

CHAPTER 25

Health and safety (including hazardous materials)

NARRABRI TO NORTH STAR—PHASE 2 ENVIRONMENTAL IMPACT STATEMENT

ARTC

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25 Health and safety (including hazardous materials)

This chapter provides an assessment of health and safety impacts for the Narrabri to North Star Phase 2—Moree to Camurra North project (the proposal). It describes the existing environment, assesses the impacts of construction and operation of the proposal, and provides recommended mitigation and management measures.

There are no Secretary's Environmental Assessment Requirements (SEARs) directly relevant to the assessment of health and safety; however, the assessment of health and safety is considered an EIS general requirement. A full copy of the SEARs is provided in Appendix A: Secretary's Environmental Assessment Requirements.

25.1 Summary of impacts

The health and safety risk assessment identified the following key risks during construction and operation:

- ▶ impacts from the transport, storage and use of hazardous substances and dangerous goods (such as spills or accidents)
- ▶ emission from construction vehicles or plant, trains during operation, and associated health impacts from air and noise pollution
- ▶ reduced safety for road users and pedestrians during construction, due to increased traffic, and increased risk of severe incidents due to increased heavy vehicle movements
- ▶ rupture of, or interference with, underground utilities and services during construction
- ▶ potential for the proposal to exacerbate bushfire risk (arising from the storage of dangerous goods, construction-site issues such as smoking or hot works, and sparks generated from train movements and rail maintenance activities).

During operation, the proposal is expected to have a positive impact on the safety of the road network by:

- ▶ relocating some of the road freight to rail, thereby reducing the heavy vehicle freight traffic on major roads both within the study area and in the greater NSW network
- ▶ improving safety at level crossings through provision of signals and the relocation of one level crossing at Back Pally Road
- ▶ improving safety on the Newell Highway by mitigating short-stacking issues where additional space is provided for trucks leaving the Newell Highway to cross private level crossings.

Potential risks to health and safety would be mitigated through managing construction and operation activities in accordance with relevant legislative and policy requirements. Specific mitigation and management measures are detailed in section 25.5.3 and Chapter 27: Environmental management.

25.2 Assessment approach

25.2.1 Methodology

A desktop assessment was completed to assess potential impacts to health and safety from construction and operation of the proposal. The key tasks included:

- ▶ reviewing legislative and policy context (discussed in section 25.2.2)
- ▶ reviewing construction and operational activities with the potential to cause health and safety impacts
- ▶ considering the potential impacts associated with hazardous materials, as defined by the guidelines to *State Environmental Planning Policy (Resilience and Hazards) 2021 (RH SEPP)* (previously *SEPP No 33—Hazardous and Offensive Development*) developed under the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act)
- ▶ reviewing bushfire-prone land maps
- ▶ qualitatively assessing potential impacts to public health and safety
- ▶ providing mitigation measures for implementation during construction and operation.

The assessment does not provide a detailed account of potential health and safety risks to onsite workers for the proposal. Potential risks to onsite workers are regulated by workplace health and safety legislation, including the *Work Health and Safety Act 2011* (NSW) and are not relevant to the approval of the proposal. Site management would be the responsibility of the construction contractor and operator, who would be required, under the *Work Health and Safety Act 2011* (NSW), to manage and operate the site in accordance with relevant regulatory requirements.

25.2.2 Legislative and policy context to the assessment

The assessment of health and safety included consideration of the following relevant legislation, policies and guidelines:

- ▶ *Rural Fires Act 1997* (NSW)
- ▶ Dangerous Goods (Road and Rail Transport) Regulation 2014
- ▶ *Planning for bush fire protection* (NSW Rural Fire Service (RFS), 2006)
- ▶ *Australian Code for the Transport of Dangerous Goods by Road & Rail* (National Transport Commission, 2020) ('the Australian Dangerous Goods Code')
- ▶ *Hazardous and Offensive Development Application Guidelines: Applying SEPP 33* (Department of Planning (DoP), 2011) ('Applying SEPP 33')
- ▶ Work Health and Safety Regulations 2011 (Cth).

25.2.2.1 Dangerous goods and hazardous materials

Hazardous materials are classified based on their health effects, while dangerous goods are classified according to their physical or chemical effects, such as fire, explosion, corrosion and poisoning, affecting property, the environment or people.

As the proposal is State significant infrastructure (SSI), the RH SEPP does not apply; however, the publication *Applying SEPP 33* (DoP, 2011) provides a process of identifying a potentially hazardous development by identifying storage and transport screening thresholds. Note, the previous SEPP 33 has been consolidated into the RH SEPP; however, all provisions remain identical. SEPP 33 provisions have been transferred to chapter 4 of the RH SEPP and therefore the guidance in *Applying SEPP 33* is still applicable. The thresholds in *Applying SEPP 33* represent the maximum quantities of hazardous materials that can be stored or transported without presenting a significant offsite risk.

Hazardous materials are defined by *Applying SEPP 33* as substances falling within the classification of the Australian Dangerous Goods Code. Dangerous goods are substances that, because of their physical, chemical (physicochemical) or acute toxicity properties, present a risk to people, property or the environment. Types of substances classified as dangerous goods include explosives, flammable liquids and gases, corrosives, chemically reactive or acutely (highly) toxic substances. Dangerous goods are defined by the Australian Dangerous Goods Code.

25.3 Existing environment

Consideration of health and safety has generally included a 2-kilometre (km) buffer of the construction impact zone (CIZ), referred to as the study area. Certain data, including bushfire and other extreme weather events, has been reviewed based on a regional scale, as this provides a more representative assessment of the risks at the proposal site.

25.3.1 Receivers

The study area is located in central north-west NSW. The proposal site traverses one local government area (LGA): the Moree Plains LGA. Moree is an important regional town providing a range of services to the surrounding agricultural areas. The town of Moree is located immediately to the south of the study area. The study area includes the Moree Race Club, residential housing, various retail stores, amenities and industrial spaces. At the 2016 census, Moree had a population of 9,311 people (ABS, 2016).

Receivers potentially impacted by the proposal include:

- ▶ local residents in Moree
- ▶ agricultural and commercial properties adjoining the rail corridor
- ▶ public road users of the Newell Highway, Gwydir Highway, Gwydirfield road, Back Pally Road and The Rocks Road.

25.3.2 Dangerous goods and hazardous materials

While minor quantities of dangerous goods and hazardous materials would be expected to be present within the study area, especially within the Light Industrial zone (Land zoning code IN2), an online search of the NSW Environment Protection Authority (EPA) Protection Of The Environment Operations (POEO) register database was undertaken in October 2020 for records that lie within or 250 metres (m) of the proposal. No environment protection licences (EPLs), applications, notices, audits or pollution studies and reduction programs were identified within 250 m of the proposal.

25.3.3 External weather events

25.3.3.1 Bushfire

Bushfires are a common occurrence in parts of Australia and can present a threat to infrastructure, public safety and environmental (biodiversity) values. Bushfires can occur from natural causes of ignition, such as lightning strikes, or as a result of human actions. Common sources of bushfire include:

- ▶ lightning (large storm cells, usually in the summer months)
- ▶ arson
- ▶ legal burning or campfires
- ▶ farm machinery (e.g. during harvest)
- ▶ rail movements (sparks from rail wheels).

The risk of bushfire was considered in terms of environmental factors that increase the risk of fire (fuel quantity and type, weather patterns and topography), as well as specific activities or infrastructure components that can exacerbate ignition risks.

Bushfire-prone areas are those areas that can support a bushfire or are likely to be subject to bushfire attack. Land maps for bushfire-prone areas have been prepared by most local councils across NSW and certified by the Commissioner of the RFS. The maps identify bushfire hazards and associated buffer zones within a LGA. No bushfire-prone land maps were publicly available for Moree and Gwydir LGAs; however, bushfire risk management plans have been prepared by the Narrabri/Moree Bush Fire Management Committee and by the Gwydir Bush Fire Management Committee.

The *Moree Plains Development Control Plan (DCP) 2013* (Moree Plains Shire Council (MPSC), 2013) (refer Chapter 9: Rural development) addresses various aspects of rural development including bushfire management to rural properties and dwelling development. This chapter supports the *Moree Plains Local Environmental Plan 2011* (MPSC, 2011) by providing additional detail and guidance on addressing bushfire management issues.

The Narrabri/Moree area has, on average, 230 bushfires per year, of which about 10 could be considered to be major fires. In the Gwydir LGA, the average is 70 bushfires per year of which 5 are usually major fires (GHD, 2017). The main source of ignition for larger fires in the greater Namoi–Gwydir Bush Fire Management Committee (BFMC) area is lightning. These fires usually occur during summer, as dry storm cells move throughout the BFMC area. Other causes of fires include farm machinery, arson and escaped burns (both legal and illegal) (Namoi–Gwydir BFMC, 2008).

Vegetation

The majority of the proposal site has been cleared of native vegetation and cultivated for agriculture, which is the dominant land use in the area, with the vast majority consisting of irrigated cropping, horticulture and grazing of sheep and cattle. Natural vegetation is generally limited to:

- ▶ the road reserves of the Newell Highway and other minor roads
- ▶ the existing rail corridor
- ▶ riverine vegetation associated with the Gwydir River, Mehi River, and Duffys and Skinners creeks
- ▶ native grasslands within the Crown land travelling stock reserve (TSR) areas to the north of the proposal.

Vegetation within and in the vicinity of the proposal site is further described in Chapter 10: Biodiversity.

Topography

The slope of a site can also influence the rate of spread of fire, with a doubling of the rate of spread for every slope increase of 10 degrees. As a result, a bushfire hazard downslope of a site would pose a greater risk as the bushfire would travel upwards, with a corresponding increase in flame height and intensity.

The proposal site rail corridor is located within an alluvial floodplain, crossing the Goondiwindi thrust fault east of Camurra, and passing into the New England Fold Belt. It is therefore mostly flat with only minor undulation around waterways.

25.3.3.2 Climate

Typical climate information based on historical data for Moree is summarised below, based on the Bureau of Meteorology (bom.gov.au/nsw/moree/climate.shtml). Average maximum temperatures range from 19°C in the winter to 33°C in the summer months. Average minimum temperatures range from between 4°C and 5°C in the winter to between 18°C and 20°C in the summer. In winter, the minimum is below zero on an average of 10.4 days. In summer, on average, more than 25 days reach over 35°C. Fog is generally rare with occurrences 1 or 2 days per month from May to September.

The Gwydir catchment is characterised by a temperate to sub-tropical climate, with a considerable gradient from east (cooler and wetter) to west (hotter and drier). Average rainfall ranges from 1000 millimetres (mm) per year in the east to around 500 mm in the west. Annual rainfall at Moree totals around 600 mm (Department of Primary Industries (DPI), 2018).

Prevailing weather associated with the bushfire season near the proposal site is high daytime temperatures and low relative humidity with winds from the north-west. Dry lightning storms are common during this period. November is typically the worst month for larger fires.

Changes in climate conditions are anticipated for the future and are discussed in Chapter 22: Climate change. Climate change impacts are likely to result in an increase in average temperatures, increased intensity of extreme rainfall events, decrease in average rainfall, increase in extreme weather events, and harsher fire conditions.

25.3.3.3 Flooding

The proposal crosses the Mehi River and Gwydir River, Skinner's Creek, Duffys Creek, two unnamed creeks and two irrigation canals. The entire length of the proposal site is located within an area that has been subject to significant flooding. The Mehi–Gwydir floodplain is a complex floodplain where flooding can have significant impacts on the local area, including extensive flooding events of the town and farming communities.

Flooding is discussed in further detail in Chapter 12: Hydrology and flooding impact assessment and Technical Paper 4: Hydrology and Flooding Impact Assessment.

25.3.3.4 Subsidence

The proposal is not identified to be within a mine subsidence zone and risk of subsidence is considered to be negligible.

25.3.4 Contamination

A search of the EPA record of notices under section 58 of the *Contaminated Land Management Act 1997* (NSW) (CLM Act) and list of notified sites under section 60 of the CLM Act was carried out in October 2020. The search did not identify any sites within, or in 250 m of, the proposal that are registered in the NSW EPA record of notices or list of notified sites. The EIS prepared by GHD in 2017 did, however, find four sites on the list of contaminated sites notified to the EPA within 250 m of the proposal (GHD, 2017). Potential sources of contamination associated with historic rural and agricultural uses and rail activities were identified.

Railway corridors have the potential to contain various contaminated materials from historical and operational sources. Such sources relate to the long-term operation of the railway and the history of nearby contaminating activities. Possible sources of contamination may include fill materials, hazardous materials from structures, leaks and spills of fuels or chemicals, historical use of pesticides and asbestos dust from train brake pads.

Overall, no areas within the proposal site have been identified to contain significant quantities of chemicals or materials indicating high risk of contamination. Contaminated land is discussed in Chapter 20: Soils and contamination. Three locations have been recorded in the ARTC contaminated land register within the rail corridor between Alice Street/Gwydir Highway intersection and the Mehi river bridge. Further information on the nature of these records was not available at the time of preparing this assessment.

25.4 Impact assessment

25.4.1 Risk assessment

25.4.1.1 Potential impacts

The environmental risk assessment for the proposal is included in Appendix C: Environmental Risk Assessment, which provides an assessment of the potential health and safety risks. The assessed risk level for the majority of potential risks to health and safety is high. Assessed risks included:

- ▶ rupture of, or interference with, underground utilities and services during construction
- ▶ exposure to hazardous materials due to inappropriate transport and storage of hazardous substances and dangerous goods during construction
- ▶ reduced safety for road users and pedestrians during construction
- ▶ safety risks to residents due to the presence of construction machinery

- ▶ increased bushfire risk as a result of construction works, due to the presence of heat-generating machinery and flammable substances
- ▶ safety risks to workers due to, among other factors, construction machinery, hazardous chemicals and, potentially, fatigue.

25.4.1.2 How potential impacts have been avoided

Potential impacts have been avoided through:

- ▶ managing construction and operation activities in accordance with relevant legislative and policy requirements, as described in section 25.2.2
- ▶ designing, constructing and operating the proposal to minimise impacts to health and safety
- ▶ implementing the management and mitigation measures provided in section 25.5.

25.4.2 Construction

25.4.2.1 Dangerous goods and hazardous materials

Construction of the proposal would require the storage and handling of dangerous goods and hazardous materials that have the potential to impact the surrounding receivers, including the local community and environment, in the result of a leak and spill. This may include the potential contamination of air, soils, surface water, and/or groundwater.

The RH SEPP includes thresholds for the storage and transport of dangerous goods. These thresholds represent the maximum amounts of dangerous goods that can be stored or transported to and from a proposal site without presenting a significant offsite risk.

A summary of dangerous goods that may be used during construction of the proposal compared to the storage and transport thresholds in *Applying SEPP 33* is provided in Table 25-1.

In general, low volumes of dangerous goods would be stored in construction compounds for the proposal, with quantities not expected to approach the RH SEPP thresholds. Exceedance of the RH SEPP thresholds is highly unlikely. The quantity of these materials would be limited to the demand from construction activities to prevent excess quantities, which may increase the risk. Refer to section 25.5.1.2 for further detail.

TABLE 25-1 DANGEROUS GOODS VOLUMES AND RH SEPP THRESHOLDS

Proposal			RH SEPP thresholds		
Dangerous goods	Australian Dangerous goods class code	Proposed storage method	Storage volume	Minimum distance from sensitive receivers	Transport (weekly)
Petrol	C3 ¹ ; 3 PG II ²	20 litre (L) drums	Greater than 5 tonnes (t) if stored with other Class 3 flammable liquids	5 m	N/A if transported with Class 3 dangerous goods
Diesel	C1 ¹ ; 3 PG III ²	20 L drums	Greater than 5 t if stored with other Class 3 flammable liquids	5 m	N/A if transported with Class 3 dangerous goods
Lubricating and hydraulic oils and greases	C2	20 L drums	N/A	N/A	N/A if transported with Class 3 dangerous goods
Cement	N/A	Bags or pallets	N/A	15 m	Not subject to thresholds
Acetylene	2.1	Cylinders (up to 55 kg)	Greater than 100 kg	5 m	2 t, 30 times per week
Epoxy glue	3 PG III	Small containers	Greater than 5 t	N/A	10 t, 60 times per week
Premix concrete	N/A	Bags or pallets	N/A	5 m	Not subject to thresholds
Shotcrete accelerator	3 PG III	1,000 L immediate bulk containers (IBCs)	Greater than 5 t	5 m	3 t, 45 times per week
Acids	8 PG II	1,000 L IBCs	Greater than 25 t	N/A	2 t, 30 times per week

Proposal		RH SEPP thresholds			
Dangerous goods	Australian Dangerous goods class code	Proposed storage method	Storage volume	Minimum distance from sensitive receivers	Transport (weekly)
Bases	8 PG II	1,000 L IBCs	Greater than 25 t	N/A	2 t, 30 times per week
Disinfectant	8 PG II	500 L IBCs	Greater than 50 t	N/A	2 t, 30 times per week

1. Classified as C1 if not stored with other Class 3 flammable liquids
2. Classified as 3PGIII if stored with other Class 3 flammable liquids

25.4.2.2 Extreme weather

Bushfire

The proposal may have the potential to ignite fires during construction. Predominantly, this would be anticipated to occur during clearing activities, where vegetation would be present within the work area, or from working adjacent to vegetated areas. Potential ignition sources relevant to the proposal's construction include the discarding of cigarettes and domestic rubbish (such as glass bottles) by construction workers and the generation of sparks through hot works, such as welding or excavator buckets, making contact with rock or rail track.

Fuel leaks and spills from plant and machinery, and the storage of flammable goods during construction, could also provide a fuel source for bushfires if ignited.

Flooding

The proposal would have the potential to impact flood behaviour, including increasing flood levels and velocities at selected receivers during construction. Impacts are anticipated in areas involving temporary works that would modify the existing rail formation, resulting in altered surface water flow conditions.

High flow velocities and/or deep flood waters could lead to safety risks and hazards to residents, road users, personnel and equipment. Flooding may cause inundation and damage to construction plant and equipment, resulting in risks from discharge of construction materials to the surrounding environment. There may also be restricted access to residential properties and ancillary construction areas. Health risks associated with flooding include surface water contamination if chemical storage areas are breached and hazardous chemicals migrate offsite. For further detail on the potential risks associated with flooding during the construction phase, refer to Chapter 12: Hydrology and flooding impact assessment.

25.4.2.3 Utilities

The potential rupture of underground utilities during excavation or collision of plant and equipment with aboveground services could pose safety risks.

Construction of the proposal may have the potential to impact utilities, including unidentified utilities, from damage or severance during excavation. Damage to aboveground services may also occur from collision with construction plant and equipment. These scenarios could pose safety risks and result in short-term outages. In addition to service disruptions, potential impacts caused by utility strikes include:

- ▶ water pipeline interference leading to flooding (causing environmental damage and/or sink holes), health impacts or personal injury
- ▶ below or aboveground electrical cable interference leading to electrocution or fatality.

Health and safety impacts associated with encountering utilities would be minimised by undertaking further utilities investigations, including intrusive investigations, and consulting with service providers during detailed design.

25.4.2.4 Contamination

The risk of encountering contamination at the site is low, with isolated areas of moderate risk, as discussed in Chapter 20: Soils and contamination; however, there are particular health risks associated with working within the rail corridor, as excavation works may expose workers to asbestos or silica dust. There is, therefore, a potential health and safety risk to construction workers and the community through inhalation and/or direct contact or impacts to the environment due to contamination of land.

Health and safety impacts associated with potential exposure to contaminated and hazardous materials would be minimised through implementation of an unexpected finds protocol and waste management plan that would be prepared as part of the Construction Environmental Management Plan (CEMP).

25.4.2.5 Emergency vehicle movements

Impacts to emergency vehicle movements may occur from disruption of traffic and access. These impacts are discussed further in Chapter 11: Traffic and transport. Access to the construction sites would generally be from Moree via the Newell Highway, Gwydirfield Road and Back Pally Road. A rail maintenance access road (RMAR) runs parallel to the rail line along the majority of the alignment and would provide a haul route. The proposal would result in disruption to traffic and access from construction vehicles using the local network, as well as temporary road closures and diversions at the location of level crossings. The results of the traffic and transport impact assessment concluded that with the implementation of mitigation, these impacts would be minor.

Impacts would be managed through implementation of a traffic, transport and access management sub-plan within the CEMP. Ongoing liaison with local councils, Transport for NSW (TfNSW) and emergency services would be undertaken as part of the detailed design, to identify additional measures to mitigate any potential impacts to emergency vehicle movements due to construction traffic.

At various stages of construction, the proposal may improve access for emergency services to areas through the use of construction access routes and work areas that would be made available to emergency vehicles if required.

25.4.2.6 Subsidence

Construction of the proposal may result in localised dewatering; however, the risk of subsidence is considered to be low. Further discussion of groundwater is provided in Chapter 14: Groundwater.

The proposal does not include the excavation of tunnels or other subsurface activities. Based on the nature of the works being undertaken and the existing environment, the risk of subsidence as a result of construction is considered negligible.

25.4.2.7 Community safety

All construction works carry with them a level of potential health and safety risks to the public, including landowners and road users. Health and safety values relevant to the community include air quality, vibration, noise and public health.

Dust, particulate, odour and vapour are likely to be generated during construction, particularly in the vicinity of worksites, areas of surface works, road works and spoil transport offsite. Chapter 24: Air quality and greenhouse gas details the likely impact to the local air shed, and mitigation measures that would be implemented to minimise potential impacts.

Community values relating to noise and vibration during construction are likely to occur through use of noise- and/or vibration-intensive equipment, and movement of construction vehicles and haulage trucks. The likely noise and vibration emitted during construction has been investigated and is detailed in Chapter 16: Noise and vibration, which also includes mitigation measures to alleviate noise and vibration impacts.

Human and public health may be impacted during construction because of the transport, use and offsite disposal of hazardous substances, as well as waste generation disposal and treatment. Issues and mitigation strategies relating to handling, management and disposal of waste are described in Chapter 21: Waste.

25.4.2.8 Workplace safety

The health and safety values of the construction workforce are associated with their exposure to, and use of, safe construction practices. Safe construction practices are critical when the workforce is required to work in the vicinity of, or operating, heavy equipment, within operating rail and road corridors, with electricity, with chemicals/dangerous goods, or at heights.

Other health and safety risks associated with construction of the proposal that may impact site workers are limited to general risks or risks from environmental phenomena, including:

- ▶ operation of vehicles and construction equipment
- ▶ movement of construction material to and from the proposal site
- ▶ plant and equipment failures or incidents resulting in flooding, inundation or excavation collapse
- ▶ construction work during environmental and climatic conditions that may pose a hazard, including storms, flooding, heatwaves or bushfires.

These risks are generally considered to be common to all construction sites and managed through standard controls and mitigation, in accordance with workplace health and safety legislation, including development of a work health and safety management plan and safe work method statements for the proposal.

NSW workplace safety laws require construction sites to have adequate site security, which includes appropriate fencing. All construction work would be undertaken in isolation from the general public. The construction contractor would need to ensure that construction sites are always secure and take all possible actions to prevent entry by unauthorised persons.

25.4.3 Operation

25.4.3.1 Dangerous goods and hazardous materials

Minor quantities of dangerous goods would be required during operation of the proposal, compared to construction. No additional dangerous goods to those detailed in section 25.4.2 would be required.

Freight train movements would include transport of hazardous materials and dangerous goods. This would have the potential to cause impacts to the surrounding community and the environment through leaks and spills. The transport of hazardous materials and dangerous goods would be the responsibility of the freight operator/s and would be undertaken in accordance with relevant standards and regulatory requirements, including the Australian Dangerous Goods Code and ARTC's standard operating procedures.

25.4.3.2 Extreme weather events

Bushfire

The potential for bushfire within the surrounding environment during operation of the proposal would be similar to the existing environment; however, the likelihood of operational activities resulting in ignition of a fire would be reduced from construction. Notwithstanding, potential impacts from operation and maintenance activities such as sparks from train movements, littering, rail grinding and welding may ignite a fire if not adequately managed. Mechanical failure of trains and rail infrastructure may also result in the ignition of a fire.

Flooding

Some changes in the velocity and depth of flooding is expected during operation of the proposal due to the elimination of the existing rail overtopping mechanism and replacement with flow under the rail via new/upgraded cross drainage structures.

While some flood velocity increases are expected around the inlets and outlets of some culverts, these impacts are very localised to the rail corridor. Other areas where velocity impacts are anticipated away from the rail corridor are also very localised and are confined to existing drainage channels. Sensitive receivers are not expected to experience increases in flood velocities. Considering the proposed EIS flood design, flood levels are generally expected to slightly increase downstream of the rail corridor and decrease in the upstream areas. For nearby residential properties, localised increased flooding may occur during 1% or 2% annual exceedance probability (AEP) events. During such events, most residential properties would experience flood level increases of between 10 and 20 mm.

While flood modelling for the proposal identified changes in flood depths and velocities, this is not expected to significantly impact the existing flood hazard across the majority of the proposal site. Flood hazard would be considered highest at Moree due to proximity to residential properties.

Further detail on flood hazard is provided in Chapter 12: Hydrology and flooding impact assessment and in Technical Paper 4: Hydrology and Flooding Impact Assessment the EIS.

25.4.3.3 Emergency vehicle movements

Access to all existing roads would be re-established during operation of the proposal and no disruption to access for emergency vehicles would occur.

A total of nine level crossings are located along the proposal site. Of these, three are located on public roads and six crossings are located on private roads. There is expected to be no increase in traffic on the road network as a result of the proposal. The increased delay at intersections and level crossings is expected to have a localised impact only; in particular, through movements on the Newell Highway are not likely to be affected. Consideration of any potential traffic delay from level crossings is discussed further in Chapter 11: Traffic and transport and is not considered to be significant.

Overall, the proposal is expected to have a positive impact on the road network by:

- ▶ relocating some of the road freight task to rail, thereby reducing the heavy vehicle freight traffic on the roads both within the study area and in the greater NSW network
- ▶ improved safety at level crossings through provision of signals and the relocation of one level crossing at Back Pally Road
- ▶ improved safety on the Newell Highway by improving any short-stacking issues where additional space is provided for trucks leaving the Newell Highway to cross private level crossings.

25.4.3.4 Community safety

During operation, community values relating to air quality and vibration are expected to be limited but may result from maintenance activities. Noise impacts are likely to result from the freight services using the new rail line; however, based on the noise assessment detailed in Chapter 16: Noise and vibration, noise impacts are expected to be low due to the distance between the rail line and sensitive receivers, except for those properties immediately adjacent to the rail corridor.

There would be minor impacts to pedestrians and cyclists given the generally low volumes within most of the proposal area. Pedestrians and cyclists using the Alice Street and Moree Station pedestrian crossings may experience some additional delay during operation as a result of increased frequency and length of trains. Alice Street and Moree Station are included within the N2NS Phase 1 project area; however, the impact to residents in this area is considered relevant to Phase 2 as well.

The proposal would utilise a variety of treatments (including signage and signalling at some crossings) to maintain the efficiency of the existing road network despite the increase in train numbers, while also reducing the overall number of level crossings to improve safety.

The proposal would be designed to maintain safety in accordance with relevant design standards and legislative requirements. This includes undertaking maintenance and repair works in accordance with ARTC's standard operating procedures.

Potential risks to health and safety may also occur from lack of knowledge within the community and the introduction of a new rail corridor. To mitigate this risk, community education programs would be implemented prior to and during operation to provide information about Inland Rail operation and safety, particularly at level crossings.

25.4.3.5 Subsidence

The proposal is currently not within a mine subsidence zone and potential future mining activities in the area would be governed by regulation preventing the development of mines within the easement of the rail corridor; therefore, risk of subsidence during operation of the railway corridor is considered to be negligible.

25.4.3.6 Contamination

The main risk of contamination during operation of the proposal is from accidental spillage of petroleum, chemicals or other hazardous materials as a result of leakage or rail accidents, which could result in pollution of the surrounding environment; however, no impacts are anticipated as existing ARTC procedures are to be implemented to manage potential leaks and spills.

25.5 Mitigation and management

25.5.1 Approach to mitigation and management

25.5.1.1 Emergency response

During construction, an emergency response sub-plan would be prepared to manage emergency responses, including:

- ▶ protocols and procedures to be followed in the event of an emergency
- ▶ roles and responsibilities
- ▶ traffic management/control systems in case of emergency
- ▶ training and induction programs for construction staff
- ▶ measures to address the potential environmental impacts of an emergency
- ▶ management of rail corridor vegetation to prevent the spread of bushfires.

The emergency response plan would be developed in consultation with relevant state and regional emergency service providers, including:

- ▶ NSW Ambulance—for the provision of first aid, transport of injured, or establishment of casualty clearing station if required
- ▶ NSW RFS—for control or negation of fire or explosive situations, rescue of trapped or injured persons, or control of chemical emergencies

- ▶ State Emergency Service—for provision of personal and equipment, assistance with traffic and crowd control, evacuation of persons, construction of earth bunds, or other assistance
- ▶ Police—for traffic control, crowd control, evacuation of persons, or coordination of rescue of trapped or injured persons.

The Local Emergency Management Committee (LEMC) and Local Emergency Management Officer (LEMO) would be the point of contact for these organisations.

25.5.1.2 Management of dangerous goods and hazardous materials

The approach for mitigation and management during construction would be implemented through the CEMP, which would include measures for the management of dangerous goods and hazardous materials, including:

- ▶ requirements for the storage, handling, and transport of dangerous goods and hazardous materials in accordance with relevant regulatory requirements and ARTC's standards
- ▶ a spill response procedure including notification and clean-up requirements in the event of a spill.

Mitigation and management during operation of the proposal would be undertaken in accordance with ARTC's existing Safety Management System and associated procedures.

25.5.1.3 Community safety

A safety awareness program would be developed and implemented to educate landowners and the broader community regarding safety around trains. This would focus on community and rural property operators who cross the rail corridor to access their properties.

25.5.2 Consideration of the interactions between mitigation measures

Mitigation measures to control impacts to health and safety of workers, visitors and the public may replicate mitigation measures proposed for the control of impacts associated with Chapter 11: Traffic and transport, Chapter 13: Surface water quality, Chapter 16: Noise and vibration, Chapter 21: Waste, and Chapter 24: Air quality and greenhouse gas.

All mitigation measures for the proposal would be consolidated and described in the CEMP. The plan would identify measures that are common between different aspects. Common impacts and common mitigation measures would be consolidated to ensure consistency and implementation.

25.5.3 Summary of mitigation measures

The measures outlined in Table 25-2 would be implemented to mitigate the potential impacts to health and safety for the proposal.

TABLE 25-2 MITIGATION MEASURES

Ref	Impact	Mitigation measures	Timing
HS-1	Public safety	A hazard analysis would be undertaken during detailed design to identify risks to public safety from the proposal, and how these can be mitigated through safety in design.	Detailed design
HS-2	Utilities	The location of existing and planned utilities, services and other infrastructure would be identified prior to construction to determine requirements for access to, diversion, protection and/or support. ARTC would continue to consult with the affected landowner and alternative access arrangements would be provided to ensure safe access to residential property.	Detailed design
HS-3	Utilities	All structures would be located in accordance with ARTC's <i>Engineering Standard for Requirements—Electric Aerials Crossing ARTC Infrastructure</i> (ARTC, 2005) to ensure that electrical wires over ARTC rail would not fall outside the corridor and would not present any hazard to the public.	Detailed design/ Construction
HS-4	Utilities	Dial Before You Dig would be used prior to commencement of works to identify and confirm the presence of any utilities including telecommunication cables.	Detailed design/ Construction

Ref	Impact	Mitigation measures	Timing
HS-5	Materials handling and storage	All liquid chemicals, oils, fuels and liquid wastes would be stored in a bunded storage area in accordance with relevant and applicable legislation, regulations or Australian Standards. This would include appropriate design, controls and procedures to eliminate, minimise and manage the water/liquid potentially present in the bund. All bunding and hydrocarbon and chemical storage areas would be routinely checked, and their integrity and functionality maintained.	Detailed design/ construction
HS-6	Materials handling and storage	A response plan to deal with accidental spills and leaks would be included as part of the hazardous chemicals, handling and storage sub-plan, developed as part of the CEMP.	Construction
HS-7	Materials handling and storage	Appropriate register and records of chemicals, hydrocarbons, and hazardous substances and materials onsite would be maintained as required by relevant legislation, regulations and proposal approval conditions. Where appropriate, this would include a relevant risk assessment prior to the substance coming to, and being used onsite, a Safety Data Sheet (SDS) Register and any safety signage required.	Construction
HS-8	Materials handling and storage	Spill kits would be clearly signed and maintained, and located near work zones, chemical, oil and fuel storage locations or within vehicles. An appropriate risk assessment would be completed to ensure that all high-risk locations for spills have an appropriate spill kit in the vicinity. Appropriate spill kit types would be located for the particular substance that may be spilt (i.e. hydrocarbon, general or Hazchem spill kit).	Construction
HS-9	Materials handling and storage	All spills would be contained and cleaned up as per the spill and incident response procedures included in the CEMP or ARTC operations Environmental Management System (EMS).	Construction
HS-10	Materials handling and storage	Staff would be trained in the use of spill kits and associated equipment, and associated records would be retained.	Construction
HS-11	Asbestos	In the event that works would disturb older infrastructure or other areas that have the potential to contain asbestos, works would be undertaken in accordance with the <i>Safe Work Australia Model Code of Practice—How to Manage and Control Asbestos in the Workplace 2016</i> (Safe Work Australia, 2020) and <i>Safe Work Australia Model Code of Practice – How to Safely Remove Asbestos 2018</i> (Safe Work Australia, 2018).	Construction
HS-12	Dangerous goods	Licensed transporters operating in compliance with <i>Australian Code for the Transport of Dangerous Goods by Road & Rail</i> (National Transport Commission, 2020) would be used for dangerous goods deliveries. Freight carts would be required to display appropriate Hazchem signage, including placards, and carry appropriate spill-containment equipment to be used by emergency services personnel in the event of an emergency.	Construction and Operation
HS-13	Materials handling and storage	A hazardous substances and dangerous goods risk management strategy would be developed to manage the potential for risks in situations where the minimum distance from sensitive receivers cannot be achieved, or the quantity of hazardous materials exceed relevant planning policy or regulatory threshold levels.	Construction
HS-14	Physical hazards	Materials and machinery would be stored tidily within works areas or construction compounds and within fenced areas so as to be inaccessible to the public.	Construction
HS-15	Road safety	Truck loads would be covered.	Construction
HS-16	Health and community wellbeing/workforce management	A workforce safety plan that references the ARTC Safety Management System would be prepared and would outline any specific actions to ensure the safety of workers across the project area.	Construction
HS-17	Health and community wellbeing	Key community safety risks associated with construction and operational activities would be identified.	Construction

Ref	Impact	Mitigation measures	Timing
HS-18	Health and community wellbeing	A rail safety awareness program would be developed and implemented prior to the operation of Inland Rail to educate the community regarding safety around trains. This would include landowners with properties that are intersected by the proposal.	Construction
HS-19	Health and community wellbeing	Direct construction exposure to respirable silica and other airborne contaminants would be controlled through the use of appropriate personal protective equipment.	Construction
HS-20	Bushfire	The ARTC <i>Engineering (Track and Civil) Code of Practice—Section 17 Right of Way: Vegetation Management</i> (ARTC, 2013) would be implemented to minimise fire risk within the rail corridor, which includes specifications for vegetation management/fire hazard reduction within the corridor.	Operation