CHAPTER 24

Conclusions

HELIDON TO CALVERT ENVIRONMENTAL IMPACT STATEMENT

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.

Contents

24. Conclusions

This draft Environmental Impact Statement (EIS) has considered the potential environmental, social and economic impacts and benefits from the construction and operation of the Helidon to Calvert (H2C) section (the Project) of the Inland Rail Program (Inland Rail). It has been prepared in accordance with the requirements of the *State Development and Public Works Organisation Act 1971* (SDPWO Act) (Qld) and the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). It also addresses the Terms of Reference (ToR) for an EIS: Inland Rail—Helidon to Calvert Project, dated October 2017.

24.1 Overview

Australian Rail Track Corporation (ARTC) proposes to construct and operate the Project, located in South East Queensland. The Project is both a greenfield and brownfield development, with approximately 50 per cent of the alignment co-located within an existing rail corridor.

Key components of the Project are:

- Approximately 47 km of new single-track, dual-gauge rail line within greenfield and brownfield corridors with four crossing loops (Helidon, Gatton, Laidley and Calvert, each a minimum 2,200 m in length)
- An approximately 850 m long tunnel through the Little Liverpool Range and bridges to accommodate topography and Project crossings of waterways and other infrastructure
- Associated rail infrastructure to support operations including maintenance sidings, signalling infrastructure and the train management system
- Rail crossings including level crossings, grade separations/road overbridges, occupational/private crossings and fauna crossing structures
- Approximately 34 km of embankments (excluding structures) and 3,638,000 m^3 of cuttings
- Tie-ins to the eastern end of the Gowrie to Helidon (G2H) Inland Rail Project, the western end of the Calvert to Kagaru (C2K) Inland Rail Project and the existing West Moreton System rail corridor (with the proposed rail corridor running parallel for approximately 24 km)
- Ancillary works including road and public utility crossings and realignments, signage and fencing and provision of services within the corridor
- Construction worksites, laydown areas and access roads
- Crossings of defined watercourses under the *Water Act 2000* (Qld) and waterways for waterway barrier works waterways under the *Fisheries Act 1994* (Qld).

The corridor required for the Project is expected to comprise a width of 40 m to 62.5 m and extending wider where earthworks, structures and other associated infrastructure are required. For the existing rail corridor, the current width has been generally maintained (where possible), and locally widened to accommodate the works.

The corridor will be of sufficient width to accommodate the infrastructure currently proposed for construction, catering for trains up to 1,800 m in length, potentially double stacked, and designed not to preclude the future extension of some crossing loops to accommodate 3,600 m trains.

Construction of the Project is planned to start in 2021 following detailed design and subject to required post-EIS approvals and procurement of a contractor. With commencement in 2021, completion is targeted for 2026. The Project will be operational when all 13 sections of Inland Rail are complete. It will be managed and maintained by ARTC with train services provided by a variety of operators.

Inland Rail will be used by an average of 33 train services per day in 2026, increasing to an average of up to 47 train services per day in 2040 (when the line is at full capacity). Annual freight tonnages are expected to increase in parallel, from 39 million tonnes per year in 2026 to 59 million tonnes per year in 2040.

Due to the Project's length, significant infrastructure elements (including the tunnel) and earthworks required for the crossing of Little Liverpool Range, a capital expenditure in the order of $1 billion is expected (ARTC, 2017a)—this includes both direct construction costs and indirect costs. Indirect costs include items such as: Contractor overhead and margins, contingency, and escalation. The total investment figure also includes ARTC Program costs such as project management, train control systems, property requirements and insurances. The total investment figure makes provision for expected Project contingency and risk.

The EIS assumes an estimated capital cost profile of approximately $565 million, based on 2019 dollars, consistent with the *Inland Rail Programme Business Case* (ARTC, 2015a). The EIS capital cost profile is an estimate of direct construction costs—including, but not limited to: delivering environmental and heritage commitments; fencing and earthworks; tunnels and tunnel services; formation and roadworks; structures; track works (loops and crossings); delivery works (incidentals and utilities); and supply of track, sleepers and turnouts.

24.2 Rationale for Inland Rail

24.2.1 Project justification

Australia's freight task is set to experience significant growth over the coming decades. The existing freight infrastructure cannot support this projected growth, with increasing pressure on already congested roads and rail lines through Sydney and increasing use of heavy trucks such as B-doubles and B-triples along the Hume, Pacific and Newell Highway.

Inland Rail will address the growing freight task by helping to move freight off the congested road network and moving interstate freight off the congested Sydney suburban rail network. It provides a reliable road-competitive solution to the freight task and enables the commercial and social benefits of rail to be leveraged to meet Australia's long-term freight challenge.

Inland Rail is needed to respond to the growth in demand for freight transport and to address existing freight capacity and infrastructure issues. As one of the missing links, the Project is a critical component of Inland Rail.

24.2.2 Direct and indirect benefits

Inland Rail presents a unique opportunity to establish a competitive freight system. Inland Rail, and the Project, will provide trunk rail infrastructure that supports a network of intermodal terminals and local sidings used to distribute commodities at the national, regional and local level.

24.2.2.1 Direct benefits

Direct benefits of Inland Rail, and the Project, include:

- **Access to and from regional markets:**
  - Improved linkages to regional areas for inter-capital freight
  - Improved mine-to-port accessibility between coal mines in the Surat and Clarence–Moreton Basins and the Port of Brisbane
  - Improved access from agricultural areas and regions to key local and international markets and ability to move greater volumes of product via rail (the preferred mode).
- **Reduced costs for the market:**
  - Reduced inter-capital freight transport costs for the market and lower prices for consumers (predominantly manufactured goods)
  - Reduced lifecycle costs for infrastructure owners/operators on the coastal route and road network (i.e. Newell, Warrego and Pacific Highways) due to lower freight volumes on these assets
  - Reduced transport costs may make economic activity more competitive, particularly in the agricultural and resource sectors
  - Reduced above rail costs for freight in the Surat and Clarence–Moreton Basins
  - Reduced operating costs for freight currently travelling by road due to economies of scale of rail relative to road transport.
- **Reliability and certainty of transit time:**
  - Improved reliability and certainty of transit time results in productivity and economic efficiency from: operating cost savings; shorter transit times; improved availability; and, reduced incidents on the coastal route
  - Benefits associated with higher axle loads, longer trains, lower gradients, longer curves, resulting in shorter transit times and avoided incidents (such as flooding)
  - Linkages between existing rail networks, such as the existing West Moreton System rail corridor and the Brisbane to Sydney Interstate Lines.
  - Replacement and upgrade of railway infrastructure within existing corridors used by Inland Rail with new linkages and upgraded infrastructure would combine to enable faster transit time on existing journeys.
- **Capacity of the transport network:**
  - Increased capacity providing the opportunity to return unused freight paths to passenger trains in Sydney and Brisbane (with improved customer outcomes from increased frequency of passenger services)
  - Increased freight capacity enabling great volumes of inter-capital freight to be moved via rail with a reduced reliance on existing State-controlled and local road networks and improved capacity on QR rail networks
  - Greater volumes of freight using rail in accessing key local and international markets.
- **Distances travelled:**
  - Reduced time between the point of source and the market for goods and produce
  - Shorter route options for existing rail journeys.

- **Road safety:**
  - Reduction of 200,000 long-haul truck movements from roads each year
  - Reduced congestion and increased capacity on existing road and rail networks
  - Reduced truck volumes in over 20 regional towns.
- **Sustainability:**
  - A long-haul freight solution that is time- and cost-competitive when compared to road—with reduced road congestion
  - Fewer vehicular carbon emissions from the transportation of freight by rail.

24.2.2.2 Indirect benefits

Indirect benefits of Inland Rail, and the Project, include:

- **Create a step-change in the Australian freight network**
  - Faster and more reliable transit times
  - Shorter alignments and more optimal grades
  - The potential for double stacking and longer and heavier axle load trains
  - Improved reliability, resilience and accessibility of the freight network.
- **Be a catalyst for growth**
  - Inland Rail will future-proof Australia's freight task against road congestion associated with population growth and the projected increase in freight demand, increasing productivity in major capital cities
  - Delivering new jobs during construction
  - Increasing Australia's gross domestic product (GDP) by $16 billion during its construction and first 50 years of operation
  - Improved safety of the transport network, with separation of freight and passenger modes in urban and regional environments.
  - At a local level, the Project has the potential to catalyse development through:
    - **Employment**—the construction workforce drawn primarily from local and regional communities with employment and training benefits and the availability of long periods of employment in Project construction—a positive opportunity for those regional personnel and their families

      The Project estimates an annual average of 190 full-time equivalents (FTEs) may be required onsite across the full construction period. Over the estimated construction period of 200–205 weeks, this equates to approximately 730–750 FTEs.
    - **Business opportunities**—local and regional businesses will benefit from the construction phase through local supply arrangements and procurement requirements and flow-on demand and additional spending by the construction workforce—leading to increased business activity in the region.
- **Be a facilitator of training and skills development**
  - ARTC's strong commitment to training local and Indigenous people will establish training pathways and creation of opportunities for the development of skilled local and Indigenous workers through the Project's construction
  - ARTC's Inland Rail Skills Academy, which is a collection of projects and partnerships aimed at:
    - Facilitating local employment and procurement opportunities regionally by 'priming the market' in each region in which Inland Rail would be constructed and making it easy for Inland Rail contractors to employ and procure trained, up-skilled and work-ready individuals locally.
  - ARTC's workforce development projects, training partnerships and the Inland Rail Skills Academy will help to ensure that young people and Indigenous people in the region have the opportunity for skills training that will prepare individuals for the construction industry.
- **Be an enabler of complementary market-driven investments**
  - Market-driven investment in complementary development opportunities and initiatives will be enabled throughout Inland Rail, from:
    - Intermodal terminals, loading facilities and sidings
    - Rollingstock investment in longer and heavier trains
    - Train operations to take advantage of the improved offering (e.g. reliability and transit times)
    - Double-stack capacity and ability to accommodate 1,800 m trains initially (and accommodate up to 3,600 m trains in the future)
  - Investment in better connecting the rail network in south-west Queensland to the Port of Brisbane.

24.2.3 Consequences of not proceeding with the Project

Addressing the continuing growth in freight demand requires a solution. Not progressing with Inland Rail will constrain national productivity and economic growth.

Not proceeding with the step-change solution offered by Inland Rail means freight task efficiency and performance will not be realised, pressure on the road networks will continue to increase, freight costs will continue to rise, consumer costs will continue to increase, and productivity in important industry sectors will decline.

The Project is a key missing link in the wider Inland Rail Program between Melbourne and Brisbane. The Project connects the Inland Rail alignment through key regions of Queensland, including the Lockyer Valley and Ipswich regions, which support the greater Brisbane region through agriculture.

24.3 Assessment approach

This EIS has been prepared to address the ToR and provides analysis and assessment of potential environmental and socio-economic impacts from the Project.

24.3.1 Methodology

For each of the environmental aspects assessed in the EIS:

- The study area was defined and the impact assessment method selected subject to the nature of the impact being assessed. Three different methods were used to assess potential impacts and opportunities: compliance assessment (quantitative), risk assessment (qualitative) and significance assessment (qualitative). The assessment method was adapted to meet the needs of each environmental aspect
- A desktop review of available information and spatial datasets was undertaken to establish existing conditions and relevant assessment-specific information
- If required, fieldwork was carried out to identify and/or ground-truth existing baseline conditions
- Potential impacts, benefits and opportunities were identified and assessed using criteria set out in legislation, guidelines or policies, or based on industry standards and best-practice methodologies
- A conservative ('worst case') approach was taken to assessing potential impacts of the Project including potential cumulative impacts.

Mitigation measures were then factored into the assessment. The initial mitigation measures adopted during the design minimised expected risks and additional mitigation and management measures were then proposed, where required, for future Project delivery phases.

With each design consideration and proposed measure in place, the residual level of potential impact was then assessed, with the effectiveness of proposed measures considered.

All relevant mitigation and management measures will be implemented as part of the Project Construction Environmental Management Plan and the Inland Rail Operational Environmental Management Plan—both of which will be developed during future delivery phases.

24.3.2 Community and stakeholder consultation

Consultation with a variety of key stakeholders and community members has been, and will continue to be, undertaken to understand key issues and obtain feedback.

The community and stakeholder engagement program:

- Raised Project awareness
- Verified the assessment methodologies and approach adopted for the EIS
- Provided opportunities for stakeholders to inform investigations (input on local values and potential constraints)
- Informed government agencies, stakeholders and the community about the progress of the Project and sought input and comment
- Allowed stakeholder and community issues to be understood and, where possible, addressed.

Consultation included:

- Stakeholder groups with specific interests in the Project, such as Traditional Owners, community groups and landowners
- Government agencies and departments (all levels), including those with either a regulatory or an advisory role associated with the Project.

Stakeholder and community feedback and comments received from all consultation tools and activities has informed the preparation of the EIS.

24.4 Assessment outcomes

24.4.1 Land use and tenure

The Project has the potential to result in direct and permanent impacts to land use and tenure, with the majority of impacts occurring immediately on commencement of land acquisition and construction of the Project. Potential impacts include:

- Changes in tenure and loss of property
- Disruption to land over which Native Title claims have been made
- Temporary and permanent changes in land use, including the loss of agricultural land and disruption to existing agricultural practices
- Impacts to accessibility, including the State and local road network and to private property
- Disruption, relocation and modification to existing services and utilities.

Between Helidon and Calvert, the temporary construction footprint (including the permanent Project footprint) traverses 341 properties and 37 easements. The permanent footprint traverses 193 properties and 36 easements. The permanent footprint will directly impact approximately 488.44 ha of land across 193 properties, of which approximately 60 per cent are freehold, 18 per cent are lands lease, 18 per cent are road, 2 per cent are reserve land and less than 1 per cent is State land or a watercourse.

The Project was designed to use the West Moreton System rail corridor and Gowrie to Grandchester future State transport corridor. Of the 193 properties within the permanent footprint, 23 are within the existing West Moreton System rail corridor and 57 properties are within the Gowrie to Grandchester future State transport corridor.

The Project will result in a number of land use benefits, including: the support of future industries and improved access to and from regional markets. The Project will also act as a catalyst for development.

Mitigation measures developed for the Project include:

- Refine the disturbance footprint further during detailed design to that required to safely construct, operate and maintain the Project, and minimise land acquisition, severance and disruption to land use, tenure and transport networks
- Where feasible, detailed design and construction planning aims to minimise alteration to the surrounding road and transport network and maintain legal property accesses
- Develop and implement a Reinstatement and Rehabilitation Plan for areas within the disturbance footprint that do not form part of the permanent works
- Develop and implement a Landscape and Rehabilitation Management Plan to define progressive and post-construction installation of the Project landscape design, and establishment, maintenance, monitoring and completion criteria.

24.4.2 Land resources

The assessment of land resources (soils, geology, salinity and contaminated land) identified the following potential Project-related impacts:

- A permanent change in landform and topography in catchments, influencing their ability to retain and move water
- Loss of natural soil resources including Class A and Class B agricultural land and Important Agricultural Areas
- Unexpected disturbance of acid sulfate soils
- Introduction of weeds that may change physical and chemical properties of soil
- Increased salinity of the landscape causing water table salting, irrigation water salting and erosion scalding
- Disturbance of contaminated land (soil and groundwater)
- Project activities leading to the generation of new contaminated land (soil and groundwater).

The majority of potential Project-related impacts to land resources were found to have low residual risk, following initial mitigation measures being incorporated into the design and the mitigation measures proposed for future Project delivery phases.

Changes to landform and topography, loss of soil resources and disturbance of existing contaminated land during the construction phase of the Project, each remained as a potential medium residual risk.

A Project Contaminated Land Management Strategy will be prepared prior to commencement of construction.

Erosion and sediment control plans will be prepared by a certified professional in erosion and sediment control, in accordance with the International Erosion Control Association Best Practice Erosion and Sediment Control.

Soil conditions across the disturbance footprint will be appropriately characterised at a suitable scale by a suitably qualified soil practitioner through additional geotechnical surveys during the detailed design phase of the Project to inform design and environmental management measures.

During detailed design, additional mitigation measures will be implemented to avoid potential fragmentation and sterilisation of Class A and Class B agricultural land and Important Agricultural Areas.

24.4.3 Landscape and visual amenity

The key landscape and visual impacts of the Project relate to the removal of vegetation, along with the provision of new infrastructure elements including embankments, deep cuts, tunnels, and new road and rail bridges. Further visual impacts of the Project include the effect of more frequent train movements through the region.

Eight Landscape Character Types (LCTs) have been identified to have up to high sensitivity to changes in the landscape character and values of the area. These LCTs were further distinguished into Landscape Character Areas, which are single, unique areas, and are the discrete geographical areas of a particular LCT. The impacts of the Project on these eight LCTs were assessed, and it was found that one LCT may experience impacts of up to high significance. The highest impacted LCT was Landscape Type H: Forested Uplands, which comprises the regionally significant Teviot and Little Liverpool Range scenic amenity areas.

Visual receptors considered within the landscape and visual amenity analysis have been identified as residents in the various population centres close to the Project alignment, and transient receptors such as commuters on roads, including the Warrego Highway and tourist drives (including part of the Cobb and Co trail).

There were 17 representative viewpoints assessed and three significant visual impacts were identified for the operation phase of the Project, including potential impact of the:

- Warrego Highway rail bridge on views from the highway
- Large embankment close to residential properties at Hardy Drive, Laidley
- Embankments and deep cuts at the foothills of the Little Liverpool Range on views from Douglas McInnes Drive near the existing rail line in Laidley.

The most significant effect on views during construction is expected in the Gatton central business district.

The requirement for specific mitigation to manage landscape and visual impacts, beyond ARTC's standard mitigation measures, is limited and constrained by practical and operational issues. The key specific mitigation proposed by ARTC is the development of a Reinstatement and Rehabilitation Plan. This plan will include landscape objectives and principles, as well as outline landscape and rehabilitation treatments, for various phases of Inland Rail. Visual representations have been included to highlight the potential for additional visual mitigation measures for the Project.

24.4.4 Flora and fauna

Project activities have the potential to impact on sensitive ecological receptors through:

- Habitat loss and degradation from vegetation clearing/removal
- Fauna species injury or mortality
- Reduction in biological viability of soil to support growth due to soil compaction and/or changes to groundwater conditions)
- Displacement of flora and fauna species from invasion of weed and pest species
- Reduction in the connectivity of biodiversity corridors
- Edge effects, barrier effects and habitat fragmentation
- Noise, dust, and/or light emissions
- Increase in litter (waste)
- Aquatic habitat degradation
- Erosion and sedimentation.

Assessment of sensitive ecological receptors against the relevant Commonwealth and State-significant impact assessment criteria indicated potential significant residual impacts (as a result of the Project) to:

- Matters listed under the EPBC Act (Project controlling provisions):

  Flora

  - Four-tailed Grevillea (*Grevillea quadricauda*)
  - Blunt-leaved Leionema (*Leionema obtusifolium*)
  - Lloyd's Olive (*Notelaea lloydii*)
  - A grass (*Paspalidium grandispiculatum*)

  Fauna

  - Spotted-tail Quoll (*Dasyurus maculatus maculatus*)
  - Collared Delma (*Delma torquata*)
  - Red Goshawk (*Erythrotriorchis radiatus*)
  - Swift Parrot (*Lathamus discolor*)
  - Brush-tailed Rock-wallaby (*Petrogale penicillata*)
  - Koala (*Phascolarctos cinereus*)
  - New Holland Mouse (*Pseudomys novaehollandiae*)
  - Grey-headed Flying-fox (*Pteropus poliocephalus*)
  - Australian Painted Snipe (*Rostratula australis*)

- Prescribed matters for Queensland:
  - Regulated vegetation (Category B (other than grassland) within a set distance from the defining banks of a relevant watercourse or relevant drainage feature)
  - Essential habitat
  - Protected wildlife habitat for the species:
    - Bailey's Cypress Pine (*Callitris baileyi*)
    - Swamp Tea-tree (*Melaleuca irbyana*)
    - Glossy Black-cockatoo (*Calyptorhynchus lathami*)
    - Powerful Owl (*Ninox strenua*).

In the detailed design phase of the Project, sensitive ecological features will be subject to further investigation. This further investigation will more accurately determine the magnitude of the significant, residual adverse impacts on the identified sensitive ecological receptors. Specific and targeted mitigation measures will be applied to reduce the potential significance of impacts, where feasible. Offsets will be applied where significant adverse impacts cannot be avoided or appropriately mitigated.

Where Project activities have cumulative, irreversible and/or permanent impacts on sensitive ecological receptors, even with the implementation of mitigation and management measures, suitable compensation mechanisms will be implemented. In these cases, recompense for any significant residual impact will need to consider one or more options of compensatory habitat, land rehabilitation, and/or contribution to research.

Provisions of offsets for the Matters of National Environmental Significance with significant residual impacts will be required under the EPBC Act Offsets policy. For Matters of State Environmental Significance, impacts to prescribed matters that are considered to constitute significant residual impacts will need to be offset consistent with the *Environmental Offsets Act 2014* (Qld).

The ARTC's Environmental Offset Delivery Strategy—Qld will inform the development of offset delivery components including an Environmental Offset Delivery Plan and Offset Area Management Plans. A Detailed Environmental Offset Delivery Plan and Offset Area Management Plans will be developed and implemented by ARTC prior to construction commencement.

24.4.5 Air quality

The results of the qualitative air-quality risk assessment show that the unmitigated air emissions from the construction phase of the Project pose a medium risk to human health (airborne dust concentrations) and a medium risk to potential amenity and aesthetic impacts (from dust deposition).

The construction dust sources associated with the Project are common emission sources. There are mitigation measures to reduce dust emissions for all the identified sources. It is expected that emissions can be well managed through diligent implementation of control measures.

For operations, dispersion modelling addressing line-source emissions (i.e. freight trains travelling along the main line) and point-source emissions (i.e. freight trains idling at crossing loops) was undertaken to assess the degree to which the Project complies with the specified air quality goals at adopted existing sensitive receptor locations.

The assessment of the operational phase of the Project, based on worst-case assumptions, conservative emission rates and conservative background concentrations, determined that compliance is predicted for all pollutant species for forecast volumes at all modelled receptors—this assumes the coal trains are veneered (consistent with current operational practices on the existing West Moreton System rail corridor). Although predicted Project contributions were not significant, impacts without veneering applied to coal trains indicated potential exceedances of particulate matter concentrations (annually averaged) when the modelled Project contributions were added to adopted background concentrations. Targeted management measures are proposed.

The assessment of potential impacts to tank water quality from Project operations (based on predicted dust deposition rates) determined ready compliance with all adopted drinking water guideline values prescribed by the National Health and Medical Research Council *Australian Drinking Water Guidelines* at all receptors. Potential odour emissions from the Project are considered minor and have been assessed qualitatively. Based on the nature of the sources associated with the Project and the receiving environment, it is expected that odour impacts on the nearest potentially affected sensitive receptors will not be significant.

Proposed mitigation measures for the Project construction phase include the implementation of an Air Quality Management Sub-plan and rehabilitation of exposed areas in accordance with the Reinstatement and Rehabilitation Plan.

During Project operations, appropriate dust and air quality management measures will be incorporated into the environmental risk management frameworks for each relevant third-party freight train operator. These will be established as part of future network access agreements. ARTC will require train operators to prepare suitably detailed environmental management plans for their operations—these plans will detail how the operator will manage any and all potential air quality risks. These plans will include clear performance requirements and traceable corrective measures and be subject to verification and auditing.

24.4.6 Surface water and hydrology

Surface water

Construction activities may result in increased salinity, debris, contaminants, erosion, and sedimentation within watercourses. In addition, water discharged from the tunnel may also cause changes to water quality. If rehabilitation is inadequate, these impacts are likely to be exacerbated.

The surface water significance assessment concluded that, during both the construction and operation phases, the combination of design considerations (initial mitigation) and proposed mitigation would be sufficient to mitigate potential impacts. The residual significance was found to be low.

Key measures associated with the management of surface water quality impacts include developing and implementing the CEMP, an Erosion and Sediment Control Plan, the Reinstatement and Rehabilitation Plan and a construction water quality monitoring program.

With proposed mitigation and management measures in place, the Project is not expected to result in any significant impacts to local or regional surface water quality.

Hydrology

The hydrologic and flooding assessment concluded that potential Project impacts will generally comply with adopted performance criteria and objectives. Calibrated and validated model predictions indicate that no adverse impacts to existing flood regimes are expected. Key outcomes include:

- Change in peak water levels. The Project design generally meets the adopted limits with a number of localised areas along the Project alignment where these limits are slightly exceeded. These areas are generally agricultural land or local roadways. No existing flood sensitive receptors are impacted by changes in peak water levels (1% AEP event).
- Change in duration of inundation. There are localised increases in duration of inundation at the same locations where peak water levels are increased. These changes in inundation duration do not affect flood sensitive receptors except for two local roads, being Dodt Road and Hall Road. Potential impacts are minor and are considered a negligible impact on the amenity of the roadway.
- Flood flow distribution. The Project has minimal impacts on flood flows and floodplain conveyance/storage, with significant floodplain structures included to maintain the existing flood regime.
- Velocities. Changes in velocities are minor, with most changes in velocities experienced immediately adjacent to the Project alignment and no existing flood-sensitive receptors impacted. Scour protection has been specified.

The hydrology works were undertaken in close consultation with potentially affected community stakeholders. The consultation works were comprehensive and provided the community with detailed information and certainty around the approach, flood modelling works and the Project design.

Throughout the detailed design, construction and operational phases of the Project, ARTC will continue to work with landowners concerned with hydrology and flooding, directly impacted landowners affected by the alignment, and local governments, State departments and local flood specialists.

Acceptable impacts will ultimately be determined on a case-by-case basis, taking into account flood-sensitive receptors and land use within the floodplains. Direct interaction and engagement will continue with all potentially impacted stakeholders/landowners. The adopted flood impact objectives will be used as guidance.

Independent International Panel of Experts

The Australian and Queensland governments established an Independent International Panel of Experts (the Panel) for flood studies to provide advice to government on the flood models and structural designs developed by the ARTC for Inland Rail in Queensland. As an advisory body to government, the Panel is independent of the ARTC in respect of the development, public consultation, and approvals for the Inland Rail EIS process. Relevant submissions received from public notification of the draft EIS will be provided to the Panel for consideration as part of its review.

Information on the Panel can be viewed here: **tmr.qld.gov.au/projects/inland-rail/independent-panel-of-experts-for-flood-studies-in-queensland**.

24.4.7 Groundwater

Based on a search of the Department of Natural Resources, Mines and Energy(now Department of Regional Development, Manufacturing and Water) groundwater database (accessed 5 March 2019), a total of 510 groundwater bores were identified within the groundwater study area. Two are of unknown status, 124 decommissioned, abandoned or proposed, and the remaining 384 are designated as 'existing'.

A staged approach was adopted for development of the groundwater study, including a desktop study, review of available geotechnical site investigation information, groundwater modelling (tunnel and cuts) and a potential impact significance assessment. Key outcomes were:

- A moderate residual significance risk was identified for the potential of reduced groundwater levels to impact groundwater users (bores and potential groundwater-dependent ecosystems (GDEs)) due to a drained Little Liverpool Range tunnel. This is based on results of modelling undertaken. The 5 m drawdown did not extend to the nearest registered bore to the tunnel located approximately 240 m southwest. The low-to-moderate potential terrestrial GDEs approximately 1 km to the northeast are not predicted to intersect with the modelled 5 m drawdown extent. Continued groundwater level monitoring will confirm groundwater levels at the tunnel and inform detailed design requirements.
- Residual significance risks were identified as being low for all other potential impacts including loss of registered bores through destruction or loss of access, reduced groundwater levels from seepage to cuttings impacting groundwater users (bores and GDEs) and changes to groundwater levels due to loading from embankments (i.e. upstream mounding and damming, and downstream groundwater level reductions). Additional geotechnical works, including investigation and monitoring of groundwater levels at deep cuts and areas of foundation treatment in low-lying floodplain areas will further inform detailed design.

An indicative groundwater monitoring program has been proposed. The program includes an indicative monitoring well network for periodic water level and groundwater quality monitoring. The proposed monitoring program will aid in an adaptive management approach and allow potential Project impacts to be identified and appropriately managed.

24.4.8 Noise and vibration

Construction noise and vibration

The assessment of noise associated with the construction of the Project indicates the potential for a high number of exceedances against external noise goals at sensitive receptors. This is typical for the construction of a major linear infrastructure project.

The noise catchment area (NCA) (predicted over a worst-case 15-minute period) that has the highest population density is NCA 3 located around Gatton, with a total of 2,497 sensitive receptors. The assessment predicted an exceedance for the upper construction noise limit for standard hours of 787 sensitive receptors within NCA 3. The remaining NCAs had a number of sensitive receptors predicted to exceed the construction noise limits. NCA 1 located around Helidon has 48 exceedances, NCA 2 surrounding Placid Hills has 22 predicted exceedances, NCA 4 surrounding Forest Hill had 201 predicted exceedances, NCA 5 surrounding Laidley has 179 predicted exceedances and NCA 6 for the remaining areas has 308 predicted exceedances.

The magnitude and number of exceedances for the loudest construction activity is 1,545 exceeding the adopted upper construction noise limit during standard hours within all NCAs. However, 62 per cent of these exceedances are lower than 10 dBA and can be sufficiently mitigated through the use of physical or management measures to reduce the potential level and duration of construction noise impacts. Where further mitigation is neither feasible nor reasonable, residual exceedances will need to be managed in consultation with the community and affected sensitive receptors.

The earthworks and rail civil works are predicted to have the greatest impact from construction noise, however, other construction works also have the potential to result in impacts, depending on timing, duration, sources present and nature of activities undertaken.

Given the density of development, and expected proximity of construction activities to potentially affected receptors, the urban centres that have the highest predicted noise impacts are in Gatton and Forest Hill due to the proximity and density of sensitive receptors to the existing rail corridor. Mitigation measures will be implemented to mitigate construction noise impacts on nearby sensitive receptors. Construction noise will also be actively managed at all Project stages.

As part of this assessment, 136 sections of roads have been identified as potential haul. For 16 road sections expected to be used to carry construction traffic over the Project works program, an increase of in noise level of 3 dBA or more in road traffic noise levels has been predicted (at times during the construction period).

Early construction activities are expected to require higher volumes of construction traffic.

Roads exceeding the adopted criteria in the year 2023 (worse-case year for construction vehicles) include:

Road/Street	Impact area
Calvert Station Road	Between Rosewood Laidley Road and Gipps Street
Hiddenvale Road	Between Gipps Street and Neumann Road
Neumann Road	Full extent
School Road	Between Rosewood Laidley Road and Rafters Road
Thagoona Haigslea Road	Between Karrabin Rosewood Road and Schumanns Road
Burgess Road	Between Old Toowoomba Road and Smithfield Road
Connors Road	Between Airforce Road and Wrights Road
Hickey Street	Between Old College Road and Buaraba Street
Mary McKillop Street	Between Turner Street and Arthur Street
Paroz Road	Between Summer Street and 200 East of Summer Street
Philps Road	Between Boxmoor Street and Warrego Highway
Railway Street	Between Summer Street and Laidley Plainland Road
Western Drive	Between Warrego Highway and Tenthill Creek Road

Early construction activities are expected to require higher volumes of construction traffic and the number of roads exceeding the adopted criteria from year three of construction drops significantly. A number of these roads are in rural locations and the existing base traffic volumes are low. As such, the initial airborne road traffic noise levels are low (before the addition of construction traffic). Mitigation measures will be applied where it is deemed feasible and reasonable to reduce the predicted impacts to sensitive receptors within proximity to the construction traffic routes.

There are five locations along the Project alignment that have been identified as part of the design phase that may adopt blasting as part of the construction method. Two of these locations are part of the tunnel construction and the other three are part of the cutting for earthworks. The closest sensitive receptor outside of the construction disturbance footprint has been assessed to identify conservative maximum permissible charge weights for each location. Further geotechnical investigations will be undertaken to confirm blasting locations and ground variables to verify initial blasting recommendations. All locations where blasting is required will be confirmed during detailed design.

Minimum working distances for vibration-intensive construction work have been presented for human comfort and structural damage limits. Equipment size will be selected by considering the minimum working distances and the distance between the area of construction and the most-affected sensitive receptor. If works are to be carried out within specified minimum working distances, further consideration of potential impacts and compliance works will be undertaken. Vibration monitoring will be undertaken at locations where the potential for building/structural damage risk during construction. Heritage, sensitive structures and critical facilities will be considered on a case-by-case basis, dependent on their sensitivity.

Operational road traffic and tunnel infrastructure

A number of roads have been predicted to exceed the adopted criteria. For five of the proposed new roads, up to 17 existing sensitive receptors are predicted above the adopted criteria. For proposed re-aligned roads (Eastern Drive, Glencore Grove Drive and Laidley Plainlands Road), up to 84 existing sensitive receptors are above the adopted criteria.

During detailed design, roads predicted to exceed the criteria will be assessed further and mitigation measures such as noise barriers or at-house treatments will be implemented where deemed reasonable and feasible.

Noise from fixed infrastructure has been assessed for maintenance activities, degraded conditions and emergency operations of the Little Liverpool Range tunnel. Based on empirically derived fan sound data, the predicted noise levels were estimated to potentially exceed the adopted internal noise criteria for indoor residential properties. The design has considered mitigation options, which will be incorporated with the aim of reducing potential impacts.

Operational noise and vibration

The assessment of noise and vibration considered the proposed daytime and night-time railway operations for the Project. The predicted noise levels indicate the airborne noise assessment criteria from the Department of Transport and Main Roads Policy (DTMR, 2019b) and ARTC's noise management strategy will be achieved at the majority of assessed sensitive receptors.

At a total of 285 sensitive receptors, the predicted noise levels are expected to be above ARTC's noise assessment criteria at the Project opening (2026) without mitigation. To mitigate this impact, consideration has been given to feasible and reasonable noise mitigation options for these receptors. For the design year 2040, an additional 30 sensitive receptors were above the adopted assessment criteria, resulting in a total of 315 sensitive receptors triggering a need for noise mitigation review.

Many of the predicted noise levels trigger the assessment criteria by less than 5 dBA at the majority of these sensitive receptors. The highest predicted Project railway noise level was 17 dBA above the relevant ARTC noise assessment criteria. Where sensitive receptors are isolated along the alignment, it is usually not practicable to construct rail noise walls or noise barriers. The feasible and practicable noise mitigation is likely to be architectural acoustic treatment of the properties to manage noise impacts within habitable rooms.

At the Gatton, Forest Hill and Valley Vista Estate at Laidley, the sensitive receptors are more densely populated, within 300 m of the rail alignment. Noise-mitigation options considered include concept noise barriers to screen railway noise levels adjacent to the rail alignment. The specific location, extent and height of noise barriers, if implemented, will be subject to a detailed review of feasible and reasonable mitigation options. Final options for mitigation (based on the concept railway noise barriers presented in the EIS) will be determined during detailed design. Depending on final design, there may be some sensitive receptors where the noise assessment criteria are not fully achieved, and these receptors may need to be considered for additional at-property treatment.

The decisions to implement at-property treatments will be based on validated (measured) rolling stock noise levels and a survey of the property. Consultation with directly affected landowners will continue and the verification of railway noise levels will be undertaken once Inland Rail operations commence on the Project.

While treatment of property can ameliorate potential noise impacts within the internal environment of receptor buildings, the external rail noise levels have the potential to be clearly audible above the ambient noise environment within relatively close proximity of the rail corridor.

An assessment of ground-borne vibration identified where vibration and its effects from railway operations may be significant for surface track and also the Little Liverpool Range tunnel. The assessment identified that triggers for further investigation are expected where receptors are located within 50 m of the surface outer rail line or 160 m from the Little Liverpool Range tunnel.

It is proposed that ground-borne noise and ground-borne vibration will be assessed further during detailed design to verify the outcomes of this assessment and determine, as-required, mitigation measures. Potential feasible and reasonable mitigation may include the use of more resilient trackform, rail pads and/or resilient matting for ballast retention.

24.4.9 Social

As for all major projects located near communities, the level of potential impact experienced is higher for those living closest.

The Project will require extensive construction works, with potential for impacts on directly affected landowners, adjacent landowners, other residents, farms, businesses and community and government services.

Distributional equity considerations for the Project include:

- An estimated 26 households within the Project permanent disturbance footprint would need to relocate to enable the Project's construction, including a number of existing tenants in affordable housing owned by DTMR
- Gatton, Forest Hill and Grandchester would experience impacts on the amenity of their towns due to construction and, longer term, intensification of the rail corridor and increased movement of freight
- The amenity of rural residential areas in the Lockyer Valley and on the urban fringes of Helidon, Grantham, Laidley and Calvert may be affected during construction
- The Project travels near areas with potential for social disadvantage, where particular care will be needed to support residents through the changes resulting from the Project
- The operations and management of farms and agribusinesses could be affected while landowners adjust to land use and tenure impacts
- Residents living near the disturbance footprint would experience noise, travel delays and changes to local character during construction
- The Project would involve a significant freight route through rural areas with potential for rail noise to affect amenity in proximity to the rail corridor
- Project benefits are likely to accrue at the local and regional levels during construction, in relation to employment of residents and involvement of businesses in the Project.

Adaptation to the Project's operation is likely to take time, and there is potential for Project operations to have long-term effects on amenity (primarily through rail noise) and connectivity near the rail corridor.

Assessment of residual risks acknowledged that some construction impacts may occur throughout the duration of the construction period (expected between 2021–2026), and that it may take time for residents to adjust to changes resulting from the Project. With a design life of 100 years, the Project's operational impacts and benefits may be experienced for the long-term.

Communities in the study area have experienced previous extreme flooding events and a current long period of severe drought, with effects on mental health and financial wellbeing, community resilience and business vitality. It is therefore particularly important that the Project's impacts are minimised and benefits for local communities are maximised.

The Project is part of Inland Rail, a larger project, which will make a strong contribution to regional, State and national development for the long term. Potential Project benefits and opportunities include:

- The construction phase represents an important source of training and career development for residents in the area
- Employment for up to 410 personnel will benefit construction industry personnel in the region and adjacent local government areas, including people who are disadvantaged in the labour market
- Opportunities for local and regional businesses to participate in the Project's supply chain during construction, and the likelihood of increased trade from construction workforce expenditure
- Long-term service and supply contracts during the operation, which could benefit local and regional businesses
- Facilitation of the growth of industries associated with logistics and freight terminal hubs, and improved accessibility to markets for businesses in the region.

A Social Impact Management Plan (SIMP) has been developed to address social impacts, invest in local communities and offset potential impacts on distributional equity.

The SIMP includes five action plans: Community and Stakeholder Engagement; Workforce Management; Housing and Accommodation; Health and Community Wellbeing; and Local Business and Industry. Each action plan includes objectives and desired outcomes, mitigation measures, and the timing for delivery of these mitigation measures.

Prior to the completion of construction, ARTC will also develop a Community and Stakeholder Engagement Action Plan for the commissioning and operational phases.

24.4.10 Economics

The economic impact assessment concluded that the Project offers support to regional development through a number of ways, including opportunities:

- To encourage, develop and grow local and regional (including Indigenous) businesses through the supply of resources and materials for the construction and operation of the Project. ARTC has developed a Sustainable Procurement Policy, which will ensure that local, regional and Indigenous businesses will have opportunities to supply the Project
- In secondary service and supply industries (such as retail, hospitality and other support services) for businesses in close proximity to the construction works. The expansion in construction activity is also likely to support additional temporary flow-on demand and additional spending by the construction workforce in the local communities
- To unlock the construction of ancillary and complementary infrastructure, industrial development and logistics operations within the region, as part of Inland Rail. Specifically, the Project may act as a significant catalyst for development in the planned and existing industrial areas at the Gatton West Industrial Zone (Lockyer Valley), Ebenezer Regional Industrial Area (Ipswich), Willowbank Industrial Estate (Ipswich) and Bromelton State Development Area (Scenic Rim).

The Project offers opportunities to support the local agricultural industry, by applying downward pressure in freight costs, improving market access, and reducing the volume of freight vehicles on the region's road network.

ARTC is committed to enhancing the economic benefits and opportunities of the Project while avoiding or managing any adverse economic impacts. ARTC have developed a SIMP, which outlines the objectives, outcomes, performance measures, and actions that ARTC will undertake to manage the potential social and socio-economic impacts of the Project.

24.4.11 Cultural heritage

Indigenous heritage

Indigenous cultural heritage will be identified, assessed and managed in accordance with the approved Cultural Heritage Management Plan (CHMP) developed between ARTC and the relevant Aboriginal Party in 2018 (CLH017009) pursuant to the *Aboriginal Cultural Heritage Act 2003* (Qld) (ACH Act). ARTC has undertaken consultation and negotiation with the Yuggera Ugarapul People, as the relevant Aboriginal Party for the Project, in accordance with Part 7 of the ACH Act for the Project. The CHMP was approved by the Chief Executive of the Department of Aboriginal and Torres Strait Islander Partnerships (now the Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships) on 5 June 2018.

Non-Indigenous heritage

An assessment of non-Indigenous heritage values and impacts was undertaken using a combination of registers searches and historical and archival research. Through this process, 42 Areas of Interest were identified, inspected (where possible), and assessed against standard significance criteria. Potential Project impacts on these places were assessed using International Council on Monuments and Sites standard guidelines both before and after the implementation of mitigation measures.

The non-Indigenous heritage works concluded that, with appropriate measures, potential Project impacts could be reduced to moderate for two places, and neutral/slight for the remainder. In general, mitigation includes an archival recording and interpretation. Impacts to the Helidon Railway Culvert and Lockyer Creek Rail Bridge remain as moderate due to the heritage significance of these items—both items are of State significance and therefore their removal from the physical fabric of Queensland cannot be mitigated below a moderate impact without retaining the items in-situ.

The Project will enhance the understanding of the historical development of the Project alignment through the preparation and implementation of an interpretation plan (included within a Cultural Heritage Sub-plan). By disseminating information to the public regarding the history and heritage items within and adjacent to the Project, the heritage significance will be mitigated, enhanced and/or preserved.

A series of mitigation or management measures were developed to ameliorate potential negative impacts on the heritage values of AOI. These include measures such as:

- Avoidance
- Archival recording of structures
- Archaeological survey to map all elements of complex sites, and identify areas of possible subsurface deposit
- Archaeological excavation or surface collection
- Procedures for dealing with chance finds of potential heritage value.

24.4.12 Traffic, transport and access

The traffic, transport and access assessment has focused on the Project's potential impact on the existing road and rail transport infrastructure. Key findings include:

- Existing operational conditions
  - The transport study area includes several State-controlled roads (SCRs) and local government roads that are expected to serve as the main transport corridors for the Project
  - Five SCRs have been identified that will interface with the Project alignment, and up to 11 SCR road sections may have construction traffic exceed 5 per cent of existing background traffic
  - Thirty-four local roads (in Lockyer Valley, Ipswich and Toowoomba local government areas) have been identified that may have construction traffic exceed 5 per cent of existing background traffic; however, the overall impact to many of these roads is expected to be minor as the high percentage of construction traffic is a function of low existing traffic volumes.
- Rail operational traffic and maintenance processes
  - Construction of connections and tie-ins to the existing rail networks are planned to occur during routine maintenance and rail possession periods—impacts to the existing rail network are therefore not expected
  - Rail operational traffic volumes are not expected to impact operational conditions of the surrounding road network.

- Traffic impact assessment
  - Project-related traffic comprises both construction and operational activities—it is anticipated that impacts would primarily occur during construction
  - Road sections predicted to generate construction-related traffic volumes greater than of 10 per cent of the background traffic have been identified—the results of the level of service (LOS) comparison between the 'with' and 'without' development scenarios indicated that the Project may potentially cause a minor change in LOS for some road sections (during each year of construction)
  - Based on the LOS comparison, it is not expected that the Project will generate the need to upgrade the road network for such a short duration of impact—with traffic and road-use management strategies and targeted mitigation measures identified.
- Road–rail interfaces
  - Level crossings can introduce risk as they represent points at which trains, cars and pedestrians can intersect. The majority of level crossing incidents are classified as 'near-miss' incidents between trains, road vehicles, and pedestrians. While rare, actual collisions can occur at level crossings, which can cause property damage, service disruptions, impact to adjacent infrastructure, injury and, in extreme cases, death
  - The rail crossing impact assessment focused on vehicle delay and queueing analysis of Project traffic at rail crossings, and at neighbouring closely spaced intersections. This analysis was undertaken for the Project at proposed rail crossings. There are currently 14 road–rail interfaces within the transport study area (construction)—with a total of seven active level crossings proposed for the Project (operations) proposed
  - A safety-based risk assessment was undertaken for all road–rail interfaces proposed for the Project, with a 'high' risk rating assigned to each level crossing location.
- Mitigation measures
  - Mitigation measures have been developed to reduce the risk associated with Project road-rail interfaces, with measures informed by key actions and areas of focus of the *Queensland Level Crossing Safety Strategy* (2012–2021) (DTMR, 2012)
  - Traffic, transport and access mitigation measures have been included as part of the Project design to manage potential impacts and a number of additional measures have been proposed and will be implemented during future delivery phases of the Project. With additional measures in place, the residual risk level of potential impacts will be further reduced.

The assessment concluded that the Project will maintain the safety and efficiency of all potentially affected transport modes. This includes the Project workforce and other transport system users. The condition of existing transport infrastructure (including pavements) will be maintained during Project construction works and operations.

The Project will be compatible with existing transport infrastructure, future transport corridors and the surrounding road network.

24.4.13 Hazard and risk

The Project has incorporated risk identification and assessment practices throughout the design development, and ARTC will implement and maintain appropriate safety practices throughout operations.

The implementation of ARTC risk management policies and procedures including the ARTC *Safety Policy* and the *Fatal & Severe Risk Program* are anticipated to effectively reduce key risks associated with the Project to a low to medium level.

Residual risks were identified with specific incidents, which included potential events related to dangerous goods freight transport use of explosives for the Little Liverpool Range tunnel construction; pedestrian and community safety; interface with live trains and derailment; overbridges; and emergency access.

Risk assessment is an ongoing process and as the design evolves, will be regularly reviewed to ensure risks are reduced as far as is reasonably practicable.

24.4.14 Waste and resource management

The waste generated during construction and operation will vary in different phases. The majority of spoil produced will be reused as fill and it is anticipated that a small portion will be required to be disposed of as waste.

The Project design calculates that approximately 3,638,000 m^3 of cut material (other than rock) from tunnelling and rail works may be generated during construction. Approximately two-thirds of the excavated material will be reused within the Project as fill, leaving an excess of approximately 1,349,000 m^3 of spoil that will need to be managed or treated with the potential for re-use within the Project and on adjacent Inland Rail projects.

With the exception of spoil, no significant waste streams have been identified for the Project. As waste streams are not considered significant, they have been categorised at a broad level and will be managed in accordance with standard industry practice and accommodated within the capacity of existing waste management arrangements that exist in the Project region. It is anticipated that alternative spoil disposal options may be required in addition to the use of local waste management facilities to ensure local facilities are not overloaded with the volume of spoil generated by the Project.

Control measures will follow the waste management hierarchy to effectively mitigate impacts on environmental values and the sensitive receptors. Avoidance is the priority and disposal is the least preferred and last option.

24.5 Cumulative impacts

The cumulative impact assessment included seven additional projects that met either one or more of the selection criteria (with an additional five considered as part of the social impact assessment works). Potential cumulative impacts on environmental aspects were considered to be of low residual impact significance. Medium residual impact significance was assessed for the key values of:

- Land resources due to the potential cumulative impacts on soil resources (losses), changes to landform and topography, erosion, and weed management
- Landscape and visual amenity due to the operational impacts associated with views of combined, successive, and sequential adjoining projects
- Flora and fauna due to the impacts of habitat loss from vegetation clearing/removal and potential cumulative issues from edge/barrier effects, habitat fragmentation and the associated reduction in connectivity to existing biodiversity corridors
- Surface water and hydrology due to the potential clearing and removal of existing riparian vegetation during construction
- Social impacts due to the combined effects of adjoining projects on social values including the labour demands, traffic volumes, traffic safety, and amenity for landowners
- Economics due to potential increased demand on both the labour market and physical inputs (materials, goods and services)
- Traffic, transport and access due to the impacts of construction traffic on local traffic volumes and the extent to which adjoining projects may intensify these effects.

There were no impact with a high residual significance assessed. Key social matters and potential impacts to the community will be managed in accordance with the Project SIMP.

Several of the projects may have overlapping construction schedules. This overlap has the potential to lead to increased traffic and congestion on existing road networks and key arterial routes. Overlapping construction schedules may also influence the availability of skilled labour in the region in the short term.

Due to the nature and scale of the projects considered in the cumulative impact assessment, it is anticipated that each project considered will be required to mitigate their respective incremental and potential cumulative impacts to acceptable levels.

Potential impacts from each Inland Rail project in the region will be appropriately managed.

24.6 Environmental management

24.6.1 Sustainability

The Inland Rail Environment and Sustainability Policy outlines objectives, targets and commitments for Inland Rail, which includes the Helidon to Calvert Project.

A Sustainability Management Plan will also be implemented with the goal of achieving an 'excellent' rating against the Infrastructure Sustainability Council of Australia Infrastructure Sustainability Rating Scheme (version 1.2).

24.6.2 Environmental Management Plan

All work associated with the Project will be in accordance with relevant ARTC corporate policies (Inland Rail Environment and Sustainability Policy, ARTC Environmental Policy and ARTC Safety Policy) and core values (no harm, future thinking, active engagement and results).

A draft Outline Environmental Management Plan (draft Outline EMP) has been prepared for the Project, which will ensure:

- Applicable environmental approvals and licences are secured in a practical and efficient manner
- Compliance with the proponent commitments and Project-imposed conditions of approval
- Negligent harm to the environment is avoided
- Due consideration is given to potentially impacted receptors, the local community and key Project stakeholders.

Detailed Environmental Management Plans (EMPs) for the construction and operation phases of the Project will be prepared based on mitigation measures documented in the draft Outline EMP, proponent commitments and any conditions of approval imposed on the Project. The EMPs will be supported by sub-plans that are targeted and issue specific.

Monitoring, auditing and reporting will ensure that Project activities are carried out in accordance with the EMPs. Should non-compliances be identified (potential or realised), corrective actions will be taken as soon as practicable.

24.7 Concluding statement

The Project, traversing from Helidon to Calvert, and Inland Rail as a whole, provides a step-change opportunity to revolutionise the capacity and mode of freight travel in Australia. Inland Rail offers a safe and sustainable solution to existing freight bottlenecks and provides opportunities for complementary development.

Key advantages in providing the mode shift of freight to rail, include:

- Increased capacity of the east-coast road network, with reduced maintenance and deferred upgrades required
- Improved safety in the road network, with an 1,800 m long freight train capable of moving the equivalent of up to 110 B-doubles
- Re-distribution of road traffic, resulting in less heavy vehicle movement through many urban centres
- Reduced fuel consumption and associated emissions.

The Project aligns with the core objectives and the guiding principles of Ecologically Sustainable Development, is consistent with the Queensland Freight Strategy (DTMR, 2019a), the Inland Rail Business Case (ARTC, 2015a) and Australian Government expectations.

This EIS has undertaken a conservative approach to identifying and assessing potential impacts of the Project, including cumulative impacts. This demonstrates the adoption of the precautionary principle. Where environmental impacts have been identified, efforts have been made (in the first instance, where practicable) to avoid or minimise those impacts through design development. To further minimise potential impacts, additional management measures have been proposed for future Project phases. Those measures will be implemented through the development of the detailed design and the environmental management framework as the Project proceeds to construction and through to operations. This demonstrates the integration of the principle of conservation of biological diversity and ecological integrity in the impact assessment process.

With regards to intergenerational equity, as part of the broader Inland Rail works, the Project will benefit existing and future generations by providing a safer, more efficient, means of transporting freight between Melbourne and Brisbane. Should the Project (and therefore Inland Rail) not proceed, the principle of intergenerational equity may be compromised. Future generations would experience increased safety and environmental impacts due to continued growth in road transport between Melbourne and Brisbane.

Although the disturbance footprint will be refined through detailed design, with the amount of clearing and removal minimised to the greatest extent possible, the potential remains for significant residual impact on some matters of national and state environmental significance.

The ARTC Environmental Offset Delivery Strategy— Qld will inform the development of offset delivery components including an Environmental Offset Delivery Plan and Offset Area Management Plans. A Detailed Environmental Offset Delivery Plan and Offset Area Management Plans will be developed and implemented by ARTC prior to construction commencing.

The delivery of the Project will:

- Provide a safe and sustainable solution to Australia's freight challenge, while seeking to minimise adverse environmental, social and economic impacts.

The EIS demonstrates that the:

- Residual impacts and benefits can be appropriately managed. The Project will develop, implement and maintain effective mitigation measures to address and mitigate potential impacts of the Project.

Opportunities have also been identified to:

- Enhance the potentially significant economic and social benefits. Key focus areas include: local employment, local industry participation and opportunities for complementary investment.

It is therefore recommended that the Project should proceed, subject to:

- Reasonable and relevant conditions that reflect the proponents commitments listed in Appendix E: Proponents Commitments.

As part of Inland Rail, the Project will help relieve pressure on existing road and rail corridors by providing a continuous rail freight route between Melbourne and Brisbane. The service offering will be competitive with road freight (i.e. a Melbourne to Brisbane transit time of less than 24 hours, with a reliability of 98 per cent), and will better connect regional farms with domestic and international export markets and will also maximise economic growth opportunities for the region.