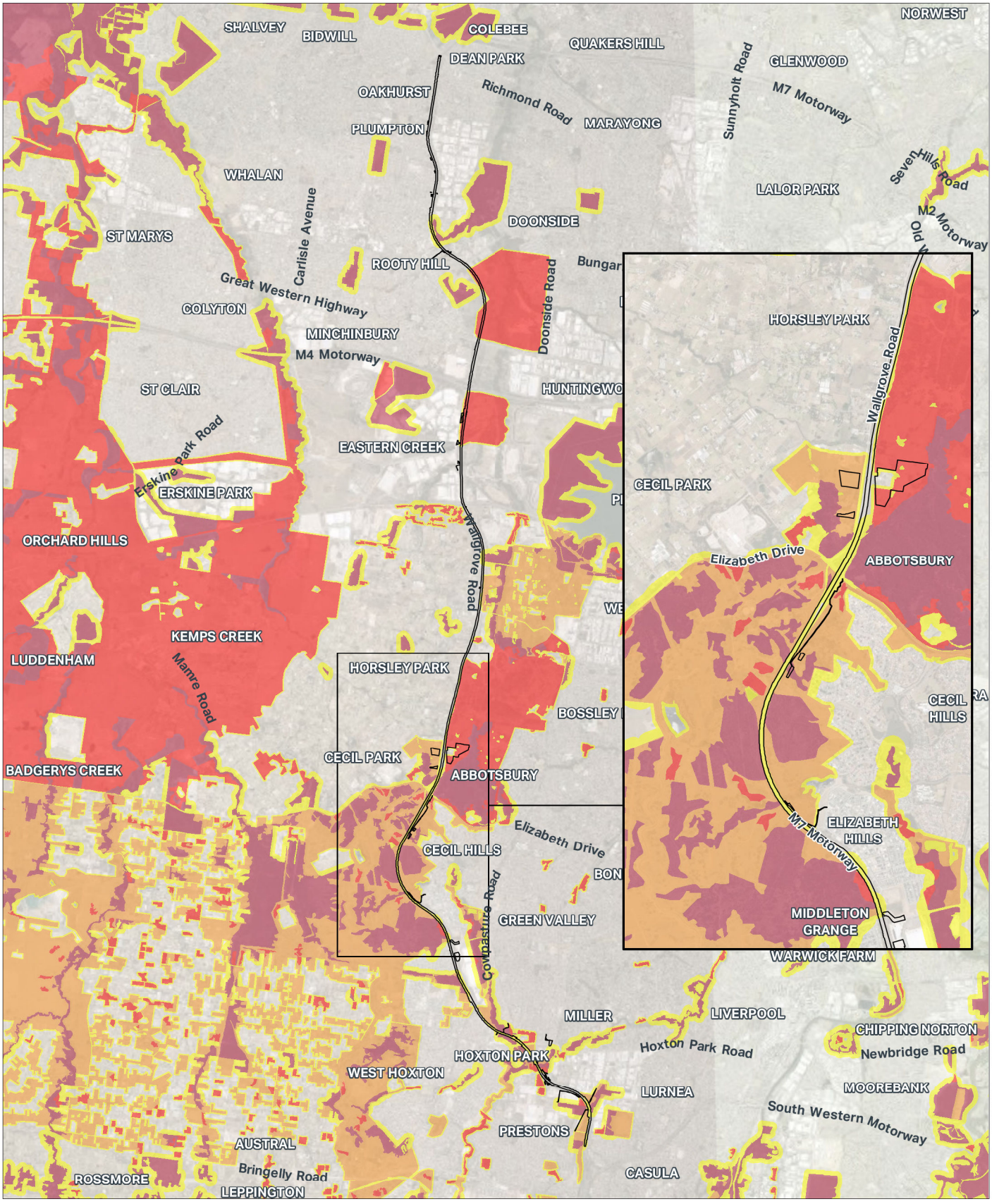

FIGURE 7-129: BUSHFIRE RISK SURROUNDING THE STUDY AREA

N 0 1 2 km

AECOM

Legend

- Study area

Bushfire Prone Land

- Category 1
- Category 2
- Category 3
- Vegetation buffer

Operation

The potential hazards related to the operation of the proposed modification are discussed below.

Public safety risks

The proposed modification would increase the vehicle capacity on the Westlink M7 and therefore increase vehicles speeds and ease traffic congestion. This is expected to improve the safety of the public travelling on the motorway and reduce crash rates (refer to **Section 7.1** (Traffic and transport)). This is also likely to improve emergency response times for first responders using the Westlink M7.

The storage and transport of dangerous goods on the motorway under the proposed modification is not expected to change from existing conditions.

No operational changes are proposed to the location and overall alignment of the shared path along the Westlink M7 as part of the proposed modification. However, the proposed modification would create a dual lane exit to the M4 Motorway on the northbound carriageway of the Westlink M7. Therefore, cyclists using the mainline of the Westlink M7 would no longer be able to cross the northbound exit ramp to the M4 Motorway (due to the two lane arrangement).

To address potential safety risks to cyclists, the proposed modification would also introduce restrictions which would prohibit cycling on the Westlink M7 mainline between the M5 Motorway and Richmond Road, to remove the potential for cyclists to be struck by vehicles on the travel carriageways.

The restrictions would mean that these cyclists would need to use the shared path that runs the length of the Westlink M7.

Health risks to the general public are not expected from exposure to noise and air emissions due to the proposed modification, once operational and adequate mitigation measures have been implemented. Potential noise or air emission impacts as a result of the proposed modification are discussed in **Section 7.2** (Noise) and **Section 7.3** (Air quality).

Natural hazards and risks

The level of flood immunity to the Westlink M7 would be maintained under the proposed modification (1% AEP flood immunity to its carriageways). The proposed modification is only expected to have a minor impact on existing flood conditions, including locations adjacent to the development. The existing drainage infrastructure of the motorway was designed to accommodate stormwater from a future widening (now proposed), however would be upgraded in some locations where necessary, The nature of the changes in flooding patterns attributable to the proposed modification would only have a minor impact on flood hazard. Refer **Section 7.4** (Hydrology and flooding) for further information.

The proposed modification is unlikely to directly increase bushfire risk from the existing situation. The proposed modification would increase the buffer between vegetated areas adjacent to the Westlink M7 with the removal of vegetation and introduction of sealed areas within the existing median. This would reduce the chance of fire spreading across the motorway. The proposed modification would therefore enhance the Westlink M7 as an effective bushfire buffer.

The impact of increased flooding and bushfire risk due to climate change is discussed in **Section 7.4** (Hydrology and flooding) and **Section 7.14** (Climate change). The potential of the proposed modification to increase the impact of natural hazards under climate change conditions is unlikely. The proposed modification would provide additional capacity for the Westlink M7 when an extreme event such as extreme rainfall, flooding and bushfire prevent access to the local roads (refer to **Section 7.14** (Climate change).

Under the National Airports Safeguarding Framework, *Guideline C: Managing the risk of Wildlife Strikes in the Vicinity of Airports* (2014) provides requirements for considering the wildlife hazard of new development within 13 kilometres of an airport. The majority of the operational footprint of the proposed modification would be within 13 kilometres of the Western Sydney Airport, however the proposed modification does not represent a new land use, or a high-risk land use in regard to wildlife hazard. Regardless, on-site detention basins and selection of landscaping trees can potentially attract birds and could present a potential risk for aeroplane bird strike, as well as to vehicles travelling on the motorway. The existing Westlink M7 water treatment basins were designed to accommodate a future increase in the impervious area of the median as a result of widening and generally should not require upgrading.

However, if it is determined during detailed design that upgrades to a basin/s is required, appropriate measures to reduce the likelihood of attracting wildlife may be required, including consideration of the basin design (e.g. retention times). Selection of landscaping tree/plant species would also have regard to wildlife hazard, including Western Sydney Airport requirements for species selection.

7.17.6 Management and mitigation

Based on the assessment above, the mitigation and management measures described in Table 7-120 are proposed to be implemented in order to manage potential hazard and their associated risks during construction and operation of the proposed modification.

Further mitigation measures related to hazards identified in this chapter are also provided in **Section 7.1** (Traffic and transport), **Section 7.2** (Noise and vibration), **Section 7.3** (Air quality)**, Section 7.4** (Hydrology and flooding)**, Section 7.11** (Soils and contamination)**, Section 7.14** (Climate change) and **Section 7.16** (Waste).

Table 7-120 Mitigations measures

Impact	ID	Mitigation measure	Responsibility	Timing
Work, health and safety	HR1	A work health safety management plan (WHSMP) will be prepared for the proposed modification in accordance with requirements of the *Workplace Health and Safety Act 2011* (NSW) and the *Work Health and Safety Regulation 2017* (NSW). The WHSMP will include: • Details of the hazards and risks associated with construction activities • Risk management measures • Procedures to comply with legislative and industry standard requirements • Use of appropriate personal protective equipment • Contingency plans, as required • An incident response management plan • Training for all personnel (including subcontractors) including site inductions, the recognition and awareness of site hazards and the locations of relevant equipment to protect themselves and manage any spills. All staff will have the relevant training and certificates.	Construction contractor	Prior to construction Construction
Bushfire risk	HR2	Measures to mitigate and manage bushfire risk will be developed and included as part of site-specific hazard and risk management measures within the WHSMP. Measures will include the maintenance of ancillary facilities in a tidy and orderly manner and the storage and management of dangerous goods and hazardous materials in accordance with applicable legislation, policy and Australian Standards.	Construction contractor	Prior to construction Construction

Impact	ID	Mitigation measure	Responsibility	Timing
	HR3	A Bushfire Emergency Management and Evacuation Plan will be developed for the construction phase. The plan will outline stop work procedures and evacuation routes. The bushfire evacuation procedure within each plan will be completed in accordance with the *Guide to Developing a Bushfire Emergency Management and Evacuation Plan* (NSW RFS, 2014).	Construction contractor	Prior to construction Construction
	HR4	Relevant works will be managed under a Hot Work and Fire Risk Work procedure. Where necessary essential hot works may be completed on a day declared to be a Total Fire Ban (TOBAN) providing it complies with the Hot Work and Fire Risk Work procedure exemption from the NSW RFS.	Construction contractor	Prior to construction Construction
Wildlife hazard	HR5	Design of water treatment basin upgrades (if required) and species selection for landscaping plants/trees will consider wildlife hazard (e.g. attracting birds), in relation to motorway use and the Western Sydney Airport. This includes the requirements of the National Airports Safeguarding Framework (NASF) (National Airports Safeguarding Advisory Group, n.d.), and specific requirements of the Western Sydney Airport (e.g. preferred landscaping species).	Construction contractor	Detailed design Construction
Incident response	HR6	An incident response management plan will be developed and implemented. The response to incidents within the road will be managed in accordance with the memorandum of understanding between Transport for NSW and the NSW Police Service, NSW Rural Fire Service, NSW Fire Brigade and other emergency services.	Construction contractor	Prior to construction Construction
Utilities	HR7	Consultation with relevant utility providers will be undertaken to confirm the presence of utilities and refine potential utility adjustments and utility protection measures (with a view to avoiding impacts if possible, and protecting or adjusting if required) during detailed design. The final construction methodology will consider any special measures required to avoid impacts on these services during construction, where possible.	Transport Construction contractor	Prior to construction Construction

Impact	ID	Mitigation measure	Responsibility	Timing
Storage of dangerous goods and hazardous substances	HR8	Storage, handling and use of dangerous goods and hazardous substances will be in accordance with the *Work Health and Safety Act 2011* and the *Storage and Handling of Dangerous Goods Code of Practice* (WorkCover NSW, 2005).	Construction contractor	Construction
	HR9	Storage areas for oils, fuels and other hazardous liquids will be located outside of identified flood-prone areas identified in Section 6.2.1 of **Appendix G** (Surface water and flooding assessment). Secure, bunded areas will be provided around storage areas.	Construction contractor	Construction
	HR10	A register and inventory of dangerous goods and hazardous substances will be kept at each storage location. This register will be maintained as part of an incident response management plan developed for the proposed modification. The register will include Safety Data Sheets which will be obtained for dangerous goods and hazardous substances prior to their delivery onsite, and stored in an accessible place.	Construction contractor	Construction
Contamination from transportation of hazardous goods	HR11	All hazardous substances will be transported in accordance with relevant legislation and codes, including the *Dangerous Goods (Road and Rail Transport) Regulation 2014* and the *'Australian Code for the Transport of Dangerous Goods by Road and Rail'* (National Transport Commission, 2020).	Construction contractor	Construction
Emergency vehicles	HR12	Suitable turning lanes for emergency vehicles will be provided across the median strip between access ramps enabling emergency vehicles to change direction without the need for travelling to the nearest access ramp.	Transport	Operation