



Surat Basin Rail project

Coordinator-General's report on the environmental impact statement

December 2010

**Pursuant to section 35(3) of the *State Development
and Public Works Organisation Act 1971***



Coordinator-General's report on the environmental impact statement

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Synopsis

Introduction

This Coordinator-General's report has been prepared pursuant to section 35(3) of the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act) and provides an evaluation of the environmental impact statement (EIS) for the Surat Basin Rail project (the project). The Department of Infrastructure and Planning (DIP) managed the impact assessment process on behalf of the Coordinator-General in accordance with the SDPWO Act.

The proponent

Surat Basin Rail Pty Ltd (SBR), as agent for and on behalf of the Surat Basin Rail Joint Venture (SBRJV), is the proponent for the project. The SBRJV is a joint venture between ATEC Dawson Valley Railway Pty Ltd (a subsidiary of Australian Transport and Energy Corridor Limited (ATEC)), Xstrata Coal Surat Basin Rail Pty Ltd (a subsidiary of Xstrata Coal Queensland Pty Ltd) and QR Surat Basin Pty Ltd (a subsidiary of QR National Limited (QRN)).

The project

SBR is proposing to develop 210 kilometres of new rail infrastructure which would connect the Western Railway system near Wandoan (230 kilometres north-west of Toowoomba) with the Moura Railway system near Banana (130 kilometres west of Gladstone). The rail infrastructure includes a single narrow gauge track with up to eight passing loops, capable of accommodating trains up to 2.5 kilometres in length, providing open access arrangements to multi-users. Most of the rail infrastructure corridor will be approximately 60 metres wide, with wider sections at passing loops and at significant cuttings and embankments.

The project, often referred to as the 'Southern Missing Link', would deliver a transport solution from the Surat Basin region through to the proposed Wiggins Island Coal Terminal at the Port of Gladstone, enabling approximately four billion tonnes of thermal coal reserves to become a potentially viable economic resource for export.

SBR anticipates that construction would commence in the 2011-12 financial year and be completed in the 2014-15 financial year. This would be subject to achieving financial close and obtaining the necessary approvals to construct and operate the rail infrastructure. The capital cost of the project is estimated to be \$1 billion and it is expected to create up to 1000 jobs during the 33-month construction period. Up to 44 jobs would be created over the 50-year operational life of the project.

The EIS assessment process

The project was declared a 'significant project for which an EIS is required' in 2007. In 2008, a delegate of the then Australian Government Minister for Environment, Water, Heritage and the Arts determined that the project was not a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Cwth). Therefore, no assessment under the EPBC Act is required.

Following a public consultation period in 2008, terms of reference (TOR) for the EIS were finalised and issued to SBR. The EIS for the project was publicly advertised during 2009, with the majority of submissions received raising issues regarding:

- impacts on local property management practices



- noise and air impacts
- proposed workforce construction camps
- transport management and social impacts
- local sourcing of construction materials
- altered drainage patterns
- overland water flows mitigation measures.

Following an evaluation of the submissions on the EIS, SBR prepared a supplementary report to the EIS (SEIS) to address the issues raised in the submissions and provided further information about a number of aspects of the project. A review of submissions received on the SEIS indicated that additional information was required to fully evaluate the following impacts:

- erosion and sediment control
- fauna and flora
- hydrology and water quality
- air quality
- noise and vibration
- waste
- traffic and transport
- cultural heritage.

Approvals

The rail infrastructure corridor will be located wholly within the proposed Surat Basin Infrastructure Corridor State Development Area (SBICSDA). However, several components of the project will not be located within the proposed SBICSDA.

Development within the proposed SBICSDA applications will be assessed by the Coordinator-General pursuant to the development scheme for the proposed SBICSDA, with the exception of those development approvals authorising the undertaking of environmentally relevant activities (ERAs), which will be assessed by the Department of Environment and Resource Management (DERM) under the *Sustainable Planning Act 2009* (SPA). The recommendations set out in Appendix 1, Schedule 1 of this report are relevant to the applications for development approvals within the proposed SBICSDA.

For those components of the project not located within the proposed SBICSDA, development will be assessed by either the Western Downs Regional Council (WDRC) or the Banana Shire Council (BSC), pursuant to the relevant planning scheme, depending on the location of the particular project components.

To the extent that any of the recommendations and conditions set out in Appendix 1 of this report apply to those components of the project development located outside the proposed SBICSDA, they do not limit the assessment managers' ability to seek additional information and/or power to impose conditions on any development approval required for the project.

Summary of key issues

This report includes a general evaluation of, and conclusions about, the environmental effects of the project and associated mitigation measures. Material that has been evaluated includes: the EIS; properly made submissions and other submissions that have been accepted; and other material that is relevant to the project, such as comments and advice from advisory agencies and other entities as well as technical reports.



In a number of areas, including erosion and sediment control, fauna and flora, hydrology and water, air quality, noise and vibration, waste, traffic and transport, construction material and equipment, and cultural heritage, the information provided by SBR in the EIS and the SEIS is limited in its detail.

Noting the preliminary stage of the project design and the information contained in the EIS and the SEIS, the environmental effects of the following areas of the project have not been evaluated:

- temporary construction camps
- quarry material
- concrete batching
- blasting
- radio repeater stations.

SBR has acknowledged that those areas of the project listed above could not, at this point in time, be fully defined. It has further acknowledged that additional detailed investigations will be undertaken during the detailed design phase of the project, following the completion of this report, to support the various development approvals required for the project.

The recommendations and conditions set out in Appendix 1 of this report cover a broad range of matters including, land and soil, terrestrial and aquatic ecology, water management, air quality, noise and vibration, waste management, traffic and transport, social impacts, cultural heritage and greenhouse gas emissions.

The recommendations and conditions require further work, including field and technical investigations, to be undertaken by SBR on the environmental impacts of the project in consultation with relevant regulatory agencies prior to the granting of the necessary development approvals for the project. The recommendations and conditions also set release limits, specify mitigation and management measures, and mandate monitoring and reporting arrangements for the project.

The main environmental issues considered in this report are briefly set out below in the order they appear in section 5 of this report.

Land and soil

The impacts on private landowners' properties will be addressed through the negotiation of Landowner Interface Agreements between SBR and individual landowners.

Given the linear nature of the project, it is accepted that some impact on Good Quality Agricultural Land (GQAL) is unavoidable. Noting the preliminary stage of the project design, SBR will be required to provide additional information to support the strategies proposed to mitigate the impacts on GQAL and ongoing agricultural activities resulting from the fragmentation and alienation of properties and the relocation of project infrastructure as part of the future approvals processes for the project. Accordingly, it is recommended that SBR provide DERM with further information on the area of GQAL impacted by the project (Appendix 1, Schedule 1, recommendations 4(a) and 4(b)).

Based on the advice provided by DERM, further detailed soil and geotechnical information is required to support the proposed erosion control measures and the future approvals required for the project. Accordingly, it is recommended that, before commencing construction work, SBR undertake further detailed investigations to identify soil types and stability, soil sodicity and soil salinity (Appendix 1, Schedule 1, recommendations 5(a), 25(a) to 26(d) and 27(a) to 27(c)).



Nature conservation

Based on information provided by DERM and the Department of Employment, Economic Development and Innovation (DEEDI) (Fisheries Queensland), further surveys and investigations are required to support future approvals with respect to vegetation habitat, fauna movement corridors, threatened flora, wetlands and aquatic values and terrestrial and aquatic species. Accordingly, a number of recommendations have been made with respect to vegetation clearing and fragmentation, habitat, terrestrial and aquatic fauna movement and flora (Appendix 1, Schedule 1, recommendations 7(a) to 10(c)).

Water resources

While SBR has discussed, in general terms, the water required for the project, additional detailed hydraulic modelling of the potential impacts on the various water sources of the proposed water take is required. Accordingly, a number of recommendations have been made to address potential water supply, water quality and flooding impacts (Appendix 1, Schedule 1, recommendations 11(a) to 1212(b)).

Air quality

While SBR undertook predictive modelling of the potential air emissions from the project, including coal dust, it did not propose mitigation measures to address air quality impacts from operations on the basis that coal dust emissions are a whole of network issue. A number of recommendations have been made to protect air quality and address air emissions, including coal dust (Appendix 1, Schedule 1, recommendations 13(a) to 15(c) and 30(a) to 31(f)).

Noise and vibration

The Coordinator-General notes Queensland Health's comments that the noise emissions of the rail operations may exceed the noise criteria for sleep disturbance specified in the EPP (Noise) 2008 at certain residential dwellings sensitive receptors. Given this is new rail infrastructure development in a rural area which has low background noise levels, further predictive modelling is required and the results are to be assessed against the acoustic quality objectives set out in the EPP (Noise) 2008. Other recommendations dealing with noise and vibration resulting from the construction and operation of the project, have also been made (Appendix 1, Schedule 1, recommendations 16(a) and 16(b), and 32(a) to 33(d)).

Waste

WDRC and DERM have advised that more detailed waste generation information is required to assess the impacts of waste on the environment. A number of recommendations have been made requiring SBR, prior to commencing construction, to address how waste (including wastewater) is to be stored, handled, transferred, removed from the site, reprocessed, recycled, incinerated or disposed of (Appendix 1, Schedule 1, recommendations 17(a), 28(a) to 29(a) and 34(a) to 35(d)). These recommendations also provide that SBR shall enter into agreements (including funding arrangements where necessary) with WDRC and BSC as necessary, to accommodate waste disposal requirements for the project where SBR seeks to use council-owned or operated waste disposal facilities.

Traffic and transport

The SEIS stated there had been a marked reduction in the number of proposed level road/rail crossings due to revisions incorporated by SBR in the currently preferred rail infrastructure corridor alignment. This will improve the safety of the railway by reducing potential traffic conflicts.

Additional information about potential road impacts related to the project and associated impact mitigation strategies is required. Therefore, a number of conditions have been imposed to address potential road surface and traffic impacts (Appendix 1, Schedule 2, conditions 3(a) to 4(a)).



Cultural heritage

The Coordinator-General agrees with SBR's assessment that the project has a low probability of causing harm to places of Indigenous cultural heritage. SBR has acknowledged that additional field inspections will be required prior to commencing construction of a particular segment of the rail infrastructure corridor and where the currently preferred rail infrastructure corridor alignment deviates from the alignment assessed in the EIS. A recommendation to this effect has been made (Appendix 1, Schedule 1, Recommendation 18(a)).

Social impacts

While the project's benefits to the regional economy are noted, these benefits in terms of employment opportunities and business services and supplies are temporary in nature as they relate primarily to the construction phase of the project. Similarly, the socio-economic impacts of the project are largely temporary in nature.

It is acknowledged that the construction activities, including the construction camps, the loss and fragmentation of agricultural land, and the arrival of new rail infrastructure in a rural, agricultural environment are likely to result in noticeable impacts on the community, particularly those members of the community in the vicinity of those activities.

In recognition of the potential adverse impacts of rail infrastructure construction on the community, the Coordinator-General has imposed a number of conditions establishing various community groups, a complaints management process and an incidents management process to address the social impacts of the project (Appendix 1, Schedule 2, conditions 5(a) to 6(c)).

Greenhouse gas emissions

While SBR has estimated the greenhouse gas emissions (GHG) emissions from the construction and operational phases of the project, these estimates are reflective of the preliminary assessment stage of the project and further studies on the GHG emissions during the project's construction phase are required.

A number of recommendations have been made requiring further GHG emissions modelling and the preparation of a GHG management plan to mitigate the carbon footprint of the project (Appendix 1, Schedule 1, recommendations 2(a) and 2(b)).

Conclusion

It is considered that in the broader community interest, there is a need for the project to assist in addressing coal export infrastructure constraints in central Queensland, in particular, delivering a potential solution to a missing link of rail infrastructure in Queensland.

The project is one element of the broader coal export supply chain system in central Queensland and does not of itself represent the entirety of the solution to coal transport constraints through central Queensland. However, the value of the project to the Queensland rail network will be enhanced by its integration with several other major rail and ports infrastructure projects in and around the Gladstone area, which are currently being undertaken in Queensland, most of which will become operational during the predicted construction period for this project.

For the purposes of fulfilling the Coordinator-General's obligations under section 35 of the SDPWO Act, the Coordinator-General has evaluated the environmental effects of those components of the project on which information was provided in the EIS and the SEIS. In carrying the environmental evaluation, the Coordinator-General notes that further information will be provided, following the completion of this report to support the relevant development applications required for the project.



Due to the conceptual nature of the project and the preliminary level of the information provided, the Coordinator-General has made recommendations and imposed conditions set out in Appendix 1 of this report. These are appropriate for the preliminary nature of the assessment at this stage and recognise that further detailed information will need to be provided as part of the detailed development approval processes required prior to construction commencing.

It is recommended that the project concept, as described in the EIS and the SEIS, and summarised in section 2 of this report, may proceed subject to:

- the recommendations and conditions set out in Appendix 1 of this report
- further design development and the finalisation of detailed environmental management plans (EMPs), which SBR has committed to completing in consultation with the relevant regulatory agencies as part of obtaining the necessary development approvals for the project.

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Graeme Newton
Coordinator-General

Date: December 2010



1. Introduction

This report provides an evaluation of the environmental impact statement (EIS) process for the Surat Basin Rail project (the project) pursuant to Division 3, Part 4 of the *State Development and Public Works Organisation Act 1971* (SDPWO Act).

The EIS was conducted by Surat Basin Rail Pty Ltd (SBR), the proponent, and prepared on its behalf by the AureconHatch, PB, AECOM consortium.

The objective of this report is to summarise the key issues associated with the potential impacts of the project on the physical, social and economic environments at the local, regional and state levels. It is not intended to record all the matters which were identified and subsequently settled. Rather, it concentrates on the substantive issues identified during the EIS process.

This report represents the end of the state's impact assessment process and details the Coordinator-General's evaluation of the environmental effects of the project, based on information contained in the EIS, submissions made on the EIS, the supplementary report to the EIS (the SEIS), comments on the SEIS and information and advice from advisory agencies and other parties.

In evaluating the EIS, recommendations have been made and conditions have been imposed in relation to the project, which may be considered by assessment managers when assessing properly made development applications for the project. These recommendations and conditions are contained in Appendix 1 of this report. It is important to note that the undertaking of the EIS process under the SDPWO Act does not exempt SBR from obtaining all necessary approvals under relevant Queensland legislation and complying with relevant planning and environmental laws and planning instruments.

Acronyms and other key terms used in this report are defined in Appendix 1, Schedule 3 of this report.



2. Project description

2.1 The proponent

The proponent for the project is SBR, as agent for and on behalf of the Surat Basin Rail Joint Venture (SBRJV). The SBRJV is a joint venture between:

- ATEC Dawson Valley Railway Pty Ltd (a subsidiary of Australian Transport and Energy Corridor Limited (ATEC))
- Xstrata Coal Surat Basin Rail Pty Ltd (a subsidiary of Xstrata Coal Queensland Pty Ltd)
- QR Surat Basin Pty Ltd (a subsidiary of QR National Limited (QRN)).

Original membership of the SBRJV included IFM DVR Pty Ltd (a fund manager) and Anglo Coal Australia Pty Ltd, in addition to the members listed above. However, following the release of the EIS both of these members withdrew from the SBRJV leaving the membership as stated above.

SBR has publicly stated its intention to seek various contractors to design, construct, maintain and operate the project and a list of bidders for such contracts will be announced in the future.

2.2 Project description

The proposed Surat Basin Rail project (the project) is approximately 210 kilometres of new rail infrastructure which would connect the Western Railway system near Wandoan (230 kilometres north-west of Toowoomba) with the Moura Railway system near Banana (130 kilometres west of Gladstone).

The project consists of the construction and operation of rail infrastructure and associated works, such as:

- vehicle access and construction tracks
- passing loops, culverts and bridges
- borrow pits
- signalling and communications
- track maintenance depot.

The rail infrastructure includes a single narrow gauge track with up to eight passing loops, capable of accommodating trains up to 2.5 kilometres in length, providing open access arrangements to multi-users. Most of the rail infrastructure corridor will be approximately 60 metres wide, with wider sections at passing loops and at significant cuttings and embankments. The design allows for future electrification with minor formation widening required for electrification.

The project does not include works and facilities located outside the rail infrastructure corridor, which are required to support the construction phase, such as establishing temporary construction camps, transporting construction material and equipment, and sourcing quarry material. In addition, the proposed development of a spur line to the Wandoan Coal Mine project is not part of the project, as it is located wholly on the Wandoan Mining Lease and such development will be assessed in accordance with the development assessment and approvals processes applicable to the Wandoan Coal Mine project.



Often referred to as the ‘Southern Missing Link’, the proposed new rail infrastructure would deliver a transport solution from the Surat Basin region through to the proposed Wiggins Island Coal Terminal at the Port of Gladstone, enabling approximately four billion tonnes of thermal coal reserves to become a potentially viable economic resource for export. A map of the project is shown in Figure 2.1 below .

Figure 2.1 Map of the project (SEIS map S1)





Should the project proceed, there would need to be a contemporaneous upgrade to the existing Moura Railway system between Banana and Gladstone to cater for an anticipated increase in rail traffic. This upgrade is not part of the project.

The EIS noted that the project could potentially form part of the proposed Australian Inland Rail Link (AIRL), proposed by a consortium consisting of ATEC and the Australian Rail Track Corporation. AIRL would ultimately link Melbourne and Darwin via New South Wales and Queensland. The Queensland section of the AIRL proposal, from the New South Wales border to Toowoomba (Gowrie) via Goondiwindi (Carrington), Toowoomba (Gowrie) to Brisbane and Toowoomba (Gowrie) to Gladstone, was declared a 'significant project' for which an EIS is required under the SDPWO Act on 4 January 2002.

The proponent for the AIRL proposal has chosen to investigate the AIRL in stages, commencing with the SBR project which aligns with that part of the Toowoomba–Gladstone section of the broader AIRL proposal.

The design of the project was revised by SBR during the supplementary report to the EIS (SEIS) process in response to, among other things, SBR's further investigations and issues raised in the EIS submissions, along with ongoing consultations with landowners.

The most significant changes to the project have resulted in the rail infrastructure corridor alignment being refined to reduce the number of road crossings from 141 to 105, reducing the number of at-grade crossings from 75 to 12, and reducing the water required for construction from 9600 megalitres to 4200 megalitres.

This evaluation is based on the reference design for the project proposed in the EIS and as modified by the SEIS. This revised design is referred to in the SEIS as 'Reference Design (July 2009)'. The detailed design for the project will be undertaken by the principal contractor appointed by SBR to design and construct the project. The detailed design process may result in amendments to the reference design for the project that is evaluated in this report. Any changes to the project design may require a Coordinator-General's change report under Division 3A, Part 4 of the SDPWO Act.

A number of alternative rail infrastructure corridor alignments were considered by SBR, including the 'no project' option. However, the reference design, which follows existing road alignments for most of its length, provides a balanced approach to addressing the benefits and costs of the project.

SBR anticipates that construction would commence in the 2011-12 financial year and be completed in the 2014-15 financial year. This would be subject to achieving financial close and obtaining the necessary approvals to construct and operate the rail infrastructure.

The capital cost of the project is estimated to be \$1 billion and it is expected to create up to 1000 jobs over the 33-month construction period. Up to 44 jobs would be created over the 50-year operational life of the project for train drivers, plus a small number of support and maintenance workers. It is proposed that the construction workforce will be accommodated in three major temporary construction camps, the locations of which have not been finalised. It is anticipated that the train drivers will be based predominantly in Gladstone.

2.3 Rationale for the project

In recent years, Queensland has experienced a rapidly growing export demand for both thermal and coking coal, and expansion of coal transport infrastructure capacity has become a priority. In addition to enhancing export capacity, the project provides an alternative transport solution from the Surat Basin region through to the Wiggins Island Coal Terminal at Gladstone, enabling approximately four billion tonnes of coal reserves to potentially become a viable economic resource. The existing alternative of exporting coal through the Port of Brisbane is capacity constrained.



The proposed project is a potential catalyst for regional economic growth in the Surat Basin region, which the Queensland Government is committed to achieving through its Blueprint for the Bush strategy. It is also a part of a strategy for the coordinated, planned and parallel delivery of substantial infrastructure to the northern Surat Basin, particularly to facilitate the development of the Wandoan Coal Mine project. By developing coordinated and appropriate infrastructure in the region, enterprises—such as coal mining operations—can grow.

The project is expected to significantly increase the potential capacity and flexibility of Central Queensland's coal export infrastructure for the Surat Basin area. The project also offers potential long-term benefits for the Surat Basin region as well as for the state.



3. Environmental impact assessment process

Part 4 of SDPWO Act establishes a framework for coordinating and evaluating the environmental effects of significant projects in Queensland.

This framework provides a basis to:

- consider the economic, social and environmental effects of a project in the context of legislative and policy provisions and decide whether the project can proceed
- impose conditions for undertaking the project to achieve economically, socially and environmentally sustainable development
- state conditions for approvals required under other relevant legislation
- recommend appropriate environmental management and monitoring programs to mitigate adverse impacts.

The Department of Infrastructure and Planning (DIP) coordinated the impact assessment process for this project on behalf of the Coordinator-General in accordance with Part 4 of the SDPWO Act.

3.1 Significant project declaration and controlled action

In December 2006, the Queensland Government awarded SBR a Novated Conditional Exclusive Mandate, providing it with sufficient security to progress the development of the project. In July 2007, the initial conditions of the mandate were satisfied and the mandate became unconditional.

An initial advice statement (IAS) was lodged with the Coordinator-General by SBR on 19 November 2007. On 30 November 2007, the project was declared, by way of notice in the Queensland Government Gazette, to be a 'significant project for which an EIS is required', pursuant to section 26(1)(a) of the SDPWO Act.

On 22 February 2008, a delegate of the then Australian Government Minister for the Environment, Water, Heritage and the Arts determined that the project was not a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act) (Decision Notice EPBC 2007/3773). Therefore, no further assessment under the EPBC Act is required.

3.2 Terms of reference for the EIS

On 12 April 2008, draft terms of reference (TOR) for the EIS for the project were publicly notified and comments on the draft TOR were accepted by the Coordinator-General until close of business on 16 May 2008.

Comments on the draft TOR were received from five members of the public including a collective submission on behalf of various landowners by a landowner's representative, and from each of the following advisory agencies¹:

- Banana Shire Council (BSC)

¹ Due to Machinery of Government changes from 26 March 2009 (see *Public Service Department Arrangements Notice (No. 2) 2009*), changes were made to Queensland Government departments referred to in this report.



- Dalby Regional Council (now the Western Downs Regional Council (WDRC))
- Department of Emergency Services (DES)
- Department of Housing
- Department of Local Government, Sport and Recreation
- Department of Main Roads
- Department of Mines and Energy
- Department of Natural Resources and Water
- Department of Primary Industry and Fisheries
- Department of Tourism, Regional Development and Industry
- Disability Services Queensland
- Environmental Protection Agency
- Queensland Health
- Queensland Police Service (QPS)
- Queensland Rail (QR)
- Queensland Transport
- Queensland Treasury.

Comments received from advisory agencies covered:

- identifying linkages to, and impacts on, downstream infrastructure, such as rail and ports
- infrastructure collocation opportunities
- impacts on air quality
- possible greenhouse gas emission impacts.

Comments received from the public included a need to identify the land acquisition process, fencing of the rail infrastructure corridor, stock, vehicle and machinery crossings in the rail infrastructure corridor, and the consultation processes.

On 28 June 2008, the TOR were finalised and a copy given to SBR. In finalising the TOR, regard was given to the comments received on the draft document from advisory agencies, members of the public and their representatives. Most of the changes to the TOR were a direct or indirect consequence of comments received.

3.3 Public notification and review of the EIS

The EIS for the project was released for public and advisory agency comment on 21 February 2009. A public notice was placed in local and regional newspapers advising where the EIS for the project could be viewed and advising that submissions on the EIS could be made to DIP until close of business on 23 March 2009.

DIP accepted 36 submissions on the project EIS, including 17 submissions from the public and public organisations, as well as 19 submissions from advisory agencies.

The primary issues raised by the public were air quality during construction and operation, the perceived lack of genuine consultation by SBR, impacts on local property management practices, the need for the project and project alternatives, inconsistency of the project operations with the character of the local community, and property definition.



The key issues raised by the advisory agencies included the predicted high level of construction noise, traffic and road network impacts (construction and operation), social and economic impacts, and the cumulative impacts on the Surat Basin region in general as a result of a number of concurrent infrastructure projects planned for the near future.

SBR was provided with all of the submissions on the EIS and was requested to prepare an SEIS which addressed the issues raised in the submissions on the EIS and to provide additional information about a number of other aspects of the project, including:

- impacts on property management, including land uses, fencing and property access
- the sterilisation of good quality agricultural land
- construction and operation noise and air impacts
- the location and description of the proposed workforce construction camps
- safety of road intersections/crossings within the rail infrastructure corridor
- confirmation that future infrastructure can be collocated in the rail corridor
- management of the introduction of noxious weed species and limit their spread
- impact on the local road network
- more detailed environmental management plans
- impacts of the increased workforce traffic on the road network
- the intended local sources of construction materials being identified
- possible sterilisation of other resources in the rail corridor including the impact on local extractive industries
- potential for increased erosion due to altered drainage patterns on surrounding properties.

3.4 Supplementary report to the EIS (SEIS)

SBR prepared an SEIS in response to the request for additional information above, which was forwarded to advisory agencies on 4 March 2010. Advisory agencies were invited to comment on the SEIS and to provide specific advice for consideration for inclusion as conditions or recommendations in this report. Comments from advisory agencies closed on 19 April 2010.

The SEIS was available for public viewing over this period on SBR's website and was accessible via a link on the DIP website.

The SEIS reflected a number of changes to the project description since the preparation of the EIS. These included:

- a re-design of the rail infrastructure to reduce the impacts of vegetation clearance and fragmentation of an endangered ecosystem
- optimisation of the rail infrastructure alignment to reduce the amount of road or property crossings.

Nine responses to the SEIS (plus two from the public) were accepted from the following advisory agencies:

- Department of Communities (DOC)
- Department of Community Safety (DCS)
- Department of Employment, Economic Development and Innovation (DEEDI)
- Department of Environment and Resource Management (DERM)
- Department of Transport and Main Roads (DTMR)



- Queensland Health
- QPS
- Toowoomba Regional Council (TRC)
- WDRC.

It was noted from these submissions that some of the identified issues were not completely resolved. These included:

- traffic and transport
- social and economic impacts
- construction camps
- nature conservation
- cumulative impact
- water/waste management.

3.5 Other public information and consultation activities

SBR conducted a public information and consultation program throughout the EIS process. Consultation included activities such as:

- newsletters distributed to landholders and Wandoan residents
- advertising and media releases
- fact sheets
- website
- static and mobile displays
- key stakeholder briefings
- council meetings
- community reference group meetings
- affected landowner discussions
- one-on-one meetings with affected landowners
- community contact points (free call information line and enquiry email address).



4. Project approvals

4.1 Overview of approvals regime

The various development components comprising the project are located in two different regulatory frameworks—the proposed Surat Basin Infrastructure Corridor State Development Area (SBICSDA) and the relevant local government planning schemes for those project development components outside the SBICSDA.

Part 4 of the SDPWO Act and the *Sustainable Planning Act 2009* (SPA) are the controlling legislation for the project at the state level.

The majority of the project development will be located within the proposed SBICSDA. Development within the SBICSDA will be assessed by the Coordinator-General pursuant to the development scheme for the proposed SBICSDA, with the exception of those development approvals authorising the undertaking of environmentally relevant activities (ERAs), which will be assessed by DERM under the SPA.

For those components of the project not located within the proposed SBICSDA, development will be assessed by either the WDRC or the BSC, pursuant to the relevant planning scheme, depending on the location of the particular project components.

The EIS process under the SDPWO Act does not replace the need for SBR to obtain all relevant approvals under the relevant legislation. However, the EIS process does have linkages to other statutory development assessment processes. For example, the EIS process replaces the information and referral and notification stages of the Integrated Development Assessment System (IDAS) under the SPA for development requiring development approvals where the application is for a material change of use (MCU) of premises or the application is impact assessable.

Under section 39 of the SDPWO Act, the Coordinator-General's report may state for the assessment manager conditions that must be attached to a development approval for the significant project. This does not limit the assessment manager's power under the SPA to assess the development and impose conditions not inconsistent with conditions stated in the Coordinator-General's report which must be attached to the development approval.

4.2 Approvals and permits required

4.2.1 Development approvals

Table 4.1, which is based on table 17.2 of the EIS as amended by section 17 of the SEIS, lists the likely approvals required for the construction and operation of the project.

Table 4.1 Summary of likely approvals required for the project

Approval/Permit/ Licence	Legislative Authority	Agency/ Assessment Manager	Project activity
Development Permit— Material change of use assessable against a planning scheme (MCU)	<i>State Development and Public Works Organisation Act 1971</i> —SBICSDA development scheme	CG/DIP	Construction and operation of a railway track and ancillary things.



Approval/Permit/ Licence	Legislative Authority	Agency/ Assessment Manager	Project activity
Development Permit— Material change of use assessable against a planning scheme (MCU)	<i>Sustainable Planning Act 2009/Sustainable Planning Regulation 2009</i>	WDRC/BSC	Construction and operation of temporary accommodation facilities to accommodate workers engaged in the construction of the railway track and ancillary things.
Development Permit— Material change of use assessable against a planning scheme (MCU)	Sustainable Planning Regulation 2009/ <i>Environmental Protection Act 1994/</i> Environmental Protection Regulation 2008—ERA 8 (Chemical Storage)	DERM	Storage of chemicals (including dangerous goods) in containers having a design storage volume >10 m ³ and <1,000 m ³ .
Development Permit— Material change of use assessable against a planning scheme (MCU)	Sustainable Planning Regulation 2009/ <i>Environmental Protection Act 1994/</i> Environmental Protection Regulation 2008—ERA 16 (Extractive and screening activities)	DERM	Extractive activities— Extracting rock or other material for use in construction of the rail corridor and sale of excess cut material (extractive).
Development Permit— Material change of use assessable against a planning scheme (MCU)	<i>Environmental Protection Act 1994/</i> Environmental Protection Regulation 2008 – ERA 21 (Motor Vehicle Workshop operation)	DERM	Fabricated metal product activities—Motor vehicle workshop.
Development Permit— Material change of use assessable against a planning scheme (MCU)	Sustainable Planning Regulation 2009/ <i>Environmental Protection Act 1994/</i> Environmental Protection Regulation 2008—ERA 33 (Crushing, milling, grinding or screening)	DERM	Miscellaneous activities— crushing, milling or grinding—processing products other than agricultural products and materials mentioned in other ERAs.
Development Permit— Material change of use assessable against a planning scheme (MCU)	Sustainable Planning Regulation 2009/ <i>Environmental Protection Act 1994/</i> Environmental Protection Regulation 2008—ERA 43 (Concrete Batching)	DERM	Non-metallic mineral product manufacture—concrete batching. Producing concrete or a concrete product in facilities having a design production of >100 tonnes/annum.
Development Permit— Material change of use assessable against a planning scheme (MCU)	<i>Sustainable Planning Act 2009/</i> Sustainable Planning Regulation 2009/ <i>Environmental Protection Act 1994/</i> Environmental Protection Regulation 2008—ERA 63 (Sewage Treatment)	DERM	Operating a sewage treatment works or a sewage pumping station.



Approval/Permit/ Licence	Legislative Authority	Agency/ Assessment Manager	Project activity
Development Permit— Operational Works	<i>Sustainable Planning Act 2009/ Sustainable Planning Regulation 2009/Environmental Protection Act 1994/ Environmental Protection Regulation 2008/ Vegetation Management Act 1999</i>	DERM	Clearing of native vegetation and high value regrowth.
Development Permit— Operational Works	<i>Sustainable Planning Act 2009/Sustainable Planning Regulation 2009/Environmental Protection Act 1994/Environmental Protection Regulation 2008/Vegetation Management Act 1999</i>	DERM	Clearing of regional ecosystems and essential habitat communities.
Development Permit— Operational Works	<i>Sustainable Planning Act 2009/Sustainable Planning Regulation 2009/Forestry Act 1959</i>	DERM	Removal of Extractive Resources/quarry material from state land other than SBICSDA land.
Development Permit— Operational Works	<i>Sustainable Planning Act 2009/Sustainable Planning Regulation 2009/Water Act 2000</i>	DERM	Removal of quarry material from a watercourse (as a result of construction works).
Development Permit— Operational Works	<i>Sustainable Planning Act 2009/Sustainable Planning Regulation 2009/Water Act 2000</i>	DERM	Taking or interfering with artesian or subartesian water (GAB—southern portion).
Development Permit— Operational Works	<i>Sustainable Planning Act 2009/Sustainable Planning Regulation 2009/Water Act 2000</i>	DERM	Works in a watercourse (water take from Dawson River—northern portion).
Development Permit— Operational Works	<i>Sustainable Planning Act 2009/Sustainable Planning Regulation 2009/Water Act 2000</i>	DERM	Taking overland flow water.
Development Permit— Operational Works	<i>Sustainable Planning Act 2009/Sustainable Planning Regulation 2009/Water Act 2000</i>	DERM	Interfering with overland flow water (drainage works).
Development Permit— Operational Works	<i>Sustainable Planning Act 2009/Sustainable Planning Regulation 2009/Water Act 2000</i>	DERM	Water storage (other than a referrable dam) (overland flow storage).
Development Permit— Operational Works	<i>Sustainable Planning Act 2009/Sustainable Planning Regulation 2009/Fisheries Act 1994</i>	DEEDI	Constructing or raising of waterway barrier works (waterway crossings).
Permit	<i>Nature Conservation Act 1994</i>	DERM	Taking, using, keeping or interfering with a protected animal or plant.



Approval/Permit/Licence	Legislative Authority	Agency/Assessment Manager	Project activity
Permit	<i>Nature Conservation Act 1994</i>	DERM	Move protected fauna.
Permit	<i>Water Act 2000</i>	DERM	Take construction water from a watercourse.
Riverine Protection Permit	<i>Water Act 2000</i>	DERM	Destroy vegetation, excavate and/or place fill within a watercourse.
Resource Operations Licence	<i>Water Act 2000</i>	DERM	Water allocation.
Licence	<i>Water Act 2000</i>	DERM	Take or interfere with water.
Approval	<i>Transport Infrastructure Act 1994</i>	DTMR	Interference with a state-controlled road or its operation.
Permit (waste disposal—contaminated land/material)	<i>Environmental Protection Act 1994/Environmental Protection Regulation 1998</i>	DERM	Disturbance of contaminated Land.
Rail Manager Accreditation	<i>Transport Infrastructure Act 1994</i>	DTMR	Railway Manager/Railway Operator accreditation.
Licence	<i>Explosives Act 1999/Explosives Regulation 2003</i>	DEEDI	Authority to use, handle, transport, store, collect or manufacture explosives.

4.2.1.2 State development area

The majority of the project development will be carried out on land within the proposed SBICSDA. SBR will need to apply to the Coordinator-General, as the 'assessment manager' under the SDPWO Act, for development approval for an MCU of premises to construct and operate a railway track and ancillary things in the proposed SBICSDA.

The application for MCU would be assessed pursuant to the development scheme for the proposed SBICSDA, which replaces the planning scheme for the WDRC and BSC local government areas.

In addition to developing the railway track and ancillary things in the proposed SBICSDA, other development works, such as the ERAs set out in Table 4.1 above, would require MCU approval. This development would be assessable by DERM under the SPA.

The general recommendations (made pursuant to the evaluation of the EIS for the project under section 35(3) of the SDPWO Act and set out in Appendix 1, Schedule 1 of this report) and the conditions (imposed pursuant to section 35(4)(d) of the SDPWO Act and set out in Appendix 1, Schedule 2 of this report) are relevant to the applications for development approvals for project development both within and outside the proposed SBICSDA.

No conditions pursuant to section 35(4)(b) of the SDPWO Act have been stated and no recommendations pursuant to section 35(4)(c) of the SDPWO Act have been made.

SBR has acknowledged that there remain a number of components of the project which cannot (at this point in time) be fully defined and that further detailed investigations will be undertaken during the detailed design phase of the project, following the completion of this report, to support the various development approvals required for the project.

The general recommendations set out in Appendix 1, Schedule 1 of this report do not limit the assessment managers' ability to seek additional information and power to impose conditions on any development approval required for the project. Rather, the general recommendations have the effect of informing the assessment managers about the relevant development applications and are advice only.



4.2.1.3 Local government areas

Certain development works associated with the project, and which are required to support the construction of the rail infrastructure, will be carried out on land located outside the proposed SBICSDA. Such development work may include, but is not limited to, establishing temporary construction camps, transporting construction material and equipment and sourcing quarry material.

For this development work, applications will be made to the relevant assessment managers (the WDRC and the BSC as appropriate) authorising such development and uses would be assessed under applicable planning schemes for the WDRC and the BSC local government areas under the SPA.

Given the preliminary nature of the project design, the EIS and the SEIS did not contain detailed information about the proposed temporary construction camps and the sourcing of quarry material and provided limited detail on transporting material and equipment required for project construction. Consequently, the environmental effects of those components of the project have not been evaluated at this preliminary assessment stage and no conditions or recommendations pursuant to section 35(4)(b) and section 35(4)(c) of the SDPWO Act have been stated or made.

Rather, general recommendations have been made and conditions imposed regarding transporting construction material and equipment for the project, that are relevant to the applications for development approvals (refer to Appendix 1, Schedule 1 of this report).

SBR has acknowledged that those components of the project noted above have not been addressed in the EIS and the SEIS due to the conceptual nature of the project at this point in time. It has committed to further defining the project and undertaking detailed investigations during the detailed design phase of the project, to support the various development approvals required for the project.

To the extent that any of the general recommendations and imposed conditions set out in Appendix 1 of this report apply to those components of the project development located outside the proposed SBICSDA, they do not limit the assessment managers' ability to seek additional information and/or power to impose conditions on any development approval required for the project.

Due to the preliminary stage of the project design and the information contained in the EIS and the SEIS, the environmental effects of those components of the project listed above have not been evaluated. Accordingly, section 37(1) of the SDPWO Act does not apply to this report and notification stages of the IDAS of the SPA continue to apply to any development applications for those components of the project.

4.2.1.4 Environmentally relevant activities

Under the SPA and the *Environmental Protection Act 1994* (EP Act), a development permit is required to carry out an ERA. DERM would be the assessment manager for any development approval applications for undertaking of ERAs, both within and outside the proposed SBICSDA.

A number of ERAs have been identified by SBR as applicable to the construction and operation of the project (listed in Table 4.1 above). DERM has advised that, with the progress of more detailed design, SBR will be required to provide further detail about the likely ERAs for the project to enable conditions to be attached to a development permit for an ERA. Therefore, no conditions have been set at this preliminary assessment stage of the project. The necessary applications for the relevant ERAs will be lodged prior to any development being authorised to commence.

However, based on DERM's advice, a number of general recommendations have been made and are relevant to the applications for development permits authorising ERAs to be undertaken for the project (refer to Appendix 1, Schedule 1 of this report).



SBR has committed to address the information gaps in the EIS and undertake further investigations during the detailed design phase of the project to support the development approvals required. Recommendations 20(a) to 36(b) are appropriate for a preliminary approval only (refer to Appendix 1, Schedule 1). These recommendations are advice only and will be considered by DERM when assessing the relevant development applications.

4.2.2 Other state approvals and requirements

There are requirements for other approvals to be obtained pursuant to legislation other than the SPA. SBR will be required to apply for these approvals directly to the relevant entity in accordance with standard legislative processes once the necessary details are available.

These other approvals include, but are not be limited to, those set out in Table 4.1 above.

In addition to the other approvals set out in Table 4.1 above, SBR will be required to comply with the relevant provisions of the following legislation, where necessary:

- *Aboriginal Cultural Heritage Act 2003*
- *Dangerous Goods Safety Management Act 2001*
- *Disaster Management Act 2003*
- *Food Act 2006*
- *Land Protection (Pest and Stock Route Management) Act 2002*
- *Queensland Heritage Act 1992*
- *Soil Conservation Act 1986*
- *Tobacco and Other Products Act 1998*
- *Transport Operations (Road Use Management) Act 1999.*

4.2.3 Commonwealth approval

As the project was determined (Decision Notice EPBC 2007/3773) on 22 February 2008, by a delegate of the Australian Government Minister for the Environment, Heritage and the Arts, not to be a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act), no approval is required under section 133 of the EPBC Act.



5. Evaluation of environmental impacts

5.1 Introduction

The SDPWO Act defines 'environment' to include:

- ecosystems and their constituent parts, including people and communities
- all natural and physical resources
- the qualities and characteristics of locations, places and areas, however large or small, that contribute to their biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community
- the social, economic, aesthetic and cultural conditions that affect, or are affected by, things mentioned above.

'Environmental effects' means 'the effects of development on the environment, whether beneficial or detrimental'. These effects can be direct or indirect, of short, medium or long-term duration and cause local or regional impacts.

This section outlines the major environmental effects identified in the EIS and the SEIS, submissions on the EIS, advisory agency comments on the SEIS and consultation with advisory agencies and other key stakeholders.

Where appropriate, comments have been provided on these matters to explain the rationale supporting conclusions reached and, where necessary, recommendations have been made to mitigate potential adverse impacts of the project that were identified in the EIS and the SEIS.

5.2 Land and soil

5.2.1 EIS findings, submissions and analysis

5.2.1.1 Property management

The EIS indicates that the rail infrastructure corridor alignment (the Reference Design dated July 2009) follows as far as practicable the natural land form and avoids major contour features taking into account engineering and financial constraints.

The rail infrastructure corridor will intersect 81 parcels of land, with tenures including freehold, leasehold, reserves and unallocated state land. The predominant land uses affected by the rail infrastructure corridor are cropping and cattle grazing, with mineral, petroleum and extractive uses also impacted.

There will be both temporary and permanent potential impacts on affected properties, including:

- the fragmentation of individual properties
- ongoing viability of small property parcels
- accessibility to and between properties
- the removal and relocation of agricultural structures such as fences, gates, water storage, pipes, sheds and other utility services.



The impacts on private landowners' properties will be addressed through the negotiation of Landowner Interface Agreements between SBR and each individual landowner. These agreements will provide for the replacement of agricultural infrastructure or compensation where infrastructure will be removed permanently. The agreements will also provide for access between properties fragmented by the rail infrastructure corridor and for those properties which have public access severed by the rail infrastructure corridor. Grade separated crossings, where provided, will enable the safe continuation of agricultural property management, including the movement of stock and farming equipment across the rail infrastructure corridor.

It is understood that, in addition to the Landowner Interface Agreements, easements will be put in place between SBR and landowners, where appropriate, to provide them with security of tenure for moving stock and farming equipment across the rail infrastructure corridor.

Where individual properties are fragmented by the rail infrastructure corridor, and create small parcels of land which are inaccessible; or where the commercial viability of ongoing agricultural production is compromised, compensation will be payable to the landowner in accordance with the land acquisition process set out in the *Acquisition of Land Act 1967*. It is proposed that the rail infrastructure corridor be located within a state development area, declared pursuant to section 77 of the SDPWO Act. Once declared, the Coordinator-General would be able to acquire the land required for the rail infrastructure corridor under section 82 of the SDPWO Act.

5.2.1.2 Stock routes

Stock routes are pathways ordinarily used for moving stock on foot or on road and are declared in the Land Protection (Pest and Stock Route Management) Regulation 2003.

The rail infrastructure corridor will impact a number of stock routes. These impacts will be mitigated by realigning or replacing stock routes with alternative routes of a similar width and quality (including appropriate infrastructure such as adequate watering facilities, fencing etc.), or the provision of grade separated crossings where the existing stock route cannot be realigned or replaced. Stock routes will be kept open and trafficable during the construction period by using sections of the rail infrastructure corridor in combination with grade level crossings.

SBR has committed to designing and constructing temporary and permanent stock route crossings, in accordance with standards set by DERM.

5.2.1.3 Good quality agricultural land

The EIS states that approximately 1220 hectares of good quality agricultural land (GQAL) will be lost as a result of the project (including loss due to fragmentation), of which 807 hectares (66 per cent of the total GQAL lost) is classified as Class A; 271 hectares (22 per cent of the total GQAL lost) is classified as Class B; and 142 hectares (12 per cent of the total GQAL lost) is classified as Class C.

There is little opportunity to avoid GQAL due to a number of constraints, including:

- the linear nature of the rail infrastructure corridor, combined with the designated study area
- the perpendicular orientation of the GQAL to the rail infrastructure corridor alignment in the southern portion of the rail infrastructure corridor
- topographical limitations in the northern portion of the rail infrastructure corridor
- the location of natural resources
- infrastructure (such as roads, designated stock routes, proposed water storages and supplies)
- residential communities
- regional ecosystems.



While the multi-criteria assessment of the rail infrastructure corridor alignment did not include GQAL as an assessment criterion, for the reasons outlined above, the inclusion of GQAL as an assessment criterion in the multi-criteria assessment would not significantly alter the impact on GQAL.

The calculation of GQAL lost as a result of the project is limited to the footprint of the rail infrastructure corridor and does not include an estimate of areas impacted by the placement of infrastructure and facilities required to support project construction. Such facilities include temporary construction camps, the concrete batching plant, water storage, sediment ponds and relocating impacted agricultural infrastructure, such as fences and pipelines.

The Coordinator-General supports DERM's advice that such project-related infrastructure and relocated agricultural infrastructure and facilities, which are located outside the footprint of the rail infrastructure corridor, should minimise the impact on GQAL.

5.2.1.4 Strategic cropping land

Since the SEIS was prepared, DERM released a directional statement about managing the State's valuable agricultural land resources titled *Protecting Queensland's Strategic Cropping Land: A policy framework* (August 2010).

While the broad outline of the policy framework has been available for public comment, the critical detail of the policy has not yet been developed, in particular, the specific criteria by which strategic cropping land will be identified.

The EIS evaluation provided by this report is made on the basis of the statutory and policy framework prevailing at the time of the report, and on the basis of information provided in the EIS and the SEIS.

5.2.1.5 Coal, mineral, petroleum and extractive resources

The EIS states that the rail infrastructure corridor will intersect a number of identified coal, mineral and coal seam gas resources. The potential impacts are located primarily in the southern portion of the rail infrastructure corridor around the township of Wandoan. The mining and petroleum leases impacted by the rail infrastructure corridor include:

- Anglo Coal (Taroom) Pty Ltd's Exploration Permit for Coal (EPC) 640, known as the Collingwood coal deposit
- Xstrata Coal Queensland Pty Ltd's Mining Lease Application (MLA) 50230, Mining Development Licences (MDLs) 221 and 223, known collectively as the Wandoan coal deposit
- Santos's Petroleum Lease (PL) 176, known as the Scotia gas field
- Newcrest Mining Limited's Mining Leases (MLs) 3229, 80088, 80089, 80120, 80144 and Exploration Permits for Minerals (EPMs) 14495 and 14936, known as the Cracow Gold Mine
- Lodestone Exploration Limited's Exploration Permits for Minerals (EPMs) 16704, 17179, 17183, 17196, 17200, 16603, known as the Dawsonvale ironstone deposit.

It is understood that both the Collingwood and Wandoan coal deposits would be won via open-cut mining methods. The rail infrastructure corridor will intersect the north-west portion of the Collingwood coal deposit and the eastern part of the Wandoan coal deposit, thereby sterilising these portions of the coal reserves.



The sterilisation of these coal resources could not be avoided due to the close proximity of Wandoan township and its expansion capacity. Its expansion capacity is determined by the Wandoan coal deposit and restrictions imposed by the rail infrastructure corridor alignment geometry and road-rail interfaces, particularly the desire to avoid multiple crossings of Nathan Road, in the case of the Collingwood coal deposit. Accordingly, the placement of the rail infrastructure corridor aims to minimise the sterilisation of these coal resources taking into account the impacts on residential amenity in and around the township of Wandoan and by following, as closely as possible, the Nathan Road corridor in this area.

The rail infrastructure corridor will also intersect the north-west portion of the Scotia gas field. The nature of current gas extraction technology by way of around 100 metres by 100 metres directionally drilled wells and single wells accessing multiple gas seams, with small collection points which are linked to the main gas pipeline by gathering pipelines, means that the resource should not be sterilised. The main gas pipeline will travel south-east away from the rail infrastructure corridor according to existing licences. Any future gas pipelines should be able to cross under the rail infrastructure corridor with suitable protection.

The gold reserves being worked at the Cracow gold mine are epithermal and at depth, with the shallowest underground operations a minimum of 50 metres below surface. The rail infrastructure corridor will traverse the south-west portion of these mining leases. However, due to the narrowness of the rail infrastructure corridor (60 metres) and the underground nature of mining operations, there should be no significant impact on the gold reserves or the ability to extract such deposits.

The impacts on the Dawsonvale ironstone deposit could not be avoided due to the challenging terrain, the widespread area of the exploration permits and constraints imposed by national parks and state forests to the east and west. The placement of the rail infrastructure corridor aims to minimise the sterilisation of the ironstone resources taking into account the constraints discussed above and the rail geometry.

5.2.1.6 Soils and geology

The rail infrastructure corridor runs generally parallel to, and to the west of, the Auburn Range and crosses over an outlier of the western fringe of the Auburn Range south of Cracow. North of Cracow, the rail infrastructure corridor intersects the edge of the Dawson River floodplain, crossing a combination of gently undulating slopes and valleys, and relatively flat topography as it moves to its northern extremity near the township of Banana.

The underlying geology of the southern end of the rail infrastructure corridor, from the township of Wandoan to Bungaban Creek, is dominated by sedimentary rock with overlying alluvial deposits associated with developed surface drainage lines.

Arenite deposits extend from the southern boundary of the alluvial deposits surrounding Bungaban Creek, northwards to the vicinity of Cockatoo Creek where deposits of alluvial material and arenite-mudrock associated with surface drainage lines are indicated.

Extending northwards from the Redrange Road/Nathan Road intersection to the Nathan Gorge turnoff, geological features are dominated by Ironstone deposits with areas of overlying alluvial material associated with surface drainage lines and outcrops of arenite and arenite-mudrock deposits, particularly in the vicinity of the Cabbage Tree Creek, which are underlain by arenite-mudrock deposits.

Extending further northwards to where the rail infrastructure corridor intersects the Downfall Creek tributaries and the upper catchment of Cracow Creek, the underlying geology is dominated by arenite deposits. The rail infrastructure corridor then crosses a series of mafites and felsites and mixed siliciclastic/carbonate rocks adjacent to the sedimentary rocks and alluvial deposits underlying the area west of the township of Cracow.



Colluvial deposits, alluvial deposits and poorly consolidated sediments overlying sedimentary rock and the mafite and felsite intrusions have been mapped in the vicinity of Castle Creek and Lonesome Creek. North of Lonesome Creek, extending to the township of Banana, the dominant geological features comprise sedimentary rocks underlying poorly consolidated sediment deposits and alluvial deposits associated with Banana Creek.

Preliminary geotechnical investigations presented in the EIS indicate that the geotechnical stability of the local area landforms will be impacted by cut and fill during construction and the presence of the rail infrastructure corridor during operation.

In addition, the EIS stated that there would likely be a disruption of the surface or subsurface hydrological or hydraulic regime. This potential impact is discussed in section 5.4 of this report.

Detailed geotechnical investigations will be required to assess the geotechnical stability of the land areas affected by the construction and operation of the rail infrastructure corridor.

The EIS states that the rail infrastructure corridor intersects a range of soil types, including loamy to sandy duplex soils, uniform clays, sands and loams and friable earths with gradational profiles. The EIS identified seven soil orders occurring within the rail infrastructure corridor, including Tenosol, Kandosol, Chromosol, Dermosol, Vertosol, Sodosol and Calcarosol.

The EIS indicates that the soil sodicity levels in the rail infrastructure corridor ranged from non-sodic through to strongly sodic, with the strong sodic levels recorded in the Kandosol, Chromosol, Dermosol and Tenosol soils. High sodicity levels in soils result in a loss of water absorption properties, potential waterlogging on the surface depending on the topography of the land, surface crusting and an increased risk of erosion and dispersion. Increased sodicity results in potential land degradation and adversely impacts crop productivity.

The EIS identified that the soils in the rail infrastructure corridor range from non-saline to moderately saline, predominantly in the subsoils.

The construction and operation of the rail infrastructure corridor will disturb and expose subsurface soils which are vulnerable to accelerated erosion, dispersivity and/or salinity due to their physical and chemical characteristics. In addition, the rail infrastructure corridor will create barriers to, and change, existing overland flow characteristics increasing the risk of salinity through changes to the water table and the mobilisation of salt. Activities which will impact landform, soil features and conditions in and around the rail infrastructure corridor include placing fill for embankment structures, disturbing existing runoff control measures, excavating cuttings, constructing a number of road and rail bridge structures, installing drainage structures, constructing access tracks and roads, relocating and installing services, and constructing storage, stockpile and lay down areas.

Significant ground improvement measures are likely to be required to mitigate the potential impacts of the proposed rail infrastructure on subsurface stability, where geotechnically unsuitable materials occur in the surface and in the subsurface materials underlying the rail infrastructure corridor, including the reactive dark cracking clays.

DERM raised issues about the adequacy of the soil testing, particularly with respect to appropriate identification of soil types, locations and characteristics. SBR acknowledged in the SEIS that detailed soil analysis is required to identify appropriate mitigation measures, including suitable drainage design. Such detailed soil analysis will be required, following the completion of this report, for the relevant development approvals for the project.



5.2.1.7 Contamination

A search of the Environmental Management Register (EMR) listed five properties which will likely be impacted by the rail infrastructure corridor and which are potentially contaminated due to a previous or current use. The potential contamination listed on these properties relates to livestock dip or spray race operations (four properties) and mine wastes (one property). With respect to the livestock dip or spray race operations contamination, it is understood that the listing criteria may only apply to a small part of the total land area within the registered lot number, and would generally pose a low risk to human health and the environment under the existing land use.

No matches were found on the Contaminated Land Register (CLR).

SBR has committed to implement mitigation measures if contaminated land is encountered during construction.

5.2.2 Conclusions

The rail infrastructure corridor alignment has balanced the impacts on individual landowner properties and on-farm agricultural structures, stock routes, GQAL, coal, mineral, petroleum and extractive resources, national parks and state forests, regional ecosystems and infrastructure such as roads.

The potential impacts on individual landowner properties and infrastructure is best mitigated and managed by developing Landowner Interface Agreements with each landowner and registering easements, providing landowners with security of tenure to move stock and farming equipment across the rail infrastructure corridor where access between fragmented properties and public access to properties is severed by the rail infrastructure corridor.

The payment of compensation to affected landowners for disrupting the use and enjoyment of their land is an appropriate mitigation measure.

Potential impacts on existing stock routes can be mitigated through the detailed design process for the rail infrastructure corridor alignment, by providing grade separated crossings and realigning or replacing existing corridors of a similar width and topography.

Consequently, it is recommended that SBR consult with DERM regarding the final design of stock route crossings to ensure uninterrupted flow of stock across the rail infrastructure corridor alignment both during construction and operation of the project (Appendix 1, Schedule 1, Recommendation 3(a)).

The impact on GQAL is unavoidable given the nature of the project but the potential impact has been minimised by using appropriate route selection techniques. Given the preliminary stage of the project design and the information contained in the EIS and the SEIS, SBR will be required to provide further detailed information to support the strategies proposed to mitigate the potential impacts on GQAL and ongoing agricultural activities as a result of the fragmentation and alienation of properties and the relocation of project infrastructure as part of the future approvals processes for the project.

Therefore, it is recommended that SBR provide DERM with further information on the area of GQAL impacted by project (Appendix 1, Schedule 1, recommendations 4(a) and 4(b)).

The Coordinator-General accepts DEEDI's advice that the impacts on coal, mineral, petroleum and extractive resources intersected by the rail infrastructure corridor alignment are unavoidable due to the challenging terrain, the widespread area of the exploration permits and other tenure and topographical constraints. It is also accepted that the rail infrastructure corridor alignment has been selected with a view to minimising as far as possible the sterilisation of coal, mineral, petroleum and extractive resources.



Based on advice provided by DERM, SBR will be required to provide further detailed soil and geotechnical information to support the proposed erosion control measures and the future approvals required for the project. Prior to commencing construction work, SBR shall undertake further investigations to identify soil types and stability, soil sodicity and soil salinity ((Appendix 1, Schedule 1, recommendations 5(a) to 5(g)).

It is noted that the rail infrastructure corridor alignment is unlikely to disturb any contaminated land. However, SBR has committed to developing a site management plan/remedial action plan prior to commencing construction to handle contaminated land, should it be disturbed by project construction. It is also noted that SBR may be required to obtain a permit from DERM to dispose of contaminated land disturbed during construction.

It is recommended that SBR provide DERM, before commencing construction activities, a site management plan/remedial action plan for the handling and disposing of contaminated land and release of contaminants to land, and that disturbed land areas are rehabilitated (Appendix 1, Schedule 1, recommendations 6(a), 25(a) to 26(d) and 27(a) to 27(c)).

5.3 Nature conservation

5.3.1 EIS findings, submissions and analysis

The proposed rail infrastructure corridor traverses 210 kilometres through a sub-tropical continental region experiencing a moderate rainfall of 673 millimetres per annum with a summer maximum and moderate temperatures. Extended dry periods are common. There are few natural permanent water sources for fauna in the ephemeral gullies throughout the region.

The rail infrastructure corridor alignment traverses extensive plains with low undulations which, prior to grazing, supported a widespread continuum of low woodlands and shrublands. Consequentially, most species of plants and animals present were widespread prior to the extensive clearing which has occurred over the past 120 years.

The survey conducted by SBR found that the vegetation in the vicinity of the rail infrastructure corridor alignment exists of fragmented native remnants, and while there are few observations in the EIS and the SEIS about the condition of the region, it is likely to be mostly cleared of its original woodlands. Woodland remnants occur over most of the southern section of the rail infrastructure corridor alignment and extensive grasslands replace shrublands that once covered the flood plains of the Dawson River across the northern section of the rail infrastructure corridor alignment. The central section passes west of the Auburn ranges where the infertile sandstone upland is deeply dissected in parts by dry gullies. A large portion of this section is close to state conservation and forest reserves that support woodlands.

The Coordinator-General accepts DERM's comments that fauna and flora surveys conducted for the EIS at this preliminary assessment stage could have been more detailed and focused on the species and vegetation remnants present, including providing more information on the common species and their needs. This is a particular issue in a region where most of the original vegetation has been cleared and it is essential to clarify the status of the remaining communities in relation to pre-European conditions, as well as for managing potential impacts on all species.

The EIS and the SEIS do provide sound information of the fauna and vegetation types that have a legal status under various state and federal conservation legislation.

While some information was provided on aquatic species likely to be found well down stream in permanent waters of the Dawson River, it is understood that surveys of aquatic systems were problematic owing to the ephemeral nature of the drainage system along the rail infrastructure corridor alignment. However, such surveys will be required, following the completion of this report, for the relevant development approvals for the project.



SBR has identified the areas of each vegetation association (regional ecosystem) that will be cleared for the rail infrastructure corridor alignment, and in the case of listed vegetation associations, the areas involved are small.

The SEIS stated that 1640 hectares, including 1464 hectares of non-remnant vegetation and 176 hectares of regional ecosystems (as show in DERM maps), is destined for clearing for the rail infrastructure corridor alignment and road realignments. This clearing includes 151 hectares of 'of concern' wooded vegetation and 127 hectares of 'high value regrowth'. 'Endangered' vegetation associations made up 9 hectares of the 'of concern' class and 28 hectares of 'high value regrowth'. One factor applied in selecting the preferred route was to avoid privately owned agricultural lands and hence 504 hectares of the 1640 hectares to be cleared are on various leasehold lands owned by the state.

Construction works including clearing of vegetation, cut, fill and earth borrowing activities, and works at gully crossings for the rail infrastructure corridor and service roads have potential to cause erosion and sedimentation in gullies, and create exposed areas suitable for weed colonisation.

A number of submissions to the EIS raised issues regarding the potential introduction of exotic species and pests as a result of project construction. Several landowners along the rail infrastructure corridor alignment have raised the issue of introducing and spreading declared weeds, severing stock routes and isolating stock from water sources.

In response, SBR has developed a draft weed and pest management plan, which will be included in, and implemented through, the EMPs for the project, and which includes measures to identify, monitor and limit opportunities for introducing and spreading exotic species and pests.

Issues raised by the Taroom Wildlife Preservation Society, and others relate to potential impacts on remnants on 'The Brae', boggomoss communities, Castle Creek wetland, the consideration of fauna underpasses at gullies and fly-over opportunities for gliders, koala habitat, and noise and dust disturbances to fauna.

It is noted that SBR examined several rail infrastructure corridor alignment options before selecting the preferred rail infrastructure corridor alignment that minimises and balances impacts on a range of factors, including 'of concern' vegetation associations and stock routes (which support remanent vegetation). Additionally, to compensate for losses of vegetation listed as 'of concern', SBR has agreed to enter into negotiations to provide suitable vegetation offsets to secure nearby patches of vegetation equivalent to that to be cleared.

Noise modelling by SBR indicates that trains will generate up to 70 decibels (dB) and that this is below the 77 dB level where noise can impact upon animal behaviour.

The EIS identified and proposed measures to mitigate the impacts of coal dust on nearby vegetation when transporting coal.

In environmental management plans, SBR has committed to measures to minimise the width of the cleared rail infrastructure corridor alignment and to reuse the fallen vegetation as ground cover. Additionally, these plans contain measures to minimise erosion and sedimentation during and post construction. SBR claims that the openings under bridge crossings will be sufficiently wide and high to permit fauna and in many cases, stock to cross under the rail infrastructure. Little information is provided on modifications to culverts to improve fauna crossing, or retaining trees adjacent to the rail infrastructure corridor to permit gliders to cross overhead.

As part of the SEIS, SBR undertook additional searches in the vicinity of the rail infrastructure corridor alignment for boggomoss wetlands and koalas. Boggomoss wetlands are small areas where artesian water surfaces support a rare snail. None of this community was observed within the potential impact zone. Likewise, SBR found no evidence or records of koala within the vicinity of the rail infrastructure corridor alignment. SBR considers that the area of river red gum at Castle Creek, known as a local wetland, will not be impacted as it is one kilometre down stream of the rail infrastructure corridor alignment.



Background monitoring has involved both field and database surveys of terrestrial fauna, flora and vegetation maps along the preferred rail infrastructure corridor alignment. DERM considers that the reports in the EIS contain only limited discussion on certain aspects of fauna and flora species requirements and on project impacts and that further detailed information will be required to support the future approvals required for the project.

DEEDI (Fisheries Queensland) raised issues about the impact of in-stream waterway crossing structures and barrier works on fish movement and indicated that the preferred approach to waterway crossings is bank-to-bank bridge structures rather than culverts.

SBR has not proposed ongoing monitoring of fauna or flora during the construction and operational phases of the project. While no special circumstances exist requiring monitoring during the operational phase of the project, monitoring of fauna or flora should be carried out during the construction phase of the project.

5.3.2 Conclusions

Based on advice provided by DERM and DEEDI (Fisheries Queensland), SBR has provided preliminary information about the potential impacts of the project with respect to:

- vegetation habitat
- fauna movement corridors
- threatened flora
- wetlands and aquatic values
- terrestrial and aquatic species.

SBR will be required to provide further detailed information on how clearing for the rail infrastructure corridor alignment will further fragment woodland and shrubland communities, given the extensive loss of these communities throughout central inland Queensland. Further surveys, investigations, analysis and discussion are required of the range of issues noted above and which have also been raised by DERM.

As the detailed design of the project is progressed, the rationale for locating the rail infrastructure corridor alignment within state leasehold corridors will require further explanation, such as comparing the flora and fauna impacts of alternatively locating it on nearby cleared private lands.

The analysis of the information provided in the fauna and flora study reports is limited and as a result further detailed information will be required for future approvals to ensure that the mitigation measures and management strategies presented in the EIS and the SEIS are adequate to address the potential impacts of the project on listed species and vegetation types (regional ecosystems).

Therefore, a number of recommendations have been made to inform the subsequent approval processes with respect to vegetation clearing and fragmentation, habitat, terrestrial and aquatic fauna movement and flora (Appendix 1, Schedule 1, recommendations 7(a) to 10(c)).

5.4 Water resources

5.4.1 EIS findings, submissions and analysis

Project construction could potentially impact on surface water and groundwater.

Activities with the potential to impact on surface water include:

- vegetation clearance
- cut and fill earth works



- drainage and other earthworks associated with the construction of waterway crossings, embankments, haul roads, stockpiling and transferring of spoil, and spillage or accidental release of pollutants.

Activities with the potential to impact on groundwater include:

- spillage or accidental release of pollutants
- surface run off from construction sites
- leachate from stockpiled soil
- cut and fill earth works
- extraction of groundwater.

The potential impacts of these activities are discussed in further detail in the following sections.

5.4.1.1 Construction water supply

The SEIS discussed in more detail the potential water sources, particularly for the construction phase of the project. It is based on a revised estimate of water demand for the construction phase of the project of 4200 megalitres, compared with the range of 6250 megalitres to 9600 megalitres indicated in the EIS. Of the 4200 megalitres, it is estimated that 3800 megalitres will be required for dust suppression and ground conditioning, and 45 megalitres of potable water for human consumption.

The SEIS stated that potable water for project construction would be obtained from the local government reticulation network and transported by road to necessary locations, e.g. the construction camps and offices.

The following water sources were canvassed:

- groundwater (discussed in section 5.4.1.3)
 - the Great Artesian Basin (GAB)
 - sub artesian aquifers
- water supplies from coal seam gas extraction
- surface water (discussed in section 5.4.1.2)
 - water from the Dawson River
 - ephemeral tributaries of the Dawson River (e.g. Juandah Creek, Cockatoo Creek, etc.) and localised watercourses
 - overland flow
- disused mine water.

For the purposes of analysing construction water, the rail infrastructure corridor was divided into two distinct geographical areas. The areas were referred to as Area 1 and Area 2, with GAB groundwater likely to be available in the southern portion of the rail infrastructure corridor (Area 1) and surface and other water supply sources likely to be available in the northern portion (Area 2).

The analysis concluded that for Area 1, where estimated construction water demand is 2700 megalitres, water is likely to be sourced from groundwater sources in the GAB and/or the Dawson River. For Area 2, where estimated construction water demand is 1500 megalitres, water is likely to be sourced from the Dawson River and/or disused mine water.

The SEIS also stated that overland flow storages would be constructed where possible to minimise the project's use of water from the Dawson River and the GAB.



The SEIS indicated that negotiations would need to take place between SBR and existing water allocation holders to enable water to be sourced from the Dawson River for the construction phase of the project. The Western Downs Regional Council (WDRC) has raised issues about the availability of construction water from town supplies.

5.4.1.2 Surface water

The project is located on the Dawson River sub-catchment of the Fitzroy River drainage basin in the Central Coast Region of Queensland. The Fitzroy River basin is Australia's second largest catchment, with an area of approximately 150 000 square kilometres. The Dawson River drains into the MacKenzie River just north of Duinga and ultimately into the Fitzroy River, meeting the Coral Sea downstream of Rockhampton.

The EIS and the SEIS provided an assessment of the existing characteristics and water quality of the watercourses intersected by the rail infrastructure corridor. The assessment proposed mitigation measures to reduce the potential impact on the receiving waters during the construction and operational phases of the project (refer EIS Chapter 6, Water Resources).

The project intersects a number of small creeks and drainage lines which are tributaries of the Dawson River, including the Juandah, Roche, Bullock, Bungaban, Cockatoo, Cabbage Tree, Downfall, Ross, Cracow, Delusion, Oxtrack, Boam, Castle, Lonesome, Banana, Orange, Pigeon, Kianga, Spring, Bottle Tree and Stakeyard Creeks.

All of the watercourses intersected by the project either drain from south to north or east to west towards the Dawson River. All of the watercourses within the Dawson River sub-catchment are ephemeral, with the exception of the Dawson River which has a perennial flow in its lower reaches. Being ephemeral systems, the major flow in these watercourses is experienced only during times of heavy rainfall and is often associated with overbank flooding.

There has been extensive clearing of native vegetation throughout the catchment for both agricultural and grazing purposes. This, along with other land use changes and land management practices, has resulted in land degradation. Native vegetation is discussed further in section 5.3 of this report.

As a consequence of erosion of both cultivated and grazed areas in the catchment, significant quantities of soil have been removed and deposited in natural drainage lines and streams downstream and on the floodplain as alluvium. Reduced stream capacity results in increased overbank flooding and promotes further erosion damage of the floodplains.

The EIS stated that the preferred rail infrastructure corridor alignment does not cross the Dawson River and noted that the waterway crossings for the project are far enough upstream of the Dawson River to be unaffected by river flooding. The SEIS did not present additional information on waterway crossings to that presented in the EIS as no significant additional bridge structure design or drainage design changes were proposed as a result of refining the rail infrastructure corridor alignment.

Surface water use in the Dawson River sub-catchment includes irrigation water supply for cotton, fodder, cereal and crops such as wheat, barley, oats, maize, mung beans, soybeans, sunflowers, sorghum and peanuts. Surface water is also used for urban water supplies for the towns of Theodore, Moura, Baralaba and Duinga. Coal mines and an ammonium nitrate plant in the Moura-Kianga area and a gold mining venture at Cracow are also supplied from the Dawson River sub-catchment.

The EIS stated that at time of writing, there were 151 registered water licence holders in the Dawson River sub-catchment, with 371 off-takes.

Watercourses impacted by the project fit the definition of 'modified aquatic ecosystem' under the Environmental Protection (Water) Policy 2009 (EPP (Water) 2009). In the absence of specific identified water quality objectives (WQOs) for the area in and around the rail infrastructure corridor, the East Coast – Central region objectives have been adopted by SBR as indicative values.



Results of historical water quality monitoring for several watercourses in the area in and around the rail infrastructure corridor were obtained for the EIS from the former Department of Natural Resources and Water (NRW) Watershed Database. A review of background information showed that very little data on water quality exists for creeks in this area.

The results obtained from the water quality monitoring for six creeks in the area in and around the rail infrastructure corridor showed that indicative WQO values were currently exceeded at all sites for the majority of parameters with the exception of acidity (pH). The results indicated that these creeks are subject to influence from human activities, including grazing, land clearing and agriculture and possibly in some instances, industry and urban-based activities.

In response to submissions on the EIS, the SEIS acknowledged that baseline water quality parameters were not referenced in the mitigation measures required for the project's construction and operation phases.

Submissions also challenged the EIS on the validity of applying indicative WQOs for the EIS analysis, due to the ephemeral nature of watercourses in the area in and around the rail infrastructure corridor.

The response in the SEIS was that the analysis was valid for streams not displaying ephemeral or intermittent flow characteristics but for streams displaying these characteristics, water quality monitoring would need to be undertaken to establish baseline conditions at creek crossings. Monitoring would need to be undertaken upstream and downstream of creek crossings. During construction, monthly monitoring will need to be undertaken when streams are flowing and following significant rainfall events, with results compared to upstream baseline parameters and relevant guidelines.

Stream discharge monitoring undertaken on a number of streams that would be intersected by the project indicates that while some flow can occur during any month, the largest flows within the catchment generally occur over the wetter summer months.

The SEIS stated that since the EIS was released, a more defined flood assessment had been completed. This work investigated the potential impact of the rail infrastructure corridor alignment on existing watercourses and was based on a number of bridge structures across watercourses where there is the potential to impact watercourses on surrounding public and private infrastructure (e.g. highways and roads and communications towers).

The following watercourses were investigated:

- Roche Creek
- Mayne Creek and Cockatoo Creek
- Ross Creek
- Cracow Creek
- Delusion Creek
- Orange Creek
- Castle Creek
- Juandah Creek.

The preliminary hydraulic modelling in the SEIS indicated that the peak water level at each of the proposed bridge structures would not exceed the one per cent Annual Exceedence Probability (AEP) design event. Further, the SEIS concluded that while the preliminary hydraulic modelling confirmed that mitigation of potential flood impacts was achievable and the impact on flora and fauna at the watercourses would be negligible, the potential flood impacts could not be assessed with certainty until the design of bridge and drainage structures was finalised.



SBR has committed to further rationalising the flood impact by refining bridge and drainage structures during the detailed design phase of the project, including providing scour protection to maintain channel stability and reduce sedimentation, and erosion and sediment control measures.

A number of potential impacts on water quality and supply during the construction phase of the project were identified and discussed in the EIS and the SEIS. These included:

- sedimentation and runoff
- hydrocarbon and chemical spills
- stormwater discharge and flow redirection
- release of weed seeds and pathogens
- overall impact on water resource of sourcing construction phase water supply.

The SEIS acknowledged that during the construction of waterway crossings, the construction of temporary bunds to stop water flow or to supply water for construction may be required and necessary permits would need to be obtained.

The SEIS recognised the importance of maintaining flows to the Castle Creek wetland and stated that the rail infrastructure corridor alignment is located to the west of the wetland potentially affecting wetland inflows from the One Mile Creek and Castle Creek catchments. The SEIS sets out specific mitigation measures for this potential impact.

The key locations where potential impacts may occur from operational activities are areas where runoff and/or discharge waters from the project can enter watercourses and drainage lines. Potential impacts discussed in the EIS included:

- sedimentation and runoff
- hydrocarbon and chemical spills
- stormwater discharge and flow direction
- potential hydraulic impacts.

It is proposed that the water quality impacts during the construction phase will be managed primarily through the erosion and sediment control plan and by implementing mitigation measures as outlined in Table 6-10 of the EIS. During the operational phase, potential impacts on water quality will be managed by implementing mitigation measures outlined in Table 6-11 of the EIS.

5.4.1.3 Groundwater

The assessment in the EIS of the existing conditions and the potential impacts that the construction and operational phases of the project may have on groundwater resources was limited to a review of previous studies and databases.

The area in and around rail infrastructure corridor is within the GAB Declared Sub artesian Area.

The EIS stated that groundwater is a potential major source of water for the construction and operation phases of the project. The EIS acknowledged that a more detailed description of the existing groundwater environment, potential impacts on the groundwater resource and proposed mitigation measures (including management and monitoring practices) will be required as part of the application process for the project's groundwater licences and permits.

The primary use of existing groundwater use in the area in and around the rail infrastructure corridor is for stock and domestic purposes. Groundwater is sourced from either the artesian or sub artesian aquifers with the better quality water being from the artesian sandstone aquifers. The townships of Wandoan and Taroom rely on artesian water from the GAB for water supplies.



Groundwater resources are limited in the area between Cracow and Banana with poor water quality limiting the extent of development and use of the resource. Currently, groundwater is utilised in the Theodore irrigation area mainly for crop irrigation purposes.

The southern part of the area in and around the rail infrastructure corridor is within the Surat North management area of the GAB. The Surat North management area is managed under the GAB Resource Operation Plan (ROP) which was released in December 2006 and which implements the water planning objectives outlined in the Water Resource (GAB) Plan.

The SEIS reiterated that groundwater from the GAB is the preferred water source for the construction phase of the project (particularly the southern portion of the project) due to reliability and quality of the water supply.

The SEIS stated that preliminary modelling indicated that the drawdown of groundwater in the area in and around the rail infrastructure corridor could be managed taking into account the requirements in the GAB ROP, provided that an adequate number of boreholes are utilised across the construction area. Further, the SEIS stated that a more detailed hydro-geological study would be undertaken once specific boreholes have been chosen for extraction.

The EIS discussed potential impacts on the groundwater resource relating to the construction and operation phases of the project. Proposed mitigation measures are set out in Table 6-13 of the EIS.

Potential impacts include groundwater contamination and reduced groundwater levels due to over-extraction, if groundwater is used as a major water source particularly during the construction phase of the project. Water will be required during construction for:

- moisture conditioning of earthworks
- concrete batching
- dust suppression
- construction camp sites and offices
- vehicle washdown.

The estimated total water requirement for the construction phase of the project is 4200 megalitres, with the major uses of the water being for moisture conditioning of bulk earthworks and dust suppression.

Required water quality varies depending on proposed use. For example, potable water is required for human consumption at construction camps and offices.

Section 5.4.1.1 of this report sets out the implications of the revised water demand estimate for both surface water and groundwater resources. The WDRC has raised issues about the availability of construction water and its impact on the GAB, from which town supplies are sourced.

DERM advised that the construction works, including cut and fill activities on the rail infrastructure corridor alignment and access tracks, may increase the risk of salinity through impedance or intersection of shallow groundwater flows. Earthworks, such as for water storages, may increase salinity through seepages. Further discussion on salinity is provided in section 5.2.1.6 of this report.

5.4.2 Conclusions

The Coordinator-General accepts DERM's advice that the collection of baseline water quality data during times of flow must align with the framework of the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC) and the *Queensland Water Quality Guidelines* (QWQG) for monitoring ephemeral waterways. Detailed environmental management regimes for all potential water quality-related impacts should accord with state and national guidelines including well developed experimental design and should be reviewed by DERM.



DERM has further advised that baseline sampling during times of flow is needed to obtain local data for the project. DERM commented that the EIS indicated that water quality information has relied on the former NRW's Watershed Database, which is not indicative of current water quality. The water monitoring program needs to ensure that water quality sampling occurs at various stages of flow. Reference is made to DERM's *Monitoring and Sampling Manual 2009—Environmental Protection (Water) Policy 2009*, Version 1 September 2009.

Baseline data at reference sites is necessary to detect potential impacts, with measured parameters reflecting potential impacts of the development activity, e.g. monitoring turbidity near areas of soil disturbance. Data gathering needs to be consistent with the current QWQG.

The environmental management plan (EMP) for surface water and aquatic ecological impacts must include a thorough representation of sites up and down stream of the rail infrastructure corridor within the same catchment area. Monitoring of water quality and aquatic biology at reference/control sites needs to commence as soon as practicable to determine localised baseline data for groundwater levels and water quality before commencing construction works. Reference/control sites must represent 'close or completely natural state' aquatic habitats as required by the QWQG 2009.

While SBR has discussed in general terms the water required for the project at this preliminary assessment stage, it has not undertaken or presented in the EIS and the SEIS detailed hydraulic modelling of the potential impacts on the various water sources of the proposed water take.

The Coordinator-General notes DERM's advice that SBR's study into potential impacts on groundwater showed that using groundwater for construction purposes may potentially decrease groundwater levels in neighbouring bores or springs, and water quality may be degraded through excessive pumping of a bore.

During the construction phase, groundwater level, or pressure, should be monitored continuously in any production bore and surrounding bores and springs monitored daily.

The mitigation measures proposed for decreased water levels must be expanded to include the cessation of pumping operations if the monitoring of neighbouring bores and springs indicates a drawdown of greater than 5 metres in a bore and 0.2 metres in a spring, compared with baseline levels (refer to Table 5 of Appendix E of the SEIS).

A number of recommendations have been made to inform the subsequent approval processes with respect to potential water supply, water quality and flooding impacts (Appendix 1, Schedule 1, recommendations 11(a) to 12(b)).

5.5 Air quality

5.5.1 EIS findings, submissions and analysis

The existing air quality environment in and around the rail infrastructure corridor alignment is influenced by the regional land uses, which are predominantly cropping and cattle grazing, with mineral, petroleum and extractive industries also present. These land uses are the main sources of pollutants, with minor contributions from local traffic, and commercial/industrial sources around the township of Wandoan.

Variations in local air quality occur due to the proximity of major roads, regional events such as bushfires and dust storms, and variations in meteorological conditions such as wind speed, wind direction and atmospheric stability.



Much of the proposed rail infrastructure corridor alignment will traverse sparsely populated rural residential areas; however, there are some locations where the route passes close to residences and community facilities. Fifty-five sensitive receptors were used to assess predicted air emissions in accordance with the *Environmental Protection (Air) Policy 2008* (EPP (Air) 2008) and the *National Environment Protection (Ambient Air Quality) Measure* (NEPM (Air)). The Wandoan Cemetery was included as a sensitive receptor in the predictive modelling following a submission on the EIS and one receptor was excluded due to its location within the rail infrastructure corridor alignment which will result in its acquisition and removal.

Of the 55 sensitive receptors, which are predominantly represented by residences, 1 is located within 100 metres, 9 are located within 500 metres (including the Wandoan Hospital Outpatients Clinic), 30 are located within 1 kilometre (including the Wandoan State School), with the remainder (including the Wandoan Cemetery) located within 2.6 kilometres of the proposed rail infrastructure corridor alignment centre line.

SBR has used air quality monitoring data from the EPA air quality monitoring station at Stupkin Lane, Targinie (Gladstone) for a description of the background air quality in and around the rail infrastructure corridor. While this monitoring station does not match the topography of the project area, it is considered to be most representative of the identified monitoring stations at South Gladstone (near an alumina refinery), Clinton (near Gladstone airport), Swans Road, Targinie (no PM₁₀ monitoring) and Willowburn Oval, Toowoomba (surrounded by light industry).

The appropriateness of using the Stupkin Lane, Targinie air quality monitoring data for background air quality in and around the rail infrastructure corridor was raised by a submitter, particularly given that PM₁₀ air quality data is available for monitoring stations at Wandoan township and at the proposed Wandoan mine site. However, it is considered that the air quality monitoring data from Wandoan township and the proposed Wandoan mine site are generally consistent with the data from Stupkin Lane, Targinie and would not result in any significant variance in the air quality impacts.

Air quality impacts of the project during construction are associated with activities such as generating dust during earthmoving operations for excavation and transport of materials, clearing vegetation and topsoil, loading and unloading of trucks, moving and queuing vehicles, re-entrainment of deposited dust by vehicle movements, wind erosion of stockpiles, unsealed roads and exposed areas, operating a concrete batching plant and blasting.

The air emissions from the construction activities above and from the operation of the construction camps (Total Suspended Particulates (TSP) and PM₁₀) have been excluded from the air quality impact assessment for construction. SBR has committed to updating the air quality impact assessment to include predicted air emissions from the construction activities above and from the construction camp activities once further detailed design is undertaken prior to and as part of obtaining the necessary development approvals for the project.

Air quality impacts of the project during operation are associated with activities including deposition of coal dust and diesel fuel combustion (particulate matter and nitrogen dioxide concentrations) generated by the hauling of coal and freight by diesel locomotives.

A number of submitters raised issues about the impacts of coal dust and diesel fumes on adjacent cropping and cattle grazing pastures, and residences. However, the results of the predictive modelling presented in the EIS, which relate solely to operational activities, indicate that the maximum concentrations of nitrogen dioxide and particulate matter as TSP, PM₁₀ and PM_{2.5} do not exceed the relevant standard and guidelines set out in EPP (Air) 2008 and NEPM (Air).



The maximum concentrations of coal dust and nitrogen dioxide emissions from the operation of the rail infrastructure based on the predictive modelling provided in the EIS and the SEIS are reported against the EPP (Air) 2008 criteria is as follows:

Table 5.1 Predicted air quality and objectives

Indicator/pollutant	Value	Predicted (maximum)	EPP(Air) 2008 objectives	Averaging period
TSP	Health and wellbeing	47.2 µg/m ³	90 µg/m ³	annual
PM _{2.5}	Health and wellbeing	10.8 µg/m ³	25 µg/m ³	24 hour
PM _{2.5}	Health and wellbeing	6.3 µg/m ³	8 µg/m ³	annual
PM ₁₀	Health and wellbeing	40.7 µg/m ³	50 µg/m ³	24 hour
Nitrogen dioxide	Health and wellbeing	0.086 ppm	0.12 ppm	1 hour
Nitrogen dioxide	Health and wellbeing	0.013 ppm	0.03 ppm	annual
Nitrogen dioxide	Health and biodiversity of ecosystems	0.013 ppm	0.016 ppm	annual

The deposition rates decrease significantly the further removed from the rail infrastructure corridor alignment the sensitive receptors are located.

The Coordinator-General noted Queensland Health’s comments about the potential cumulative impact of the rail loading facility and the Wandoan Coal Mine project operations on air quality at sensitive receptors, particularly those around the township of Wandoan. However, it is considered that these impacts are appropriately assessed and addressed as part of the Wandoan Coal Mine project as these activities take place wholly on the Wandoan Mining Lease.

5.5.2 Conclusions

It is accepted that due to the nature of the project, with the blasting and cut and fill and transport of spoil, there is the potential for impacts on air quality in the vicinity of the project worksites during the construction phase of the project.

It is noted that the level of information provided by SBR at this preliminary assessment stage with respect to air emissions during construction is limited due to the preliminary nature of the project design. Further air quality impact assessment is required in relation to construction activities, including the operation of the concrete batching plant, blasting activities and construction camps.

With respect to operational air quality impacts, SBR’s position that coal dust emissions are a whole of rail network issue and therefore require no project specific mitigation measures is not accepted. While SBR has discussed QRN’s transitional environmental program (TEP), coal loss management program (CLMP) and coal dust management plan (CDMP), it has not committed to implementing the mitigation measures contained in those documents to address the potential nuisance caused by fugitive coal dust.



Considering the above matters, a number of recommendations have been made to inform the subsequent approval processes with respect to protecting air quality and addressing air emissions, including coal dust (Appendix 1, Schedule 1, recommendations 13(a) to 15(c) and 30(a) to 31(f)).

5.6 Noise and vibration

5.6.1 EIS findings, submissions and analysis

5.6.1.1 Noise

The EIS states that the background noise levels are broadly representative of a rural area, with the main sources of noise being road traffic and the operation of farming machinery.

The EIS describes the primary noise from the construction of the project to be generated by the following activities:

- earthworks from operating bulldozers and graders
- drainage works from operating a scraper and excavator
- structures from operating impact pile drivers and concrete pumps
- pavement works from operating graders, water trucks and flat drum rollers
- track works from operating graders, ballast tamping machines and dump trucks.

The noise generated by operating the concrete batching plant, construction camps, blasting activities and construction traffic movement has been excluded from the assessment of noise emissions as the precise configuration, location and volumes for these construction activities have not been determined.

For the purposes of predicting noise levels associated with construction and operational activities, the same 55 sensitive receptors used to predict air quality emissions have been used. Of the 55 sensitive receptors, 1 is located within 100 metres, 9 are located within 500 metres (including the Wandoan Hospital Outpatients Clinic), 30 are located within 1 kilometre (including the Wandoan State School), with the remainder (including the Wandoan Cemetery) located within 2.6 kilometres of the proposed rail infrastructure corridor alignment centre line. The Wandoan Cemetery is also included as a sensitive receptor in the predictive modelling following a submission on the EIS about the noise impact assessment and the sensitive receptors.

It is noted that the EPP (Noise) 2008 does not apply to the operation of a railway. Noise impacts associated with a rail infrastructure corridor are assessed against QRN's *Code of Practice for Railway Noise Management* (QRN Code of Practice). However, given this is new rail infrastructure development where the rural residential or noise-sensitive receivers are not subject to existing rail noise, it is considered that additional mitigation measures should be implemented to reduce the noise emissions from the operation of the rail infrastructure at night time.

The predicted maximum noise emissions from the operation of the rail infrastructure as set out in the EIS and the SEIS are reported to be 70.8 dB(A) for a maximum noise level (L_{Amax}) for pass-by events such as a train travelling along the rail infrastructure corridor alignment and 57.7 dB(A) for an average level of noise (L_{Aeq}) over day, evening and night time periods.

These predicted noise levels compare to the noise criteria in QRN's Code of Practice of 87 dB(A) L_{Amax} and 65 dB(A) $L_{Aeq(24hr)}$. However, the noise level criteria in QRN's Code of Practice do not distinguish between noise emissions at day time (7 am to 6 pm), evening (6 pm to 10 pm) and night time (10 pm to 7 am).



It is accepted that noise is generally more intrusive and disturbing at night time due to the lower background levels and the large number of people at home by comparison to day time and evening when more noise sensitive activities occur.

The EPP (Noise) 2008 recognises this difference and sets out the equivalent acoustic quality objectives (measured at a sensitive place—dwellings (indoors)) for the average level of noise ($L_{A1,adj,1hr}$) of 45 dB(A) at day time (7 am to 6 pm) and evening (6 pm to 10 pm), and 40 dB(A) at night time (10 pm to 7 am).

It is also accepted that noise impacts are greater in areas with low background noise levels, low-frequency noise sources and sources with combinations of noise and vibrations. All of these elements are present in the project.

In the EIS, SBR committed to the following construction noise mitigation measures to minimise the impact of noise disturbance:

- maintaining mechanical equipment
- switching off equipment that is not in use
- avoiding concurrently operating equipment with high noise emissions in close proximity to residences
- restricting the hours of construction works in close proximity to residences
- consulting with residents with regard to the timing and likely noise emissions from construction activities
- implementing a complaints resolution procedure to thoroughly investigate complaints
- establishing clear communication protocols on scheduled train movements to assist in the planning of funeral services at the Wandoan Cemetery.

5.6.1.2 Vibration

The primary sources of vibration during the construction phase of the project, as identified in the EIS and the SEIS, are activities associated with using mechanical equipment including:

- dump trucks
- road trucks
- excavators
- backhoes
- trenchers
- bulldozers
- scrapers
- graders
- water carts
- compactors
- vibratory rollers
- concrete pavers
- rock breakers
- jackhammers
- rock drills
- impact pile drivers.



The vibration generated by operating the concrete batching plant, construction camps and blasting activities has been excluded from the assessment of vibration levels and impacts on sensitive receptors as the specific locations, blast patterns, and charge sizes have not been determined and will not be determined until the detailed design phase of the project.

The level of information provided by SBR on vibration at this preliminary assessment stage means further information will be required to ensure the mitigation measures proposed are adequate to address the impacts. However, the EIS found that for the vibration impacts identified and assessed, it is unlikely that the vibration guidelines set out in DERM's *Guideline: Noise and Vibration from Blasting, AS 2670:2000 Vibration and Shock—Guide to the Evaluation of Human Exposure to Whole Body Vibration* and *BS 6472 1992 Evaluation of Human Exposure to Vibration in Buildings* would be exceeded with the exception of those construction activities described above which have not been modelled.

The predicted vibration levels from operating the rail infrastructure meet the AS 2670:2000 guideline of 0.2 mm/s continuous or intermittent vibration peak particle velocity (PPV) at all sensitive receptors at night time.

5.6.2 Conclusions

It is accepted that due to the nature of the project, noise and vibration impacts from the construction and operation of the project are largely unavoidable. However, it is considered that the mitigation measures to be implemented by SBR, and set out in the EMP, will go some way towards addressing the noise and vibration impacts of the project.

There are likely to be impacts from noise and vibration due to the location of the project in proximity to residences and other key infrastructure, and the nature of activities required to be undertaken during the construction phase. These activities include earthworks, drainage works, impact pile drivers, concrete pumps, graders, water trucks, flat drum rollers, ballast tamping machines, dump trucks, concrete batching plant, construction camps, blasting activities and construction traffic movement.

The noise and vibration impacts experienced by persons in close proximity to the construction work are temporary in nature. However, given the rural residential nature of the area in which construction activities will be undertaken and the low background noise levels, the construction noise and vibration impacts will need to be carefully managed.

It is noted that the level of information provided by SBR at this preliminary assessment stage on noise emissions and vibration levels during construction is limited due to the preliminary nature of the project design. Further noise and vibration modelling will be required to assess the noise and vibration emissions resulting from the operation of the concrete batching plant, construction camps, blasting activities and construction traffic movement, once further detailed design is undertaken before, and as part of, obtaining the necessary development approvals for the project.

The Coordinator-General notes Queensland Health's comments that the rail infrastructure operations noise emissions may exceed the noise criteria for sleep disturbance ($L_{A1,adj,1hr}$) specified in the EPP (Noise) 2008 at certain residential dwellings sensitive receptors.

While QRN's Code of Practice sets objectives against which acoustic quality of rail infrastructure operation should be assessed, it is considered that the EPP (Noise) 2008 is a more appropriate measure given this is new rail infrastructure development in a rural area, which has low background noise levels and is not subject to existing rail noise. Further predictive modelling and assessment against the acoustic quality objectives set out in the EPP (Noise) 2008 is required, with additional mitigation measures to be developed to further reduce the predicted noise impacts from rail infrastructure operations.

These mitigation measures may include, but are not limited to, long-term strategies such as:

- using new generation rolling stock, which is quieter
- limiting gradients and heights of cuttings and fill and other track features



- rail traffic controls (e.g. speed limits, time limits, use of horns)
- rail track measures such as special rail fasteners, rail grinding
- construction of noise bunds.

It is considered that the vibration generated by the pass-by of rail rolling stock will not have an adverse impact on the health and wellbeing of persons at any sensitive receptor at any time of the day or night.

Accordingly, a number of recommendations have been made to inform the subsequent approval processes with respect to noise and vibration resulting from the construction and operation of the project (Appendix 1, Schedule 1, recommendations 16(a) to 16(b) and 32(a) to 33(d)).

5.7 Waste

5.7.1 EIS findings, submissions and analysis

The EIS and the SEIS outlined the characteristics of wastes and indicative quantities likely to be generated during construction, operation and decommissioning of the project.

Points of waste generation during construction are likely to be associated with:

- the three main construction camps each with a capacity to accommodate up to 450 persons—likely to be located at the intersection of Defence and Castle Creek Roads, Nathan Road at Pigeon Creek and Nathan Road at Bungaban-Twelve Mile Road, producing largely domestic and office wastes
- general rail corridor infrastructure alignment—wastes produced during the vegetation clearing and earthworks phases
- remote and temporary work camps
- concrete batching plant—likely to be located near the Downfall Creek Bridge site
- mechanical workshop—likely to be one or more of these located as part of the main construction camps
- bridge, culvert and stock crossing locations.

The EIS stated that the largest volume of waste will be generated from construction activities for the rail corridor infrastructure itself, rather than ancillary services and activities associated with project construction, the long-term operation of the rail infrastructure and decommissioning of the rail infrastructure.

The estimates for the volume of waste likely to be generated from primary construction activities are not available at this preliminary assessment stage. The EIS and the SEIS stated that estimates will be calculated during the detailed design phase of the project, following the completion of this report, and will be required for the relevant development approvals for the project.

During construction, hazardous wastes, in the form of hydrocarbons and sewage, will likely be generated from activities such as plant maintenance and on-site personnel ablution facilities. On-site storage will be required for petrol, diesel, oil, lubricants and sewage.

The EIS estimated the total waste generated through the operation of the three main construction camps for the project as:

- 65 tonnes per annum of domestic recyclable waste
- 130 tonnes per annum of domestic non-recyclable waste
- 190 kilolitres per day of sewage and domestic wastewater.



The SEIS stated that SBR will continue to liaise with the BSC and the WDRC in regard to waste disposal in the respective local government areas.

The EIS acknowledged that the project has the potential to impact on the environment through resource consumption and through the uncontrolled release of contaminants and waste. The EIS also acknowledged the need for a waste management plan (WMP) to be implemented through the project's EMPs.

Queensland's waste management legislation sets out a waste management hierarchy of actions ranging from most preferred (avoidance) to least preferred (disposal).

The EIS discussed re-use, recycle and disposal options for various waste streams.

The EIS further stated that temporary on-site sewage treatment plants may be built at each construction camp. The intention is that sewage from the construction camps will be treated on-site to a level suitable for re-use or at least to a level whereby discharge into the surrounding catchment will not cause adverse downstream impacts.

The SEIS also stated that all trackable wastes, including contaminated soil, effluent, lead acid batteries, oil and grease and used spill absorbent material, will be removed from site and disposed of by suitably licensed waste transporters and receivers.

5.7.2 Conclusions

SBR has committed to continue liaising with the WDRC and the BSC about waste disposal requirements for the project. It is recommended that SBR, prior to commencing construction, enter into arrangements with the WDRC and the BSC, as necessary, to accommodate waste disposal requirements for the project where SBR proposes to use council-owned or operated waste disposal facilities (Appendix 1, Schedule 1, Recommendation 17(a)).

The SEIS stated that during the construction phase in particular, the project will generate waste including organics (mulch), artificial solids (steel, cement, concrete), hydrocarbons (oils, fuels, lubricants), municipal solid waste and waste water. However, it is noted that opportunities will exist to reduce, re-use and recycle some waste materials generated and SBR intends to prepare and implement a WMP as part of its broader EMPs.

The Coordinator-General supports the advice provided by the WDRC and DERM, that more detailed waste generation information is required to assess the impacts of waste on the environment and to establish appropriate mitigation measures and waste management and handling strategies to address the potential impacts.

A number of recommendations have been made to address how waste, including waste water, is to be stored, handled, transferred, removed from the site, reprocessed, recycled, incinerated, or disposed of (Appendix 1, Schedule 1, recommendations 28(a) to 29(a) and 34(a) to 35(d)).

5.8 Traffic and transport

5.8.1 EIS findings, submissions and analysis

5.8.1.1 Road transport

The existing road network in the Wandoan and Banana local government areas is described in section 10 of the EIS. The regional road network includes three state-controlled highways:

- the Dawson Highway, which extends from Gladstone to Springsure
- the Leichhardt Highway, which runs northward from Goondiwindi, through Wandoan, Taroom, Theodore and Banana to the Capricorn Highway near Westwood near Rockhampton. At Banana, the Leichhardt Highway connects to the Dawson Highway
- the Warrego Highway, which provides a transport route from Brisbane and Toowoomba.



The project crosses a number of local roads which will be used for access to support the construction of the project:

- Castle Creek Road—under the control of the BSC
- Defence Road—under the control of the BSC
- Eidsvold-Theodore Road—a state-controlled road
- Carmody's Road under the control of the BSC
- Nathan Gorge Road—under the control of the BSC
- Nathan Road—North (Red Range Road to Nathan Gorge Road) under the control of the BSC
- Nathan Road—South under the control of the BSC
- Cracow Road—under the control of the BSC
- Deearne Road—under the control of the BSC
- Bowlings Road—under the control of the BSC
- Bungaban-Twelve Mile Road—under the control of the WDRC
- Walshs Road under—the control of the WDRC
- Jackson-Wandoan Road—a state-controlled road.

The EIS summarised existing annual average daily traffic volumes on local roads that are relevant to the project. The data shows very low traffic volumes on local roads.

5.8.1.2 Construction traffic

The EIS provided the results of a construction traffic operation assessment undertaken with respect to moving equipment and materials to and from the area in and around the rail infrastructure corridor. The EIS assumed the extent of traffic impacts arising from the construction phase will be more noticeable than the longer term impacts resulting from operation of the rail infrastructure.

The analysis assumed that there would be three major construction camps each comprising approximately 76 accommodation units transported from Brisbane via Toowoomba.

The analysis also assumed that each construction camp would have a maximum capacity of 450 workers and that the peak number of trips will occur at the start and end of the working week with workers arriving at and departing from the construction camps. It also assumed that the majority of the construction workforce will be transported daily via bus to and from each construction site.

The analysis also examined possible quantities of construction materials, points of origin and likely transport routes.

The EIS stated that during the initial works phase, construction vehicles will rely on the existing regional and local road network for access and trips until an access track is completed along the length of the rail infrastructure corridor.

However, the EIS stated that significant volumes of traffic and heavy vehicles will still rely on the public road network throughout the construction phase. The composition of construction vehicles using public roads is likely to include:

- fuel tankers
- cement trucks
- water trucks
- B double trucks



- site passenger vehicles
- waste collection trucks
- buses/vans to transport staff between the construction camps and construction sites.

The EIS sets out daily trip generation and total trip estimations from various construction activities. The EIS also presented estimated traffic volumes generated by the project, considering underlying projected growth rates and the percentage increase the project is expected to have on existing traffic levels.

However, the traffic assessment is limited at this preliminary assessment stage as SBR is yet to confirm the source of construction materials. The SEIS stated that the associated traffic volumes and trip generation information will be determined during detailed design.

Under the *Guidelines for Assessment of Road Impacts of Development* (DTMR 2006), traffic impacts need to be considered where traffic due to a development, equals or exceeds five per cent of the existing traffic levels. The analysis concluded that the traffic generated by the project is expected to exceed this threshold on most roads affected by the project, with the exception of the Warrego and Dawson Highways.

The analysis also concluded that the increase in traffic volumes will be most noticeable on unsealed (gravel) roads which are constructed to a lower design standard. This means that although sight distances and opportunities to overtake may be limited, the predicted volumes of traffic are considered by SBR to be within the acceptable operating capacity of these roads.

SBR recognised that the increased construction traffic volumes generated by the project may cause deterioration of the condition of roads in the region. SBR proposes to undertake a condition assessment survey prior to construction and to reinstate to agreed standards after construction is complete. It has also committed to establish a maintenance regime with the responsible road authorities (DTMR and the local councils).

The SEIS stated that a Terms Sheet for the SBR Project Compensation Deed had been developed, which would include provisions for the survey and maintenance of affected roadways, and address requirements for road upgrades and relocations.

SBR stated that parties to this Compensation Deed may include SBR, DTMR, local councils and the appointed construction contractor.

SBR also stated that it would prepare a construction traffic management plan (TMP) prior to commencing construction, in consultation with key transport-related stakeholders, including DTMR, local councils, the QPS and the DCS.

In its comments on the SEIS, the QPS noted the importance of it being consulted by SBR in preparing TMPs and being a member of the traffic and transport liaison group (TTLG) to be established by SBR.

The Toowoomba Regional Council (TRC) has requested that it be involved in the development, implementation and monitoring of the proposed TMP.

The WDRC has stated its requirement that SBR enter into an infrastructure agreement with the WDRC dealing with, amongst other things, maintaining and restoring council roads. The WDRC acknowledged SBR's commitment to prepare a TMP but has stated that it would require SBR to undertake a comprehensive traffic impact study to assess the impact of the project on the local road network.

SBR has also proposed the formation of a traffic and transport local liaison group tasked with reviewing reports on road maintenance, cost reviews and dispute resolution.

The EIS concluded that, once operational, the project will result in minimal changes to the existing road traffic pattern. It stated that a small number of inspection and service vehicles will use state-controlled roads and the local road network. However, once vehicles are on site, they will be mostly confined to the service road located within the rail infrastructure corridor.



DTMR, in its comments on the SEIS, acknowledged that the EIS provided traffic generation information and that section 10.4 of the SEIS outlined SBR's commitment to assess and address road impacts via a Compensation Agreement and TMP when contractors are appointed. DTMR further advised that the level of detailed information at this preliminary assessment stage about potential road impacts (including impacts of project traffic on road pavements or intersection performance and required impact mitigation strategies) made it difficult for DTMR to recommend clear conditions of approval.

DTMR also raised an issue about agreeing in-principle with details in a draft Terms Sheet for a Compensation Agreement, without a draft road impact assessment. DTMR observed that the draft Terms Sheet appeared to shift direct responsibility for mitigating road impacts of the project from SBR to the construction contractor. DTMR acknowledged that SBR had committed to undertake a pre- and post-construction road condition survey as one of the matters to be dealt with in the Terms Sheet for a Compensation Deed. However, DTMR stated that it would prefer negotiations over development of the Terms Sheet wait until an initial road impact assessment is undertaken. The Coordinator-General supports DTMR's position on this matter.

Further, DTMR stated that it is important to further refine SBR's 'statement of commitments' on managing workforce movements to and from the construction site to limit private vehicles accessing the accommodation and material stockpile sites, to ensure the ongoing safety and efficiency of the state-controlled road corridor.

5.8.1.3 Rail crossings

The EIS stated that the rail infrastructure corridor alignment requires a total of 140 crossings, comprising:

- 3 state-controlled road crossings
- 23 council road crossings
- 114 occupation (private) crossings.

Eleven minor public road crossings and 62 private road crossings were proposed to be at rail level. Other public road crossings and stock route crossings (as declared under regulation) and private stock crossings were proposed to be under or over the rail infrastructure (where practicable). Forty of the 62 private road crossings have been included as an allowance for machinery crossings, internal maintenance access crossings and additional property access.

The suitability of the proposed crossing treatment and the associated safety implications was a key issue raised in the EIS submissions and ongoing consultation activities with the local community.

The SEIS reported on further work by SBR on road/rail crossings. Table 5.2 below, reproduced from the SEIS, compares the total number and type of crossings for the EIS preferred alignment and the subsequent Reference Design (July 2009).

Table 5.2 Comparison of public and private crossing treatments

Type	Number of crossings (EIS preferred alignment)	Number of crossings (Reference Design (July 2009))
Public—at-grade crossings	13 ¹	3 ²
Public—grade-separated crossings (including stock routes)	15	19
Private—at-grade crossings (including easements)	62	9
Private—grade-separated crossings	51	74

¹ includes three potential future public level crossings



² includes two potential future public level crossings (Kitty Moran Road to be grade-separated).

The SEIS stated that there had been a marked reduction in the number of proposed level crossings, with the 13 public level crossings identified in the EIS having been reduced to include only one level crossing at Walshs Road; and two potential public level crossings. Although a level crossing is still proposed at Walshs Road, SBR proposes to relocate the intersection to improve safety at the crossing.

Further, the level of treatment for all at-grade level crossings will be assessed using the Australian Level Crossing Assessment Method, on a case-by-case basis during detailed design phase of the project, following the completion of this report, and will be required for the relevant development approvals for the project.

The SEIS concluded that the proposed road infrastructure changes based on the Reference Design (July 2009) represent significant improvements in safety by reducing potential traffic conflicts. Reducing the number of level crossings will also reduce traffic delays.

Level crossings will be designed and constructed to QRN standards for over-wide machinery.

The SEIS also stated that further alterations may occur to the number, location and type of crossings as the design is further detailed and landowner consultation continues. The details and location of private and stock access crossings will be negotiated on a case-by-case basis with individual landowners and state and local authorities.

SBR stated that access roads on public land linking with occupational crossings would be at least equivalent standard to existing access. Emergency services' access to the local community and construction personnel will be maintained at all times, and for incidents associated with rail infrastructure operation.

5.8.1.4 Rail transport

The EIS stated that the transport task of coal/freight haulage will initially be undertaken by standard Blackwater sized trains to transport coal from surrounding mine sites. The EIS further stated that, in the longer term, larger (1.5 times greater in size) Blackwater trains will be used and that it is likely that under normal circumstances, trains on the rail infrastructure corridor alignment will operate 24 hours a day, seven days a week for most of the calendar year.

It is anticipated that freight will be transported in a standard interstate single stack container configuration, with train approximately 1800 metres in length.

The EIS concluded that, once operational, the project will have a direct impact on the capacity of the Moura Railway system. The project will connect the western railway system and the Moura Railway system which will result in a significant increase in rail traffic on the Moura Railway system, primarily because of the increase in the need to transport coal from the region to coal load out facilities at Gladstone. The Moura Railway system will require upgrades to accommodate the anticipated increase in rail traffic volumes.

5.8.2 Conclusions

It is noted that the level of information provided by SBR about potential road impacts related to the project and impact mitigation strategies is reflective of the preliminary assessment stage of the project.

A number of conditions have been imposed to address potential road surface and traffic impacts (Appendix 1, Schedule 2, conditions 3(a) to 4(a)).



5.9 Cultural heritage

5.9.1 EIS findings, submissions and analysis

5.9.1.1 Non-indigenous cultural heritage

Section 12 of the EIS described the contextual history of the project region and outlined the existing environmental values for non-Indigenous cultural heritage assessment as part of the EIS for the project.

The assessment methodology consisted of archival, library and field research, consultation with local historical societies and a consideration of the environmental setting and heritage character of the area in and around the rail infrastructure corridor.

Reference was made to the *Environment Protection and Biodiversity Act 1999* (EPBC Act) (Cwth), the *Queensland Heritage Act 1992* and the Banana Shire and the former Taroom Shire planning schemes.

As part of the investigations, interested stakeholders in the area in and around the rail infrastructure corridor were consulted. No places of heritage significance within the area in and around the rail infrastructure corridor were identified by these stakeholders.

A search of Commonwealth (Australian Heritage Places inventory), Queensland (EPA Queensland Heritage Register) and local heritage registers was undertaken. The search found 13 places listed within the previous local government boundaries of the Banana and former Taroom shires, but none of these places were located within the area in and around the rail infrastructure corridor.

The EIS stated that the lack of currently listed or identified heritage places does not mean that there are no sites of historic heritage value. Further study would be needed, principally in the form of visual inspection along the rail infrastructure corridor alignment in order to ascertain if there are sites of potential heritage value.

Within the area in and around the rail infrastructure corridor, there is only one identified place of heritage significance—the Juandah Homestead site. This site is not affected by the footprint of rail infrastructure corridor alignment.

The EIS stated that if, during construction, structures of possible historical significance are discovered, work would cease in that area to allow an appropriately qualified heritage assessor the opportunity to assess the site.

As part of the SEIS, a supplementary non-Indigenous cultural heritage assessment was undertaken based on the revised rail infrastructure corridor alignment (Reference Design Corridor (July 2009)). No additional places of non-Indigenous cultural heritage significance were identified.

In response to a submission on the EIS, the SEIS clarified that a review of the National Heritage and Commonwealth Heritage Lists for the Banana and the former Taroom local government areas resulted in no recorded sites in the area in and around the rail infrastructure corridor.

In response to another submission on the EIS, SBR further investigated the National Heritage List, which is designed to recognise and protect places of outstanding heritage to the nation, and the Commonwealth Heritage List, which includes Commonwealth-owned or leased places of significant heritage value.

The investigation found that no places of possible historical significance were affected by the rail infrastructure corridor alignment and that the specific places mentioned in the submission as being of possible historical significance (Orange Creek Mining Complex and the Klondyke and Royal Standard Mining Leases) were identified to be located approximately 200 metres east of the proposed rail infrastructure corridor.



Comment on the EIS suggested that a full cultural heritage survey of the entire area in and around the rail infrastructure corridor should have been conducted as part of the non-Indigenous cultural heritage study. However, this would have involved a survey that traversed approximately 210 kilometres of potential rail infrastructure corridor. The Coordinator-General supports SBR's conclusion in the SEIS that, based on 'desktop' research and community consultation, such a survey had a low probability of discovering additional places of non-Indigenous cultural heritage and was therefore not warranted at this stage.

It is noted that the assessment to date has not included the location or footprint for temporary construction camps for the project.

5.9.1.2 Indigenous cultural heritage

The methodology adopted for Indigenous cultural heritage protection is largely determined by the provisions of the *Aboriginal Cultural Heritage Act 2003* (Cwth) (ACH Act). The ACH Act sets out a process with statutory timeframes for development of approved Cultural Heritage Management Plans (CHMP) for the project.

The EIS stated that there are currently three native title claims under the *Native Title Act 1993* (Cwth) over the area in and around the rail infrastructure corridor. These claims have been lodged by the Wulli Wulli, Gangulu and Iman # 2 People. The claim lodged by the Gangulu People was registered but was dismissed by the Native Title Tribunal on 3 June 2009.

A fourth claim has been lodged by the Iman # 1 People. It is understood that the claim lodged by the Iman #1 People was not registered and was dismissed by the National Native Title Tribunal on 1 May 2008.

The EIS further stated that CHMPs have been agreed between SBR and the Iman #2 and the Wulli Wulli People, but that agreement had not yet been reached with the Gangulu People.

The EIS indicated that representatives of the Iman #2 and the Wulli Wulli People had participated in elements of cultural heritage field surveys of the rail infrastructure corridor alignment and that the survey identified a number of sites and objects to be recorded and managed in accordance with the CHMPs.

The EIS also listed potential impacts and mitigation measures to be implemented through the CHMPs. It stated that avoidance is the best management tool for avoiding impact on significant indigenous heritage sites but that avoidance will not always be a viable or necessary option.

The SEIS stated that, after publishing the EIS, a CHMP had been agreed with the Gangulu People.

The SEIS also stated that where the rail infrastructure corridor alignment deviates from areas previously surveyed, additional field inspections will need to be carried out with the Indigenous parties prior to construction of the project.

The only submission on the EIS about Indigenous cultural heritage matters related to the potential impact of coal dust on a rock art site located near the rail infrastructure corridor alignment. SBR proposes to manage this matter through the relevant CHMP.

5.9.2 Conclusions

The Coordinator-General accepts SBR's conclusion that no places of known non-Indigenous cultural heritage significance are impacted by the rail infrastructure corridor and that the project has a low probability of harming such places. The Coordinator-General supports the proposed mitigation measure of taking further action if a previously unidentified structure of possible historical significance is discovered during the construction phase of the project.

The conclusion in the SEIS that the project has a low probability of harming places of Indigenous cultural heritage is supported. It is considered that SBR has taken satisfactory measures to manage potential impacts and mitigation measures through the CHMPs.



The Coordinator-General supports SBR's acknowledgment that additional field inspections are required to identify possible sites and objects of Indigenous cultural heritage before commencing construction in a particular segment of the rail infrastructure corridor and where the currently preferred rail infrastructure corridor alignment deviates from the alignment assessed in the EIS and the SEIS. A recommendation to this effect has been made (Appendix 1, Schedule 1, Recommendation 18(a)).

5.10 Social impacts

5.10.1 EIS findings, submissions and analysis

The project will generate socio-economic benefits throughout the broader region as a result of estimated project expenditure and additional indirect flow-on effects. Economic activity will occur initially from first round impacts (or direct impacts), arising from expenditure of the capital budget to upgrade the current rail systems and develop the larger new rail and associated infrastructure. Second round, or indirect impacts, will arise as industries supplying inputs to the project increase their purchases to meet additional demand generated by the project. The economic stimulus generated by the project through inter-industry activity will occur as a result of both the construction and operation phases.

The EIS discussed potential adverse impacts on the social environment and public amenity of the area for both the construction and operation phases of the project. The impacts during construction are likely to be:

- loss or encumbrance of residential, commercial and agricultural uses
- potential indirect impacts on agricultural landowners resulting in a decline in past land use outcomes and surface water quality
- restricted access due to construction traffic and traffic diversions
- local traffic impacts including restriction or delays for local buses and other means of transportation
- impacts on visual amenity for businesses and residents
- vibration, dust and noise emissions.

These specific impacts have been considered elsewhere in this report and where required, recommendations have been made and conditions imposed to reduce the impacts to an acceptable level. However, other indices relating to the social and economic environment need further scrutiny to ensure the impacts are fully appreciated.

For the purposes of estimating the project's effect on population change, a maximum construction workforce of 1350 was assumed based on an estimate that each of the three construction camps would have a capacity of 450 persons. This is a conservative assumption and the maximum construction workforce is not expected to exceed 1000 persons.

A demographic profile of the region and community, and service profiles for the region including the townships of Wandoan, Taroom, Theodore, Banana and Cracow were developed.

The EIS stated that it is unlikely that the same personnel would be employed continuously throughout the construction period. Specialist contractors are likely to be employed for specific components of the project.



It is estimated that a maximum of 10 per cent of the construction workforce could be sourced locally. It is also assumed that between 5 per cent and 10 per cent of the construction workforce may move permanently to the region and hence be seeking accommodation in the region. It is further assumed that a number of persons not directly associated with the project will move to the area to take advantage of economic opportunities related to increased economic activity in the area. Based on existing occupancy rates in existing townships, the EIS concluded that there is capacity in the region to cater for the relatively modest increase in population likely to be associated with the project.

The EIS foreshadowed that there is a potential issue relating to accommodation options for a workforce of approximately 50 persons for the construction of the Downfall Creek bridge. Accommodation options are either to:

- establish a short-term camp close to the site or
- use nearby townships as dormitory towns until such time as a major construction camp is operational.

The use of accommodation in dormitory towns may impact on the availability of accommodation for tourism purposes.

The EIS recognised that there are potentially negative social issues associated with the influx of a relatively large construction workforce into the region. The EIS noted that behaviour protocols would need to be included in the social impact assessment as part of individual development applications for the individual construction camps.

The impact of the operational workforce on the regional population (44 train drivers and a small number of maintenance workers) is expected to be minimal.

5.10.2 Community engagement

In the SEIS, SBR proposes to establish the Surat Basin Rail local liaison group (SBRLLG) with three dedicated sub-groups dealing with:

- traffic and transport
- health and community
- environment.

Membership of the SBRLLG is proposed to include representatives from:

- Queensland Health
- WDRC
- BSC
- QPS
- DOC
- DIP
- DEEDI
- key community stakeholders such as major social service agencies and local economic development groups.

It is proposed that the SBRLLG and each sub-group would appoint a secretary, to be funded by SBR, to handle administrative matters, including complaints. It is considered important that the secretary or secretaries should be independent persons nominated by SBR and approved by the Coordinator-General.

SBR has agreed to continue liaising with the QPS about the possibility of a commercial arrangement, whereby the QPS may make use of a high quality telecommunication facility to be established by SBR for the length of the rail infrastructure corridor.



SBR has developed and incorporated a social impact management, monitoring and evaluation strategy into the EMPs for the project.

The SEIS commented that the project would likely provide a major catalyst for economic growth and development in the region. SBR has committed to developing a local industry participation plan to promote employment opportunities for local residents and explore opportunities for local businesses to supply goods and services to the project.

5.10.3 Conclusions

The project will create short-term employment opportunities and flow-on economic benefits by providing indirect employment opportunities and support services for the rail infrastructure construction and upgrade activities on the Western and Moura Railway systems.

A key driver of the project's design has been to minimise its impacts on the local community through, for example, locating the new rail infrastructure corridor in areas that limit the impact on current land use, transport and access arrangements. The construction methods, times and practices discussed, and recommendations made in this report, will work towards reducing the impacts.

While the project will generate benefits to the regional economy, its impacts (particularly those related to construction activities) on residents in the vicinity of the rail infrastructure corridor is an issue which must be carefully managed. In addition, the construction workforce and short-term construction work camps are likely to be of a size which will result in noticeable impacts during the construction phase of the project, relative to the broader regional population.

There is predicted to be a limited impact on the availability or affordability of accommodation in the region. Similarly, the availability of community and social services will experience a related peak demand impact due to the influx of a construction workforce and short-term construction work camps.

SBR has agreed to establish the SBRLG and to work with the local community to ensure a good understanding of the project and to ascertain individual requirements and address issues.

In acknowledgment of potential adverse impacts of the construction of the rail infrastructure on the community, a number of conditions have been imposed regarding the establishment of various community groups, a complaints management process and an incidents management process to address the social impacts of the project (Appendix 1, Schedule 2, conditions 5(a) to 6(c)).

5.11 Hazard and risk

5.11.1 EIS findings, submissions and analysis

The project involves constructing some 210 kilometres of rail infrastructure through a lightly settled grazing and broad scale cropping region of central western Queensland. The rail infrastructure will run between Wandoan and Banana passing near Taroom and Theodore. These towns have small populations in the vicinity of 200–500 residents. The existing land uses pose limited risks (e.g. agricultural activities, road travel, grass fires) to community members.

Limited health and emergency services are provided in the region because of the small populations.

The construction of the project is expected to employ up to 1000 construction workers over a 2–3 year period, while operations are expected to employ up to 44 train drivers when operating at full capacity and a small number of support and track maintenance workers. It is proposed that construction workers will be housed in three camps located along the route with work progressing on three fronts.



SBR has identified in its EIS, legislation, polices, codes of practice, Australian Standards and other material which impose conditions on construction and rail operations in relation to potential hazards and risks to human health and safety.

Due to the isolated nature of the rail infrastructure corridor and the low population densities in the region, it is considered that the potential impacts of the project on human health and safety from construction and operational activities will be largely confined to the construction workforce.

SBR has undertaken an appraisal of the health, safety and hazard aspects of the construction and operation of the rail infrastructure and has identified in the EIS and the SEIS, activities and environmental outcomes that may contribute to, or be a risk to, the health or safety of workers, local residents and travellers in the district. This appraisal is extensive covering natural events, construction and operation activities, and inventories of hazardous materials likely to be used or transported. The potential risks, likelihood of occurrences and magnitude of any consequences to humans and the environment have been assessed in a matrix. Strategies to deal with each risk factor are outlined in the EIS.

It is noted that SBR has not finalised arrangements with local authorities for supplying drinking water to the construction camps, or the disposal of waste and effluent generated by the construction camps. Appropriate arrangements are essential to ensure sound health for the workers.

A number of submitters on the EIS raised issues relating to the safety at level crossings. In response, SBR has made changes to the rail infrastructure corridor alignment to reduce hazard and risk, amongst other matters.

SBR has committed to identify potential risks and hazards in the workplace and in the regional community from activities associated with the project. SBR has, in the EIS, also committed to procedures which include preparing risk, incident and emergency management plans to minimise and mitigate potential impacts on the health and safety of its workforce and members of the local community.

It is considered that the initial efforts undertaken by SBR will provide an adequate foundation from which to develop management practices to minimise risks and hazards in the project's workplace and in the local community and to handle any incidents that may occur.

There have been a significant number of changes to the number and type of crossing treatments as set out below:

- 3 public at-grade level crossings (EIS proposed 13)
- 19 public grade-separated crossings (including stock routes) (EIS proposed 15)
- 9 private at-grade crossings (including easements) (EIS proposed 62)
- 74 private grade-separated crossings (EIS proposed 51).

These changes are also discussed in section 5.8 of this report. The proposed changes significantly reduce possible conflicts between road users, farming operations and the rail infrastructure.

The transportation of dangerous goods and hazardous substances shall be carried out in accordance with the *Australian Code for Transportation of Dangerous Goods by Road and Rail*, 7th edition.

In the SEIS, SBR has committed to develop a TMP in conjunction with suppliers of dangerous goods. The TMP will also include fatigue management measures.

In its comments on the SEIS, The QPS noted the importance of it being consulted by SBR in the preparation of TMPs. The QPS also noted SBR's intention to develop an Emergency Preparedness and Response Plan (EPRP). The QPS also advised that it has certain powers under the *Disaster Management Act 2003* (Qld) and that SBR's EPRP should be consistent with this legislation.



In the SEIS, SBR reiterated that an EPRP would be developed as part of the EMPs for the project. The EPRP will be prepared in conjunction with key stakeholders including the relevant councils, the QPS and the DCS. The SEIS stated that the requirements of the EPRP have been updated to reference local councils' disaster management plans.

5.11.2 Conclusions

The Coordinator-General accepts the arrangements included in SBR's risk and incident management plans for monitoring risk and hazardous activities, quantities of substances and recording incidents and recovery actions.

It is noted SBR proposes to develop hazard, risk and incident management plans to address workplace and community health and safety issues.

SBR has improved the proposed rail crossing treatments along the proposed rail infrastructure corridor alignment, thereby reducing the possibility of conflict between road users, farming operations and the rail infrastructure. This enhances safety for local communities.

The revised EMP in Section 18 of the SEIS includes requirements to develop and implement an EPRP in consultation with key parties such as the relevant councils, the QPS and the DCS, the establishment of a project emergency response team and associated procedures and training requirements.

No recommendations have been made and no conditions have been stated or imposed in relation to the potential hazards and risks associated with the construction and operation of the project. It is recognised that such issues will be appropriately informed, assessed and conditioned in the approvals processes which will follow the completion of this report.

5.12 Other impacts

5.12.1 EIS findings, submissions and analysis

5.12.1.1 Greenhouse gas emissions

The EIS stated that the basic sources of greenhouse gas (GHG) emissions from project construction and operation include:

- using fuels for:
 - installing and removing construction camps and site offices
 - travelling between construction camps and construction sites
 - constructing the rail infrastructure
 - operating the trains (scope 1—direct emissions)
- using electricity for:
 - construction camps and site offices (scope 2—energy indirect emissions)
 - vegetation removal (scope 1—direct emissions).

However, the EIS did not estimate GHG emissions associated with the following construction activities:

- transporting construction materials to the site
- blasting using ammonia nitrate/fuel oil explosives
- operating the concrete batching plant.



Estimation of the GHG emissions associated with the project was undertaken in accordance with the National Greenhouse Accounts Factors (NGAF) workbook prepared by the Australian Government Department of Climate Change. The total estimated GHG emissions for project construction are estimated to be 52 297 tonnes carbon dioxide equivalent (CO₂-e). The total estimated GHG emissions for project operation are estimated to be 155 843 tonnes carbon dioxide equivalent (CO₂-e).

5.12.1.2 Cumulative impacts

Section 16, Volume 1 of the EIS discussed the project's potential cumulative impacts and those caused by the project in combination with other known and proposed developments in the area.

The EIS stated that the proposed Wandoan Coal Mine project is likely to be the major customer for the project and the construction phases of the two projects are likely to overlap.

The EIS also mentioned the Moura Railway system upgrade, which will be required to accommodate the anticipated increase in rail traffic volumes.

The project is likely to act as a catalyst to encourage further resource development in the Surat Basin.

Any cumulative impacts are likely to be concentrated at the southern end of the rail infrastructure corridor near Wandoan where the project and the Wandoan Coal Mine project geographically converge. For example, there may be some mixing of construction traffic for the projects.

The EIS also stated that impacts of the project are likely to be more pronounced during its anticipated 2–3 year construction phase, with relatively low impacts anticipated during the project's operational phase.

The EIS stated that most construction phase impacts are likely to be concentrated geographically where construction activity is occurring and at major construction camp locations.

Issues were raised in submissions on the EIS about cumulative impacts (dust, noise and vibration) of the project and the Wandoan coal mine project on the health of Wandoan residents in particular. Also, issues were raised about the capacity of the QPS to provide acceptable standards of service to the community in light of workforce-related population growth in the region. Therefore, construction impacts are likely to be short-term in nature and some will occur in different geographical areas as construction of the rail infrastructure proceeds.

It is considered that the project will not contribute significantly to cumulative impacts once it is operational, given the linear nature of the project and its operational profile.

Construction water volumes for the project are estimated to be in the order of 4200 ML for the entire construction period, with much of this water demand attributable to dust suppression and ground conditioning activities. As such, this water will need to be sourced from various locations along the 210 kilometre route of the rail infrastructure corridor. Therefore, the potential cumulative impact on a particular water source attributable to the project is likely to be minimal.

Other potential cumulative impacts relate to potable water, wastewater and sewage. SBR is conducting ongoing discussions with relevant councils about the potential supply of potable water for human consumption and about potential treatment of wastewater and sewage. However, the quantities involved are expected to be minimal and short-term in nature.



5.12.2 Conclusions

It is noted that the level of information provided by SBR with respect to GHG emissions during construction is reflective of the preliminary assessment stage of the project. Accordingly, SBR is required to undertake further GHG estimates for the project related to transporting construction materials to the site, blasting using ammonia nitrate/fuel oil explosives, and operating the concrete batching plant. The results of these estimates are to be included in the inventory of projected future GHG emissions once there is further certainty about those components of the project.

While it is acknowledged that the transport of coal and other goods by rail is a more environmentally efficient form of transport than by road, there is a need for the project to demonstrate that it has minimised potential GHG emissions during the operational phase of the project through the implementation of specific mitigations measures.

A number of recommendations have been made requiring further GHG emissions modelling and the preparation of a GHG management plan to mitigate the carbon footprint of the project (Appendix 1, Schedule 1, recommendations 2(a) and 2(b)).

The project is closely linked to the evolution of the Wandoan Coal Mine project. As a result, the project will contribute to cumulative impacts insofar as its construction phase coincides with that of the Wandoan Coal Mine project and the cumulative impacts are likely to be more pronounced in the Wandoan area where the projects geographically merge.

It is considered that most cumulative impacts are likely to be short-term in nature and mitigation measures will be applied as set out in individual sections of this report and individual sections of the report dealing with the Wandoan Coal Mine project. SBR is committed to preparing a suite of EMPs covering the life of the project and to ongoing consultation with relevant government agencies and the community. It is considered that this creates the opportunity for impacts and mitigation measures to be managed over time.

It is not necessary to make recommendations or state or impose conditions on the project on account of potential cumulative impacts. It is considered that cumulative impacts—to the extent that they do occur—can be adequately dealt with by requirements in individual sections of this report, as part of the future approvals processes for the project and the evaluation report for the Wandoan Coal Mine project.



6. Environmental management plans

A draft planning environmental management plan (EMP(P)) was provided in section 18, Volume 1 of the EIS. The draft EMP(P) was revised based on submissions on the EIS and the revised draft EMP(P) is contained in the SEIS.

The draft EMP(P) has been developed taking into account DERM's *Guideline for Preparing Environmental Management Plans*. It proposes environmental measures, actions, commitments and procedures to be implemented during the design, construction, operation and decommissioning phases of the project to address environmental impacts relevant to the project for the respective phases. The draft EMP(P) identifies:

- affected environmental values
- potential impacts on environmental values
- indicators and performance criteria
- mitigation strategies
- monitoring
- corrective actions.

The draft EMP(P) is the first of a series of EMPs to be developed for the project and all measures identified within the EMP(P) are to be further reviewed once the construction contractor has been appointed. The other EMPs include:

- an environmental design report (EMP(D)) which, while not an EMP, will indicate how the design mitigation measures from the EMP(P) have been incorporated into the project design
- a construction environmental management plan (EMP(C)) to be developed and implemented by the construction contractor
- an operational environmental management plan (EMP(O)) to be developed by the asset owner for implementation by users of the SBR project rail infrastructure, including coal producers, the rail network manager and coal train operators, and maintenance personnel/contractors
- a decommissioning environmental management plan (EMP(Decom)) to be developed by the asset owner/contractor responsible for decommissioning facilities.

Section 18.5 of the SEIS sets out various environmental management strategies which have been developed to address particular environmental impacts relevant to the project. Section 18.6 of the SEIS sets out proposed monitoring, review and auditing commitments for the EMPs, together with SBR's commitments regarding reporting and corrective actions, if necessary. Corrective action will be required in the following circumstances:

- non-conformance with performance criteria
- non-conformance with the EMP(D), EMP(C), EMP(O) and EMP(Decom)
- an environmental or safety incident
- complaints.



The construction and operational phases of the project will require development approval from DERM pursuant to the EP Act. In undertaking the project, SBR shall comply with the general environmental duty in section 319 of the EP Act not to undertake activities that cause or are likely to cause environmental harm unless all reasonable and practicable measures are taken to prevent or minimise the environmental harm. There is also a duty on all persons to notify of any actual or threatened serious or material environmental harm that becomes known during the undertaking of an activity.

The environmental requirements and obligations of all relevant legislation are addressed in the EMPs for the project. The EMPs also convert the undertakings and commitments made by SBR in the EIS and the SEIS, and the findings of the various environmental studies into actions and commitments to be implemented by the designers, constructors and operators of the project.

Specific development approvals for various environmentally relevant activities (ERAs) for the project are discussed in section 4.2.1.4 of this report.

Noting the preliminary stage of the project design, DERM has advised that further detailed information on the environmental impacts of the project will be required to inform elements of the draft EMPs, including erosion and sediment control, fauna and flora, water quality, air quality, noise and vibration, and waste. The draft EMPs were prepared on the understanding that final EMPs would be provided once the detailed design for the project is undertaken. The final EMPs would need to include, but not be limited to, the mitigation measures outlined in the draft EMPs and must reflect the recommendations made and the conditions imposed in the relevant sections of this report.

Therefore, site-specific studies and surveys shall be completed in consultation with DERM, to further inform the final alignment of the rail infrastructure corridor and design of the rail infrastructure with the findings of the studies and surveys to be incorporated in the relevant EMPs.

To ensure the EMPs meet this requirement, a number of recommendations have been made setting minimum requirements for matters which must be addressed in the EMPs (Appendix 1, Schedule 1, recommendations 11(a) to 1(d)).

A number of recommendations relating to the likely ERAs for the project are relevant to the EMPs (Appendix 1, Schedule 1, recommendations 19(a) to 36(b)).



7. Conclusions

All of the documentation provided as part of the EIS process for the Surat Basin Rail project has been considered in preparing this report in accordance with Division 3, Part 4 of the SDPWO Act.

The evaluation of the environmental effects of the project has been limited to the construction, operation and maintenance of the rail infrastructure and associated works as defined in section 2.2 of this report.

The rail infrastructure is located wholly within the proposed SBICSDA. Accordingly, the majority of the project development works will occur within the proposed SBICSDA.

However, certain development works associated with the project, which are required to support the construction of the rail infrastructure, such as establishing temporary construction camps, transporting construction material and equipment, and sourcing quarry material, would be carried out on land located outside the proposed SBICSDA.

Noting the preliminary stage of the project design and the information contained in the EIS and the SEIS, the environmental effects of the following areas of the project, some of which are located within the proposed SBICSDA, have not been evaluated:

- temporary construction camps
- quarry material
- concrete batching
- blasting
- radio repeater stations.

In a number of other areas, including erosion and sediment control, fauna and flora, hydrology and water, air quality, noise and vibration, waste, traffic and transport, construction material and equipment, and cultural heritage, the further detailed information will be required to be provided by SBR after this report is completed to support the future approvals required for the project.

SBR has acknowledged that those areas of the project listed above could not, at this point in time, be fully defined and has further acknowledged that it will undertake further investigations during the detailed design phase of the project.

Based on the information provided, including that from the advisory agencies, the project concept, excluding those areas of the project listed above, as described in the EIS and the SEIS, and summarised in section 2 of this report, may proceed subject to:

- the recommendations and conditions set out in Appendix 1 of this report
- further design development and finalising detailed EMPs, which SBR has committed to completing in consultation with the relevant regulatory agencies as part of obtaining the necessary development approvals for the project.

In the event of inconsistencies between the EIS and the SEIS documents and the recommendations in this report, the recommendations in this report prevail.

Due to the conceptual nature of the project and the preliminary level of the information provided in the EIS and the SEIS, the Coordinator-General has made recommendations and imposed conditions set out in Appendix 1 of this report. These recommendations and conditions are appropriate for the preliminary nature of the assessment at this stage and recognise the further detailed information which will need to be provided as part of the detailed development approval processes required prior to construction commencing.



Applications for development approvals for the components of the project located within the proposed SBICSDA will be assessed by the Coordinator-General pursuant to the development scheme for the proposed SBICSDA. The recommendations set out in Appendix 1, Schedule 1 of this report will be considered when the Coordinator-General assesses a properly made application made by SBR for an MCU of premises for the construction and operation of a railway track and ancillary things in the proposed SBICSDA.

In addition to the development of the railway track and ancillary things in the proposed SBICSDA, other development works within the proposed SBICSDA, such as the ERAs, would require MCU approval. This development would be assessed by DERM under the SPA.

The approvals for undertaking ERAs, both within and outside the proposed SBICSDA, must be a preliminary approval only pursuant to section 39(1)(c) of the SDPWO Act.

To the extent that any of the recommendations and conditions set out in Appendix 1 of this report apply to those components of the project development located outside the proposed SBICSDA, they do not limit the assessment managers' ability to seek additional information and power to impose conditions on any development approval required for the project.

A copy of this report will be issued to SBR, pursuant to section 35(5)(a) of the SDPWO Act.

Copies of this report will also be issued to those advisory agencies which participated in the EIS process.

Pursuant to section 35(5)(b) of the SDPWO Act, a copy of this report will also be made available on the DIP web site at: www.dip.qld.gov.au/projects

Appendix 1 Conditions and recommendations

Contents

Schedule 1	Coordinator-General's recommendations
Schedule 2	Coordinator-General's imposed conditions
Schedule 3	Glossary of terms



Schedule 1 Coordinator-General's recommendations

The general recommendations, set out below, are made pursuant to the evaluation of the EIS for the project under section 35(3) of the SDPWO Act and are relevant to the various applications for development approvals for the project.

The recommendations inform and provide guidance to the relevant assessment managers in assessing the respective development applications, and do not limit assessment managers' ability to seek additional information and/or power to impose conditions on any development approval required for the project.

Entities to be consulted by SBR in regards to each recommendation have been nominated in the relevant recommendation in this schedule.

To simplify the presentation, this Schedule 1 has been divided into the following parts.

Part 1: General environmental management

Part 2: Land

Part 3: Flora and fauna

Part 4: Water

Part 5: Air

Part 6: Noise and vibration

Part 7: Waste

Part 8: Cultural heritage

Part 9: Environmentally relevant activities

Part 1: General environmental management

1 Environmental management plans (EMPs)

- (a) SBR shall complete and submit to DERM and other relevant entities and consultative bodies for review, prior to commencing construction works, draft EMPs which are specific to both the site and method of construction and operation and which incorporate the final project design and the findings of site-specific surveys.
- (b) SBR shall take into account any comments from those bodies in finalising the EMPs.
- (c) The EMPs shall be made available to the public on request.
- (d) SBR shall regularly review the EMPs and implement further or alternative mitigation measures in response to monitoring results, where non-conformance is identified and corrective action proposed, and undertake ongoing community consultation.

2 Greenhouse gas (GHG) emissions

- (a) SBR shall undertake additional estimates of project GHG emissions to include all construction-related activities and provide the revised inventory of projected future GHG emissions to the Office of Climate Change before commencing construction.
- (b) Before commencing construction, SBR shall provide the Office of Climate Change with a GHG Management Plan, proposing measures to mitigate the carbon footprint of the project and which includes a commitment to implementing the proposed mitigation measures and monitoring GHG emissions.

Part 2: Land

3 Stock routes

- (a) SBR shall consult with DERM regarding the final design of stock route crossings to ensure uninterrupted flow of stock across the rail infrastructure corridor alignment both during construction and operation of the project.

4 Good quality agricultural land (GQAL)

- (a) SBR shall provide DERM with an assessment of the area of GQAL impacted by placement of other project related infrastructure and facilities, and the relocation of impacted agricultural infrastructure.
- (b) The placement of any permanent and temporary project infrastructure and agricultural infrastructure and facilities located outside the footprint of the rail infrastructure corridor shall not cause disruption to ongoing agricultural activities on GQAL.

5 Soils

- (a) SBR shall provide DERM with detailed soil (soil profiles and soil chemistry) and geotechnical investigations which accurately identify and map those soil types that were recognised in the broad-scale land systems mapping as soils at increased risk of erosion or salinity resulting from construction work activities such as cut-and-fill and compaction works in and around the rail infrastructure corridor alignment, water storages, and access tracks etc.
- (b) SBR shall specify for DERM suitable control measures for those sections mapped as medium to high risk to minimise the potential for increased erosion and soil degradation, giving particular attention to measures that avoid disturbing and exposing those soils with sodic subsoils. Where works cannot avoid such risks, SBR must define the specific measures required to prevent disturbance of sodic soils causing adverse on site and off site impacts.
- (c) SBR shall reinstate runoff control measures or provide alternative measures to minimise the occurrence of erosive flows.



- (d) SBR shall provide DERM with appropriate measures to ensure erosion does not result in adverse impacts on adjacent lands or on natural resources in the vicinity, including but not limited to a monitoring program to assess impacts and identify mitigation measures to be undertaken where construction activities cause degradation of the adjacent lands or natural resources.
- (e) SBR shall, to the satisfaction of DERM, appropriately dispose of spoil containing sodic soil material and not leave it exposed where it can result in adverse risks to land and water resources.
- (f) SBR shall apply expert advice in designing a suitable network of shallow groundwater bores, to monitor changes in shallow groundwater levels and water quality, including salinity levels, to the satisfaction of DERM.
- (g) SBR shall install shallow groundwater monitoring bores in areas of high salinity risk prior to starting construction, to establish baseline conditions. The monitoring program is to include a commitment to undertaking appropriate measures to moderate any adverse impacts that may become evident during the both the construction and operation phases, to the satisfaction of DERM.

6 Contaminated land

- (a) SBR shall provide DERM, before commencing construction, with a site management plan/remedial action plan for the handling and disposing of contaminated land.

Part 3: Flora and fauna

7 Waterway crossings

- (a) SBR shall develop a set of criteria for the design of all waterway crossings to be approved by DEEDI (Fisheries Queensland).

The criteria should detail the waterway crossing methodologies available to the project and the specific conditions to which each crossing type is suited.

Each waterway crossing is to be assessed against the criteria to ensure the most suitable, least impact crossing is selected. The criteria should include, but not be limited to the following:

- (i) For each waterway crossing type—measures that do not impact on fish movement.
- (ii) For each waterway—waterway type, height, gradient of banks, waterway width at bed level and at the top of the crossing structure, flow regime including water velocities, turbulence and depths at the point of crossing (with and without the crossing in place), form base flows to drown-out of the crossing.
- (iii) Requirements for fish passage within the crossing.
- (iv) Engineering details of the crossing—height, width along the waterway, type, size, and number of culverts, flow capacity, construction materials, location of low flow channel, and slope through the culvert compared with the natural bed gradient.
- (v) Method of and timetable for construction and duration the crossing will be in place.
- (vi) Monthly reporting during the construction phase of the project detailing each waterway crossing that has been constructed. The reports should justify the waterway crossing methodology, explain the duration the temporary crossing was in place and include photographs of the site before, during and after the construction and removal (in the case of temporary crossings) of the crossing.

8 In-stream storages

- (a) All temporary instream water storages to provide water during construction are to be removed and the area of temporary disturbance rehabilitated following completion of works in that location to the satisfaction of DEEDI (Fisheries Queensland).

9 Terrestrial habitat

- (a) To the greatest extent practicable, the location of any construction lay down areas, temporary constructions camps and vehicle access roads and tracks are to avoid remnant vegetation.
- (b) Offsets for all vegetation types being cleared are to be identified and secured within the proximity of the rail infrastructure corridor alignment prior to completion of construction in accordance with DERM's *Policy for Vegetation Management Offset* version 2.4 and the *Queensland Government Environmental Offsets Policy 2008*. This will need to be negotiated with DERM.
- (c) The fencing of the rail infrastructure corridor alignment boundaries are to be designed so as to direct fauna into underpasses at bridges and culverts, and where necessary, exclude cattle but permit kangaroos.
- (d) SBR shall provide to DERM further information and discussion on the value of remnant vegetation to all species, not just the listed species, and the impacts of the fragmentation to be caused on all species.
- (e) SBR shall provide DERM with a comprehensive survey of all timber to be cleared, detailing commercial timber for determination of operational requirements.
- (f) Mature habitat trees (hollow-bearing) shall be retained/reinstated, where possible, to the satisfaction of DERM. Hollow-bearing trees that must be felled together with fallen timber/logs and nesting sites etc. should be moved as little as possible during construction and subsequently relocated to the vicinity of the cleared rail infrastructure corridor alignment and/or left as ground habitat.
- (g) SBR shall prepare, in consultation with DERM, a more detailed assessment of fauna habitat, and apply the findings to the design, construction and operational measures to mitigate impacts on fauna movement.
- (h) SBR shall complete surveys of directly affected vegetation/fauna habitat within the rail infrastructure corridor alignment construction footprint to confirm existence location of any threatened flora/fauna and incorporate findings in management plans and provide the findings to DERM.
- (i) SBR shall carry out surveys to identify any terrestrial species that are ecologically-dependent on wetlands/waterways and incorporate design and management measures to mitigate impacts on any such species and provide such information to DERM.
- (j) SBR shall assess the feasibility of removing and relocating all relevant species, such as the boggomoss snail, fresh-water turtle and various threatened species of flora referred to in the EIS and the SEIS and provide such information to DERM.

10 Aquatic habitat

- (a) SBR shall undertake a more detailed appraisal of the wetlands, watercourses and other aquatic values along and in proximity to the rail infrastructure corridor alignment to identify specific values potentially impacted by the project and to support any categorisation of sites against the Sensitive Area Criteria, and incorporate findings in management plans to minimise any adverse impacts on aquatic flora and fauna during the construction phase of the project. Include site-specific data that accurately and comprehensively describe the environmental values and ecological condition at each wetland site (such as crossings) and provide to DERM prior to/in conjunction with applications for any development approvals.



- (b) Disturbed fish habitats shall be rehabilitated and restored as soon as possible on completion of construction works to a habitat of a similar quality to that available prior to construction works to the satisfaction of DEEDI (Fisheries Queensland).
- (c) Construction works are to be conducted in already degraded or disturbed areas in preference to undisturbed areas where possible. Justification should be provided where fish habitats are to be disturbed along with details of the alternatives considered and reasons for the preferred option to be provided to DEEDI (Fisheries Queensland).

Part 4: Water

11 Water supply

- (a) SBR shall collect water quality data from selected reference and control sites before the construction phase of the project, during all phases of the hydrological cycle (including times of flow), to make meaningful comparisons with data collected during times of construction and operational phases of the project and provide the results to DERM.
- (b) SBR shall prepare a water quality management plan to address waterway crossings with monitoring in accordance with the Water Quality and River Health Monitoring Program and submit the plan to DERM for review. The plan should detail what issues will be addressed, the parameters that will be sampled and the reasoning behind all site selections including reference sites. The plan should also ensure that flow is factored into pre, during and post-construction phases.
- (c) SBR shall undertake additional baseline measurements of neighbouring bores, including groundwater levels and water quality prior to the construction phase of the project and apply the findings to a groundwater management plan. The draft plan is to be submitted to DERM to inform conditions to be placed on licenses required for the supply of groundwater for the construction phase.
- (d) If the extraction activities are shown to draw down groundwater greater than 2 metres in unconsolidated alluvium, 5 metres in consolidated strata and 0.2 metres in springs, then take of water will cease, DERM will be notified, the cause will be investigated and an appropriate course of action would be agreed.

12 Flooding

- (a) SBR shall undertake further hydraulic investigation once the proposed bridge structures, culverts and drainage design have been finalised and develop mitigation measures to minimise the afflux impact of the project to the satisfaction of DCS.
- (b) The placement of any temporary project infrastructure required for the construction of the project shall not be located on floodplains. DERM is the agency responsible for monitoring compliance with this recommendation.

Part 5: Air

13 Air quality

- (a) SBR shall undertake additional predictive modelling and assessment of air quality impacts relating to concrete batching plant, blasting and construction camps activities and provide the results to Queensland Health and DERM before commencing construction.

14 Dust management

- (a) SBR shall prepare a construction dust management plan for DERM's approval and acceptance.

15 Coal dust

- (a) SBR shall develop, in consultation with DERM, a coal dust management plan (CDMP) for the project, which is similar to, and consistent with, the CDMP being implemented by QR Network Pty Ltd across the Central Queensland Coal Network.
- (b) SBR shall liaise with QR Network regarding the implementation of the QR Network CDMP and its integration with the SBR project CDMP.
- (c) The SBR project CDMP shall ensure users of the SBR project rail infrastructure (coal producers, rail network manager, coal train operators) comply, where relevant, with the following coal dust emission mitigation measures included in the SBR project CDMP:
 - (i) product coal transported by the project has a coal surface moisture content and regulation system designed to reduce dust emissions during rail transport
 - (ii) coal wagons are not overloaded to minimise the loss of coal during transport
 - (iii) implementation of an effective surface (veneering) treatment strategy
 - (iv) installation of veneer spray stations at coal load-outs consistent with the veneering strategy
 - (v) introduction of standards informed by monitoring processes and coal type testing
 - (vi) implementation of wagon loading practices
 - (vii) installation of profiling chute loaders and skirts
 - (viii) installation of batch weighing load-out systems
 - (ix) implementation of coal type testing for dustiness
 - (x) installation of appropriate coal load out infrastructure
 - (xi) implementation of a coal dust removal (ballast cleaning) program
 - (xii) establishment of a community liaison and coal dust complaints management system
 - (xiii) incorporation of weighbridges as necessary to monitor loading and detect overloading
 - (xiv) establishment of a coal dust monitoring and reporting system
 - (xv) use of wagons and supporting operational procedures that facilitate the efficient and effective implementation of the SBR project CDMP.

Part 6: Noise and vibration

16 Noise

- (a) SBR shall undertake additional predictive modelling and assessment of construction noise quality impacts relating to concrete batching plant, blasting and construction camps activities on sensitive/commercial places and develop appropriate mitigation measures to further reduce the predicted noise impacts and provide the results to Queensland Health and DERM prior to the commencement of construction.
- (b) SBR shall undertake additional predictive modelling and assessment of operational noise quality impacts to identify the potential exceedences with the EPP (Noise) 2008 criteria for sleep disturbance and develop additional mitigation measures to further reduce the predicted noise impacts from operations of the rail infrastructure and provide the results to Queensland Health and DERM prior to the commencement of construction.



Part 7: Waste

17 Waste management and handling

- (a) SBR shall, prior to commencing construction of the project, enter into agreements, including funding arrangements where necessary, with the WDRC and the BSC, as necessary, to accommodate waste disposal requirements for the project where SBR seeks to use, and the relevant council agrees to the use of, council owned or operated waste disposal facilities.

Part 8: Cultural heritage

18 Indigenous cultural heritage

- (a) Prior to commencing construction of a particular segment of the rail infrastructure corridor, SBR shall conduct Indigenous cultural heritage field investigations, with participation as necessary by relevant Indigenous stakeholders, on the segment of the currently preferred rail infrastructure corridor alignment which was not covered by field investigations on the original rail infrastructure corridor alignment to the satisfaction of DERM.

Part 9: Environmentally relevant activities

General

19 Prevent and/or minimise likelihood of environmental harm

- (a) A person carrying out an environmentally relevant activity (ERA) to which the approval relates, shall take all reasonable and practicable measures to prevent and/or to minimise the likelihood of environmental harm being caused.
- (b) A copy of the development approval shall be kept in a location readily accessible to personnel carrying out the activity.

20 Site management plan

- (a) From commencement of an ERA to which the approval relates, a site management plan (SMP) shall be implemented. The SMP shall identify all potential sources of environmental harm, including but not limited to the actual and potential release of all contaminants, the potential impact of these sources and what actions will be taken to prevent the likelihood of environmental harm being caused. The SMP shall also provide for the review and 'continuous improvement' in the overall environmental performance of all ERAs that are carried out. The SMP shall be approved by the administering authority prior to the commencement of activities on site.

The SMP shall address the following matters:

- (i) environmental commitments—a commitment by senior management to achieve specified and relevant environmental goals
- (ii) identification of environmental issues and potential impacts
- (iii) control measures for routine operations to minimise the likelihood of environmental harm
- (iv) contingency plans and emergency procedures for non-routine situations
- (v) organisational structure and responsibility
- (vi) effective communication
- (vii) monitoring of contaminant releases
- (viii) conducting environmental impact assessments
- (ix) staff training
- (x) recordkeeping

- (xi) complaint management
 - (xii) periodic review of environmental performance and continuous improvement
 - (xiii) waste management plans/procedures to be implemented in accordance with the relevant conditions listed in the approval
 - (xiv) stormwater management plans/procedures to be implemented in accordance with the relevant conditions listed in the approval.
- (b) The SMP shall not be implemented or amended in a way that contravenes any condition of the approval. If there is a potential conflict between the SMP and the conditions of an approval, the conditions of the approval take precedent.

21 Recordkeeping

- (a) The operator of an ERA authorised by a development approval shall record, compile and keep all data required by the approval. This data shall be made available to the administering authority if requested.
- (b) All records required by the approval shall be kept for 5 years.

22 Notification

- (a) Any emergency, incident or event, which results in the release of contaminants not in accordance with, or reasonably expected to be in accordance with, the conditions of an approval shall be reported by telephone to the administering authorities' pollution hotline or the district office located in the area where the release occurred. Any such release shall be reported as soon as practicable, but no later than 24 hours after the holder of the development approval becomes aware of the release.

23 Information to follow notification

- (a) A written notice detailing the following information shall be provided to the administering authority within 7 days of any advice provided in accordance with recommendation 22(a):
- (i) the name of the operator, including their approval/registration number
 - (ii) the name and telephone number of a designated contact person
 - (iii) the quantity and nature of the substance released
 - (iv) vehicle and registration details
 - (v) the names of person/s involved in the release and/or cleanup
 - (vi) the location and time of the release
 - (vii) the suspected cause of the release
 - (viii) a description of the effects of the release
 - (ix) details of the area of impact
 - (x) the results of any sampling performed in relation to the release
 - (xi) actions taken to mitigate any environmental harm caused by the release and details of the success of these actions
 - (xii) proposed actions to prevent a recurrence of the release.

24 Third party environmental auditing

- (a) Compliance with the conditions of an approval shall be audited within 3 months of the commencement of the activity.



- (b) The audit identified in recommendation 24(a) shall be conducted by a suitably qualified third party auditor, nominated by the approval holder and accepted by the administering authority.
- (c) In relation to the audit required by recommendation 24(a), the auditor shall submit a copy of the final version of the auditors report to the administering authority within 28 days of completing the audit.
- (d) The total financial cost of the audit required by recommendation 24(a) will be the responsibility of the holder of the approval.
- (e) If a person carrying out an environmentally relevant activity (ERA), to which the approval relates, becomes aware of material or serious environmental harm as a result of carrying out an activity, then the said activity shall cease immediately, and remedial measures shall be implemented.

Land

25 Rehabilitation

- (a) As soon as practicable, but no later than 6 months after completing the extraction activities, disturbed areas of the site shall be rehabilitated in accordance with the rehabilitation management plan mentioned in recommendation 26(a). This includes rehabilitating all disturbed areas such as slopes, borrow pits, stockpile storage and sediment basins.

26 Rehabilitation Management Plan

- (a) Not more than 2 years after the commencement of activities on site, the holder of the approval shall complete an investigation into rehabilitation of disturbed areas and submit a site rehabilitation plan for the administering authority's review, comment and acceptance. On acceptance of the plan it shall be implemented immediately and it shall be reviewed every time new areas are disturbed on site during operations.

The rehabilitation management plan shall, at a minimum:

- (i) map existing areas of rehabilitation
 - (ii) specify design objectives for rehabilitation of disturbed areas and post quarry land uses across the site
 - (iii) specify soil characteristics, soil analysis, soil separation for use on rehabilitation
 - (iv) detail rehabilitation methods applied to areas
 - (v) contain landform design criteria including end of quarry design
 - (vi) detail how landform design will be consistent with the proposed future use
 - (vii) Identify success criteria for areas and itemise revegetation criteria
 - (viii) explain planned native vegetation rehabilitation areas and corridors
 - (ix) identify at least a minimum of 1 reference and 3 rehabilitation sites to be used to develop rehabilitation success criteria
 - (x) describe rehabilitation indicators and the monitoring program to be used
 - (xi) develop a contingency plan for rehabilitation maintenance or redesign
 - (xii) describe end of quarry landform design plan and post quarry land uses across the site
- (b) Maintenance of rehabilitated areas shall take place to ensure:
 - (i) erosion control measures remain effective

- (ii) plants show healthy growth
 - (iii) any weed infestations are removed and prevented from re-occurring
 - (iv) plants that have not taken, died or have become diseased are removed and replaced as soon as practical
 - (v) significant plant losses are examined for possible causes
 - (vi) the rehabilitated land should be capable of withstanding normal disturbances such as drought, fire or flood
 - (vii) rehabilitated ecosystems shall be sustainable in the long term.
- (c) For excavations that are to remain at the completion of extraction activities, the holder of the registration certificate:
- (i) shall provide safe access to the excavation
 - (ii) shall ensure that the excavated areas are surrounded by a rock bund and/or fences to make the area safe to the general public
 - (iii) shall ensure that water quality in any remaining excavation or from seepage released from the site, complies with the appropriate water quality guidelines nominated by the Queensland Water Quality Guidelines
 - (iv) however, if the quality of waters in the vicinity of the extraction does not comply with those Guideline values due to the occurrence of natural minerals sourced from the undisturbed geological setting, 26(c)(iii) does not apply to the extent of the natural contamination
- (d) Topsoil shall be:
- (i) removed, where practicable, from areas to be significantly disturbed prior to the commencement of extraction activities
 - (ii) stockpiled in a manner that will preserve its biological and chemical integrity; and used for onsite rehabilitation purposes.

27 Contaminant release to land

- (a) The storage and handling of all contaminants, wastes and other materials on site shall be:
- (i) contained within on-site containment systems
 - (ii) controlled in a manner that prevents any release to the environment
 - (iii) designed to minimise rainfall collection therein to the greatest extent practicable.
- Any system or measures to contain contaminants on site shall be constructed in accordance with the relevant Australian Standard.
- (b) Appropriate spill kit(s) and relevant operator instructions/emergency procedure guides for managing wastes and chemicals associated with the ERA shall be kept at the site.
- (c) All relevant personnel operating under the approval shall be trained in the use of the spill kit(s).

Water

28 Stormwater management

- (a) There shall be no release of contaminants from the site to surface waters or the bed or banks of any watercourse.
- (b) The maintenance and cleaning of vehicles and any other equipment or plant is to be carried out in areas where contaminants cannot be released to any waters.



- (c) Any spillage of wastes, contaminants or other materials is to be cleaned up as quickly as practicable. Such spillages shall not be cleaned up by hosing, sweeping or otherwise releasing such wastes, contaminants or material to any waters.
- (d) Erosion protection measures and sediment control measures are to be implemented and maintained to minimise:
 - (i) erosion of soils in areas disturbed by the activity
 - (ii) the release of sediment to any waters.
- (e) Erosion control and sediment control structures are to be maintained at all times during the periods of site clearing, construction, plant operation, decommissioning and any necessary rehabilitation. The structure shall be checked, repaired or replaced as required after each rain event.
- (f) Suitable banks and/or diversion drains are to be installed and maintained so that all stormwater originating from land up gradient of disturbed areas, including extraction and storage areas is diverted away from entering these areas and any ponds or other structures used for the storage or treatment of contaminants or waste.
- (g) All waters flowing over disturbed areas including but not limited to the extraction area and storage areas, are to be diverted to an onsite sediment basin.
- (h) Minimum design specifications for on site sediment control measures are as follows:
 - (i) the minimum size of any sediment basin shall be sufficient to contain the contaminated runoff expected from a 24 hour storm with an average recurrence interval of 1 in 5 years
 - (ii) water retaining structures shall be designed to prevent the influx of surface water from adjacent water courses from a 24 hour storm with an average recurrence interval of 1 in 10 years
 - (iii) drainage structures shall be sufficient to convey the runoff from a 24 hour storm with an average recurrence interval of 1 in 10 years
 - (iv) in the event of site flooding, flow paths shall be designed to minimise re-suspension of fines or slimes
 - (v) site discharge spillways shall be constructed of, and built in, competent materials
 - (vi) during sediment basin dewatering, the measured concentration of total suspended solids in any discharge to waters, shall be less than 40 milligrams per litre (mg/L).
- (i) All structures used for the storage or treatment of contaminants or wastes at or on the authorised place shall be constructed, installed and maintained:
 - (i) so as to minimise the likelihood of any release of contaminants or wastes through the bed or banks of the structure to any waters (including groundwater)
 - (ii) so that a freeboard of not less than 0.5 metres is maintained at all times, except in emergencies
 - (iii) so as to ensure the stability of the structures' construction.
- (j) Contaminants shall not be directly or indirectly released to any waters, including groundwater, or the bed or banks of any waters, accept as specifically authorised under the water conditions of an approval.
- (k) A person carrying out an activity to which the approval relates shall not release stormwater runoff into waters, a roadside gutter or stormwater drain that results in a build-up of earth in waters, a roadside gutter or stormwater drain.

29 Provision of treated effluent to other persons

- (a) If responsibility for the treated effluent is given or transferred to another person:
 - (i) the responsibility for such effluent shall only be given or transferred in accordance with a written agreement (the third party agreement)
 - (ii) include in the third party agreement a commitment from the person utilising the effluent to use effluent in such a way as to prevent environmental harm or public health incidences and specifically make the persons aware of the General Environmental Duty (GED) under section 319 of the *Environmental Protection Act 1994*, environmental sustainability of any effluent disposal and protection of environmental values of waters
 - (iii) upon being notified or otherwise becoming aware that the person's use of effluent is causing or threatens to cause environmental harm or is posing a human health risk, and if the person does not rectify the situation upon written request, the giving and transferring responsibility for such effluent shall cease.

Air

30 Nuisance

- (a) The release of noxious or offensive odours or any other noxious or offensive airborne contaminants resulting from any activity shall not cause a nuisance at any nuisance sensitive place.

31 Dust nuisance

- (a) The release of dust and/or particulate matter resulting from any activity shall not cause an environmental nuisance at any nuisance sensitive place.
- (b) Dust suppression measures shall be implemented on site to prevent the movement of dust, created as a result of any activity, past the site boundaries.
- (c) Release of dust or particulate, exceeding the following levels, when measured at any nuisance sensitive place, is considered as an environmental nuisance:
 - (i) dust deposition of 3.0 grams per square metre per month, when measured in accordance with Australian Standard AS 3580.10:2003 Methods of sampling and analysis of ambient air – Determination of particulate matter – Deposited matter – Gravimetric method (or more recent edition), or
 - (ii) a concentration of particulate matter with an aerodynamic diameter of less than 10 micrometres (PM₁₀) suspended in the atmosphere of 50 micrograms per cubic metre over a 24 hour averaging period, at a nuisance sensitive place downwind of the site, when monitored in accordance with Australian Standard AS 3580.9.6 'Ambient Air – Particulate Matter – Determination of suspended particulate PM₁₀ high volume sampler with size – selective inlet – gravimetric method'; or any alternative method of monitoring PM₁₀ that may be permitted by the Air Quality Sampling Manual as published from time to time by the administering authority.
- (d) When requested by the administering authority, dust and particulate monitoring shall be undertaken within a reasonable timeframe nominated by the administering authority, to investigate any complaint of environmental nuisance caused by dust and/or particulate matter. The results of the monitoring shall be notified to the administering authority within 7 days following completion of the monitoring. Monitoring shall be carried out at a place(s) relevant to the potentially affected nuisance sensitive place and at upwind control sites and shall include:
 - (i) for a complaint alleging dust nuisance, dust deposition.



- (ii) for a complaint alleging adverse health effects caused by dust, the concentration per cubic metre of particulate matter with an aerodynamic diameter of less than 10 micrometre (μm) (PM_{10}) suspended in the atmosphere over a 24 hour averaging time.
- (e) All sealed traffic areas shall be cleaned as necessary to minimise the release of dust and particulate matter to the atmosphere.
- (f) Watering of unsealed roads shall be carried out so as to minimise the release of dust and particulate matter to the atmosphere.

Noise and vibration

32 Nuisance

- (a) Noise resulting from the activity shall not cause an environmental nuisance at any sensitive place.
- (b) When requested by the administering authority, noise monitoring shall be undertaken and recorded, to investigate any complaint about noise nuisance being caused by the activity, and the noise monitoring results notified to the administering authority within 7 days.
- (c) The method of measuring and reporting noise levels in response to any noise monitoring conducted under the approval shall be in accordance with the most recently published edition of the administering authorities Noise Measurement Manual or an equivalent authoritative document approved by the administering authority (e.g. *AS 1055 Acoustics – Description and measurement of environmental noise*).

33 Blasting

- (a) Blasting activities shall be carried out in such a manner that if blasting noise should propagate to a nuisance sensitive place, then the air blast overpressure shall not:
 - (i) be more than 115 dB Lin Peak for 9 out of any 10 consecutive blasts
 - (ii) exceed 120 dB Lin Peak for any single blast
 - (iii) Blasting shall not occur on Sundays, except in exceptional circumstances, and public holidays. Excluding exceptional circumstances (noted below), blasting can only occur during the hours of 9 am to 3 pm, Monday to Friday and 9 am to 1 pm on Saturdays.
 - (iv) Blasting may not be conducted at times different from the prescribed blasting schedule except in exceptional circumstances where rain, lightning, other atmospheric conditions or the safety of the principal holder or public requires unscheduled detonation.
- (b) Within 5 kilometres of a nuisance sensitive place when blasting is carried out, a monitoring program shall be implemented to measure air blast overpressure and vibration in accordance with the conditions of this code.
 - (i) When requested by the administering authority, air blast overpressure and vibration monitoring and recording shall be undertaken to investigate any complaint of nuisance.
 - (ii) The results of any blasting monitoring shall be reported to the administering authority within 14 days.
 - (iii) In conjunction with monitoring, records shall be kept of the following:
 - (iv) location, date and time of recording
 - (v) location of the blast(s) within the site (including which bench level)

- (vi) atmospheric conditions including temperature, relative humidity, temperature gradient (if such information can be obtained), cloud cover, wind speed and direction
 - (vii) distance from blast site to noise affected building(s) or structure(s)
 - (viii) air blast overpressure level (dBLin Peak)
 - (ix) peak particle velocity (mms^{-1})
 - (x) effects due to extraneous factors
 - (xi) In any area, when requested by administering authority, a monitoring program shall be developed and implemented to measure air blast overpressure & vibration at a nuisance sensitive place in accordance with the conditions of an approval.
- (c) Vibration shall not be caused, permitted or allowed to transmit from blasting operations, which causes or is likely to cause a nuisance at any nuisance sensitive place.
- (d) Vibration from blasting operations is not considered to be a nuisance if monitoring shows that vibration does not exceed the following levels in the time periods specified in Figure 1.1i)Table A-1 below.

Table A-1 Vibration limits—vibration sensitive place

Vibration parameter	Vibration measured at a nuisance sensitive place	
	Monday to Friday 9am to 3pm Saturday 9am to 1pm	Sundays and public holidays
Peak particle velocity (mms^{-1}).	Blasting operations shall be carried out in such a manner that if ground vibration should propagate to a noise sensitive place, the ground-borne vibration shall not exceed: 5 mms^{-1} for 9 out of any 10 consecutive blasts initiated; and 10 mms^{-1} for any single blast.	No blasting to occur, except in exceptional circumstances.

Waste

34 Waste management

- (a) From commencement of an ERA to which the approval relates, a waste management plan shall be implemented. The waste management plan shall address at least the following matters:
- (i) the types and amounts of waste generated by the ERA
 - (ii) how the waste will be dealt with, including a description of the types and amounts of waste that will be dealt with under each of the waste management practices mentioned in the waste management hierarchy (section 10 of the Environmental Protection (Waste Management) Policy 2000)
 - (iii) a record of all regulated waste (excluding Trackable waste) shall be kept detailing the following information:
 - date of pickup of waste
 - description of waste
 - quantity of waste.



- origin of the waste.
- destination of the waste.
- (iv) procedures for identifying and implementing opportunities to improve the waste management practices employed e.g. opportunities for beneficial reuse of biosolids
- (v) procedures for dealing with accidents, spills and other incidents that may impact on the waste management
- (vi) details of any accredited management system employed, or planned to be employed, to deal with the waste
- (vii) how often the performance of the waste management practices will be assessed (at least annually)
- (viii) the indicators or other criteria on which the performance of the waste management practices will be assessed.

35 Waste handling

- (a) Waste generated in the carrying out the activities shall be stored, handled and transferred in a proper and efficient manner. Waste shall not be released to the environment, stored, transferred or disposed contrary to any condition of a development approval.
- (b) Regulated waste, if removed from the site, shall only be reprocessed, recycled, stored, incinerated or disposed at a licensed regulated waste facility.
- (c) All waste (not including overburden) generated in carrying out the activity shall be disposed of at a facility that can lawfully accept that waste.
- (d) Waste, including vegetation matter, shall not be burnt on site.

Complaints

36 Complaints management

- (a) The operator of the activity shall record the following details for all complaints received and provide this information to the administering authority on request:
 - (i) time, date, name and contact details of the complainant
 - (ii) the allegation made by the complainant
 - (iii) details of communications with the complainant
 - (iv) any investigations undertaken
 - (v) conclusions formed
 - (vi) any actions taken.
- (b) The operator of the activity shall attempt to make contact with any complainant within 2 business days of a complainant being received and initiate complaint resolution measures as set out in any SMP developed for the site.

ERA definitions

Words and phrases used in relation to the recommendations for the approvals to carry out an ERA are defined below. Where a definition for a term used in the approval is sought and the term is not defined within the approval, the definitions provided in the relevant legislation shall be used.

Activity means an environmentally relevant activity, or associated auxiliary activity to which this approval relates.

Administering authority means:

- for a matter, the administration and enforcement of which has been devolved to a local government under section 514 of the *Environmental Protection Act 1994*, the local government
- for all other matters, the Chief Executive of the Department of Environment and Resource Management
- another State Government Department, Authority, Storage Operator, Board or Trust, whose role is to administer provisions under another enacted legislation.

Approval means 'notice of development application decision' or 'notice of concurrence agency response' under the *Sustainable Planning Act 2009*.

Authorised place means the place authorised under this development approval for the carrying out of the specified environmentally relevant activities.

Bund means an earth mound or similar structure (e.g. a concrete block wall), whether impervious or not, constructed to contain spilled material (e.g. petrol, diesel, oil etc.), or a structure to prevent or reduce soil erosion.

Contaminant means (section 11 of the EP Act):

- a gas, liquid or solid
- an odour
- an organism (whether alive or dead), including a virus
- energy, including noise, heat, radioactivity and electromagnetic radiation
- a combination of contaminants.

Deposit means drop, place or throw a contaminant in waters or onto a place or releases the contaminant or otherwise cause it to move into waters or onto a place.

Dwelling means any of the following structures or vehicles that are principally used as a residence:

- a house, unit, motel, nursing home or other building or part of a building.
- a caravan, mobile home or other vehicle or structure on land.
- a water craft in a marina.

Effective dust control system means a method, process, procedure or course of action that if taken, will minimise the likelihood of environmental nuisance being caused.

Environmental nuisance means (section 15 of the EP Act) unreasonable interference or likely interference with an environmental value caused by:

- noise, dust, odour, light or
- an unhealthy, offensive or unsightly condition because of contamination or
- another way prescribed by regulation (e.g. unreasonable noise or dust emissions).



Impulse adjustment means an adjustment applied if impulsiveness is a significant characteristic of the sound within a measurement time interval. If impulsive components are clearly audible, the adjustment will be 5 dB(A). If the components are only just detectable, an adjustment of 2 dB(A) will be appropriate.

Infrastructure includes roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, pipelines, powerlines, airstrips, helipads etc., which are constructed or installed specifically for the project.

Nuisance sensitive place means any of the following places and includes a place within the curtilage of such a place reasonably used by persons at that place:

- a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises
- a motel, hotel or hostel
- a library, childcare centre, kindergarten, school, college, university or other educational institution
- a hospital, surgery or other medical institution
- a park or garden that is open to the public (whether or not on payment of money) for use other than for sport or organised entertainment
- a protected area
- a place used as an office, business or commercial purposes.

Offensive means causing offence or displeasure; is disagreeable to the sense; disgusting; nauseous or repulsive.

Person means as per part 8 of the *Acts Interpretation Act 1954*.

Prescribed water contaminant means as per schedule 9 of the *Environment Protection Regulation 2008*.

Protected area means a protected area under the *Nature Conservation Act 1992*, or a marine park under the *Marine Parks Act 1992*, or a World Heritage Area.

Registration certificate means a certificate given under section 73F of the EP Act to the principal holder of an ERA.

Release of a contaminant, includes:

- to deposit, discharge, emit or disturb the contaminant
- to cause or allow the contaminant to be deposited, discharged, emitted or disturbed
- to allow the contaminant to escape
- to fail to prevent the contaminant from escaping.

Site means land on or in which it is proposed to carry out the development approved under the development approval.

Tidal water means the sea and any part of a harbour or watercourse ordinarily within the ebb and flow of the tide at spring tides.

Topsoil means the surface layer of a soil profile, which is usually more fertile, darker in colour, better structured and supports greater biological activity than underlying layers. The surface layer may vary in depth depending on soil forming factors, including parent material, location and slope, but generally is not greater than about 300 millimetres in depth from the natural surface.

TSS means total suspended solids.

Water means:

- water in a watercourse, lake or spring
- underground water
- overland flow water
- water that has been collected in a dam.

Watercourse means the meaning assigned to it in schedule 4 of the *Water Act 2000*.



Schedule 2 Coordinator-General's imposed conditions

The conditions set out below are imposed by the Coordinator-General pursuant to section 54B of the SDPWO Act and are relevant to the applications for development approvals for those components of the project to the extent that there is no relevant approval applicable under other legislation.

All of the conditions imposed in this Schedule 2 take effect from the date of this Coordinator-General's report.

These conditions do not relieve SBR of the obligation to obtain all approvals and licences from all relevant authorities required under any other Act.

In accordance with section 54B(3) of the SDPWO Act, entities have been nominated as having jurisdiction for the conditions in this schedule. Entities with jurisdiction for each condition have been nominated in the relevant condition in this schedule.

Pursuant to section 54D of the SDPWO Act, these conditions apply to anyone who undertakes the project, including for example SBR and an agent, contractor, subcontractor or licensee of SBR, and any public utility providers undertaking public utility works as a result of the project.

To simplify the presentation, this Schedule 2 has been divided into the following parts.

Part 1: General

Part 2: Traffic and transport

Part 3: Social

Part 1: General

1 Third party auditing

- (a) The following third party auditing requirements shall be applied for the whole project:
- (i) compliance with the Coordinator-General's imposed conditions of this report must be audited by an appropriately qualified and experienced third party auditor or auditors appropriate to the matters being audited, nominated by SBR, and accepted by the Coordinator-General within 1 year of the commencement of construction of the project and annually thereafter
 - (ii) SBR shall submit the third party audit report(s) to the Coordinator-General within 40 business days of the end of the relevant period
 - (iii) the audit report must identify the component of the project being audited, the conditions that were activated during the period, and a compliance/non-compliance table. A description of the evidence to support the compliance table shall be provided. The audit report shall also contain recommendations on any non-compliance or other matter to improve compliance. The third party auditor shall certify the findings of the audit report
 - (iv) the financial cost of the third party audit is borne by SBR.
 - (v) subject to Condition 1(a)(i), and not more than 1 month following the submission of the audit report, SBR shall provide written advice to the Coordinator-General addressing the actions taken by SBR promptly and routinely to ensure compliance with the Coordinator-General's imposed conditions and the actions taken to routinely prevent a recurrence of any non-compliance issues.

The Coordinator-General nominates DIP as having jurisdiction for this imposed condition. DIP is the responsible agency for monitoring compliance with this condition.

2 Non-compliance

- (a) SBR shall when first becoming aware of a non-compliance of any Coordinator-General imposed condition:
- (i) authorise and undertake action to bring the matter into compliance within an effective timeframe
 - (ii) report the non-compliance and remedial action to the Coordinator-General within 2 business days.

The Coordinator-General nominates DIP as having jurisdiction for this imposed condition. DIP is the responsible agency for monitoring compliance with this condition.

Part 2: Traffic and transport

3 Road impact

- (a) No later than six months prior to the commencement of construction works on the project, SBR shall:
- (i) finalise at its cost a road impact assessment (RIA) that includes details of all project transport impacts on the safety and efficiency of state-controlled roads in accordance with DTMR's *Guidelines for Assessment of Road Impacts of Development (2006)* (GARID) and the methodology outlined in the *Notes for Contribution Calculations* prepared by the former Main Roads Central District in consultation with the Managers of DTMR's Rockhampton and Toowoomba Regional Offices.



- (ii) submit the RIA to the Managers DTMR Rockhampton/Toowoomba Offices for review and approval.
- (iii) prepare a road-use management plan (RMP) for all use of state-controlled and other roads for each phase of the project. The RMP shall detail parameters on which the RIA is based such as project traffic volumes, proposed transport routes and so on, and will detail road maintenance and/or upgrades required to mitigate road impacts, any necessary road-use management requirements such as transport scheduling, preferred transport routes, noise and dust control and so on, to ensure road safety and transport efficiency. The RMP must include arrangements to ensure compliance with the management of workforce movements associated with the project. DTMR must approve the RMP prior to implementation by SBR and any amendment to the RMP.
- (iv) prior to undertaking any works, obtain the relevant licenses and permits under the *Transport Infrastructure Act (Qld) 1994* for works within the state-controlled road corridor.

The Coordinator-General nominates DTMR as having jurisdiction for this imposed condition. DTMR is the responsible agency for monitoring compliance with this imposed.

- (b) At the relevant time as determined by DTMR, SBR shall:
 - (i) undertake road impact mitigation strategies such as upgrade/improvement works to all intersections with the state-controlled road network that are adversely impacted as determined by DTMR Rockhampton/Toowoomba Regional Offices following completion of the RIA and any necessary road maintenance identified in the finalised RMP to ameliorate any adverse impacts on state-controlled roads.
 - (ii) design, have approved by DTMR and provide any required access/intersections onto state-controlled roads, for example, for camp accommodation facilities and material stockpile locations.
 - (iii) design, have approved by DTMR and provide grade-separated crossings of rail from state-controlled roads, currently identified as (a) Jackson-Wandoan Road (b) Leichhardt Highway and (c) Eidsvold-Theodore Road.

The Coordinator-General nominates DTMR as having jurisdiction for this imposed condition. DTMR is the responsible agency for monitoring compliance with this condition.

- (c) Prior to commencement of construction works on the project, SBR shall enter into an Infrastructure Agreement with DTMR for:
 - (i) contribution or upgrade to all intersections with the state-controlled road network that are adversely impacted upon, as determined and agreed upon with DTMR Rockhampton/Toowoomba Regional Offices, following completion of the comprehensive RIA referred to in Condition 3(a).
 - (ii) roadway link contribution associated with project traffic as calculated and agreed upon with DTMR Rockhampton/Toowoomba Regional Offices, following completion of the comprehensive RIA referred to in Condition 3(a).
 - (iii) rehabilitation and maintenance contributions associated with project traffic as calculated and agreed upon with DTMR Rockhampton/Toowoomba Regional Offices, following completion of the comprehensive RIA referred to in Condition 3(a).

The Coordinator-General nominates DTMR as having jurisdiction for this imposed condition. DTMR is the agency responsible for monitoring compliance with this condition.

- (d) Prior to commencement of construction works on the project, SBR shall finalise at its cost a RIA relating to impacts of the project on the local government-controlled road network. SBR shall prepare a RMP relating to the local road network as referred to in Condition 3(a) and prepare and submit draft TMPs relating to the local road network to the relevant local authorities for their review and approval.

The Coordinator-General nominates DTMR as having jurisdiction for this imposed condition. DTMR is the agency responsible for monitoring compliance with this condition.

- (e) Prior to commencement of construction works on the project, SBR shall enter into Infrastructure Agreements with the Western Downs Regional Council (WDRC), Banana Shire Council (BSC), Toowoomba Regional Council (TRC), Rockhampton Regional Council (RRC) and Gladstone Regional Council (GRC), as relevant, to fund any upgrading or deviation of roads required for construction vehicles or ongoing through traffic and any additional maintenance required during the construction period.

The Infrastructure Agreements shall contain the requirement for SBR to undertake two joint asset condition assessments—one prior to construction traffic using local government roads, and the second at the completion of the project, to determine whether any additional maintenance is required to restore road networks to the original condition, with any identifiable works required being at the cost of SBR.

The Infrastructure Agreements shall require that all roads providing access to work camps are to be constructed to all weather access standard, with appropriate turning facilities provided for major local roads.

The Coordinator-General nominates WDRC, BSC, TRC, RRC and GRC, as relevant, as having jurisdiction for this imposed condition. WDRC, BSC, TRC, RRC and GRC, as relevant, are the agencies responsible for monitoring compliance with this condition.

4 Traffic management

- (a) Prior to commencement of any significant construction works on the project, SBR shall:
- (i) finalise detailed drawings and traffic management plans (TMPs) for all construction and other activities in the state-controlled road corridor.
 - (ii) present detailed drawings and TMPs for review and approval by DTMR, the Queensland Police Service, WDRC, BSC, TRC, RRC and GRC, as relevant. The TMPs shall incorporate a provision that, prior to commencing any program of oversize transport movements that may be required for the construction of the project, SBR shall seek the approval of DTMR, QPS and relevant regional councils.
 - (iii) obtain the necessary permits for any excess mass or over-dimensional loads associated with the project as required under *the Transport Operations (Road Use Management) Act 1995* (Qld).
 - (iv) implement and comply with the TMPs during construction and commissioning of the project and construction of all access road intersections.

The Coordinator-General nominates DTMR as having jurisdiction for this imposed condition. DTMR is the agency responsible for monitoring compliance with this condition.



Part 3: Social

5 Community engagement

- (a) To support the proposed establishment of the Surat Basin Rail local liaison group (SBRLLG) and its sub-groups, SBR shall develop and submit to the Coordinator-General for review and approval, at least one month prior to the commencement of construction a community and stakeholder management plan.

The Coordinator-General nominates DIP as having jurisdiction for this imposed condition. DIP is the responsible agency for monitoring compliance with this condition.

- (b) The plan shall be developed in consultation with all landowners or business owners directly or potentially affected by the construction activities and include:
- (i) provision for the appointment of an independent community liaison representative(s) (ICLR) nominated by SBR and approved by the Coordinator-General to chair meetings of the SBRLLG and its sub-groups
 - (ii) a detailed communication strategy to ensure that community members, including those in sensitive groups identified in the EIS, are informed of the project and its impacts in a timely and responsive manner

The Coordinator-General nominates DIP as having jurisdiction for this imposed condition. DIP is the responsible agency for monitoring compliance with this condition.

- (c) SBR shall implement, comply with and regularly review the community and stakeholder management plan for the duration of the project construction phase.

The Coordinator-General nominates DIP as having jurisdiction for this imposed condition. DIP is the responsible agency for monitoring compliance with this condition.

6 Complaints management

- (a) SBR, as well as any contractual agent that undertakes operations on behalf of SBR, shall develop prior to the commencement of construction, a project impacts complaints response management system and a complaints register, at its cost, which records the following details:

- (i) time, date, name and contact details of the complainant
- (ii) the allegation made by the complainant
- (iii) details of communications with the complainant
- (iv) any investigations undertaken
- (v) conclusions formed
- (vi) any actions taken.

The Coordinator-General nominates DIP as having jurisdiction for this imposed condition. DIP is the responsible agency for monitoring compliance with this condition.

- (b) All complaints are to be responded to within 2 business days by a staff member with specific knowledge of the project. SBR shall provide a project hotline, as well as approved administrative protocols to provide for the receipt, recording, timely investigation of and response to complaints. This includes the implementation of preventative or corrective actions and the mechanisms to inform the person who made the complaint of actions being undertaken in response.

The Coordinator-General nominates DIP as having jurisdiction for this imposed condition. DIP is the responsible agency for monitoring compliance with this condition.

- (c) Complaints received are to be recorded in a register to be coordinated by SBR and reported to DIP together with remedial action within 2 business days of receipt of the complaint or as otherwise requested by DIP.

The Coordinator-General nominates DIP as having jurisdiction for this imposed condition. DIP is the responsible agency for monitoring compliance with this condition.



Schedule 3 Glossary of terms

'AIRL' means the Australian Inland Rail project.

'ANZECC' means the Australian and New Zealand Guidelines for Fresh and Marine Water Quality.

'ATEC' means the Australian Transport and Energy Corporation Limited.

'BSC' means the Banana Shire Council.

'CDMP' means the coal dust management plan for coal transport and coal dust emissions.

'CG' means the Coordinator-General.

'CHMP' means cultural heritage management plan.

'CLMP' means the coal loss management program for coal transport and coal dust emissions.

'CLR' means Contaminated Land Register as defined by EP Act and the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland 1998*.

'CO_{2-e}' is the abbreviation of 'carbon dioxide equivalent' and is the internationally recognised measure that allows for the comparison of different greenhouse gases in terms of their global warming potential.

'Commencement of construction' means the date on which SBR commences the construction works.

'Construction Areas' means the construction worksites, construction car parks, and any areas licensed for construction or on which Construction Works are carried out.

'Construction Works' means all works necessary for the construction of the project, including, site preparation, public utility works, clearing of vegetation, cut, fill and earth borrowing activities, works at gully crossings for the rail infrastructure corridor and service roads, and excluding Early Site Works.

'dB(A) means decibels measured at the 'A' frequency weighting network.

'DCS' means Department of Community Safety.

'DEEDI' means the Department of Employment, Economic Development and Innovation.

'DERM' means the Department of Environment and Resource Management.

'Detailed design' means the drawings, specifications and other design documents developed by SBR, based on the concept design included in the EIS and the SEIS, for and necessary to effect the construction of the project, which have been developed to the phase sufficient to support an application for development permit and building works.

'DIP' means the Department of Infrastructure and Planning.

'DOC' means Department of Communities.

'DSQ' means Disability Services Queensland in DOC.

'DTMR' means the Department of Transport and Main Roads.

'**Early Site Works**' means works to prepare the Site for development including, site clearance (including demolition of existing buildings and structures), remediation of contamination and construction of buildings of a temporary nature that are associated with the Project.

'EIS' means the *Environmental Impact Statement for the Surat Basin Rail Project (February 2009)*.

'EMP' means an environmental management plan.

'EMP(C)' means the construction EMP to be developed and implemented by the construction contractor.

'EMP(D)' means the environmental design report which will indicate how the design mitigation measures from the EMP(P) have been incorporated into the design.

'EMP(Decom)' means the decommissioning EMP to be developed by the asset owner/contractor responsible for decommissioning any project rail infrastructure and facilities.

'EMP(O)' means the operational EMP to be developed by the rail infrastructure asset owner for implementation by users of the SBR project rail infrastructure, including coal producers, the rail network manager, coal train operators and maintenance personnel/contractors.

'EMP(P)' means the planning EMP setting out the environmental measures, actions, commitments and procedures to be implemented during the design, construction, operation and decommissioning phases of the project to address environmental impacts relevant to the respective project phases.

'EMR' means Environmental Management Register as defined by the EP Act the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland 1998*.

'EP Act' means the *Environmental Protection Act 1994*.

'EPBC Act' means the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth).

'EPP (Air)' means the *Environmental Protection (Air) Policy 2008*.

'EPP (Noise)' means the *Environmental Protection (Noise) Policy 2008*.

'EPP (Water)' means the *Environmental Protection (Water) Policy 2009*.

'GAB' means Great Artesian Basin.

'GHG' means greenhouse gas.

'GQAL' means Good Quality Agricultural Land as defined by *State Planning Policy 1/92: Development and the Conservation of Agricultural Land*.

'IDAS' means the Integrated Development Assessment System under SPA.

'ICLR' means independent community liaison representative defined by Schedule 2, Condition 3 of this Coordinator General's Report.

'L_{A1}' means the A-weighted sound pressure level that is exceeded for 1% of a 1 hour period when measured using time-weighted 'F'.



'**L_{Aeq}**' means the average A-weighted sound pressure level of a continuous steady sound that has the same mean square sound pressure as a sound level that varies with time.

'**L_{Amax}**' means the maximum average A-weighted sound pressure measured over a specified period of time.

'**MCU**' means a material change of use of premises.

'**NEPC**' means National Environmental Protection Council.

'**NEPM**' means National Environment Protection Measures made under the *National Environment Protection Council Act 1994* (Cwth).

'**NGAF**' means the National Greenhouse Accounts Factors set by the Australian Government Department of Climate Change.

'**NO₂**' means nitrogen dioxide.

'**NO_x**' means oxides of nitrogen, which includes NO₂.

'**pH**' means acidity.

'**PM_{2.5}**' means particulate matter with equivalent aerodynamic diameter less than 2.5µm.

'**PM₁₀**' means particulate matter with equivalent aerodynamic diameter less than 10µm.

'**PPV**' means peak particle velocity, which is a measure of ground vibration magnitude and is the maximum instantaneous particle velocity at a point during a given time interval in mms⁻¹.

'**project**' means the Surat Basin Rail (SBR) project, as described in the *Initial Advice Statement (November 2007)*, the *Environmental Impact Statement (February 2009)*, and the *Supplementary Report to the EIS (March 2010)* for the project.

'**proponent**' means Surat Basin Rail Pty Ltd, as the entity responsible for procurement of the Project and which has indicated its intention to seek a contractor to design, construct, maintain and operate the Project.

'**Public Utility Works**' means

- (a) the replacement, modification or relocation of public utilities required as a consequence of the Project; and
- (b) the construction of new utility infrastructure required for the Project.

'**QPS**' means the Queensland Police Service.

'**QRN**' means QR National Limited.

'**QWQG**' means the Queensland Water Quality Guidelines.

'**RIA**' means a road impact assessment as defined by Schedule 2, Condition 3 of this Coordinator-General's report.

'**RMP**' means a road-use management plan as defined by Schedule 2, Condition 3 of this Coordinator-General's report.

'**ROP**' means resource operation plan.

'**SBICSDA**' means the Surat Basin Rail Infrastructure Corridor State Development Area.

'SBR' means the Surat Basin Rail Pty Ltd.

'SBRJV' means the Surat Basin Rail Joint Venture.

'SBRLG' means the Surat Basin Rail local liaison group as defined by Schedule 2, Condition 5 of this Coordinator-General's report.

'SDPWO Act' means the *State Development and Public Works Organisation Act 1971*.

'SEIS' means the supplementary report to the EIS.

'SPA' means *Sustainable Planning Act 2009*.

'TEP' means the Transitional Environmental Program (TEP) for coal transport and coal dust emissions.

'TMP' means the construction Traffic Management Plan as defined by Schedule 2, Condition 4 of this Coordinator-General's report.

'TOR' means Terms of Reference for the EIS.

'TRC' means the Toowoomba Regional Council.

'TSP' means Total Suspended Particles.

'WDRC' means the Western Downs Regional Council.

'WMP' means the waste management plan to be developed as part of the EMPs for the project.