Submitter No.	417	Issue Reference:	5000
Submitter Type	Council	TOR Category	Nature Conservation
Name	Isaac Regional Council	Relevant EIS Section	

DETAILS OF THE ISSUE

The EIS should clearly commit to the prevention of destruction of endangered species habitat and the long term ecological sustainability of locally identified species. The EIS should clearly propose remediation and ecological integrity strategies addressing the fragmentation of the ecological landscape by the project affecting the long term endangered species survival.

PROPONENT RESPONSE

The Environmental Management Plans set out measures for the protection and maintenance of habitat for threatened species in close proximity to the project elements. The *Biodiversity Offset Proposal* provides for those impacts that cannot be minimised or mitigated (see *Biodiversity Offset Proposal* in *Appendices – Volume 2* of this SEIS). The *Rehabilitation and Decommissioning* section of the *Draft Mine EM Plan* provides strategies for rehabilitation, whilst the *Initial Biosecurity Management Strategy* has been prepared to identify, reduce and manage the risks associated with weeds and pests (both are contained in *Appendices – Volume 2* of this SEIS).

Submitter No.	1840	Issue Reference:	5001
Submitter Type	Council	TOR Category	Nature Conservation (Offsets)
Name	Barcaldine Regional Council	Relevant EIS Section	3.1.8.2

DETAILS OF THE ISSUE

What is the likelihood (or progress) of identifying and acquiring another appropriately sized parcel of land, as offset for the BNR?

PROPONENT RESPONSE

Through discussions with the Department of Environment and Heritage Protection's Nature Refuges Branch, Ecofund (working on behalf of Waratah Coal) has identified several appropriately sized parcels of land with the potential to be secured as an offset to counterbalance the loss of the Bimblebox Nature Refuge. Ecofund has assessed the environmental values of these properties and their suitability to be secured as offsets has been determined. The results of Ecofund's assessment and details of potential options to offset impacts of the project on the Bimblebox Nature Refuge are outlined in Section 8 of the *Biodiversity Offset Proposal* (see *Appendices – Volume 2* of the SEIS).

Submitter No.	1840	Issue Reference:	5002
Submitter Type	Council	TOR Category	Nature Conservation (Offsets)
Name	Barcaldine Regional Council	Relevant EIS Section	3.1.10.2

DETAILS OF THE ISSUE

- Mitigation measures appear to be mainly dependent on offsets.
- The protection of the Large-podded tick-trefoil is of concern.

- Has the Galilee coal Biodiversity Strategy (App 27) been approved by Waratah? There appear to be eight different biodiversity values requiring compensation and offsets?

Considering the extent of the compensation and offsets required, an understanding of the potential success of the strategy is required, particularly an understanding of the areas of offset, extent of ground inspection and potential for negotiated outcomes.

PROPONENT RESPONSE

Ecofund has prepared a *Biodiversity Offset Proposal* to expand on the offset information previously provided in the EIS *Biodiversity Offset Strategy*. The *Biodiversity Offset Proposal* includes:

- an explanation of how the project has been designed and located to avoid and/or minimise the extent of clearing
- identification of the impacts of the project requiring offsets, including impacts on the Bimblebox Nature Refuge (BNR)
- summation of the offset requirements of the project under relevant Queensland and Australian Government offset policies
- the approach to offset delivery including:
  - details of direct offset options incorporating Queensland Government preferred offset options identified by the Nature Refuge team and within the strategic footprints of Galilee Basin Offset Strategy
  - maps of direct offset options
  - details of alternative, or back-up, direct offset options for specific environmental values and for the replacement of the BNR
  - details of the staged approach to offset delivery.
- details of offset implementation, including landholder engagement, field assessments, regulatory approval, development of Offset Area Management Plans (OAMPs), reporting requirements, legally binding mechanisms, and implementation of the OAMPs.

The proposal demonstrates that, for the unavoidable impacts of the project, it is possible to deliver compliant offsets in accordance with the applicable offset policies and to fulfil Waratah Coal's voluntary commitment to provide an offset to compensate for the loss of the BNR. The proposal indicates that the following environmental values will be required to be offset as a result of the impacts of the project:

- Endangered and of concern regional ecosystems
- Endangered and of concern high value regrowth
- Threshold regional ecosystems
- Mapped essential habitat
- Watercourse vegetation
- Connectivity
- Wetlands
- Wetland Protection Areas
- Flora and fauna protected under the *Nature Conservation Act 1992*
- Listed threatened species and ecological communities protected under the *Environment Protection and Biodiversity Conservation Act 1999*, and
- Bimblebox Nature Refuge.

It is anticipated that offsets for the project will be delivered in accordance with the tasks and timeframes set out below.

- Submission of the Biodiversity Offset Proposal — February 2013
- Co-ordinator General's Report — May 2013
- Landholder engagement and negotiation — March 2013 – ongoing
- Field assessments and ecological equivalence — February 2013 – ongoing
- Preparation of Offset Area Management Plans — November 2013 – February 2014
- Regulatory approval of Offset Area Management Plans — March 2014
- Securing legally binding mechanisms — March – April 2014
- Implementation of Offset Area Management Plans — April 2014 – ongoing

See also the *Biodiversity Offset Proposal* contained in *Appendices – Volume 2* of this SEIS.

Submitter No.	**419**	Issue Reference:	**5003**
Submitter Type	Government	TOR Category	**Nature Conservation (Offsets)**
Name	**DERM**	Relevant EIS Section	Volume 5, Appendix 27, Biodiversity Offset Strategy

DETAILS OF THE ISSUE

The EIS proposes the clearing and mining of a Nature Refuge. DERM considers it unlikely that a Nature Refuge agreement would offer enough security for a proposed Nature Refuge.

Any proposed offset area should be tendered for National Park or Conservation Park tenure in order to ensure permanent protection security. Additionally, DERM notes that the proponent has 1,507,096 ha of exploration permits for coal in the Galilee Basin within the Desert Uplands bioregion. It would be in the proponent's interest to explore the opportunity to relinquish the exploration permits over the area proposed as offsets and to explore the possibility that the area is permanently sterilised from future mining.

PROPONENT RESPONSE

A *Biodiversity Offset Proposal* has been prepared and provides details of the proposed offset to compensate for impacts on the Bimblebox Nature Refuge (see *Biodiversity Offset Proposal* in *Appendices – Volume 2* of this SEIS). In consultation with the Department of Environment and Heritage Protection's Nature Refuges Branch, properties currently covered by exploration permits held by Waratah Coal have been assessed for their offset suitability. It is proposed, subject to agreement by all affected parties, that exploration permits over the proposed offset area will be extinguished.

All offsets must be secured by a legally binding mechanism. The *Biodiversity Offset Proposal* outlines details of the suggested legally binding mechanisms to secure offsets. The appropriate mechanism for each offset will be determined through negotiation with regulators, Waratah Coal and the landholder. Legally binding mechanisms may include the following, as recognised by the NC Act:

- **Conservation park** – under the NC Act a conservation park is to be managed to:
  - conserve and present the area's cultural and natural resources and their values
  - provide for the permanent conservation of the area's natural condition to the greatest possible extent

  - ensure that any commercial use of the area's natural resources, including fishing and grazing, is ecologically sustainable.
- **Nature refuge** – A nature refuge is a voluntary agreement between a landholder and the Queensland Government that acknowledges a commitment to manage and preserve land with significant conservation values while allowing compatible and sustainable land uses to continue. Under the NC Act a nature refuge is to be managed to:
  - conserve the area's significant cultural and natural resources
  - provide for the controlled use of the area's cultural and natural resources
  - provide for the interests of landholders to be taken into account.
- **Resource reserve** – under the NC Act a resources reserve is to be managed to:
  - recognise and, if appropriate, protect the area's cultural and natural resources
  - provide for the controlled use of the area's cultural natural resources
  - ensure that the area is maintained predominantly in its natural condition
  - eliminate the felling of timber for a commercial purpose.
- **National park** – under the NC Act a national park is to be managed to:
  - provide, to the greatest possible extent, for the permanent preservation of the area's natural condition and the protection of the area's cultural resources and values – the cardinal principle for the management of national parks
  - present the area's cultural and natural resources and their values
  - ensure that the only use of the area is nature-based and ecologically sustainable.

Legally binding mechanisms may include conservation agreements under the EPBC Act. This involves an agreement between the Australian Government Environment Minister and another person for the protection and conservation of biodiversity in an area of land or sea. A conservation agreement may provide for:

- activities that promote the protection and conservation of the following:
  - biodiversity
  - the world heritage values of declared World Heritage properties
  - the National Heritage values of National Heritage places
  - the Commonwealth Heritage values of Commonwealth Heritage places
  - the ecological character of a declared Ramsar wetland
  - the environment, in respect of the impact of a nuclear action
  - the environment in a Commonwealth marine area
  - the environment on Commonwealth land.
- financial, technical or other assistance from the Commonwealth
- monitoring compliance with the agreement.

Offsets may also be protected through a Voluntary Declaration as recognised under the VM Act. A voluntary declaration is registered on the property title. For the area to be considered for declaration as an area of high nature conservation value the area must be one or more of the following:

- a wildlife refugium – an area where a species or a group of species has retreated due to a threatening process (e.g. climatic change)

- a centre of endemism – an area containing concentrations of species that are largely restricted to the area
- an area containing a vegetation clump or corridor that contributes to the maintenance of biodiversity
- an area that makes a significant contribution to the conservation of biodiversity
- an area that contributes to the conservation value of a wetland, lake or spring
- another area that contributes to the conservation of the environment.

Submitter No.	**419**	Issue Reference:	**5004**
Submitter Type	Government	TOR Category	**Nature Conservation (Offsets)**
Name	**DERM**	Relevant EIS Section	Volume 3 Section 6.4.2, Potential impacts of construction on ecological communities/Res, Table 10

DETAILS OF THE ISSUE

Regional Ecosystem 11.3.5 is a threshold regional ecosystem and therefore needs to be considered for offsetting.

PROPONENT RESPONSE

The *Biodiversity Offset Proposal* (see *Appendices – Volume 2* of this SEIS) outlines all relevant offset requirements of the project, including threshold regional ecosystems. The offset requirements associated with the values outlined in Appendices 1, 4, 5 and 8 of the *Queensland Biodiversity Offset Policy (Version 1)* are addressed in the *Biodiversity Offset Proposal*. All impacts to threshold regional ecosystems are also addressed in the *Biodiversity Offset Proposal*.

Submitter No.	**419**	Issue Reference:	**5005**
Submitter Type	Government	TOR Category	**Nature Conservation (Offsets)**
Name	**DERM**	Relevant EIS Section	Volume 3, Section 6.6.3, Environmental Offsets – main offset requirements

DETAILS OF THE ISSUE

The EIS states that the main offset requirements associated with the rail component of the project include: TECs, endangered and of concern REs, threatened fauna species habitat and threatened flora species *Eucalyptus ravetiana*. The EIS does not describe the offset requirements to riparian buffers and connectivity values.

The EIS should include sufficient detail of the loss of State significant values in terms of impacts on bioregional wildlife corridors and riparian buffers. It is recommended that offset requirements are addressed in association with loss of connectivity, riparian buffers and State significant biodiversity values, as detailed in the Biodiversity Planning Assessments for both the Brigalow Belt and the Desert Uplands bioregions.

PROPONENT RESPONSE

The *Biodiversity Offset Proposal* (contained in *Appendices – Volume 2* of this SEIS) includes details of the impacts of the project on all State significant biodiversity values including impacts on connectivity and watercourse vegetation. The offset requirements of the project are outlined in the Proposal and are based on an assessment of all relevant offset policies including:

- *Environment Protection and Biodiversity Conservation Act 1999*
- *Environmental Offsets Policy, 2012*

- *Queensland Government Environmental Offsets Policy, 2008*
- *Policy for Vegetation Management Offsets Version 3, 2011*
- *Queensland Biodiversity Offset Policy Version 1, 2011*
- *Marine Fish Habitat Offset Policy, 2012.*

The offset requirements of the project includes significant wetlands and wetland protection areas, watercourse vegetation, connectivity, 'endangered' and 'of concern' regional ecosystems, essential habitat, threshold regional ecosystems, 'endangered' and 'of concern' high value regrowth, protected flora and fauna species under the *Nature Conservation Act 1992*, matters of national environmental significance protected under the *Environment Protection and Biodiversity Conservation Act 1999* and the Bimblebox Nature Refuge.

Submitter No.	**419**	Issue Reference:	**5006**
Submitter Type	Government	TOR Category	**Nature Conservation (Offsets)**
Name	**DERM**	Relevant EIS Section	Volume 5, Appendix 10, Terrestrial ecology, Section 8.3

DETAILS OF THE ISSUE

The establishment of offset rehabilitation linkages between the Bimblebox Nature Refuge and currently unconnected remnant vegetation to the west are not of ecological equivalence to Bimblebox Nature Refuge.

The EIS should consider a remnant offset of a ratio of 1:5 of the Bimblebox Nature Refuge Area in its entirety (due to the irreplaceability of the biodiversity values) within the 'Desert Uplands Ecological Footprint' area as determined by DERM (a copy will be made available when it is completed). In order to secure the offset in perpetuity the recommended tenure for the offset area should be National Park.

PROPONENT RESPONSE

Through discussions with the Department of Environment and Heritage Protection's Nature Refuges Branch, Ecofund has identified several properties with the potential to be acquired as an offset to counterbalance the loss of the Bimblebox Nature Refuge. Ecofund has assessed the environmental values of these properties and their suitability to be secured as offsets has been determined. The results of Ecofund's assessment and details of potential options to offset impacts of the project on the Bimblebox Nature Refuge are outlined in Section 8 of the *Biodiversity Offset Proposal* (see *Appendices – Volume 2* of the SEIS). Based on discussions with the Nature Refuges Branch and the Office of Coordinator-General subsequent to DERM's submission to the EIS, properties that provide for an impact to offset ratio of 1:2 will be pursued as a priority.

Legally binding mechanisms which will be considered to ensure the long term protection of the offset area include national park, national park (recovery), conservation park, nature refuge, and conservation agreement under the *Environment Protection and Biodiversity Conservation Act 1999*. The *Biodiversity Offset Proposal* outlines details of the suggested legally binding mechanisms to secure offsets. The appropriate mechanism for each offset will be determined through negotiation with regulators, Waratah Coal and the landholder.

Submitter No.	419	Issue Reference:	5007
Submitter Type	Government	TOR Category	Nature Conservation (Offsets)
Name	DERM	Relevant EIS Section	Volume 5, Appendix 10, Terrestrial ecology, Section 8.3

DETAILS OF THE ISSUE

The establishment of offset rehabilitation linkages between the Bimblebox Nature Refuge and currently unconnected remnant vegetation to the west are not of ecological equivalence to the Bimblebox Nature Refuge.

The EIS should apply the ecological equivalence methodology of the Queensland Biodiversity Offsets Policy (v1 2011). The areas proposed as potential offset, especially Potential Offset Rehabilitation Linkage (North-west) contains areas of blade-ploughed buffel grass which would not meet the ecological function definition of a regional ecosystem – which requires there to be over 20% of the over storey species present as regeneration and greater than 10% of benchmark tree canopy cover for that particular regional ecosystem. Areas to be proposed as offsets need to have ecological functionality.

PROPONENT RESPONSE

Based on the most up to date impact data, Ecofund has determined the offset requirements of the project under all relevant Queensland and Australian Government offset policies. Based on this information, Ecofund has identified the most suitable options to acquit the offset requirements of the project. Ecofund has assessed the compliance of these properties with the relevant offset policies through desktop assessment including, to the extent possible without undertaking field assessments, ecological equivalence with the impact areas. Ecological equivalence assessments of offset sites will be undertaken post landholder engagement. Ecological equivalence will be determined based on the *Ecological Equivalence Methodology Guideline (Version 1)* to ensure that the offset sites have ecological functionality.

See also the *Biodiversity Offset Proposal* contained in *Appendices – Volume 2* of this SEIS.

Submitter No.	419	Issue Reference:	5008
Submitter Type	Government	TOR Category	Nature Conservation
Name	DERM	Relevant EIS Section	Section 6.3.1 – Flora (p172-177) & Section 6.3.2 – Fauna (p178-186)

DETAILS OF THE ISSUE

The EIS does not fully address nature conservation requirements. Requirements apply where the *Nature Conservation Act 1992* provisions are relevant. Survey work must be conducted properly using suitable methods. Methods should be sent to DERM for approval and appropriate permits must be obtained before field work commences. In particular endangered, vulnerable and near threatened species must be considered and offset arrangements be finalised before any development work commences. Species that are found to occur which are listed as extinct in the wild, must not be tampered with.

The EIS should provide quantitative information on how the project will address the following requirements.

The proponent must comply with the provisions of the *Nature Conservation Act 1992* particularly in regard to the following:

1. Where there is a requirement for clearing of plants protected under the *Nature Conservation Act 1992*:
   a. Clearing of protected plants must only occur in accordance with a clearing permit or an exemption under the *Nature Conservation Act 1992*, and

b. Offsets must be provided for the permanent loss (take) of near threatened, rare, vulnerable and endangered plants to achieve an equivalent or better overall outcome at a regional scale in accordance with the Queensland Government Environmental Offsets Policy 2008 and generally in accordance with the Queensland Government Policy for Biodiversity Offsets.

2. Where the activities of the proponent may cause disturbance to animal breeding places the prior approval of DERM must be obtained, and

3. Where there is a need to take fauna, the prior approval of DERM must be obtained.

PROPONENT RESPONSE

Waratah Coal has undertaken flora and fauna surveys using suitable methods that were discussed and agreed upon with DEHP prior to the survey work commencing. With reference to the clearing of plants, the Mine Site Flora and Vegetation Reports (see *Appendices – Volume 2* of this SEIS) present additional work within the mine lease area. This work has confirmed the existing knowledge with respect to the location of the near threatened plant species large-podded trefoil, *Desmodium macrocarpum* and has identified a number of additional sites where the large-podded trefoil occurs. Most of the sites occur within the Bimblebox Nature Refuge, with a single specimen located within Monklands station.

Waratah Coal will comply with all relevant provisions of the *Nature Conservation Act 1992* where there is a requirement for clearing of plants, or a need to take fauna, protected under the Act. Removal of any protected plants will only occur in accordance with a clearing permit or an exemption under the *Nature Conservation Act 1992*. Likewise and in regard to fauna, the Act identifies the requirements that Waratah Coal is responsible for in regard to any actions involving a need to take fauna and/or disturbance to breeding fauna. Waratah Coal will meet all such obligations as required.

Offsets will be secured to counterbalance the permanent loss (take) of near threatened, rare, vulnerable and endangered plants in accordance with the requirements of the Queensland Biodiversity Offset Policy Version 1.

Submitter No.	**774**	Issue Reference:	**4106**
Submitter Type	Individual	TOR Category	**Nature Conservation**
Name	**Name withheld**	Relevant EIS Section	

DETAILS OF THE ISSUE

- Mining in Bimblebox Nature Refuge – BNR has unique values that can not be replaced
- Conservation of flora and fauna
- Rehabilitation – unsatisfactory.

PROPONENT RESPONSE

Mining in BNR, BNR values and conservation of flora and fauna

Development of a major mine or mineral development within a Nature Refuge is assessed on a case-by-case basis by DEHP and SEWPaC, so is a matter for them to address. In this case an Environmental Impact Statement is required to assist the government in their assessment. Assessment of the flora, fauna and other conservation values of the BNR is a requirement of the EIS and has been addressed both in the EIS and this SEIS.

Rehabilitation

Refer to the *Rehabilitation and Decommissioning* section of the *Draft Mine EM Plan* in *Appendices – Volume 2* of this SEIS for a description of the proposed rehabilitation objectives of the project.

Submitter No.	419	Issue Reference:	4107
Submitter Type		TOR Category	**Nature Conservation (Aquatic Ecology) & Nature Conservation (Offsets)**
Name	**DERM**	Relevant EIS Section	Volume 2, Chapter 9 Surface Water Resources, Section 9.5.5 Creek Diversion (p264)

DETAILS OF THE ISSUE

The EIS identifies 'loss of riparian habitat within the section of diversion channel…' Table 25 (p175) identifies 'post mining land use' as '…creeks with riparian native bushland'.

The Vegetation Offset Strategy (page 138) states 'a landscaping and re-vegetation plan will be implemented after construction of the project and will involve targeted re-vegetation of riparian areas…'

Re-vegetation of targeted riparian areas should include diversion areas. Rehabilitation of riparian vegetation should be adequately addressed in rehabilitation planning, particularly in relation to rehabilitation of the diverted creek.

PROPONENT RESPONSE

Concept design of the proposed creek diversions has been undertaken in accordance with *Bowen Basin River Diversions, Design and Rehabilitation Criteria*[1] and *Watercourse Diversions – Central Queensland Mining Industry*[2]. As a part of this design geomorphic assessment of the existing creeks to be diverted has been undertaken. This assessment has allowed the geomorphic features to be replicated as part of the diversion works.

A rehabilitation plan for these specific project components will be prepared and will include the rehabilitation of the diverted creeks and specification of riparian habitats. The use of locally propagated native flora species will be implemented where practicable to maintain habitat characteristics and prevent the spread of weed and pest flora species.

The final Rehabilitation and Decommissioning Plan for the site will identify the closure actions required for the various surface water management structures including the watercourse diversions. At this stage, it is considered that the diversions would remain (Section 1.3 of the existing EIS): given the operational life of the project the diversions will be functioning as natural watercourses by closure, hence re-establishment of the original watercourse could potentially result in additional impact downstream.

Submitter No.	419	Issue Reference:	4045
Submitter Type		TOR Category	Decommissioning & Rehabilitation / **Nature Conservation (Terrestrial Ecology)**
Name	**DERM**	Relevant EIS Section	Volume 2 Terrestrial Ecology, Commitments, Section 6.7.2

DETAILS OF THE ISSUE

The EIS commits to developing and implementing a mine recovery, remediation, rehabilitation plan and monitoring plan.

1 ACARP (2002) *Bowen Basin River Diversions, Design and Rehabilitation Criteria,* Australian Coal Association Research Program.

2 DERM (2011) *Watercourse Diversions – Central Queensland Mining Industry.* Department of Environment and Resource Management.

PROPONENT RESPONSE

A *Rehabilitation and Decommissioning* section is contained within the *Draft Mine EM Plan* contained in *Appendices – Volume 2* of this SEIS – refer to section 9.6.3 – 9.9 of the *Draft Mine EM Plan.*

The final Rehabilitation and Decommissioning Plan will be completed prior to the finalisation of the overall Mine Plan and the EM Plan, and integrated into these documents.

Submitter No.	**425**	Issue Reference:	**19098**
Submitter Type	Individual	TOR Category	Land (Land Use & Tenure) / **Nature Conservation**
Name	**Name withheld**	Relevant EIS Section	

DETAILS OF THE ISSUE

Noxious weeds.

PROPONENT RESPONSE

The *Draft Mine EM Plan* and *Draft Rail EMP* (both contained in *Appendices – Volume 2* of this SEIS) outlines weed management measures including control strategies for environmental weeds such as Parthenium and Buffel Grass. Section 2 of the *Initial Biosecurity Management Strategy* provides measures to deal with weed species (see *Initial Biosecurity Management Strategy* in *Appendices – Volume 2* of this SEIS).

Submitter No.	**534**	Issue Reference:	**19100**
Submitter Type	Individual	TOR Category	**Nature Conservation**
Name	**Name withheld**	Relevant EIS Section	Vol 2, Ch6

DETAILS OF THE ISSUE

Spread of noxious weeds during preliminary drilling and later when mining commences especially with spread of parthenium in Clermont and Emerald.

PROPONENT RESPONSE

The *Draft Mine EM Plan* and *Draft Rail EMP* (both contained in *Appendices – Volume 2* of this SEIS) outlines weed management measures including control strategies for environmental weeds such as Parthenium and Buffel Grass (see *Appendices – Volume 2* of this SEIS). The *Initial Biosecurity Management Strategy* (contained in *Appendices – Volume 2* of this SEIS) has been prepared to identify, reduce and manage the risks associated with weeds and pests.

Submitter No.	683	Issue Reference:	19101
Submitter Type	Individual	TOR Category	Nature Conservation
Name	Name withheld	Relevant EIS Section	

DETAILS OF THE ISSUE

- Loss of research and monitoring on the BNR which evaluates and demonstrates opportunities for integrating cattle production with nature conservation
- Mining in a nature refuge, and
- Inevitable spread of exotics (buffel grass) from the development site.

PROPONENT RESPONSE

Loss of Research and Monitoring on the BNR

Waratah Coal acknowledges that loss of the BNR will mean discontinuation of various currently occurring research projects. Whilst acknowledging that this will produce spatial variability in the datasets, Waratah Coal would welcome the opportunity to discuss with DEHP, and other stakeholder agencies and NGOs, the potential to transfer these projects to Waratah Coal's proposed offsets area/s. The proposed offsets will provide the same values as those currently contained within the BNR and will be located as close as possible to the BNR, within the Desert Uplands Bioregion.

Mining in a Nature Refuge

Development of a major mine or mineral development project within a Nature Refuge is assessed on a case-by-case basis by DEHP and DSEWPAC, so is a matter for them to address. In this case, an Environmental Impact Statement is required to assist the government in their assessment.

Inevitable spread of exotics (buffel grass) from the development site.

Buffel grass is already prevalent within the area around the mine site, being the dominant introduced pasture species in the area. There is already buffel grass present within the Bimblebox Nature Refuge. The *Initial Biosecurity Management Strategy* (contained in *Appendices – Volume 2* of this SEIS) has been prepared to identify and reduce the risks associated with weeds and pests at the mine site.

Submitter No.	419	Issue Reference:	10011 / 6050 / 8019
Submitter Type		TOR Category	Nature Conservation (Terrestrial Ecology)
Name	DERM	Relevant EIS Section	Chapter 6 Terrestrial Ecology, Section 6.4.1.2, Underground Mine (p187)

DETAILS OF THE ISSUE

The EIS states that further work needs to be undertaken to quantify the type and magnitude of the impacts of subsidence on habitat above the underground mining operations. The EIS commits to preparing a Subsidence Management Plan prior to the commencement of underground mining operations.

Mitigation measures should include re-establishing drainage patterns to prevent water ponding in subsided panels as well as other mitigation measures outlined in the DERM draft guideline 'Watercourse Subsidence – Central Queensland Mining Industry'.

The EIS should provide sufficient detailed information on the predicted impacts of subsidence, including changes to topography, associated changes to drainage patterns including the location of predicted ponding within subsided panels and provide the mitigation measures required to minimise impacts including measures to reduce the impact on the landscape and the capture (take) of water resources. The proponent should refer to the DERM draft guideline (version 7.0) 'Watercourse Subsidence – Central Queensland Mining Industry' for further information.

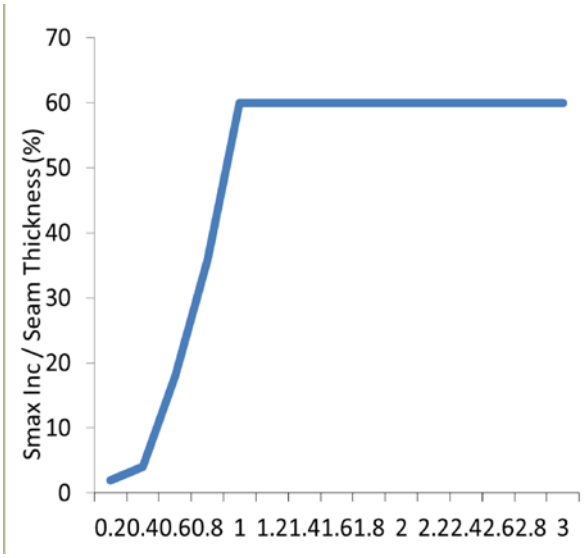
PROPONENT RESPONSE

Surface changes due to longwall mining are dependent on the amount of surface subsidence, determined by factors such as overlying strata geology, the longwall block width, the seam height extracted, and the depth of cover. Subsidence impacts on the surface include the formation of tension cracks and in flat areas internal drain way subsidence troughs can form.

The subsidence profiles used for the 3D extrapolation were based on subsidence parameters of angle of draw, maximum subsidence and pillar subsidence. Subsidence ranges from supercritical to subcritical below a depth of 481m. A caving angle of 26.5˚ has been used in this report.

Total subsidence comprises sag subsidence between pillars and the abutment subsidence above the pillars. The maximum sag subsidence is determined using the maximum subsidence/seam thickness and panel width to depth ratio profile as outlined in Figure 1, and is based on the prediction curves in MSEC (2007)[3]. The maximum sag subsidence for supercritical subsidence has a ratio of 0.6 times the seam thickness. For subcritical subsidence, the maximum sag subsidence is reduced as per the trend in Figure 1. Tables 1 and 2 give the summary of the calculations.

Figure 1. Prediction curve for maximum incremental subsidence with the estimated linear relationship, MSEC Trend, adopted for Galilee Basin



3 Mine Subsidence Engineering Consultants. 2007. *General Discussion of Mine Subsidence Ground Movements*. August 2007.

Table 1. Summary of mine subsidence calculations

ITEM								
Mine	1		2		3		4	
Seam	DU		DL2		DL1, DLX ply, DL2		B8	
Average Seam Thickness (m)	2.50		2.00		2.00		2.66	
Depth of Cover, Minimum, Maximum (m)	100	380	120	390	100	390	90	250
Maximum Subsidence (m)	1.50	1.40	1.20	1.10	1.20	1.10	1.60	1.55
Pillar Subsidence (m)*	0.04	0.15	0.05	0.15	0.04	0.15	0.04	0.10

* 40m chain pillar, rib-to-rib

Table 2. Summary of subsidence calculations for multiple seams mining

ITEM								
Mining Sequence	Mine 4 above Mine 1				Mine 4 above Mine 2			
Seam	B8		DU		B8		DL2	
Average Seam Thickness (m)	2.66		2.50		2.66		2.00	
Depth of Cover, Minimum, Maximum (m)	90	250	195	355	90	250	195	355
Maximum Subsidence (m)	1.60	1.55	1.60	1.50	1.60	1.60	1.20	1.10
Pillar Subsidence (m)*	0.04	0.10	0.08	0.14	0.04	0.10	0.08	0.14
Cumulative Maximum Subsidence (m), Minimum Depth of Cover (m)	3.20				2.80			
Cumulative Maximum Subsidence (m), Maximum Depth of Cover (m)	3.05				2.70			
Cumulative Pillar Subsidence (m), Minimum Depth of Cover (m)	0.12				0.12			
Cumulative Pillar Subsidence (m), Maximum Depth of Cover (m)	0.24				0.24			

* 40m chain pillar, rib-to-rib

Hence, the maximum subsidence (i.e. in the centre of the longwall mining panels) will range from 1.6m for standalone mines to 3.2m in areas of cumulative subsidence where underground mine 4 lies above underground mine 1. See Figure 2.

Longitudinal tension cracks of 2.5mm to 20mm may occur within the longwall panels parallel to the chain pillar areas where the depth of cover between the surface and the underground mines is less than 180m. See Figure 3.

Figure 2. Predicted Subsidence Contours

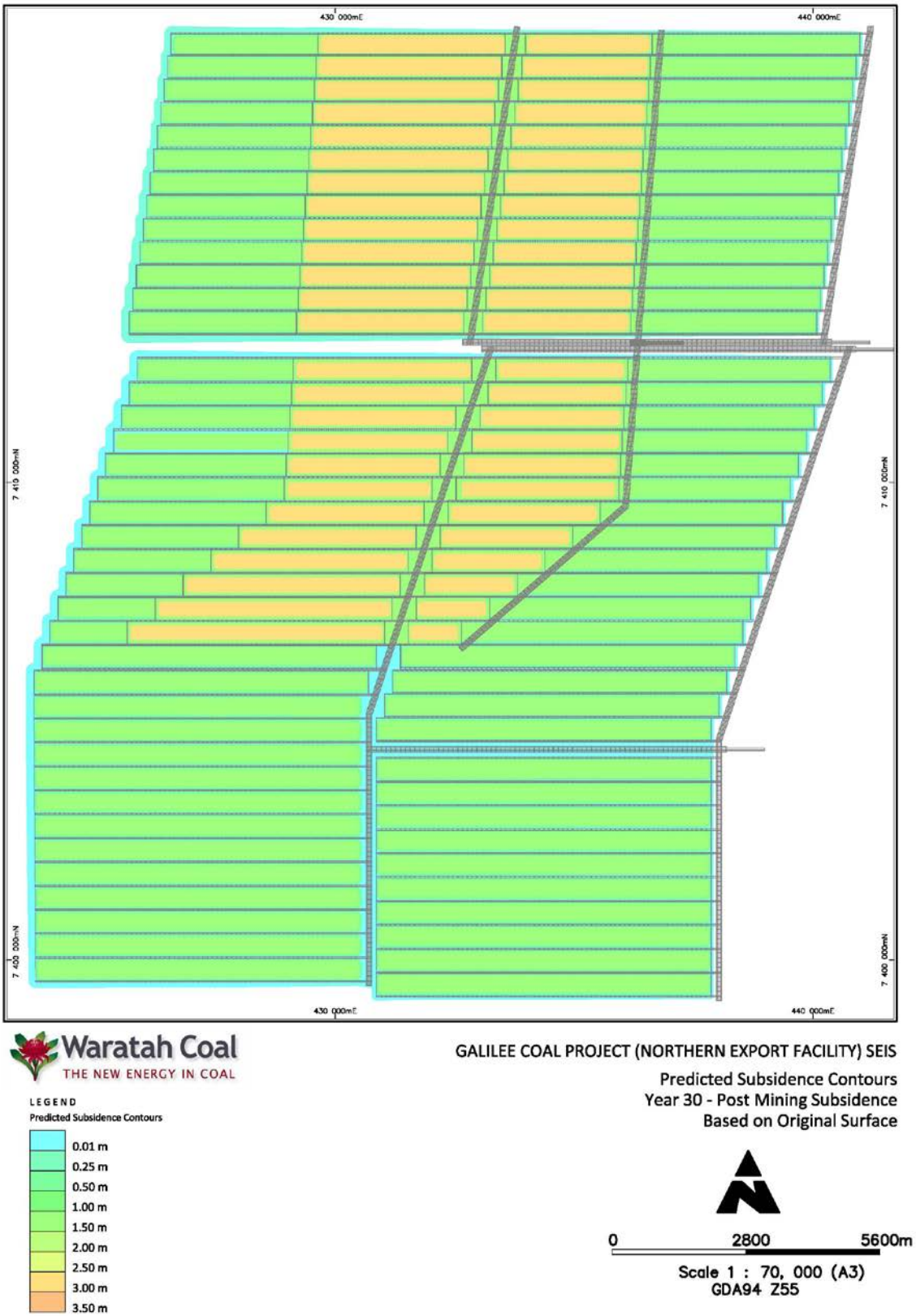
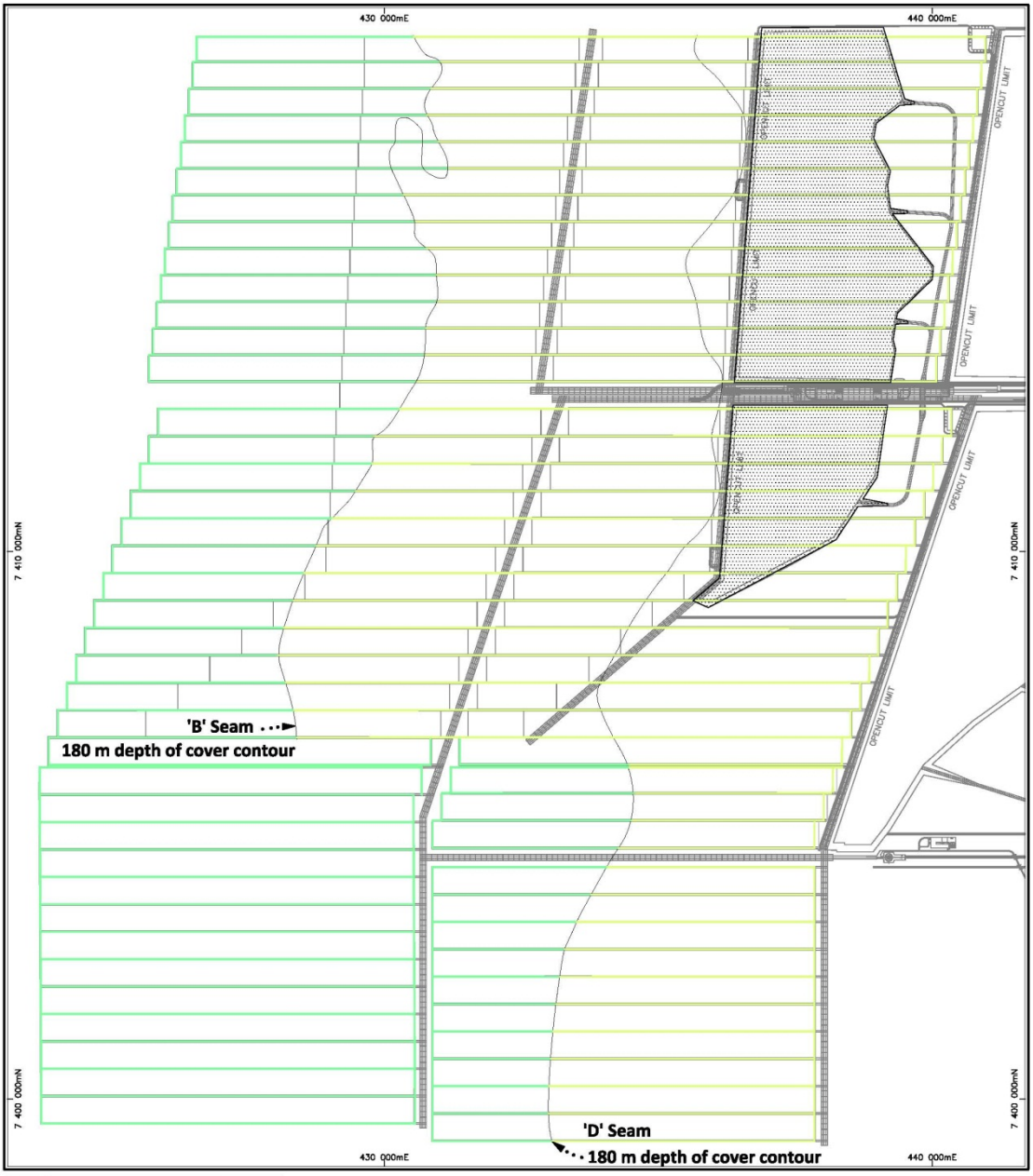


Figure 3. Predicted Surface Fracturing



Types of remedial works for these impacts may include ripping, re-compacting and seeding of all tension cracks and reshaping any internally draining areas to be externally draining by the construction of contour drains and topsoiling and seeding any disturbed areas. These works will extend to blanketing and compacting of some water courses post-subsidence, preventing inflow of runoff into underground mining areas and maintain environmental surface flows. Materials which have been investigated for use in compacted blankets include silty alluvium and clay. Some re-alignment of water courses and minor earthworks will be necessary, but the work done so far allows these activities to be well planned prior to subsidence in any particular area. The natural fall of the mining area drains freely to the north and is sufficient to minimise the events of subsidence troughs. In the flatter areas, reshaping of any internally draining areas to be externally draining will be done by the construction of contour drains and appropriate rehabilitation measures.

On the cessation of subsidence in any one area and completion of remedial works, it is planned that the land will be returned to grazing and original land activities. Yield trials will verify the maintenance of original land productions.

The project area surface stratigraphy contains cohesive Quaternary alluvial and Tertiary sands, clays and laterites which are self-healing to tensile surface fracturing. Surface tension cracks which form in cohesionless creek bed alluvium and Recent Colluvium are self-healing and readily infill. Open tension cracks in surface clays need to be ripped and compacted.

Revised flood modelling has been undertaken using a post-mine ground surface (refer to the *Surface Water Impacts Assessment of Longwall Mining Subsidence* report contained in *Appendices – Volume 2* of this SEIS. This modelling identifies locations of changes to the surface flow regime and assesses possible mitigation measures where necessary in accordance with Watercourse Subsidence – Central Queensland Mining Industry Guideline.

Additional Surface Water Quality, Aquatic Ecosystem, and GDE assessments have been undertaken and provide an assessment of the potential impacts of the mining activities on aquatic ecosystems. Potential impacts on water quality and aquatic ecosystems relating to activities associated with the project are defined and discussed in the technical reports (see the *Mine Site Aquatic Ecology and Water Quality* report and the *Subterranean Fauna Survey* contained in *Appendices – Volume 2* of this SEIS). A *Mine Site Water Quality Monitoring Program* has also been prepared (see *Appendices – Volume 2* of this SEIS).

For further information regarding subsidence and impacts refer to *Longwall Mining Subsidence Report* in *Appendices – Volume 2* of this SEIS.

For further information on the proposed management / mitigation and monitoring of subsidence, see the *Land* ection contained in the *Draft Mine EM Plan* in *Appendices – Volume 2* of this SEIS.

For further information on Rehabilitation of Subsidence refer to the *Rehabilitation and Decommissioning* section contained in the *Draft Mine EM Plan* in *Appendices – Volume 2* of this SEIS.

Submitter No.	419	Issue Reference:	3001
Submitter Type	Government	TOR Category	Nature Conservation (Terrestrial Ecology)
Name	DERM	Relevant EIS Section	Volume 3, Appendix 11, Terrestrial Ecology, Section 4.3.3

DETAILS OF THE ISSUE

The fauna habitat surveys that were carried out do not satisfy the terms of reference for this project. Detailed fauna surveys need to be carried out in both the wet and dry season.

For the purposes of this EIS a thorough and comprehensive fauna surveys must be carried out at each of the sites in both the wet and dry seasons. Details should be reported in a matrix format of site by species and preferably recorded in a format compatible with the DERM Wildnet database.

PROPONENT RESPONSE

Mine Site

The fauna survey program undertaken for the EIS provided coverage of both dry and wet season conditions. The survey program comprised an eight-day survey in October 2009 (dry season) and a 12-day program in April 2010 (wet season). Both surveys included standardised site-based survey approach at eight locations where a suite of survey methodologies and survey effort was replicated in a systematic manner. The eight sites in the EIS were representative of the primary fauna habitat types on the study site, and provided coverage by way of four remnant open woodland sites, one remnant open woodland/riparian site, one remnant riparian site, and two non-remnant grassland sites.

Subsequent to the EIS submission, a series of meetings were undertaken in early 2012 with DERM representatives from Threatened Species Partnerships (Brisbane), Biodiversity Planning (Emerald), and the Environmental Performance and Coordination Branch (Brisbane). The purpose of these meetings was to identify the nature and extent of additional fauna surveys which would satisfy DERM requirements.

As a result of that series of meetings, the approved outcome comprised two main survey approaches. The first involved the implementation of a suite of standardised techniques at a variety of survey sites which replicated the protocols and effort applied previously for the EIS survey work. The survey program was to be implemented under late wet season conditions. The key objectives of this work was to intensify survey coverage within the Bimblebox Nature Refuge, and to expand site survey coverage to specifically include fauna habitats on the western side of Lambton Meadows.

The second key outcome required by DERM was to implement target surveys for a suite of threatened reptiles. DERM recommended additional targeted surveys for at least three reptile species, though others were included by the SEIS study team. Reptile species targeted during these surveys were the Common Death Adder *Acanthophis antarciticus*, Yakka Skink *Egernia rugosa*, *Ctenotus capricorni*, Brigalow Scaly-foot *Paradelma orientalis*, and Ornamental Snake *Denisonia maculata*.

The SEIS fauna report provides details of how the DERM survey requirements were executed during the April 2012 survey program. See SEIS *Fauna Assessment Report* in *Appendices – Volume 2* of this SEIS.

Submitter No.	419	Issue Reference:	3002
Submitter Type	Government	TOR Category	Nature Conservation (Terrestrial Ecology)
Name	DERM	Relevant EIS Section	Appendix 10, Terrestrial fauna surveys, Section 6.3.2.4

DETAILS OF THE ISSUE

The results of the fauna surveys are not quantified by site. Therefore it is impossible to gauge the importance of habitat impacts as per species composition.

The EIS should table the fauna survey results in a matrix of site by species.

PROPONENT RESPONSE

Whilst the issue raised is acknowledged, it should be noted that the project ToR did not require quantification by survey sites. Notwithstanding this, the SEIS fauna report provides a detailed breakdown of the results of standardised bird surveys, diurnal ground searches, nocturnal surveys and the trapping program (which included Elliott, funnel, and pitfall traps) undertaken at each of the six sites surveyed in 2012. Data is presented for each site by survey method and for species recorded. In addition, species richness data for each survey site is also provided (see SEIS *Fauna Assessment Report* in *Appendices – Volume 2* of this SEIS).

Submitter No.	419	Issue Reference:	3003
Submitter Type	Government	TOR Category	Nature Conservation (Terrestrial Ecology)
Name	DERM	Relevant EIS Section	Appendix 10, Figure 2, Terrestrial fauna surveys

DETAILS OF THE ISSUE

The fauna survey sites described in the EIS are not adequately placed to determine the impacts on the remnant vegetation habitat values – as two sites are in a blade-ploughed paddock and four are on the edge of remnant vegetation. Only two sites are situated in the core areas of the remnant vegetation.

The fauna survey sites should be more adequately situated to survey the fauna values of the remnant vegetation.

PROPONENT RESPONSE

The fauna survey sites described in the EIS were all located within either the predicted or potential impact areas. The location of five of the eight survey sites in the EIS coincide with the probable clearing footprint. These include one remnant woodland site, one remnant woodland/riparian site, one remnant riparian site, and two non-remnant sites. The remaining three survey sites were established in remnant woodland and within the predicted mine subsidence footprint.

The 2012 SEIS surveys sites provide additional representation of remnant vegetation within the predicted or potential impact areas. The location of three sites coincide with remnant woodland within the probable clearing footprint, whilst the remaining three survey sites are located within remnant woodland and their location coincides with the predicted mine subsidence footprint (see SEIS *Fauna Assessment Report* in *Appendices – Volume 2* of this SEIS). The location of all six sites is consistent with previous 2012 DERM requirements.

The combined coverage of the two survey programs (a total of 14 survey sites; EIS and SEIS) comprise eight survey sites whose location coincides with the probable clearing footprint (i.e. six remnant woodland and two non-remnant sites) and six remnant woodland survey sites within the predicted mine subsidence footprint (see SEIS *Fauna Assessment Report* in *Appendices – Volume 2* of this SEIS).

Submitter No.	**419**	Issue Reference:	**3004 / 2030 / 14006**
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)**
Name	**DERM**	Relevant EIS Section	

DETAILS OF THE ISSUE

The EIS discusses three rail alignment options (between 400 and 450km). These options have significantly different ecological impacts. The EIS indicates that Option 1 may have less biodiversity impacts than the other options however, contains insufficient information on the ecological impacts for each option.

The EIS should quantify and detail the potential ecological impacts of each rail alignment option.

PROPONENT RESPONSE

Options 1 and 2 of the rail alignment between KP410-460 have been removed leaving the former Option 3 as the sole option for this section of the rail alignment (see Sheet 5 of Figure 2 in Issue Reference 21024 in Part C – 0A – Project Description). This is the option that most closely follows cadastral boundaries, and as such, minimises impacts upon affected landowners.

The desktop options assessment of all three options presented as Appendix 5A of the EIS concluded that the impacts from each of the options would be essentially the same or very similar. As a result, Option 1 was disregarded as this has the potential to impact upon the Alpha Coal (Hancock Prospecting) Mine Infrastructure Area. Option 2 was disregarded for both social and environmental reasons. Option 2 runs through the middle of property boundaries and hence constitutes the most impact of any option to the landholders in the Surbiton Area. Whilst all options have the potential to impact Weeping Myall Woodlands, Option 2 has the added potential to impact upon protected Brigalow communities (*Acacia harpophylla* dominant and co-dominant); and the Vulnerable flora species – *Acacia ramiflora*.

Hence Option 3 was selected as it is the option that, along with Option 1, has least potential to impact upon environmental values, but in addition, i most closely follows cadastral boundaries and hence limits impacts on landholders in the Surbiton area. There have been some minor shanges to the option 3 alignment as presented in the EIS to accommodate the mine layout at the Alpha Coal Mine. It is noted that some further changes to the alignment through the Alpha Coal and Kevin's Corner mine areas may be necessary once the final rail alignments, final land property boundaries and final infrastructure locations are determined

Waratah Coal has included Option 3 in their calculations for the *Biodiversity Offset Proposal* (contained in *Appendices – Volume 2* of this SEIS), and has commissioned ground truthing of Option 3 to verify the presence or absence of the potential environmental values detailed in the options assessment in Appendix 5A of the EIS. Ground truthing will occur in 2013.

The *Rail Alignment through MLAs 70426 and 70425* report contained in the *Appendices – Volume 2* of this SEIS provides the detail of the rail alignment designs by Waratah Coal since the inception of the project in 2008.

Submitter No.	**419**	Issue Reference:	**6015 / 6043 / 6044 / 6045 / 6046 / 4035 / 4108 / 2000 / 2023 / 17013**
Submitter Type	Government	TOR Category	Cumulative Impacts (Water Resources [Surface Water]) / **Nature Conservation (Aquatic Ecology)**
Name	**DERM**	Relevant EIS Section	Chapter 5, Cumulative Impact Assessment Table 6 – Mine Cumulative Impact: land use (p7) and Table 10 Mine Cumulative Impact surface water and aquatic ecology (p69) – Creek Diversions

DETAILS OF THE ISSUE

Both of these tables list creek diversions with a High (9) impact rating however through mitigation strategies under the EM plan and conditions of approval this is subsequently rated as 6 (Medium).

There is no supporting documentation within the EIS on how the proponent intends to design or undertake rehabilitation of the diversion channel to enable the Department to consider whether this rating is appropriate or could be achieved.

In addition, there is insufficient information within the EIS to determine the impacts of the proposed diversion on the downstream watercourse, or proposed infrastructure on the downstream mining lease, or to assess the impacts of the possible reduction in contributing catchment to the watercourse as a result of the ponding of water within subsided panels.

The EIS and EM plan should clearly identify the impacts of the proposed diversion within their mining lease to be able to demonstrate that there will be no impacts from the diversions or other infrastructure off lease.

The EIS and EM plan should detail the impact of the mine on the changes to the catchment flows whether from the diversion, subsidence (ponding) or the proposed dam on Tallarenha Creek.

The EIS should provide sufficient information regarding the design of the diversion and its rehabilitation to demonstrate that this rating is appropriate.

PROPONENT RESPONSE

Concept design of the proposed creek diversions has been undertaken (refer to the *Mine Site Creek Diversion and Flooding* report contained in *Appendices – Volume 2* of this SEIS) in accordance with Bowen Basin River Diversions, Design and Rehabilitation Criteria[4] and Watercourse Diversions – Central Queensland Mining Industry[5] As a part of this design, geomorphic assessment of the existing creeks to be diverted has been undertaken. This assessment has allowed the geomorphic features to be replicated as part of the diversion works. Features include maintained stream length, bed slope, meander radius, capacity and instream benching. The location and extent of the proposed diversions is detailed in Figure 4. See also the Creek Diversion and Levee Concept Design Plans in Appendix C of the *Mine Site Creek Diversion and Flooding Report* in *Appendices – Volume 2* of this SEIS.

Hydraulic modeling has also been undertaken (refer to the *Mine Site Creek Diversion and Flooding* report) to assess the hydraulic performance of the diversions, the results of which indicate compliance with the velocity, stream power and shear stress limits specified by DERM, though there are some very localised minor deviations for velocity which will be mitigated through appropriate scour protection or planting. The results of the hydraulic modelling also demonstrate that changes in flood behaviour such as velocity, inundation depth and extent are limited to within the mine lease area.

4 ACARP (2002) *Bowen Basin River Diversions, Design and Rehabilitation Criteria*, Australian Coal Association Research Program.

5 DERM (2011) *Watercourse Diversions – Central Queensland Mining Industry*. Department of Environment and Resource Management.

Figure 4. Concept of mine site creek diversions

Additional aquatic ecosystem assessments have been undertaken and will be completed in the next several months, including an assessment of the potential impacts of the mining activities on aquatic ecosystems. Potential impacts on water quality and aquatic ecosystems relating to activities associated with the project will be defined and discussed, in part in a workshop forum environment involving representatives from relevant EIS disciplines (as discussed in section 3.2 of the *Mine Aquatic Ecology and Water Quality* contained in *Appendices – Volume 2* of this SEIS).

Water balance modelling of the final underground and open cut mining operations has been undertaken to identify the potential maximum impact of the mine on stream flows in waterways downstream of the mine (refer to the *Surface Water Impact Assessment of Longwall Mining Subsidence* report contained in *Appendices – Volume 2* of this SEIS). This modelling indicates that the mean annual stream flow in Lagoon Creek at the downstream boundary will decrease by a maximum of 12% as a result of site operations. This is a worst case scenario based on the final mine landform and assuming that no mitigation of longwall mining subsidence occurs. Management strategies have been identified that will significantly reduce the impact of the underground mining component of the project on downstream stream flows.

A specific rehabilitation plan for the diversions will be prepared and will include the rehabilitation of the diverted creek and specification of riparian habitats. The use of locally propagated native flora species is recommended where practicable to maintain habitat characteristics and prevent the spread of weed and pest flora species.

The final Rehabilitation and Decommissioning Plan for the site will identify the closure actions required for the various surface water management structures including the watercourse diversions. At this stage, it is considered that the

diversions would remain (Section 1.3 of the existing EIS); given the operational life of the project, the diversions will be functioning as natural watercourses by closure, hence re-establishment of the original watercourse could potentially result in additional impact downstream. See the *Rehabilitation and Decommissioning* section of the *Draft Mine EM Plan* contained in *Appendices – Volume 2* of this SEIS.

Submitter No.	**283**	Issue Reference:	6038
Submitter Type	NGO	TOR Category	**Nature Conservation (Aquatic Ecology)**
Name	**Capricorn Conservation Council**	Relevant EIS Section	Aquatic Ecology

DETAILS OF THE ISSUE

Effect of taking water from Connors River dam – risk to aquatic species, stream health, flushing capacity for the Fitzroy and saturated aquifers.

Alternative water for mine operations and coal washing should be more thoroughly investigated. Options could include mine pit water and coal seam gas water.

PROPONENT RESPONSE

The site water management system has been further investigated and designed such that there is minimal requirement for imported water. Water captured onsite will be used in underground workings, dust suppression and coal washing. Despite this there is still an annual clean water requirement during mine operation estimated at 2500ML/yr, comprising:

- 2,000ML/year for the CHPP vacuum pumps.
- 350ML/year for wash downs within the Mine Industrial Area.
- 150ML/year for potable and fire fighting purposes.

Potable water demands for the mine construction phase are estimated to peak at 290ML/yr. This water demand will be met through contracted potable water suppliers carting from an offsite source.

In the initial EIS submission for the Galilee Coal Project a raw water storage was proposed to be constructed on Tallarenha Creek within the MLA. This dam is no longer included in the project. Waratah Coal had also applied for an annual allocation of 2,500ML/year from the Connors River Dam Project which was being developed by SunWater.

The Connors River Dam Project is no longer proceeding and SunWater is currently investigating the feasibility of a pipeline to supply water from the Burdekin River to the Galilee Basin. This pipeline is unlikely to be constructed in time for the commencement of mining at the Galilee Coal Project.

A raw water supply of 2,500ML/year is required for the mine. The following raw water supply options have been identified for the mine:

1. Existing Water Supply Schemes (Regional Pipelines):
    a. Burdekin Haughton Water Supply Scheme (BHWSS)
    b. Trading with existing water allocation holders
    c. Nogoa Mackenzie Water Supply Scheme (NMWSS)

2. Unallocated Surface Water:
   a. Burdekin WRP area
3. Groundwater and Local Supply, and
4. The Great Artesian Basin (GAB)

Of these options, it is proposed to utilise an initial temporary supply of raw water from a borefield in the vicinity of the mine. Discussions with DEHP have indicated that this is a feasible option. The ultimate permanent raw water solution is proposed via a pipeline from the Burdekin River to supply coal mines in the Galilee Basin.

Additional investigations will be required to confirm the feasibility of these proposed raw water sources. A potential contingency measure for the mine raw water supply is the operation of a water treatment plant at the mine to produce low salinity water from excess mine affected water. The initial water balance investigations for the mine indicate that there will be sufficient excess mine affected water to provide a raw water supply of 2,500ML/year via a water treatment plant.

Refer to the *Mine Site Water Management System* report contained in *Appendices – Volume 2* of this SEIS.

Submitter No.	**419**	Issue Reference:	6039
Submitter Type	Government	TOR Category	**Nature Conservation (Aquatic Ecology)**
Name	**DERM**	Relevant EIS Section	

DETAILS OF THE ISSUE

DERM, in conjunction with the Queensland Wetland Program have produced a number of guidelines that will be of assistance in further design of the proposed project. These include the Queensland Buffer Guideline, conceptual models and rehabilitation and management guidelines.

PROPONENT RESPONSE

Waratah Coal will commit to using the tools identified by DEHP as part of its EM Plan process in order to protect wetlands in the project area.

Submitter No.	**419**	Issue Reference:	**6047 / 2026**
Submitter Type	Government	TOR Category	**Nature Conservation (Aquatic Ecology)** / Water Resources (Surface Water)
Name	**DERM**	Relevant EIS Section	Chapter 7 Aquatic Ecology, Section 7.5.4, Diversions (p222)

DETAILS OF THE ISSUE

The EIS states 'The diversion of Tallarenha Creek would impact on drainage in the region with higher flows caused by the diversion potentially impacting on hydrology and increasing flooding risk of the creeks downstream of the diversions…' and 'Potential impacts to hydrology are addressed in the flooding technical report…'.

No results from modelling were presented in the flooding technical report to quantify the impacts to hydrology from the diversions.

DERM notes that another mining lease holder downstream of this mining operation is also proposing diversion works. The design of the diversion/s for this project cannot impact on the downstream mining lease holder and proposed works or any other downstream landholder.

The EIS should address the design of the diversion and provide information on the impacts of the diversion on downstream users outside of the mine boundary. The design of the diversion needs to minimise the impact on flooding levels and frequencies both upstream and downstream of the project.

PROPONENT RESPONSE

Additional flood modelling of the proposed diversions and flood protection levees has been undertaken and is described in the *Mine Site Creek Diversion and Flooding* report (in *Appendices – Volume 2* of this SEIS). Results of this modelling indicate that although there are changes to the flood behaviour, including increases in flood depth and inundation extent, these impacts are contained wholly within the mine lease. Therefore impacts as a result of proposed diversion works do not impact downstream land holders. This *Mine Site Creek Diversion and Flooding* report details the modelling results and flood mapping which demonstrates that there are no off-site impacts.

Additional surface water aquatic ecology and GDE sampling has been undertaken in Tallarenha and Lagoon Creeks that provided an improved basis for understanding the key ecological components immediately downstream of the mine potentially at risk from altered hydrology-associated impacts (see *Mine Site Aquatic Ecology and Water Quality* report and the *Subterranean Fauna Survey* contained in *Appendices – Volume 2* of this SEIS). A *Mine Water Quality Monitoring Program* has also been prepared and is contained in *Appendices – Volume 2* of this SEIS.

Refer also to Issue Reference 6015 in Part C – 17 – Cumulative Impacts.

Submitter No.	**419**	Issue Reference:	**6048**
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)**
Name	**DERM**	Relevant EIS Section	Chapter 6 Terrestrial Ecology, Section 6.5.2, Potential Impacts of Mine Operation on flora in General (p202)

DETAILS OF THE ISSUE

The EIS states that the potential to alter surface and near surface water characteristics will be managed through the establishment of appropriate watercourse diversions. However, there is no evidence in the EIS that watercourse diversions will be appropriate to manage potential alterations of surface and near surface water.

The diversion should be designed to mimic (as near as possible) the natural features of the watercourse in accordance with the following documents:

- Project C8030 (Stage 1) – Maintenance of Geomorphic Processes in Bowen Basin River Diversions
- Project C9068 (Stage 2) – Monitoring Geomorphic Processes in Bowen Basin River Diversions
- Project C9068 (Stage 3) – Design and Rehabilitation Criteria for Bowen Basin River Diversions, and
- The Department of Environment and Resource Management Regional Guideline entitled 'Watercourse Diversions – Central Queensland Mining Industry' dated 15/3/2011.

The EIS must contain sufficient conceptual information on the diversion to demonstrate that any diversion can be constructed to meet engineering requirements and relevant regulatory guidelines with specific reference as to how the design and the monitoring of the diversion will meet the ACARP and Departmental guidelines relating to watercourse diversions.

Further assessment of the diversion, including detailed functional hydraulic design, rehabilitation and monitoring requirements, will be required as part of approval processes under the *Water Act 2000* and associated approvals under the *Sustainable Planning Act 2009*.

PROPONENT RESPONSE

See also Issue Reference 6015 in Part C – 17 – Cumulative Impacts and the *Mine Site Creek Diversion and Flooding* report contained in *Appendices – Volume 2* of this SEIS.

Submitter No.	**419**	Issue Reference:	**4109 / 6049 / 19104 / 10012**
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)**
Name	**DERM**	Relevant EIS Section	Volume 2 Terrestrial Ecology, Commitments, Section 6.7.2

DETAILS OF THE ISSUE

The EIS should commit the proponent to developing a subsidence management plan in consultation with DERM.

The EIS should include a subsidence management plan that evaluates the rehabilitation and offset requirements resulting from the impacts of subsidence.

PROPONENT RESPONSE

As specified in Vol 2, Chapter 6, Section 6.4.1.2 and Section 6.7.2 of the EIS, a subsidence management plan will be prepared prior to the commencement of underground mining operations. The plan will be developed in consultation with DEHP and will be risk based, flexible, responsive and capable of dealing with unexpected changes or uncertainties.

Waratah Coal has also committed to providing compensation in the form of an offset (see *Biodiversity Offset Proposal* in *Appendices – Volume 2* of this SEIS) for the unavoidable impacts of subsidence on nature conservation values. A Rehabilitation and Decommissioning Plan will be prepared prior to construction commencing that will provide for decommissioning, rehabilitation, remediation and a closure. See Issue Reference 4040 (in Part C – 19 – Decommissioning and Rehabilitation) for more information.

Waratah Coal aims to minimise the potential impact of subsidence that may result from longwall mining undertaken by its operation and proactively manage subsidence impacts that may result from its underground operations. This includes the prevention and management of impacts as well as monitoring to provide early identification of impacts.

More specifically, the objectives of the Subsidence Management Strategy are to:

- Outline the monitoring and measurement protocols
- Establish responsibilities for the management of subsidence related issues during and immediately following under-mining
- Satisfy the applicable regulatory requirements for subsidence management across the Waratah Coal Project
- Justify the relevance, suitability and adequacy of the proposed mine layout and mine sequence with respect to subsidence related issues
- Establish management priorities and detail the proposed mitigation/remediation and management measures. This includes presenting contingency plans / procedures, and
- Detail the review and reporting protocols.

Subsidence Management Process, Structure and Organisation

Waratah Coal's overall approach to subsidence management includes the following:

- Design to reduce surface impacts – Mine design is such to reduce the potential impact to public safety, the natural environment and built features
- Identify and manage environmental risks – specialist studies (including subsidence) are prepared to identify potential impacts to public safety, the natural environment and built features
- Measure baseline information – Background data is established for the surface above the proposed mining area, this will include the establishment of subsidence monitoring points
- Monitor the effects of mining – Continued monitoring of data for the surface above the proposed mining area, including subsidence monitoring points
- Regularly assess and interpret monitoring – Monitoring data is analysed to identify any variances
- Re-assess impacts – Where variances are identified that are greater than predictions, additional assessment of impacts is undertaken
- Identify and implement remedial actions – If additional assessment indicates greater impacts, then remedial action may be required. Stakeholder consultation will be undertaken in determining and implementing remedial actions, as required
- Implement remedial actions – In the event that any surface impacts due to subsidence are noted, appropriate remediation and/or mitigation measures will be implemented in consultation with appropriate stakeholders, and
- Provide regular progress reports – Progress reports will be provided to relevant parties in accordance with reporting conditions outlined in approval documentation.

Surface subsidence caused by longwall mining will be managed through Subsidence and Rehabilitation Management Plans (see *Rehabilitation and Decommissioning* section of the *Draft Mine EM Plan* and *Longwall Mining Subsidence Report* in *Appendices – Volume 2* of this SEIS).

See also the *Land* ection contained in the *Draft Mine EM Plan* in *Appendices – Volume 2* of this SEIS.

Submitter No.	**419**	Issue Reference:	**2014 / 6040**
Submitter Type	Government	TOR Category	**Nature Conservation (Aquatic Ecology)**
Name	**DERM**	Relevant EIS Section	Volume 2 Chapter 9, Surface Water Resources, Section 9.5.4 Tallarenha Dam (p264)

DETAILS OF THE ISSUE

The proposed dam at the confluence of Beta Creek and Tallarenha Creek will lead to 'Reduced stream flows downstream of the dam, impacting on flora and fauna that depend on periodic wet/dry cycles.'

A number of palustrine wetlands are mapped as occurring downstream of the proposed dam, these include wetlands that are of High Ecological Significance under the Temporary State Planning Policy 1/11 Protecting Wetlands of High Ecological Significance.

Section 7.8.7 of the Mine EM plan (p144) identifies the need for 'Future work to elucidate the aquatic assemblage...'

The EIS should include baseline surveys of downstream wetlands environmental values, including:

- flora and fauna surveys (wet and dry)
- an assessment of the hydrological requirements for each impacted wetland
- impacts of changes, and
- avoidance or mitigation measures.

The data collected should also be provided to DERM in the appropriate electronic format.

PROPONENT RESPONSE

The dam at the Confluence of Beta Creek and Tallarenha Creek is no longer proposed due to the low reliability for clean water supply to the mine. Therefore is no longer part of the EIS and will not result to in changes to the hydrological regime.

Monitoring was undertaken in a wetland corresponding to the area where the water supply dam was proposed (see the *Mine Site Aquatic Ecology and Water Quality* report contained in *Appendices – Volume 2* of this SEIS) to help characterise the aquatic habitat and flora and fauna associated with this wetland.

Note also that additional surface water aquatic ecology and groundwater dependent ecosystems (GDE) sampling was undertaken in Tallarehna and Lagoon Creeks (see the *Mine Site Aquatic Ecology and Water Quality* report and the *Subterranean Fauna Survey* report contained in *Appendices – Volume 2* of this SEIS). This work provides an improved basis for understanding the key ecological components immediately downstream of the mine site potentially at risk from altered hydrology-associated impacts.

Submitter No.	**419**	Issue Reference:	**2015 / 6041**
Submitter Type	Government	TOR Category	**Nature Conservation (Aquatic Ecology)**
Name	**DERM**	Relevant EIS Section	Chapter 1 Project Description, Section 1.2.4.6 Proposed Tallarenha/Lagoon Creek Diversion (p57-58)

DETAILS OF THE ISSUE

The proposed Tallarenha Creek diversion and storage seem to be located in the same area as a wetland of High Ecological Significance exists (Volume 2, Chapter 7, Figure 2 on page 219). Should a diversion and storage result in the removal or impact on this wetland, the EIS should address how the requirements of the 'Temporary State Planning Policy 1/aa Protecting Wetlands of High Ecological Significance in Great Barrier Reef Catchments' would be met.

PROPONENT RESPONSE

The dam on Tallarenha Creek is no longer proposed and therefore will not impact the existing mapped wetland. The wetland mapping indicates the wetland is located upstream of the confluence of Beta Creek and Tallarenha Creek. The proposed diversion works associated with Lagoon Creek begins downstream of this confluence. Therefore the wetland is unlikely to be impacted as result of proposed diversion works.

Refer also to Issue Reference 2014 in this chapter.

Submitter No.	419	Issue Reference:	2016 / 6042
Submitter Type	Government	TOR Category	**Nature Conservation (Aquatic Ecology)**
Name	**DERM**	Relevant EIS Section	Surface Water Resources, Chapter 9, Mine EIS

DETAILS OF THE ISSUE

Impacts on downstream ecosystems of the proposed on-creek dam on Tallarenha Creek (clean water supply) are insufficiently presented. The only mention found of this impact was found in Section 9.5.4 of Chapter 9 Surface Water Resources.

It is highly likely that damming Tallarenha Creek will impact on the downstream waterways and associated ecosystems or water users. For example, the proposal is likely to reduce the duration and intensity of downstream flows which support aquatic ecosystems in semi-permanent and permanent waterways (and ecosystems supported by the typical ephemeral flows, i.e. wetting/drying cycles). In addition, other environmental values (other than aquatic ecosystems) should be considered as potentially impacted by such a proposal; for example downstream livestock drinking water. It is clear from the photos of water quality monitoring sites downstream of the mine that many cattle footprints line the waterways, presumably where the animals congregate to drink.

It is recommended that the percentage and duration of altered flows downstream of the proposed dam during construction, operation and during mine rehabilitation be estimated, characterised and presented in the EIS and the relevant EM plans. The planned mitigation measures should also be appropriately addressed.

PROPONENT RESPONSE

The dam at the Confluence of Beta Creek and Tallarenha Creek is no longer proposed due to the low reliability for clean water supply to the mine. Therefore is no longer part of the EIS and will not result in impacts on downstream ecosystems.

Submitter No.	419	Issue Reference:	2017
Submitter Type	Government	TOR Category	**Nature Conservation (Aquatic Ecology)** / Water Resources (Surface Water)
Name	**DERM**	Relevant EIS Section	Volume 2, Section 9.4.6 – Existing water quality

DETAILS OF THE ISSUE

The EIS is inconsistent with Queensland Water Quality Guidelines (QWQG) for the development of Water Quality Objectives (WQOs) and Reference Site selection.

Volume 2, Chapter 9, page 265 states that water quality criteria will be developed using 20th and 80th percentiles from baseline assessments. This implies WQOs have been developed under the QWQG methodology. QWQG (2009) recommends 18 samples per site (or group of sites similar water type) over at least 12 months to develop WQOs. Sites have been grouped at the river basin level with no apparent consistency in water quality parameters between sites within the current groups.

QWQG recommends data should be collected over 12-24 months. The EIS uses data collected with 1-2 samples per site over six months to develop WQOs, this is inadequate to give reliable values.

Reference and impact monitoring sites within each group have not been identified for use over the life of the project.

In order to effectively manage water quality across the project it is necessary to identify different water types. To do this will require separate analysis of water quality data.

That the EIS should describe the current state (with relevant data) of reference and monitoring sites using methods consistent with Queensland Water Quality Guideline methods and standards (DERM, 2009)[6].

It is recommended that any WQOs established for the location should be derived with methods consistent with the Queensland Water Quality Guideline (DERM, 2009a) standards. This will require collecting samples over a wider temporal range, and collecting the recommended number of samples at reference sites to develop WQOs. Reference site selection also needs take into consideration proposed mining projects upstream of the project site (e.g. Alpha Coal – South Galilee Coal Project).

PROPONENT RESPONSE

The existing data collected as part of the SEIS is detailed in the *Mine Site Aquatic Ecology and Water Quality* report and the *Rail Aquatic Ecology and Water Quality* report (contained in the *Appendices – Volume 2* of this SEIS). A detailed *Mine Water Quality Monitoring Plan* has also been developed (also contained in the *Appendices – Volume 2* of this SEIS) which includes both a summary of existing available data (including against the Alpha Coal Project EIS data), and a plan for a robust program to derive interim and later formal water quality objectives for the project.

Sampling was undertaken during the EIS (two occasions) and the SEIS (another 2 occasions) during the:

- October 2009 and April/May 2010 (EIS), and
- April 2012 and September 2012 (SEIS).

This spans around 3 years, and four rounds, with the EIS sampling including 24 sites in the Belyando Basin, including 11 sites in the Sandy Creek sub-catchment and one site in the Belyando Floodplain sub-catchment, and the SEIS including 14 sites (some of which were the same or very close to the EIS sites), though the same waterways were sampled during both the EIS and SEIS. The consistency of the data was hampered by the ephemerality of the streams, and incomplete crossover of parameters and sites between the EIS and SEIS sampling, due in part to access constraints.

The Alpha Coal Project EIS[7] presented median and 95th percentile data for various analyses for each site monitored, based on seven rounds of sampling at each of 15 sites, most of which were considered as fulfilling the reference site criteria. Based on these data all but fulfilling the minimum requirements to derive interim water quality objectives they put forward interim water quality objectives for a range of parameters.

Statistics of the water quality data collected as part of the Galilee Coal Project sampling (EIS and SEIS) was compared to similar statistics from the Alpha Coal Project (i.e. medians and 95th percentiles) as described in the *Mine Water Quality Monitoring Plan* (refer to *Appendices – Volume 2* of this SEIS). It was concluded that the water quality data collected as part of the China First Coal Project baseline water quality monitoring program is broadly consistent with that collected as part of the Alpha Coal Project EIS. This finding was expected given that the two projects are regionally directly adjacent to one another and that some of the same waterways were sampled as part of the two studies. Given that baseline water quality monitoring program data collected thus far for the Project are broadly consistent with those collected by for the Alpha Coal EIS from the reference sites used to derive their interim water quality objectives, it is proposed that those interim water quality objectives be adopted for the Project until such time as the baseline water quality data are sufficient to derive final water quality objectives for waterways within and adjacent to the Project. Details of the interim water quality objectives put forward by Hancock Coal as part of their Alpha Coal EIS, and proposed for the Galilee Coal Project are given in the *Mine Water Quality Monitoring Plan*.

6 Queensland Water Quality Guidelines, Version 3 (2009), DERM, Queensland Government

7 Hancock Prospecting. 2011. *Alpha Coal EIS*.

The adoption of these interim levels is proposed to be followed by a robust monitoring program designed to collect additional data to support setting of more localised interim water quality objectives. The choice of parameters, frequencies, methods and sites (including reference and control / impact sites) is discussed further in the *Mine Water Quality Monitoring Plan* (refer to *Appendices – Volume 2* of this SEIS), aimed to follow the suggested DERM (2009) Queensland Water Quality Guideline[8] standards.

The *Mine Water Quality Monitoring Plan* also sets out proposed End of Pipe release limits and flow criteria, and operational monitoring requirements.

Submitter No.	**419**	Issue Reference:	**2018 / 19102**
Submitter Type	Government	TOR Category	**Nature Conservation (Aquatic Ecology)**
Name	**DERM**	Relevant EIS Section	Chapter 7 – EMP: Mine, Section 7.8.3, Element 3 Hydrology and Water Quality (p130)

DETAILS OF THE ISSUE

This section does not provide sufficient information regarding the potential impacts of the activities on the environment, in particular impacts on ecosystems. The EM plan should identify all potential impacts of the activity on ecosystem quality.

PROPONENT RESPONSE

Additional aquatic ecosystem assessments have been undertaken and are presented in the *Mine Site Aquatic Ecology and Water Quality* report (contained in *Appendices – Volume 2* of this SEIS), including an assessment of the potential impacts of the mining activities on aquatic ecosystems.

The potential impacts on ecosystem quality are expected to include:

- The clearing of vegetation and topsoils from working areas and stockpiling on site resulting in sediment mobilisation
- Impacts on vegetation and banks during bridge and culvert construction resulting in possible sediment mobilisation
- The storage of chemicals (e.g. hydrocarbons, surfactants etc.) during construction and operation and the movement of these to watercourses
- The storage seepage and overtopping of potentially contaminated water from tailings dams, pits or other environmental control dams
- The construction and operation of underground mines which may result in subsidence impacting drainage in the immediate area
- The construction of creek diversions resulting in increased sediment mobilisation or storage
- Changes to contributing catchment area and runoff characteristics to Lagoon Creek resulting in reduced flow rates and annual flow volumes, and
- Erosion in creek diversion due to increased velocity resulting in increased sediment load.

The potential effects as a result of these impacts if uncontrolled may include:

- Increased total suspended solids and turbidity within receiving waterways
- Increased sediment mobilisation and sediment load within receiving waterways with subsequent impacts on aquatic ecosystems

8 DERM (2009) *Monitoring and Sampling Manual 2009,* Department of Environment and Resource Management, Version 2, September 2010.

- Increased salinity of receiving waterways with impact to non-salt tolerant species and possible impacts to livestock downstream
- Increased nutrient levels resulting in increased eutrophication of downstream waterbodies
- Reduced streamflow volumes resulting in impacts aquatics biota and riparian vegetation, and
- Increased concentrations of dissolved heavy metals and other contaminants resulting in toxicity and accumulation in receiving waters with possible impacts on drinking water supplies.

The *Draft EM Plan* (contained in *Appendices – Volume 2* of this SEIS) documents the potential impacts and set out control measures required for mitigation of potential impacts on aquatic ecosystems.

Submitter No.	**419**	Issue Reference:	**2019**
Submitter Type	Government	TOR Category	**Nature Conservation (Aquatic Ecology)**
Name	**DERM**	Relevant EIS Section	Volume 2 Mine, Chapter 7 Aquatic Ecology, section 7.3.2.8 Artesian Spring Communities (p216)

DETAILS OF THE ISSUE

There appears to be confusion between an 'aquifer ecosystem' and a 'spring community'. Aquifer ecosystems occur within subterranean water-bearing rock formations and may include stygofauna, whereas spring communities are surface wetland features that have groundwater connection but may only incidentally include stygofauna.

Section 7.3.2.8 should be titled Aquifer Ecosystems.

PROPONENT RESPONSE

Noted, and will be considered in future documentation regarding these matters.

Submitter No.	**419**	Issue Reference:	**2020**
Submitter Type	Government	TOR Category	**Nature Conservation (Aquatic Ecology)**
Name	**DERM**	Relevant EIS Section	Environmental Values (p41-42 Executive Summary)

DETAILS OF THE ISSUE

The environmental value assessment should include an assessment of all environmental values downstream of the proposed activity and that will be potentially affected. The assessment should not simply be an assessment of current environmental values on the proposed mine site itself.

The EIS should undertake an assessment of environmental values of waterways downstream of the proposed mine site. In addition to livestock drinking water, values such as crop irrigation, general farm use, potential recreational values (primary or secondary), human drinking water must be considered. This should include a map and subsequent inclusion of relevant water quality objectives (WQO) for those environmental values.

PROPONENT RESPONSE

The existing data collected as part of the SEIS is detailed in the *Mine Site Aquatic Ecology and Water Quality* report and the *Rail Aquatic Ecology and Water Quality* report (contained in the *Appendices – Volume 2* of this SEIS). A detailed *Mine Water Quality Monitoring Plan* has also been developed (also contained in the *Appendices – Volume 2* of this SEIS) which includes both a summary of existing available data (including against the Alpha Coal Project EIS data), and a plan for a robust program to derive interim and later formal water quality objectives for the project.

Sampling was undertaken during the EIS (two occasions) and the SEIS (another 2 occasions) during the:

- October 2009 and April/May 2010 (EIS), and
- April 2012 and September 2012 (SEIS).

This spans around 3 years, and four rounds, with the EIS sampling including 24 sites in the Belyando Basin, including 11 sites in the Sandy Creek sub-catchment and one site in the Belyando Floodplain sub-catchment, and the SEIS including 14 sites (some of which were the same or very close to the EIS sites), though the same waterways were sampled during both the EIS and SEIS. The consistency of the data was hampered by the ephemerality of the streams, and incomplete crossover of parameters and sites between the EIS and SEIS sampling, due in part to access constraints.

The Alpha Coal Project EIS[9] presented median and 95th percentile data for various analyses for each site monitored, based on seven rounds of sampling at each of 15 sites, most of which were considered as fulfilling the reference site criteria. Based on these data all but fulfilling the minimum requirements to derive interim water quality objectives they put forward interim water quality objectives for a range of parameters.

Statistics of the water quality data collected as part of the Galilee Coal Project sampling (EIS and SEIS) was compared to similar statistics from the Alpha Coal Project (i.e. medians and 95th percentiles) as described in the *Mine Water Quality Monitoring Plan* (refer to *Appendices – Volume 2* of this SEIS). It was concluded that the water quality data collected as part of the China First Coal Project baseline water quality monitoring program is broadly consistent with that collected as part of the Alpha Coal Project EIS. This finding was expected given that the two projects are regionally directly adjacent to one another and that some of the same waterways were sampled as part of the two studies. Given that baseline water quality monitoring program data collected thus far for the Project are broadly consistent with those collected by for the Alpha Coal EIS from the reference sites used to derive their interim water quality objectives, it is proposed that those interim water quality objectives be adopted for the Project until such time as the baseline water quality data are sufficient to derive final water quality objectives for waterways within and adjacent to the Project. Details of the interim water quality objectives put forward by Hancock Coal as part of their Alpha Coal EIS, and proposed for the Galilee Coal Project are given in the *Mine Water Quality Monitoring Plan*.

The adoption of these interim levels is proposed to be followed by a robust monitoring program designed to collect additional data to support setting of more localized interim water quality objectives. The choice of parameters, frequencies, methods and sites (including reference and control / impact sites) is discussed further in the *Mine Water Quality Monitoring Plan* (refer to *Appendices – Volume 2* of this SEIS), aimed to follow the suggested DERM (2009) Queensland Water Quality Guideline[10] standards.

The *Mine Water Quality Monitoring Plan* also sets out proposed End of Pipe release limits and flow criteria, and operational monitoring requirements.

9 Hancock Prospecting. 2011. *Alpha Coal EIS*.

10 DERM (2009) *Monitoring and Sampling Manual 2009,* Department of Environment and Resource Management, Version 2, September 2010.

Submitter No.	419	Issue Reference:	2021
Submitter Type	Government	TOR Category	Nature Conservation (Aquatic Ecology)
Name	DERM	Relevant EIS Section	Mine site EMP, Section 7.8.7, Element 7, Aquatic Flora and Fauna (p144-146)

DETAILS OF THE ISSUE

The environmental management plan for aquatic flora and fauna does not clearly outline performance criteria, implementation strategies, reporting, etc for the operational and rehabilitation phases of the project (rather for the construction phase only). It is important that considerations of the operational phase include performance criteria of 'no uncontrolled release events to local waterways of mine-affected water' (as the verbal commitment at the recent information session suggested).

PROPONENT RESPONSE

A new *Draft Mine EM Plan* (contained in *Appendices – Volume 2* of this SEIS) has been developed for the mine, based on information available to date. It has been prepared in accordance with the content requirements of an EM Plan for a mining lease as set out in Section 203 of the *Environmental Protection Act 1994*, and with reference to the Department of Environment and Resource Management (DERM) publications *Guideline: Mining – Level 1 mining and exploration projects*[11] and *Mining – Environmental management plan (mining lease)* (EM Plan (ML))[12]. It includes construction, operation, closure/rehabilitation, and post-closure stages.

The structure of the EM Plan follows the following stepped process for each component (i.e. air, land, noise, etc.):

- Identification of environmental values through detailed site investigations (provided by specialist studies)
- Identification of potential impacts on environmental values identified
- Development of environmental protection objectives to minimise potential impacts
- Development of environmental commitments including control measures to achieve the stated objectives, and
- Development of proposed environmental authority conditions to be included in the environmental authority.

These are informed by the specialist studies currently underway, and as such the EM Plan will be finalised following the completion of these specialist studies (and prior to issue of the Environmental Authority). The EM Plan will also include a commitment to no uncontrolled releases to local waterways (or the surrounding environment) of mine affected water.

11 *Guideline: Mining, Level 1 mining and exploration projects*. Department of Environment and Heritage Protection, EM581, Version , 4 July 2012.

12 *Information sheet: Mining – Environmental management plan (mining lease)* (EM Plan (ML)). Department of Environment and Resource Management, 17 September 2010.

Submitter No.	419	Issue Reference:	2022
Submitter Type	Government	TOR Category	Nature Conservation (Aquatic Ecology)
Name	DERM	Relevant EIS Section	Volume 5, Appendix 13, Aquatic Ecology, Section 3.10, Artesian Spring Communities, Stygofauna, (p3-20)

DETAILS OF THE ISSUE

There appears to be confusion between an 'aquifer ecosystem' and a 'spring community'. Aquifer ecosystems occur within subterranean water-bearing rock formations whereas, spring communities are surface wetland features that have groundwater connection. Section 3.10 of the EIS should be reworded to read Aquifer Ecosystems – Stygofauna.

PROPONENT RESPONSE

Noted, and will be considered in future documentation regarding these matters.

Submitter No.	364	Issue Reference:	2024
Submitter Type	Government	TOR Category	Nature Conservation (Aquatic Ecology)
Name	DEEDI (Fisheries Qld)	Relevant EIS Section	Volume 1 – Chapter 2 – 2.2.2.13

DETAILS OF THE ISSUE

The section refers to "Fish Habitat Reserves".

The proponent be advised that the correct terminology is "declared Fish Habitat Area"

PROPONENT RESPONSE

Noted, and will be considered in future documentation regarding these matters.

Submitter No.	364	Issue Reference:	2025
Submitter Type	Government	TOR Category	Nature Conservation (Aquatic Ecology)
Name	DEEDI (Fisheries Qld)	Relevant EIS Section	Volume 1 – Chapter 5 – 5.4.2.1 & 5.4.2.3

DETAILS OF THE ISSUE

The section refers to "Fish Habitat Reserves".

The proponent be advised that the words "and aquatic ecology" should be added to the first dot point to better reflect the cumulative impacts considered by the *Fisheries Act 1994*.

PROPONENT RESPONSE

Noted, and will be considered in future documentation regarding these matters.

Submitter No.	419	Issue Reference:	2027
Submitter Type	Government	TOR Category	Nature Conservation (Terrestrial Ecology)
Name	DERM	Relevant EIS Section	Volume 2 Mine, Chapter 8, section 8.2.2.8, Stygofaunal Sample Collection (p231)

DETAILS OF THE ISSUE

This section of the EIS is incomplete. According to the Western Australian Guideline 54A Sampling and Survey Methods, page 6 sampled bores should ideally allow 6 months for a bore to colonise. Therefore the bore construction date should be included in the sample collection methods.

The guideline also states that sampling should ideally be undertaken in two different seasons and that the second round of sampling should be more than three months after the first round to maximise chances of collecting most fauna. Therefore the sampling dates should be included in the sample collection methods.

PROPONENT RESPONSE

The design of the Waratah Coal stygofauna survey generally conformed to the WA Guidelines (2003 and 2007)[13]. The details, including the sample dates are included in the *Subterranean Fauna Survey* report contained in *Appendices – Volume 2* of this SEIS.

Submitter No.	419	Issue Reference:	2028
Submitter Type	Government	TOR Category	Nature Conservation (Terrestrial Ecology)
Name	DERM	Relevant EIS Section	

DETAILS OF THE ISSUE

The guideline also states that sampling should encompass the full range of geology and geomorphology present (p21). According to the map in Figure 2, Mine site Surface Geology, Chapter 3, Volume 2, page 120 Quaternary alluvium is present to the northeast of the mine area and should be sampled for stygofauna. All consolidated sediments that outcrop in the mine area should also be sampled for stygofauna.

PROPONENT RESPONSE

See the *Subterranean Fauna Survey* report contained in *Appendices – Volume 2* of this SEIS for details of the geological and geomorphological units sampled.

13 WA EPA. 2003. *Guidance for the assessment of environmental factors (in accordance with the Environmetal Protection Act 1986). Sampling of subterranean fauna in groundwater and caves. Guidance Statement 54.* Environmental Protection Authority, Western Australia.

WA EPA. 2007. *Guidance for the assessment of environmental factors (in accordance with the Environmetal Protection Act 1986). Sampling methods and survey considerations for subterranean fauna in Western Australia. Guidance Statement 54.* Environmental Protection Authority, Western Australia.

Submitter No.	**419**	Issue Reference:	**2029**
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)**
Name	**DERM**	Relevant EIS Section	Volume 2 Project Overview, Chapter 8 Groundwater, Section 8.3.1.4 Ecosystems (p235)

DETAILS OF THE ISSUE

The TOR requires a detailed assessment and discussion of groundwater dependent ecosystems. This section of the EIS states the 'No groundwater dependent ecosystems were present in the vicinity of the mine.'

It is noted that there is no reference to groundwater dependent ecosystem (GDE) sampling or survey with the exception of styfgofauna sampling.

Section 3.4.2.2 of the TOR states that 'Any potential for the project to impact on groundwater dependent ecosystems should be assessed and described. Avoidance and mitigation measures should be described.

The full scope of GDEs should be assessed according to Eamus *et al.* 2006[14]. The EIS should discuss hyporheic GDEs, ecosystems dependent on surface expression of groundwater (including baseflow, wetland and spring GDEs), and ecosystems dependent on the subsurface presence (terrestrial GDEs).

PROPONENT RESPONSE

The EIS TOR specified only that: "The Order or Family taxonomic rank of the presence and nature of stygofauna occurring in groundwater likely to be affected by the project" be described (TOR, pg 41). The DERM comment suggests that the definition of GDE's given in Eamus *et al* (2006) is DEHP's preferred basis for assessing potential impacts of the GCP on GDE's in the study area. That definition covers a very broad suite of communities and not all of these have obligate dependency on groundwater (e.g. riparian vegetation fringing ephemeral streams and adjacent terrestrial vegetation source part of their water needs through rainfall). Stygofauna, on the other hand, are entirely dependent on the availability and quality of groundwater. Hyporheic fauna associated with ephemeral waterways also have a dependence on groundwater connectivity, although hyporheic fauna communities often share many species in common with surface water macroinvertebrate communities. In GHD's (Waratah Coal's consultants for stygofauna and aquatic ecology) experience, coverage of the full complement of GDE communities for EIS's of this nature is above and beyond current best practice. More typically, EIS TOR's have specified only that stygofauna be assessed and is in line with what E3 outlined as their scope of works in the EIS report. On this basis, GHD's recommendation to Waratah Coal was that attention for the Supplementary EIS should be directed to obligate GDE communities, or those with strong groundwater dependencies – i.e. stygofauna and hyporheic fauna. As such the sampling program reflected this (see the *Subterranean Fauna Survey* report contained in *Appendices – Volume 2* of this SEIS).

Submitter No.	**419**	Issue Reference:	**2031**
Submitter Type	Government	TOR Category	Project Approvals / **Nature Conservation (Aquatic Ecology)**
Name	**DERM**	Relevant EIS Section	Volume 1 – Chapter 6 – 6.2.7 & Volume 2 – Chapters 7 & 9

DETAILS OF THE ISSUE

This section sets out undertakings being made in relation to Aquatic Ecology as a part of the Mine project.

14 Eamus, D., Froend, R., Loomes, R., Hose, G.C. & Murray, B.R. 2006. *A functional methodology for determining the groundwater regime needed to maintain the health of groundwater-dependent vegetation.* Australian Journal of Botany, V54(2). Pages 97-114.

The proponents undertake to "investigate requirements for fishway design on the proposed dam" in addition to works to create waterway diversions of the proposed Tallarenha Creek / Lagoon Creek diversion.

Approvals under the SPA are not required for mining associated activities within the mining lease, however DEEDI request that the Coordinator-General consider the recommended conditions to ensure minimisation of impacts to fisheries resources.

PROPONENT RESPONSE

Noted, however this issue is no longer required to be addressed as the proposed dam in question is no longer being considered as part of the project design plan.

Submitter No.	**419**	Issue Reference:	**2048 / 6087**
Submitter Type	Government	TOR Category	Water Resources (Surface Water) / **Nature Conservation (Aquatic Ecology)**
Name	**DERM**	Relevant EIS Section	Volume 2, Section 9.5.5 – Creek Diversion

DETAILS OF THE ISSUE

The EIS does not provide sufficient detailed information on water quality management in regards to stream diversions for Tallarenha Creek and Lagoon Creek.

The EIS provides no clear description of how potential increased turbidity from erosion resulting from the creek diversions will impact on water quality or aquatic ecology values.

The EIS also does not describe how these impacts will be mitigated or managed.

PROPONENT RESPONSE

A desktop geomorphic review of the creek reaches to be diverted has been undertaken. This assessment indicates that the reaches are significantly modified as a result of farming activities. This has led to increased sediment mobilisation and loss of riparian vegetation which is evident through the bank erosion and increased sediment bed load within the reaches. It is expected that this sediment load becomes easily mobilised during the wet season resulting increased turbidity under existing conditions. The proposed diversion of Malcolm Creek and Lagoon Creek has been designed to maintain existing stream lengths, bed slope and meander radius of the existing creek systems. Results of the hydraulic modelling undertaken for the diversion designs indicates a reduction in velocities, stream power and bed shear stress below natural conditions. The diversion will also go through a significant establishment phase to allow the establishment of vegetation to stabilise batters and decrease sediment mobilisation. In addition construction and operational monitoring will also identify areas of erosion or poor performance which will be rectified through the establishment of vegetation or rock armouring.

The main aquatic ecology components at risk through erosion-related sediment runoff would be submerged macrophytes (which are unlikely to be present in Lagoon Creek based on its sandy ephemeral nature), pollution-sensitive and riffle-bed associated macroinvertebrates (few would be expected in an ephemeral sand-bed stream such as Lagoon Creek) and fish that spawn on these substrates (e.g. Eel tail catfish, Purple spotted gudgeon – neither of which is considered rare or threatened). If turbidity and TSS reached high enough levels (i.e. through severe erosion) there could be some direct fish mortality through the clogging or abrasion of gills, but the likelihood of such impacts occurring is small given many local fish species are used to short-term elevated turbidity and TSS associated with rainfall events, and fish have some capacity to move out of areas where elevated turbidity and TSS occur. If there

were direct mortality impacts, these impacts would likely be restricted in spatial scale and no species of conservation significance would be affected. Recovery in the affected areas after such impacts would also likely be relatively rapid based on recolonisation from adjacent reaches or sub-catchments.

As noted above, the diversion has been designed and will be constructed according to relevant guidelines and best practice techniques, such that erosion during the establishment and operation phases would be minimised.

Submitter No.	**419**	**Issue Reference:**	**2049**
Submitter Type	Government	**TOR Category**	Water Resources (Surface Water) /**Nature Conservation (Aquatic Ecology)**
Name	**DERM**	**Relevant EIS Section**	Volume 2, Section 9.4.5 – Description of surface waters

DETAILS OF THE ISSUE

A number of waterways (Beta Creek, Lagoon Creek, Malcolm Creek, Pebbly Creek, Saltbush Creek, and Spring Creek – refer Volume 2, section 9.4.5) intersect the mine site footprint and may be subject to mining and/or subsidence impacts. The current state of these creeks and potential impacts of mining and related activities have not been sufficiently described in the EIS, particularly with reference to seasonal variation in flow as per the Terms of Reference. Detailed information should be provided to allow DERM to adequately assess the potential impacts on these watercourses.

To adequately assess potential impacts on water quality, the EIS should describe the current state of Beta Creek, Lagoon Creek, Malcolm Creek, Pebbly Creek, Saltbush Creek, and Spring Creek.

PROPONENT RESPONSE

This issue was addressed as part of the surface water quality, groundwater dependent ecosystem and aquatic ecosystem assessments carried out as part of the supplementary EIS (see *Mine Site Aquatic Ecology and Water Quality* report and *Subterranean Fauna Survey* report contained in *Appendices – Volume 2* of this SEIS). These creeks were surveyed both in terms of water quality and in terms of aquatic habitat and aquatic flora and fauna. A *Mine Water Quality Monitoring Program* has also been prepared and is contained in *Appendices – Volume 2* of this SEIS.

These creeks have been identified as being highly ephemeral with little to no flow occurring within the dry season. This conclusion has been drawn from anecdotal evidence as analysis of stream gauging data from the Native Companion Creek within the neighbouring catchment. The proposed water management system has been designed to minimise the impacts to seasonal variation of flow within the watercourses traversing the mine site as much as practical. Natural catchments will be diverted through the mine site prevent the taking of water from maintain the hydrological regime of the system.

Submitter No.	419	Issue Reference:	2050
Submitter Type	Government	TOR Category	Water Resources (Surface Water) /**Nature Conservation (Aquatic Ecology)**
Name	**DERM**	Relevant EIS Section	Volume 2, Chapter 9 – Description of surface waters

DETAILS OF THE ISSUE

As per the Terms of Reference the EIS should describe the environmental values of the surface waterways of the affected area in terms of:

- Values identified in the EPP (Water), and
- downstream water uses, including their significance to the local community and/or environment

PROPONENT RESPONSE

A desktop assessment of environmental values (EVs) for the waterways downstream of the mine has been undertaken and is described in the *Environmental Values Identification for Galilee Coal Mine* report (refer to *Appendices – Volume 2* of this SEIS). This included a detailed assessment of all potential EVs that could apply to the waterways potentially affected by the Project.

In addition, the Department of Environment and Heritage Protection is also currently performing an Environmental Values identification study for the Burdekin River basin which is due for completion in December 2013. Draft Environmental Values for the Burdekin River basin were established by NQ Dry Tropics in 2009 as part of the Burdekin Water Quality Improvement Plan. A desktop review of water uses within the receiving waterways of the Galilee Coal Mine has confirmed the suitability of the draft Environmental Values identified in the Burdekin Water Quality Improvement Plan. The draft Environmental Values identified for the Galilee Coal Mine are:

- **Lagoon Creek, Sandy Creek, tributary of Jordan Creek and Jordan Creek:** aquatic ecosystems (slightly to moderately disturbed), stock watering, and cultural and spiritual values.
- **Belyando River:** aquatic ecosystems (slightly to moderately disturbed), stock watering, irrigation, drinking water, and cultural and spiritual values.

Submitter No.	908	Issue Reference:	17051
Submitter Type	Individual	TOR Category	**Nature Conservation**
Name	**Name withheld**	Relevant EIS Section	

DETAILS OF THE ISSUE

Setting a precedent for mining in Nature Refuges

Disagrees that the the proposal is unviable without the reserves under the BNR

PROPONENT RESPONSE

Precedence for mining in Nature Refuges

Development of a major mine or mineral development project within a Nature Refuge is assessed on a case-by-case basis by DEHP and DSEWPAC, so is a matter for them to address. In this case, an Environmental Impact Statement is required to assist the government in their assessment.

Viability of Project without reserves under the Bimblebox Nature Refuge

The project is unviable if the reserves under the Bimblebox Nature Reserve (BNR) are not mined.

Due to the distance to market for coal from the Galilee Basin mines, there is a critical volume and quality of coal required to make each project economically viable, such that the capital costs of the rail and port infrastructure are justified.

For the Galilee Coal Project, the reserves beneath the BNR are critical as they are the most cost effective of all reserves within the mining lease to recover, being the shallowest of all the reserves. In addition, the coal reserves under the BNR are of superior quality compared with other coal within the mining lease. This superior coal is required for blending with the other comparatively inferior coal to give an overall coal product with an energy level of 6350k/cal, which makes the product competitive on the world coal market. The coal from the Galilee Coal Project has been presold at these energy levels.

If the BNR is not available for mining, in addition to reduction in coal quality being likely to result in the loss of the contract for the pre-sale, it is estimated[15] that the loss in coal reserves for the open-cut operations will be over 42% (167 million tonnes) and for the total mine operations (both open-cut and underground) almost 40%. This represents a reserve of almost 410 million tonnes of coal which makes cost recovery to build the rail, mine and port infrastructure unlikely. It is also worth noting that the reduction in royalties to the Queensland Treasury would be almost A$3 billion (based on $100/tonne coal price). Additional reductions in royalties would also result due to reduced sale prices from the comparatively inferior product that would result without the reserves from under the BNR being available for blending.

Submitter No.	**664**	Issue Reference:	**17088**
Submitter Type	Council	TOR Category	**Nature Conservation** / Water Resources
Name	**Whitsunday Regional Council**	Relevant EIS Section	

DETAILS OF THE ISSUE

Water resources

The rail alignment traverses four different catchments including the Belyando, Suttor, Bowen/Bogie and Don. Species of aquatic flora and fauna are threatened by the construction of the rail corridor. The particular concern for the Council area is the array of species that may be impacted in the Bowen River Catchment. The report includes information that demonstrates the current health and variety of species present. It states that EMP's will be developed for the construction and operational phases of the project that address freshwater ecology issues and mitigation and management techniques. More information is required to determine how the proposed waterway crossings will affect the aquatic ecology when the final route of the rail corridor and design of crossings is finalised.

Potential impacts of most concern to the waterways include the loss of riparian vegetation, increased sediment load, increased turbidity and suspended solids, contamination from equipment used to build bridge and river crossings, disturbance of Acid Sulfate Soils, increased traffic across stream bed, barriers to fish movement and the overall decline of ecosystem health and diversity. The flooding levels may also be affected with the introduction of structures in the streambed altering the hydraulic regime significantly. It is likely the rail corridor will impact on local groundwater regimes and overland flow.

It is also estimated in the EIS that 10,000 megalitres of water will be required for the construction of the rail line mostly for earthworks. However no detail has been provided regarding the quantity required to service temporary accommodation. Where the water will be sourced from has not been specified but does include use of domestic supplies from Collinsville and Mount Coolon, farm dams, existing turkey nest dams and groundwater. It is proposed

15 Estimates provided by Zenith Consulting Pty Ltd

to source water for the marshalling and maintenance yard from the Bowen supply network. Quantity required and timing of the water requirements have not been defined. These factors must be taken into consideration so as to not impede the supply of water to the community and landowners.

PROPONENT RESPONSE

Responses to the three issues raised are as follows:

1. Aquatic ecology

Waratah Coal have undertaken supplementary assessments of aquatic ecology and surface water quality throughout the length of the railway corridor and results are included in the *Rail Aquatic Ecology and Water Quality* report (contained in *Appendices – Volume 2* of this SEIS). This has been used to assist in preparation of the *Draft Rail EMP* (also contained in *Appendices – Volume 2* of this SEIS) and as a baseline from which future potential impacts on aquatic ecological refuges along the railway corridor can be monitored.

2. Flood levels, groundwater, overland flows

FLOOD LEVELS AND OVERLAND FLOWS

Waratah Coal have undertaken extensive flood modelling for the pre- and post-railway scenarios. Environmental design criteria for these structures has been set to maintain flow connectivity, particularly within expansive floodplains and braided river systems. The *Rail Corridor Cross Drainage* report (contained in *Appendices – Volume 2* of this SEIS) outlines the design methodology and hydraulic performance of the rail waterway crossings in relation to flooding. The design ensures that aquatic ecosystems and landowners will not be significantly affected by increased flood levels, extended duration of flooding or excessive concentration of flow velocities caused by the railway.

GROUNDWATER

Waratah Coal can undertake work with respects to potential impacts of the rail on groundwater now that the vertical alignment for the rail has been engineered and the excavation depths for cuttings are known. The approach will be to use Queensland government bore records to glean typical depths to the water table along the route. These depths will then be compared to the expected depth of excavation along the route to isolate locations where the water table might be breached. If necessary, at places with a definite risk, actual depths to water could be checked by augering/drilling or shallow geophysics.

Occasional alterations of shallow groundwater flow directions are considered unlikely to be of any material concern. The shallow groundwater will still pass beneath the rail line.

There is the potential for changes in groundwater quality (as a result of rail construction activities) to influence any shallow alluvial aquifers and hyporheic environments connected to waterways with consequent impacts on any stygofauna or hyporheic fauna (assuming they exist) associated with those ecosystems. Equally, if the groundwater is expressed at the surface then any significant changes in groundwater quality could potentially impact on surface water ecosystems or other values such as irrigation or stock drinking. Appropriate chemical handling procedures will be put in place as part of the construction rail EMP to provide for management and mitigation of potential impacts. See also the *Draft Rail EMP* contained in *Appendices – Volume 2* of this SEIS.

3. Water requirements

The quantity of water required to service the temporary accommodation is estimated to be approximately 66ML per annum which has been included in the total rail construction requirement of 10,000ML. The ongoing requirement for the marshalling yard and maintenance facilities will be approximately 3.5ML per annum.

These water requirements will be sourced in consultation with the landowners and the relevant authorities to ensure that existing landowners and users are not affected. Preliminary investigations have indicated that potentially eleven new or existing water sources would be available without impeding on current supply.

Submitter No.	**769**	Issue Reference:	**17091**
Submitter Type	NGO	TOR Category	**Nature Conservation**
Name	**Black Throated Finch Recovery Team**	Relevant EIS Section	

DETAILS OF THE ISSUE

- Rollingstock yards near Abbot Point coincide with potential BTF habitat
- Reference is made in the EIS to additional work which could advance the assessment of BTF values
- BTFRT consider the exclusion of consideration of the (then recently sighted) records of BTF inappropriate, and
- BTFRT believe that field studies need to be undertaken to generate a reliable habitat map for BTF.

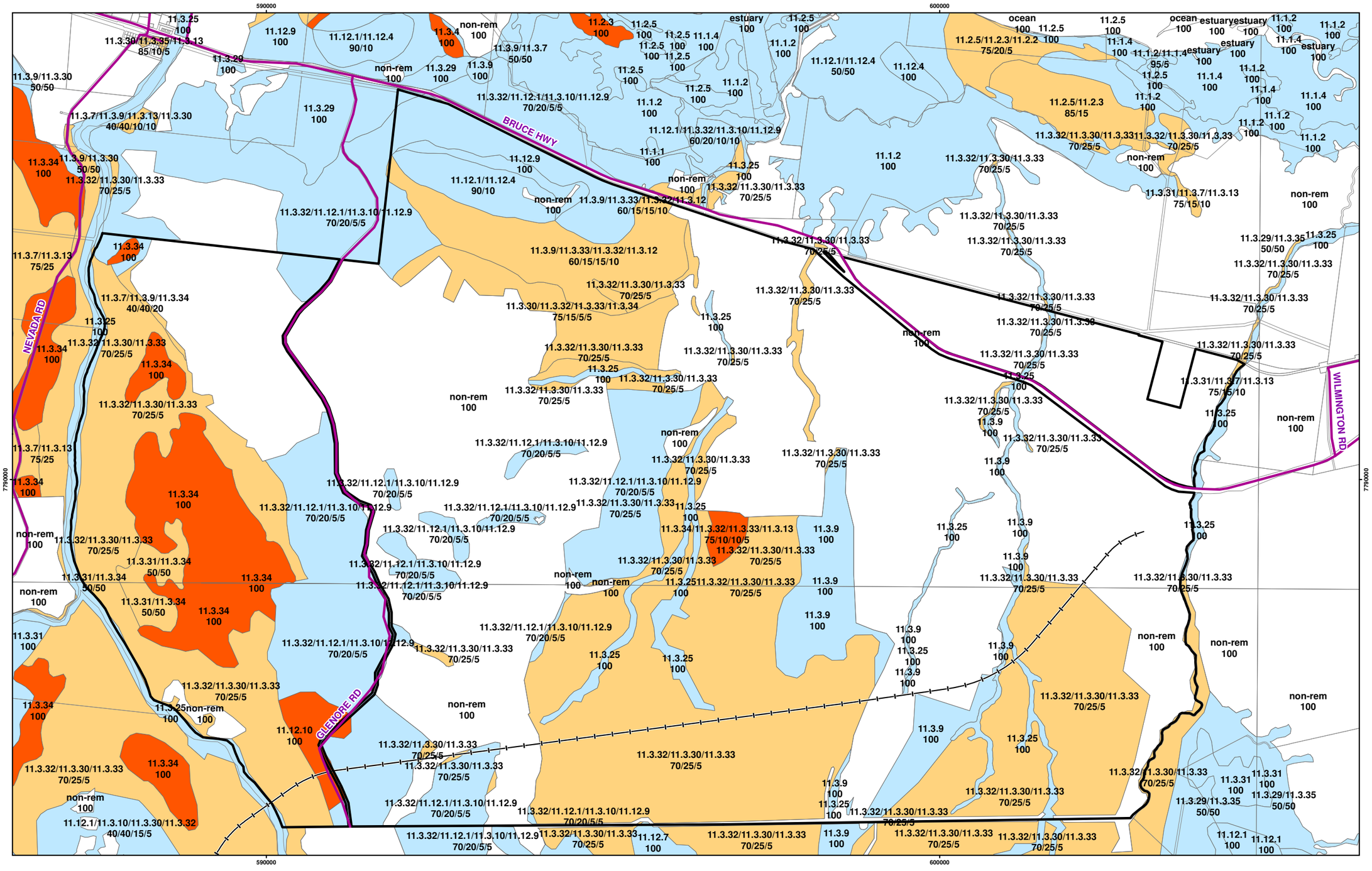
PROPONENT RESPONSE

Rollingstock yards:

The proposed preferred location of the marshaling yard is situated alongside the proposed rail corridor in Lot 24 on RP805036 (see Figure 5). The following provides a description of the remnant regional ecosystems within and around the footprint of the proposed marshaling yards:

- Small patches of RE 11.3.9 – *Eucalyptus platyphylla, Corymbia* spp. woodland on alluvial plains – VMA status least concern – present as unique polygons
- Small patches of RE 11.3.25 – *Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines – VMA status least concern – present as unique polygons
- Majority of the proposed location overlays a large patch of mixed polygon 11.3.32/11.3.30/11.3.33 (polygon comprised of 70/25/5 % respectively)
  - RE 11.3.32 – *Allocasuarina luehmannii* open woodland on alluvial plains – VMA status least concern – dominant component of mixed polygon comprising 70% of the mixed polygon vegetation.
  - RE 11.3.30 – *Eucalyptus crebra, Corymbia dallachiana* woodland on alluvial plains – VMA status least concern – sub-dominant component of mixed polygon comprising 25% of the mixed polygon vegetation.
  - RE 11.3.33 – *Eremophila mitchellii* open woodland on alluvial plains – VMA status Of Concern – sub-dominant component of mixed polygon comprising 5% of the mixed polygon vegetation.
- Edge of a patch of mixed polygon 11.3.32/11.12.1/11.3.10/11.12.9 (polygon comprised of 70/20/5/5 % respectively)
  - RE 11.3.32 – *Allocasuarina luehmannii* open woodland on alluvial plains – VMA status least concern – dominant component of mixed polygon comprising 70% of the mixed polygon vegetation.
  - RE 11.12.1 – *Eucalyptus crebra* woodland on igneous rocks – VMA status least concern – sub-dominant component of mixed polygon comprising 20% of the mixed polygon vegetation.
  - RE 11.3.10 – *Eucalyptus brownii* woodland on alluvial plains – VMA status least concern – sub-dominant component of mixed polygon comprising 5% of the mixed polygon vegetation.
  - RE 11.12.9 – *Eucalyptus platyphylla* woodland on igneous rocks – VMA status least concern – sub-dominant component of mixed polygon comprising 5% of the mixed polygon vegetation.

Figure 5. Lot 24 RP805036 – Remnant Vegetation



GALILEE COAL PROJECT (Northern Export Facility)

Waratah Coal
THE NEW ENERGY IN COAL

Mineralogy House, Level 7, 380 Queen Street, Brisbane Qld 4000, Australia

Source:	Cadastral Boundaries: DERM 2012 2011 Roads & Waterways: Geoscience Australia 2010 Rail Alignment: Waratah Coal Pty. Ltd. 2012 VMA Regional Ecosystems v6.1 State of Queensland (Department of Environment and Resource Management)
Disclaimer:	This plan is based on or contains data provided by others. Waratah Coal Pty. Ltd. gives no warranty in relation to the data (including accuracy, reliability, completness, currency or suiability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to and use of the data. Data must not be used for direct marketing or be used in breach of privacy laws.
File:	File: WAR20-26-SEIS0071a-FIGXXa-Lot 24 RP805036-REMNANT-VEGETATION-121206 Date: 6/12/2012

0 660 1,320 1,980 2,640 3,300
Metres

A3 Scale 1:50,000

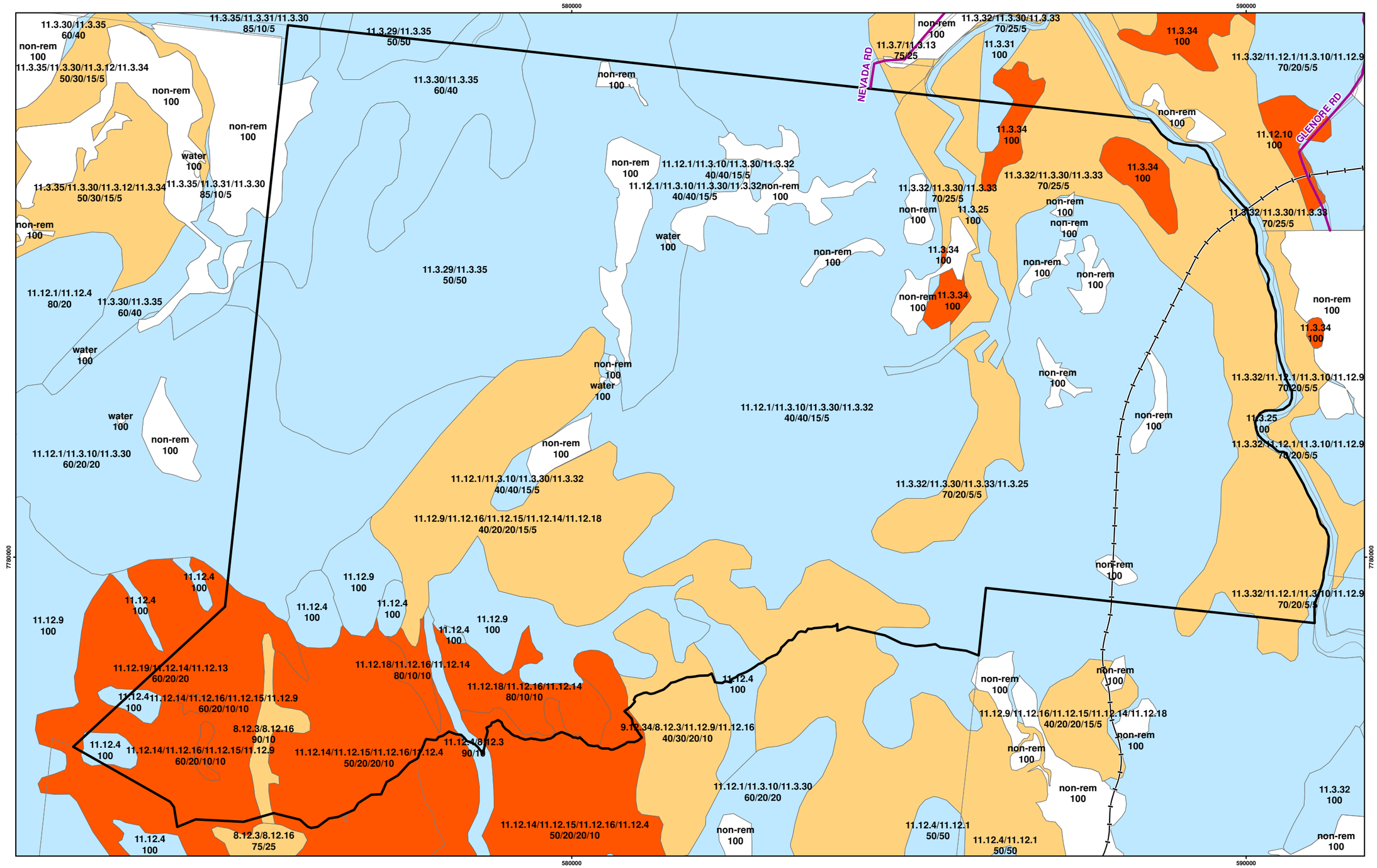
Coordinate System: GDA 1994 MGA Zone 55 Projection: Transverse Mercator

Lot 24 RP805036
Cadastral boundaries
Proposed Railway Line

Remnant vegetation
Not Of Concern
Of Concern - Dominant
Of Concern - Subdominant
Non-remnant

LOT 24 RP805036 - REMNANT VEGETATION

Figure 6. Lot 4 SB687 – Remnant Vegetation



GALILEE COAL PROJECT (Northern Export Facility)	
Waratah Coal — THE NEW ENERGY IN COAL	
Mineralogy House, Level 7, 380 Queen Street, Brisbane Qld 4000, Australia	
Source:	Cadastral Boundaries: DERM 2012 2011 Roads & Waterways: Geoscience Australia 2010 Rail Alignment: Waratah Coal Pty. Ltd. 2012 VMA Regional Ecosystems v6.1: State of Queensland (Department of Environment and Resource Management)
Disclaimer:	This plan is based on or contains data provided by others. Waratah Coal Pty. Ltd. gives no warranty in relation to the data (including accuracy, reliability, completness, currency or suiability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to and use of the data. Data must not be used for direct marketing or be used in breach of privacy laws.
File:	File: WAR20-26-SEIS052a-FIGXXa-Lot 4 SB687-REMNANT-VEGETATION-121207 Date: 7/12/2012

0 500 1,000 1,500 2,000 2,500 3,000 Metres

A3 Scale 1:50,000

Coordinate System: GDA 1994 MGA Zone 55 Projection: Transverse Mercator

infra_Streets
Lot 4 SB687
Cadastral boundaries
Proposed Railway Line

Remnant vegetation
Not Of Concern
Of Concern - Dominant
Of Concern - Subdominant
Non-remnant

LOT 4 SB687 - REMNANT VEGETATION

Waratah Coal note that RE 11.3.25b *Eucalyptus camaldulensis* or less often *E. tereticornis* open-forest to woodland fringing drainage lines and RE 11.3.30 *Eucalyptus crebra, Corymbia dallachiana* woodland on alluvial plains, are included in the 17 Regional Ecosystems that the southern subspecies of Black-throated Finch (*Poephila cincta cincta*) has been recorded from in Northern Queensland since 1994 (BTF Recovery Team *et al.*, 2007[16]). However, the mapping shows that only a small proportion of the site is comprised of these REs and the site is considered to be the most desirable location for the marshaling yards of its proximity to labour and service resources as well as the suitability for general layout and operation. As such, Waratah Coal have chosen to locate the marshaling yards in this location, and will pay particular attention to groundtruthing this section of the rail when they do their ecological assessment of the rail in 2013. Should the location reveal suitable Black-throated Finch habitat, or other significant environmental constraints, Waratah Coal will relocate the marshaling yards to the proposed alternative location, or other more environmentally suitable location further down the track.

The proposed alternative location for the marshaling yard is situated alongside the proposed rail corridor in Lot 4 on SB687 (see Figure 6). This area contains the following least concern remnant regional ecosystems:

- RE 11.12.1 – *Eucalyptus crebra* woodland on igneous rocks – co-dominant regional ecosystem on the site comprising 40% of the site vegetation;
- RE 11.3.10 – *Eucalyptus brownii* woodland on alluvial plains – co-dominant regional ecosystem on the site comprising 40% of the site vegetation;
- RE 11.3.30 – *Eucalyptus crebra, Corymbia dallachiana* woodland on alluvial plains sub-dominant regional ecosystem on the site comprising 15% of the site vegetation;
- RE 11.3.32 – *Allocasuarina luehmannii* open woodland on alluvial plains – sub-dominant regional ecosystem on the site comprising 5% of the site vegetation.

As for the preferred site, Waratah Coal note that RE 11.3.30 *Eucalyptus crebra, Corymbia dallachiana* woodland on alluvial plains, is one of the 17 Regional Ecosystems that the southern subspecies of Black-throated Finch (*Poephila cincta cincta*) has been recorded from in Northern Queensland since 1994 (BTF Recovery Team *et al.*, 2007[17]). However, as the mapping shows that only 15% of the site is comprised of this RE, Waratah Coal have chosen to locate an alternative to the preferred location for the marshaling yards at this site, and will pay particular attention to groundtruthing this section of the rail when they do their ecological assessment of the rail in 2013. Should both the preferred location and this alternate location reveal suitable Black-throated Finch habitat, or other significant environmental constraints, Waratah Coal will relocate the marshaling yards to a more environmentally suitable location further down the track.

Additional work to advance the assessment of BTF and field studies to generate a reliable habitat map for BTF:

Since lodgement of the EIS considerable work (equating to 65 survey person days) has been undertaken on BTF and BTF habitat values at the mine site. This work contains habitat mapping. The work is presented in the *Fauna Assessment* report contained in *Appendices – Volume 2* of this SEIS.

Exclusion of the consideration of the (then recently sighted) records of BTF inappropriate:

SEWPaC advised Waratah Coal on 10 September 2011 (via phone) that they had received confirmation from Birds Australia accepting the Black-throated Finch records and on that basis they considered it a confirmed record. As the

16 Black-throated Finch Recovery Team, Department of Environment and Climate Change (NSW) and Queensland Parks and Wildlife Service. 2007. *National recovery plan for the black-throated finch southern subspecies Poephila cincta cincta.* Report to the Department of the Environment and Water Resources, Canberra. Department of Environment and Climate Change (NSW), Hurstville and Queensland Parks and Wildlife Service, Brisbane.

17 Black-throated Finch Recovery Team, Department of Environment and Climate Change (NSW) and Queensland Parks and Wildlife Service. 2007. *National recovery plan for the black-throated finch (Poephila cincta cincta).* Report to the Department of the Environment and Water Resources, Canberra.

EIS was submitted to DSEWPAC and the Queensland Coordinator-Generals Office on 9 September, the draft EIS was already printed, bound and issued at this time, hence it was not possible to amend the document to reflect the confirmation of the sighting. The sighting is well documented in the draft EIS as a putative record (which it still was at the time of writing).

Submitter No.	**1840**	Issue Reference:	14002
Submitter Type	Council	TOR Category	**Nature Conservation**
Name	**Barcaldine Regional Council**	Relevant EIS Section	1.3 – 1.3.1

DETAILS OF THE ISSUE

Ecological values presented are indicative and not definitive. Committed to undertaking detailed surveys of all remnant vegetation... prior to finalisation of alignment.

PROPONENT RESPONSE

Mine site – Flora and vegetation

Waratah Coal has undertaken four surveys of properties over which the mine sites is located.

1. Worley Parsons (2009)[18]
2. Unidel (2010)[19]
3. Rob Friend & Associates Pty Ltd (RF&A) (2012)[20], and
4. O2 Ecology (2012)[21].

The Worley Parsons (2009) report mostly focused on Glen Innes Station, otherwise known as the Bimblebox Nature Refuge (BNR). The Unidel (2010) dealt with the whole of the Mining Lease Application site area, and the two Mine Site Supplementary EIS *Flora and Vegetation* reports (RF&A 2012 and O2 Ecology 2012) also collectively covered the whole of the Mining Lease Application area.

All four flora and vegetation surveys used the methodology devised by the Queensland Herbarium (Neldner *et al.*, 2012)[22] (v3.2) as the basis for the vegetation surveys. The Worley Parsons and Unidel work used tertiary level surveys, whilst the RF&A work primarily used secondary level surveys complimented with quaternary level surveys. The O2 Ecology work primarily used secondary sites with four tertiary sites. During the RF&A surveys, random meander surveys were also undertaken in known habitat of the only threatened flora species recorded within the mine site area, *Desmodium macrocarpum*, to seek to improve the knowledge of the occurrences of this species within the study area.

In addition to these surveys undertaken by Waratah Coal, other surveys for a range of purposes have also been undertaken by the State Government as well CSIRO. See the RF&A and O2 Ecology *Flora and Vegetation Assessments* contained in the *Appendices – Volume 2* of this SEIS.

18 Worley Parsons (2009). *Flora and Fauna Survey Report – EPC 1040 Glen Innes, Central Queensland.* A report prepared by WorleyParsons for Waratah Coal.

19 Unidel (2010). *Waratah Coal China First Project Mine site terrestrial flora and fauna assessment.* A report prepared by the Unidel Group for Waratah Coal Pty Ltd.

20 Rob Friend and Associates Pty Ltd. (2012). *Flora and Vegetation Report – Galilee Coal Project (Northern Export Facility).* A report prepared by Rob Friend and Associates for Waratah Coal.

21 O2 Ecology. 2012. *Spring Creek (Galilee Coal Project) Supplemental Flora and Vegetation Assessment.* A report prepared for Waratah Coal.

22 Neldner, V.J., Wilson, B. A., Thompson, E.J. and Dillewaard, H.A. (2012) *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland.* Version 3.2. Updated August 2012. Queensland Herbarium – Queensland Department of Science, Information Technology, Innovation and the Arts, Brisbane.

Therefore based on the work undertaken to date Waratah Coal believes it has a high level of scientific information about the flora and vegetation communities, as well as interpretive data on declared and environmental weeds species throughout the mine site area.

It is important to note that the secondary level survey data has also assisted the Fauna Ecologists, Austecology, to improve their modeling of suitable habitat for Black-throated Finch and Squatter Pigeon (see SEIS *Fauna Assessment Report* contained in *Appendices – Volume 2* of this SEIS).

Waratah Coal acknowledges that a number of additional secondary sites were not able to be investigated prior to the submission of the SEIS due to the wet weather in the Desert Uplands during May and June of 2012. Waratah Coal intends to complete this survey work and provide additional information to the regulatory authorities as soon as practicable following the submission of this SEIS.

Rail Corridor – Flora and Vegetation

Waratah Coal has undertaken a single broad community level assessment of vegetation types along the rail corridor (Unidel, 2010)[23] and intends to undertake further work to add to this initial vegetation survey work.

Further to this work a review of the aerial photography of areas mapped as regional ecosystems has enabled Waratah Coal to identify potential survey sites along the corridor where the certified mapping may be incorrect or a polygon has not been assessed previously.

This initial work provides a good base line of data with respect to the vegetation assemblages and regional ecosystems along the rail corridor, however Waratah Coal acknowledge that further vegetation assessment work is necessary and will undertake this work during or immediately after the 2012/2013 wet season to ensure suitable conditions (i.e. when most plant species are flowering or producing seed), and hence adequate survey data can be collected from all vegetation communities along the rail corridor.

Waratah Coal proposes to use a mix of secondary, tertiary and quaternary level surveys. Secondary level surveys will be undertaken in areas where additional floristic and vegetation community type data is required, and where data will be need to assist other disciplines such as fauna and ground water dependent ecosystems.

Submitter No.	**419**	Issue Reference:	**14003**
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)**
Name	**DERM**	Relevant EIS Section	Volume 3, Appendix 11, Terrestrial Ecology, Rail, Section 4.2.4

DETAILS OF THE ISSUE

The EIS states that the flora field assessment was carried out over 10 days, however the vegetation survey sheets indicate that the survey was conducted from 21st of July to the 26th of July over a period of six days which equates to about 10 sites per day. This is not considered an adequate time to record the presence or absence of significant flora species, given that that the survey was carried out in the dry season.

23 Unidel (2010).*Waratah Coal China First Rail Corridor Terrestrial Flora and Fauna Report*. A report prepared by the Unidel Group for Waratah Coal Pty Ltd.

PROPONENT RESPONSE

Whilst the initial vegetation survey work undertaken along the rail corridor provides a good base of vegetation and flora data, Waratah Coal acknowledges that they must undertake additional work to ensure it can identify impacts to significant conservation significant flora species and ecological communities.

The survey methodology for the supplementary studies was devised in accordance with standard methodologies (Neldner *et al*., 2005)[24] and discussed with DERM ecologists (on April 12, 2012) who agreed that this methodology was appropriate and suitable. For a variety of reasons, implementation of the full survey program along the rail was not possible in April 2012. Hence work was deferred until the 2012/2013 wet season. The additional survey work was being undertaken at the time of writing of this SEIS. This work is due to be reported upon and delivered to the Coordinator-General in April 2013.

Submitter No.	**419**	Issue Reference:	**14004**
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)**
Name	**DERM**	Relevant EIS Section	Volume 3, Section 6.3.1.4, Regional Ecosystems (Page-245)

DETAILS OF THE ISSUE

Clearing of native vegetation for the proposal.

Prior to any clearing of native vegetation application being sent to DERM Vegetation Management, the applicant applies for a Property Map of Assessable Vegetation (PMAV) to change the Regional Ecosystem Mapping if any inaccurate mapping data was identified.

- A Property Vegetation Management Plan (PVMP), consistent with the *Vegetation Management Regulation 2000,* must be provided to and approved by the Chief Executive administering the *Vegetation Management Act 1999* as a requirement of the Operational Works Development application. The PVMP must include:
  a. the purpose for clearing
  b. details on how the clearing of vegetation has been avoided or minimised
  c. the location and confirmation of the full extent of the areas proposed to be cleared
  d. details of how the proposed clearing meets the performance requirements of the relevant Regional Vegetation Management Code, and
  e. a vegetation offset proposal consistent with the relevant Policy for Vegetation Management Offsets and must include:
     - the number of hectares needing to be offset for each performance requirement criteria under the relevant code
     - The availability of offset areas within the landscape which meet the Vegetation Management Offsets Policy for each performance requirement, and
     - Within eighteen months (18 months) of the date upon which the Development Approval is issued by the State of Queensland, the Applicant must legally secure the offset properties that meet the requirements set out in the relevant Policy for Vegetation Management Offsets.

24 Neldner, V.J., Wilson, B. A., Thompson, E.J. and Dillewaard, H.A. (2005) *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland.* Version 3.1. Updated September 2005. Queensland Herbarium, Environmental Protection Agency, Brisbane. 128 pp.

PROPONENT RESPONSE

Mine site

The clearing of vegetation within the mine lease area is exempt under the *Vegetation Management Act 1999* (VMA) and the *Sustainable Planning Act 2009*. Therefore there is no requirement for Waratah Coal to prepare a Property Map of Assessable Vegetation (PMAV) for the mine site. Nor does Waratah Coal need to respond to the Vegetation Offsets Policy.

However, the clearing of vegetation and particularly the removal of protected flora species such as the Near Threatened *Desmodium macrocarpum*, does require a response to the State's Environmental Offset Strategy and more particularly the Queensland Government Biodiversity Offset Policy (BOP).

Despite the exemption for the removal of vegetation from the mine lease area, Waratah Coal has developed a *Biodiversity Offset Proposal* which seeks to cover both the mine site and rail corridor, and makes additional voluntary provision for the Bimblebox Nature Refuge. Information on the offsets proposal is contained in the *Biodiversity Offset Proposal* in *Appendices – Volume 2* of this SEIS.

Further information will be produced at the appropriate time as part of any permit to clear application Waratah Coal is required to submit to the State before it undertakes any removal of identified conservation significant flora species.

Rail Corridor

Unlike the mine site the rail corridor will be subject to the provisions of the VMA and as such Waratah Coal will submit an Operational Works application to DEHP for the removal of assessable vegetation and high value regrowth. This will involve preparation of a PMAV or a series of (property based) PMAV's as part of the Operational Works application.

Waratah Coal proposes to use the data collected already (Unidel, 2010)[25] and additional work it proposes to collect during or post the 2012/2013 wet season using predominantly secondary level surveys (as defined by Neldner *et al.*, 2012)[26]. Data will also be collected using Forms A – G where appropriate.

Waratah Coal will ensure any PMAV or PVMP it provides to the State as part of the Operational Works application will contain all the relevant information to enable the State to properly assess the application.

Submitter No.	**419**	Issue Reference:	**14005**
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)**
Name	**DERM**	Relevant EIS Section	Appendix 10, Terrestrial fauna surveys, Section 6.3.2.4

DETAILS OF THE ISSUE

The EIS does not address the difference in quality of the developed parts of the study area. There are major parts of the study area which have been blade-ploughed and are therefore a mono-culture of buffel pasture with no tree regrowth. There are other areas with substantial natural regeneration of tree growth. These two types of developed areas offer completely different opportunities in terms of regeneration to remnant vegetation.

The EIS should address this shortfall and qualify the developed areas in terms of their ecological potential to regenerate.

25 Unidel (2010). *Waratah Coal China First Rail Corridor Terrestrial Flora and Fauna Report*. A report prepared by the Unidel Group for Waratah Coal Pty Ltd.

26 Neldner, V.J., Wilson, B. A., Thompson, E.J. and Dillewaard, H.A. (2012) *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland*. Version 3.2. Updated August 2012. Queensland Herbarium – Queensland Department of Science, Information Technology, Innovation and the Arts, Brisbane.

PROPONENT RESPONSE

Waratah Coal has mapped the existing vegetation communities/regional ecosystems as well as the extent of disturbance or impacts from the open-cut mine area, the underground mine area and the development of auxiliary and support infrastructure for the mines operations.

This mapping is reported upon in the two *Mine Site Flora and Vegetation* reports (contained in *Appendices – Volume 2* of this SEIS). The mapping clearly depicts areas of cleared mono-culture pasture and those areas where natural regeneration has occurred. This information will be considered in the future development of rehabilitation management strategies, which will be devised to make the best use of the pre-existing condition. See also the *Rehabilitation and Decommissioning* section of the *Draft Mine EM Plan* contained in *Appendices – Volume 2* of this SEIS.

Submitter No.	**419**	Issue Reference:	**14007 / 3005**
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)**
Name	**DERM**	Relevant EIS Section	Volume 2 Terrestrial Ecology, Section 6.3.2.3, Cavendish Area (p179)

DETAILS OF THE ISSUE

The main property in this area is Lambton Meadows, which contains significant biodiversity values, and not the Cavendish area.

The EIS must rectify this error. The EIS should comprehensively address the biodiversity values on Lambton Meadows.

PROPONENT RESPONSE

Since lodgment of the EIS the following supplementary work has been undertaken around Lambton Meadows.

Fauna

Meetings with DERM ecologists were undertaken in early 2012 to determine additional fauna surveys which would satisfy DERM requirements. As part of the agreed spatial coverage, two fauna survey sites were to be established within remnant woodland habitat on the western side of Lambton Meadows. These two locations formed part of a suite of six survey sites where standardised site-based survey protocols were implemented as part of the April 2012 SEIS survey program (see *SEIS Fauna Assessment* report contained in *Appendices – Volume 2* of this SEIS). The Lambton Meadows property was also surveyed regularly throughout the period May 2011 to March 2012 as part of the Black-throated Finch (southern) target survey program, and during the April 2012 target reptile survey program (see *SEIS Fauna Assessment* report contained in *Appendices – Volume 2* of this SEIS).

In addition, information previously not available during the compilation of the draft EIS, was collated and reviewed for the SEIS Fauna Assessment Report. That included data derived from systematic fauna surveys previously implemented by State Government agencies across the Lambton Meadows property in 1998, 1999, and 2006. That information has been incorporated within the *SEIS Fauna Assessment* report contained in *Appendices – Volume 2* of this SEIS.

Flora

Further assessment of vegetation communities and threatened flora species, as well as a set of biocondition assessments has also been undertaken by Waratah Coal within Lambton Meadows since lodgment of the EIS in September 2011. This information as well as a discussion of the values of Lambton Meadows and other properties

within the mine lease area is presented in the two *Mine Site Flora and Vegetation* reports (contained in *Appendices – Volume 2* of this SEIS).

Base line data is also available from the 2010 survey (Unidel, 2010)[27] and this information was contained in the Environmental Impact Statement.

Submitter No.	**419**	**Issue Reference:**	**14008**
Submitter Type	Government	**TOR Category**	**Nature Conservation** / Project Approvals
Name	**DERM**	**Relevant EIS Section**	Section 6.3.1.4 – Ecological Communities/ Regional Ecosystems (p174)

DETAILS OF THE ISSUE

Clearing native vegetation for a mining activity carried out on a mining lease is exempt under the *Vegetation Management Act 1999* and the *Sustainable Planning Act 2009*.

Clearing remnant vegetation outside of mining leases will be subject to the provisions of the *Vegetation Management Act 1999*. Any clearing of remnant vegetation outside of mining leases that is assessable development under *Sustainable Planning Act 2009* is subject to an assessment against the relevant regional vegetation management code, available from *http://www.derm.qld.gov.au/vegetation/regional_codes.html*

In order to meet certain requirements of the relevant Code under the *Vegetation Management Act 1999*, the proponent may be required to provide vegetation offsets in accordance with DERM's Policy for Vegetation Management Offsets, Version 2.4 (2009) available from: *http://www.derm.qld.gov.au/about/policy/documents/3450/veg_2006_2888.pdf*

The EIS should identify remnant vegetation outside of the mining lease that is assessable development under the *Vegetation Management Act 1999* and provide details of how any proposed clearing will meet the relevant regional vegetation management code.'

PROPONENT RESPONSE

As part of any operational works application that will result in the removal of assessable vegetation not exempt from the *Vegetation Management Act 1999*, Waratah Coal will prepare a PVMP or PVMP which will contain a response to the applicable Regional Vegetation Management Codes. The Regional Vegetation Management Code relevant for the mine site area and parts of the rail corridor is the *Western Bioregions Regional Vegetation Management Code*.

For the remaining parts of the rail corridor the *Brigalow Belt and New England Tablelands Bioregions Regional Vegetation Management Code* is the relevant code which Waratah Coal will need to respond to.

Offsets will be secured to counterbalance the permanent loss (take) of near threatened, rare, vulnerable and endangered plants outside of the mine lease area in accordance with the requirements of the *Queensland Biodiversity Offset Policy Version 1* (2011). See also the *Biodiversity Offset Proposal* contained in *Appendices – Volume 2* of this SEIS.

27 Unidel (2010). *Waratah Coal China First Project Mine site terrestrial flora and fauna assessment*. A report prepared by the Unidel Group for Waratah Coal Pty Ltd.

Submitter No.	**419**	Issue Reference:	**14009 / 5008 / 3006**
Submitter Type	Government	TOR Category	**Nature Conservation** / Project Approvals
Name	**DERM**	Relevant EIS Section	Section 6.3.1 – Flora (p172-177) and Section 6.3.2 – Fauna (p178-186)

DETAILS OF THE ISSUE

The EIS does not fully address nature conservation requirements. Requirements apply where the *Nature Conservation Act 1992* provisions are relevant. Survey work must be conducted properly using suitable methods. Methods should be sent to DERM for approval and appropriate permits must be obtained before field work commences. In particular Endangered, Vulnerable and Near Threatened species must be considered and offset arrangements be finalised before any development work commences. Species that are found to occur which are listed as Extinct in the wild, must not be tampered with.

The EIS should provide quantitative information on how the project will address the following requirements.

The proponent must comply with the provisions of the *Nature Conservation Act 1992* particularly in regard to the following:

1. Where there is a requirement for clearing of plants protected under the *Nature Conservation Act 1992*:
    a. clearing of protected plants must only occur in accordance with a clearing permit or an exemption under the *Nature Conservation Act 1992*
    b. offsets must be provided for the permanent loss (take) of near threatened, rare, vulnerable and endangered plants to achieve an equivalent or better overall outcome at a regional scale in accordance with the Queensland Government Environmental Offsets Policy 2008 and generally in accordance with the Queensland Government Policy for Biodiversity Offsets
2. Where the activities of the proponent may cause disturbance to animal breeding places the prior approval of DERM must be obtained., and
3. Where there is a need to take fauna, the prior approval of DERM must be obtained.

PROPONENT RESPONSE

Two *Mine Site Flora and Vegetation Reports* (contained in *Appendices – Volume 2* of this SEIS) present additional work within the mine lease area. This work has confirmed the existing knowledge with respect to the location of the near threatened plant species large-podded trefoil, *Desmodium macrocarpum* and has identified a number of additional sites where the large-podded trefoil occurs. Most of the sites occur within the Bimblebox Nature Refuge, with a single specimen located within Monklands station.

Waratah Coal will comply with all relevant provisions of the *Nature Conservation Act 1992*, and in particular, where there is a requirement for clearing of plants protected under the Act. Removal of any protected plants will only occur in accordance with a clearing permit or an exemption under the *Nature Conservation Act 1992*. Likewise and in regard to fauna, the Act identifies the requirements that Waratah Coal is responsible for in regard to any actions involving a need to take fauna and/or disturbance to breeding fauna. Waratah Coal will meet all such obligations are required.

Offsets will be secured to counterbalance the permanent loss (take) of near threatened, rare, vulnerable and endangered plants in accordance with the requirements of the Queensland Biodiversity Offset Policy Version 1.

Submitter No.	1841	Issue Reference:	21004
Submitter Type	Government	TOR Category	Nature Conservation (Terrestrial Ecology)
Name	Commonwealth DSEWPaC	Relevant EIS Section	Volume 1, Chapter 6 – Terrestrial Ecology

DETAILS OF THE ISSUE

As no changes appear to have been made to this chapter, the department's comments remain as they were in previous correspondence.

PROPONENT RESPONSE

This chapter was completely revised from the February 2011 version of the EIS, with some of the more prominent changes being reference to the Biodiversity Offsets Strategy and the commitment to provide compensation for the entire Bimblebox Nature Refuge, references to the additional work on Black-throated Finch that had occurred up to publication and the associated Appendix, and commitment to undertake an adaptive Subsidence Management Plan.

Moreover, since submission of the EIS in September, Waratah Coal have commissioned extensive ecological works at the mine, including further specific Black-throated Finch work as well as work on other conservation significant fauna, and further work on vegetation and flora mapping and assessment. The fauna work is presented in the *Fauna Assessment Report* contained within the *Appendices – Volume 2* of this SEIS, along with the two Flora and Vegetation Reports. Furthermore, a *Biodiversity Offset Proposal* has been prepared and is contained within the *Appendices – Volume 2* of this SEIS.

Submitter No.	1841	Issue Reference:	21006
Submitter Type	Government	TOR Category	Nature Conservation (Terrestrial Ecology)
Name	Commonwealth DSEWPaC	Relevant EIS Section	Volume 5B – Appendix 10

DETAILS OF THE ISSUE

Describes the environment and provides an indication that habitat quality is quite good in places due to the type of species recorded there.

The report indicates that someone talked to Rod Fensham and Eric Vanderduys, but it does not really relay the content of those conversations.

PROPONENT RESPONSE

This is not considered material to the progression of the EIS.

Submitter No.	1841	Issue Reference:	21007
Submitter Type	Government	TOR Category	Nature Conservation (Terrestrial Ecology) / Water Resources (Surface Water)
Name	Commonwealth DSEWPaC	Relevant EIS Section	Volume 5B – Appendix 10

DETAILS OF THE ISSUE

Need more information about the final creek diversions and what they will impact on.

PROPONENT RESPONSE

The proposed creek diversions will be limited to within the mine lease area. Construction of the diversions will require no additional clearing of vegetaion to that already proposed to facilitate the mine infrastructure (see Figure 7).

None of the vegetation to be cleared in the mine clearing footprint is analogous with any TEC, and there have been no records of any flora species listed under the EPBC Act within mine clearing footprint (see the two *Flora and Vegetation Reports* contained in *Appendices – Volume 2* of this SEIS). Potential or actual fauna species listed under the EPBC Act at the mine site are Northern Quoll, Koala, Brigalow Scaly-foot, Yakka Skink, Squatter Pigeon and Black-throated Finch. The *Fauna Assessment Report* (contained in *Appendices – Volume 2* of this SEIS) describes the potential likelihood of presence and use of the site by these species, as well as the potential impacts and mitigation measures. The *Biodiversity Offset Proposal* (contained in *Appendices – Volume 2*) of this SEIS outlines the offset proposal for those impacts that cannot be minimised or mitigated.

Concept design of the proposed diversions has been commissioned by Waratah Coal, with design undertaken in accordance with DERM and relevant industry guidelines for watercourse diversions. See the *Mine Site Creek Diversion and Flooding Report* in *Appendices – Volume 2* of this SEIS. Water within the proposed diversions will be returned to the natural waterways prior to leaving the mine lease boundary.

Submitter No.	**1841**	Issue Reference:	21008
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)**
Name	**Commonwealth DSEWPaC**	Relevant EIS Section	Volume 5B – Appendix 10, Section 5.2.1

DETAILS OF THE ISSUE

Sites identified as within Bimblebox do not correlate with map.

PROPONENT RESPONSE

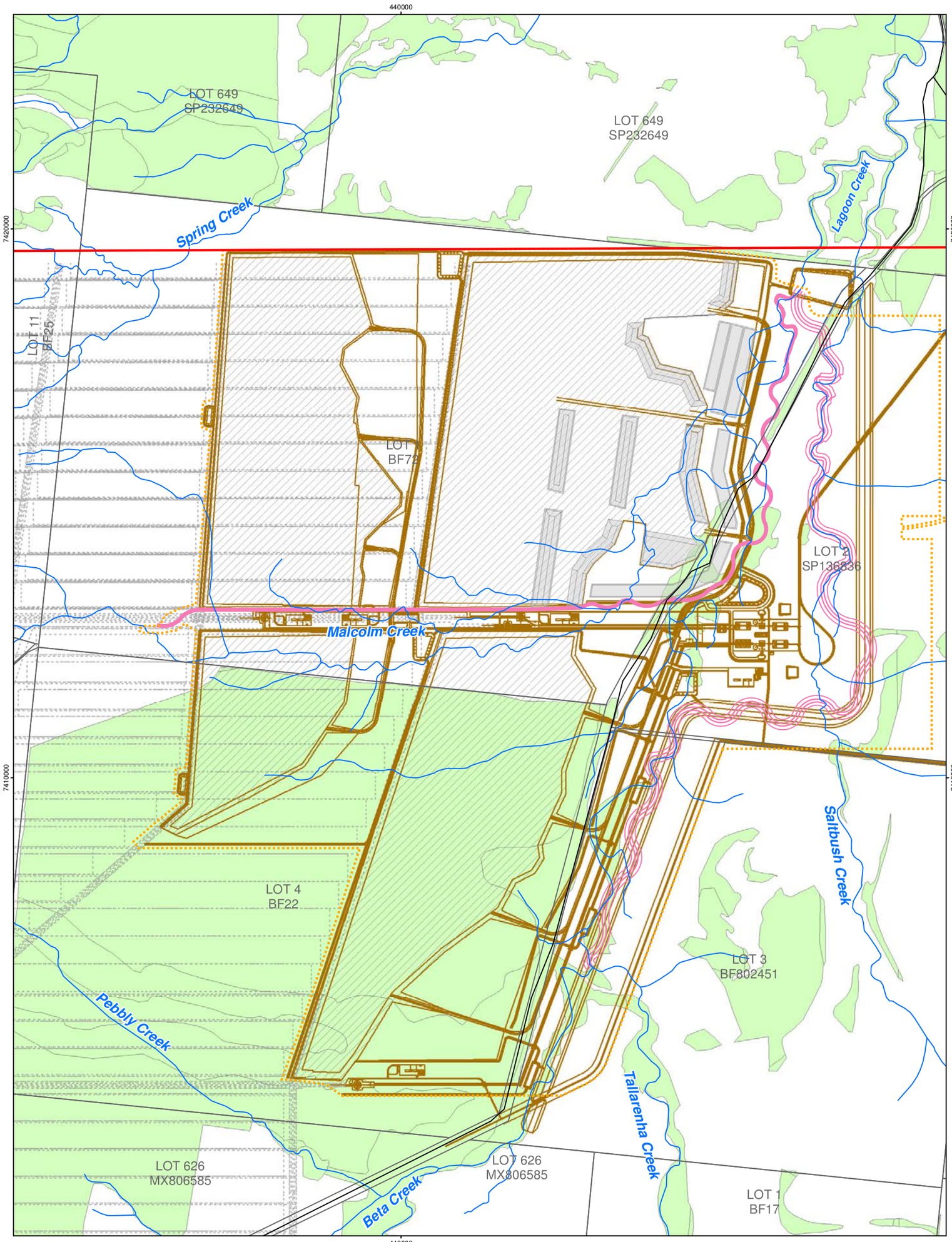
Waratah Coal assumes this refers to a typographical error in paragraph two in which RE 10.3.27 (depicted correctly on the associated map) is incorrectly referred to as 10.3.25 as the subdominant component of RE10.4.3/RE10.3.27. Waratah Coal acknowledges the error. The assessment and mapping of terrestrial flora and vegetation values at the mine site has been completely redone and is presented in the two *Flora and Vegetation Reports* contained in *Appendices – Volume 2* of this SEIS.

Submitter No.	**1841**	Issue Reference:	21009
Submitter Type	Government	TOR Category	**Nature Conservation (Offsets)**
Name	**Commonwealth DSEWPaC**	Relevant EIS Section	Volume 5B – Appendix 10,

DETAILS OF THE ISSUE

The proposed offset and rehabilitation areas are located over the longwall mine area. This means that if in the future subsidence proves to be a problem, then these areas will also be impacted upon. There is no discussion that clearly identifies what the management approach will be for these areas and how they will be managed if subsidence occurs. The department considers that these offset and rehabilitation areas need to have a contingency plan in place should there be impacts in the future. Where an offset area is compromised by future impacts associated with (or as a result of) mining operations another offset will need to be found, and that it will be larger again to accommodate the additional loss of the original offset. If the department approves the project it will be conditioned accordingly.

Figure 7: Proposed Creek Diversions



GALILEE COAL PROJECT
(Northern Export Facility)

Waratah Coal
THE NEW ENERGY IN COAL

Mineralogy House, Level 7, 380 Queen Street, Brisbane Qld 4000, Australia

Source:	Cadastral Boundaries: DERM 2012 Roads: Geoscience Australia 2010 Mine Detail: Waratah Coal Pty. Ltd. 2012 Creek Diversions: Engeny Water Management 2012 Remnant Vegetation: DERM Regional Ecosystems v6.1 2012 Watercourses: Vegetation Management Act Queensland Regrowth Other Watercourses Version 2.1 2012
Disclaimer:	This plan is based on or contains data provided by others. Waratah Coal Pty. Ltd. gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or suiability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to and use of the data. Data must not be used for disect marketing or be used in breach of privacy laws.
File:	File:WAR20-26-SEIS008b-FIG-3-CREEK-DIVERSION-IMPACTS-121114

0 1 2 3
Kilometers

A3 Scale 1:60,000

Coordinate System: GDA 1994 MGA Zone 55 Projection: Transverse Mercator

- EPC1040 & Part of EPC1079
- Cadastral Boundary
- Watercourse
- Mine Infrastructure
- Open Cut Mining Area
- Underground Mining Area
- Dry Paste Tailings Storage
- Creek Diversion
- Probable Clearing Footprint

Regional Ecosystem
- Least Concern
- Non-remnant

CREEK DIVERSION IMPACTS ON REMNANT REGIONAL ECOSYSTEMS

PROPONENT RESPONSE

As described on page one of all the EIS Appendix Volumes, the majority of the technical reports contained in the Appendices were prepared in 2010, and as such some of the information in them has been superseded. A number of new Appendices, that supercede elements of the older Appendices, are listed at the bottom of page one of each of the EIS Appendix Volumes. The *Biodiversity Offsets Strategy* was one of these new Appendices. As is detailed in the *Biodiversity Offset Strategy* (produced in June 2011), Waratah Coal does not propose to locate offsets within the mining lease. It should also be noted that since June 2011, work has continued on the biodiversity offset proposal and work has advanced further such that a *Biodiversity Offset Proposal* has been prepared and is contained within the *Appendices – Volume 2* of this SEIS.

Submitter No.	**1841**	Issue Reference:	21010
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)**
Name	**Commonwealth DSEWPaC**	Relevant EIS Section	Volume 5B – Appendix 10,

DETAILS OF THE ISSUE

In addition to managing the offset, there are also the future impacts of the creek diversions and the loss of water into the current vegetated areas. More information is required to describe the planned diversions, the current environment, how these diversions will affect the area, and what the diversions will look like (i.e. 50m wide concrete channels?).

PROPONENT RESPONSE

There are three creeks proposed to be diverted within the mine lease area: Malcolm, Lagoon and Saltbush Creeks. These diversions will involve re-alignment of the waterways around key mine facilities. A geomorphic assessment and concept design of the proposed diversions is presented in the *Mine Site Creek Diversion and Flooding Report* contained within the *Appendices – Volume 2* of this SEIS.

The diversions have been designed to maintain the existing geomorphic features of the existing creeks including stream length, grade, meander radius, incisement ratio and flow capacity as well as natural features such as in-stream benching. The diversions will be revegetated with native vegetation and a purpose specific management plan will be developed to assist in establishment of this vegetation and long term maintenance. This management plan is being developed in accordance with the Australian Coal Association Research Program (ACARP) guidelines. There will be no cross-catchment transfers of water. All diversions will discharge water back into their natural flow paths prior to leaving the site boundary. Hence there will be no loss of water into current vegetated areas.

Submitter No.	**1841**	Issue Reference:	21011
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)**
Name	**Commonwealth DSEWPaC**	Relevant EIS Section	Volume 5B – Appendix 10, Section 6.5 – Potential Impacts on Environmentally Sensitive Areas and Section 7 Potential Impacts During Operation

DETAILS OF THE ISSUE

The department considers that impacts are likely to be greater than what is stated in section 6.5, especially when the impacts of dust and noise are combined with the direct loss of vegetation. The description of the impacts are very general and the risk categories are vague.

PROPONENT RESPONSE

Impact assessment has been refined to consider both direct and indirect impacts. Details regarding impacts on conservation significant fauna are provided in Section 7 of the *Fauna Assessment Report* contained in *Appendices – Volume 2* of this SEIS. The two Mine Site *Flora and Vegetation Reports* also contained in *Appendices – Volume 2* of this SEIS provide details on the vegetation.

The *Draft EM Plan* (contained in *Appendices – Volume 2* of this SEIS) provides a consolidated description of the impacts.

Submitter No.	**1841**	Issue Reference:	21013
Submitter Type	Government	TOR Category	**Nature Conservation (Offsets)**
Name	**Commonwealth DSEWPaC**	Relevant EIS Section	Volume 5B – Appendix 10, Section 8.3 – Environmetal Offsets

DETAILS OF THE ISSUE

Talks about creation of linkages, but no description of how or what they would look like.

PROPONENT RESPONSE

As described in response to Issue Reference 21009, the information relating to the offsets strategy in Appendix 10 of the EIS has been superseded by the *Biodiversity Offsets Strategy* contained in Appendix 27 of the EIS, and also by the work further to that, which is presented in the *Biodiversity Offset Proposal*, contained within the *Appendices – Volume 2* of this SEIS.

As is detailed in the *Biodiversity Offset Proposal*, Waratah Coal does not propose to locate offsets within the mining lease. Linkages between areas of high ecological value has been a consideration in the selection of location/s for the proposed offsets, as Waratah Coal will provide offsets for connectivity. Consideration may still be given to creation of linkages within and adjacent to the mining lease.

Submitter No.	**1841**	Issue Reference:	21014
Submitter Type	Government	TOR Category	**Nature Conservation** / EMP
Name	**Commonwealth DSEWPaC**	Relevant EIS Section	Volume 5B – Appendix 10, Section 8.3 – Environmetal Offsets

DETAILS OF THE ISSUE

Section 9.2 – Some of the proposed management actions do not appear to be environmental strategies, but rather normal mining operation managements. The purpose of some of the strategies requires clarification.

PROPONENT RESPONSE

Waratah Coal commissioned a new *Draft EM Plan* for the mine which covers construction and operational phases of the project (see *Appendices – Volume 2* of this SEIS). It is acknowledged that the EMP included in the draft EIS provided much information on impacts and control measures for the construction phase and said little about the operational and decommissioning/rehabilitation phases. This has now been addressed (in fact most of this information was contained in the EIS chapters and simply had not been repeated in the EMP). Environmental values and impacts have been transferred from the draft EIS to the EMPs for all project phases.

Environmental Management and protection objectives are detailed in a number of reports throughout the *Appendices – Volume 2* of this SEIS. These have been taken into account in the preparation of the *Draft Mine EM Plan* and *Draft Rail EMP* (also contained in *Appendices – Volume 2* of this SEIS).

The *Draft Mine EM Plan* and the *Draft Rail EMP* have been updated. Both are contained in *Appendices – Volume 2* of this SEIS

Submitter No.	**1841**	Issue Reference:	21015
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)**
Name	**Commonwealth DSEWPaC**	Relevant EIS Section	Volume 5B – Appendix 10, Table 1 and Figure 18; Section 3.1.2.3 MNES Report

DETAILS OF THE ISSUE

Table 1 does not include the ornamental snake and yet mapping shows its habitat is present within the mine site.

PROPONENT RESPONSE

An assessment of the potential habitat for Ornamental Snake at the mine site is included in Section 6.3. of the *Fauna Assessment Report* in the *Appendices – Volume 2* of this SEIS. The species was not detected within the mining lease during targeted surveys for threatened reptiles. The report states:

> "In regard the Ornamental Snake, there are very small (and isolated) areas of heavier cracking clay soils which support Brigalow, though with poor gilgai development. These and adjacent habitats have been searched under suitable conditions when this species was thought to be active[28]. It is considered unlikely that Ornamental Snakes could be sustained on the study site given the very small and isolated inholdings of "potentially suitable habitat" for this reptile."

Submitter No.	**1841**	Issue Reference:	21016
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)**
Name	**Commonwealth DSEWPaC**	Relevant EIS Section	Volume 5B – Appendix 10, Table 2

DETAILS OF THE ISSUE

Table 2 identifies that pre-clearance surveys will be undertaken to determine that birds are nesting on site. This measure is pointless for a species that is considered to be largely sedentary. Once they have been moved away there may not be any suitable habitat to move to.

PROPONENT RESPONSE

The primary purpose of pre-clearing surveys is to address animal welfare issues, that is, to avoid disturbance to breeding fauna and minimisation of fauna mortality by removing animals prior to clearing and subsequent translocation to suitable habitats outside clearing footprints. These are well-recognised best practice activities and routinely implemented and conditioned.

28 The author of the SEIS *Fauna Assessment Report* detected active Ornamental Snake at a site to the north-east of the mining lease within days of the April targeted threatened reptile surveys on the study site.

Submitter No.	1841	Issue Reference:	21017
Submitter Type	Government	TOR Category	Nature Conservation (Terrestrial Ecology)
Name	Commonwealth DSEWPaC	Relevant EIS Section	Volume 5B – Appendix 10A

DETAILS OF THE ISSUE

Again information is not clear on certain points. The report indicates that surveys were undertaken for permanent water resources, described as persisting for four months of the year or longer during the late wet season. It is not clear if this assessment included troughs. The report only mapped areas of nesting habitat, which is one part of the life cycle and a very restricted one, as this species relies on water being within 400m of good foraging and nesting. The mapping shows suitable nesting habitat within 400-1000m of permanent water. There is no real justification for taking such a narrow view. The mapping and subsequent discussions need to discuss the suitability of the remaining vegetation on the site for this species. So while, the resulting maps indicate approximately one quarter of the site contains suitable nesting habitat, the department considers that the remaining vegetation is likely to be suitable habitat for the remainder of the year. This is based on the vegetation description provided in other areas of the EIS documents and the NRS description of the property.

PROPONENT RESPONSE

Section 2.2.1 of Appendix 10A of EIS identifies that a wide variety of wetlands were surveyed, which included seasonal and more permanent water bodies (see also EIS – Appendix A of Appendix 10A). Predictive modelling was undertaken to assess high and low probability nesting habitat. A key model parameter was related to the presence of water resources that were estimated to persist for at least four months of the year or longer. Such predictive modelling and the inclusion of that key water resource parameter have been used widely (e.g. NRA 2006[29]).

In regard to assessments of potential breeding habitat and proximity to water, section 3.3.4 of the report notes the following (which is drawn from DSEWPaCs Black-throated Finch (BTF) background paper[30]) – nest sites within 400m of a water source are considered typical for the subspecies, with nest sites rarely more than one kilometre from permanent water during the breeding season (NRA 2006 cited in DEWHA 2009).

Waratah Coal acknowledge that the report's discussion on BTF habitat values was limited, though the report very clearly states that it provides preliminary advice on the initial stages of an on-going site survey and habitat assessment program, and that on completion of the field survey program, the final report will provide a detailed interpretation of the findings of the field surveys and desktop information review. These findings are presented in Section 5 of the *Fauna Assessment Report* in the *Appendices – Volume 2* of this SEIS. The mapping and discussions in that report address the suitability of the remaining vegetation on the site for this species.

29 NRA (2006). *Distribution of Black-throated Finch Habitat in the Townsville Thuringowa Local Government Areas – A Predictive Model.* Draft report to Enertrade, the Department of Environment and Heritage and the Black-throated Finch Recovery Team.

30 DEWHA (2009). *Background Paper – Significant impact guidelines for the endangered black-throated finch (southern)* (*Poephila cincta cincta*). Background Paper to the EPBC Policy Statement 3.13 Nationally Threatened Species and Ecological Communities guidelines. Department of the Environment, Water, Heritage and the Arts, Canberra.

The following table outlines the additional survey work that has been undertaken since the preparation of the Appendix 10A report.

EVENT	DATES	SEASON	SURVEY EFFORT (PERSON DAYS)	TARGET SURVEY APPROACHES			
				Nest Searches	Foot Transects	Driving Transects	Water Source Monitoring
1	11-15 May 2011	Late Wet	10	Primary	Primary	Secondary	Minimal
2	30-31 May 2011	Late Wet	4	Primary	Primary	Secondary	Minimal
3	20-22 July 2011	Early Dry	6	Secondary	Primary	Secondary	Minimal
4	17-19 August 2011	Dry	6	Minimal	Primary	Secondary	Secondary
5	13-16 September 2011	Dry	6	Minimal	Primary	Primary	Secondary
6	14-20 October 2011	Late Dry	19	Minimal	Minimal	Secondary	Primary
7	13-19 March 2012	Wet	14	Primary	Primary	Secondary	Secondary
Total Survey Person Days			65				
Minimum Target Survey Person Hours			586				

Submitter No.	**1841**	Issue Reference:	21018
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)**
Name	**Commonwealth DSEWPaC**	Relevant EIS Section	Volume 5B – Appendix 10A – Section 3.3.7

DETAILS OF THE ISSUE

Birds have been encountered near breeding sites outside breeding season suggesting a fairly high site fidelity. Again demonstrates that pre-clearance surveys will not be meaningful to the species if there is no habitat remaining on the site.

PROPONENT RESPONSE

The primary purpose of pre-clearing surveys is to address animal welfare issues, that is, to avoid disturbance to breeding fauna and minimisation of fauna mortality by removing animals prior to clearing and subsequent translocation to suitable habitats outside clearing footprints. These are well-recognised best practice activities and routinely implemented and conditioned.

Submitter No.	**1841**	Issue Reference:	21019
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)**
Name	**Commonwealth DSEWPaC**	Relevant EIS Section	Volume 5B – Appendix 10A – Section 4.1.1

DETAILS OF THE ISSUE

The consultant's report does not truly reflect the basis behind the additional surveys. The surveys were undertaken on the request of the department; the instigation was due to new sighting records for BTF being made on the Waratah and at the Carmichael sites at the same time indicating a possible advantageous time for surveying. This information does not appear to have been passed onto the consultants, as their report does not reflect this scenario.

PROPONENT RESPONSE

The Department's concerns and requirements for additional Black-throated Finch (BTF) assessments were communicated to Waratah Coal via a letter dated 11 April 2012[31] and this communication was made prior to the BTF sighting (19 May 2011) on Waratah Coal's site. Waratah Coal had already commissioned and implemented additional BTF surveys prior to the May 19 2011 record (see Appendix 10A report section 2.2.1; i.e. surveys undertaken 11 to 15 May and 30 to 31 May). Hence at the time of surveying, the sighting had not occurred yet (11-15 May) and had only just occurred (30-31 May) so the consultants had no knowledge of the new sightings at Bimblebox Nature Refuge (BNR) and the Carmichael site that the Department refers to. It is also worth noting that our consultants had planned to be surveying for BTF on the BNR on the 19 May, but were denied access at this time by the BNR landholders.

Submitter No.	**1841**	Issue Reference:	**21020**
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)**
Name	**Commonwealth DSEWPaC**	Relevant EIS Section	Volume 5C – Appendix 11 – Terrestrial Ecology – Rail

DETAILS OF THE ISSUE

As with the mine ecology report, there has been no changes to this document and the earlier concerns regarding the lack of pertinent information remain, such as needing a clearer understanding of the location and extent of clearing for the vulnerable listed *Eucalyptus raveretiana*.

PROPONENT RESPONSE

As described on page one of all the EIS Appendix Volumes, the majority of the technical reports contained in the Appendices were prepared in 2010. No changes were made to these older Appendices, and as such, several new Appendices were presented that superced elements of older Appendices. The 'newer' Appendices are listed at the bottom of page one of each of the EIS Appendix Volumes. However, at the time of writing the EIS (lodged in September 2011) no new work had been undertaken on ecological values along the rail alignment.

The mine ecology chapter of the draft EIS (Vol 3, Chapter 6) was revised, however, it is acknowledged that at the time of writing the September 2011 version EIS that minimal work had occurred to advance understanding of rail ecological issues from the earlier iteration of the draft EIS received by the department in February 2011. Nonetheless, the chapter was revised for editorial and a section inserted to provide more information on *E. raveretiana* which was discussed with DSEWPaC at the time (via phone).

With specific reference to *E. raveretiana*, the Terrestrial Ecological section of the EIS (Section 6.4.4) indicates further detailed and site specific work is required to locate populations of Black ironbox between KP0 – 100 which is between the coast at Bowen and the Bowen River South of Collinsville.

During the field investigations undertaken for the EIS (Unidel, 2010[32]) *E. raveretiana* was recorded in survey sites S03 in RE 11.3.25b, S05 in RE 11.3.25a, S11 in RE 11.3.25a, and S14 in RE 11.3.25. S03, S05 and S11 were all located on ephemeral minor waterways while S14 is located on a larger waterway, Pelican Creek, immediately south of Collinsville. This data indicates that further investigations of minor ephemeral waterways are needed to fully map the actual and potential impacts to this species throughout its range and along the final rail alignment corridor.

31 DSEWPC letter *Comments on the draft EIS Establishment of Galilee Coal Mine and Associated Infrastructure*, Galilee, Qld (dated 11 April 2011). EPBC Ref 2009/4737

32 Unidel (2010). *Waratah Coal China First Rail Corridor Terrestrial Flora and Fauna Report*. A report prepared by the Unidel Group for Waratah Coal Pty Ltd

The planned survey program will be undertaken during or immediately after the 2012/2013 wet season to ensure suitable conditions, and hence adequate survey data, can be collected from all vegetation communities along the rail corridor. The survey will include additional effort on rail crossings at minor waterways to an extent of about 100 metre on either side of the rail corridor. The additional survey effort will also include other minor waterways beyond the nominal range (outlining stands or even specimens not within the final rail corridor alignment) to gain a perspective the potential impacts of the rail line for the population at each particular affected location.

Flora and vegetation assessment methodologies for both rail and mine have been discussed and agreed upon with the relevant officers from (the former) Queensland DERM.

Submitter No.	**1841**	Issue Reference:	**21021**
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)**
Name	**Commonwealth DSEWPaC**	Relevant EIS Section	Volume 5C – Appendix 11 – Terrestrial Ecology – Rail

DETAILS OF THE ISSUE

The surveys are still considered poor and the assumptions made, such as: the projects ability to avoid Great Artesian Basin (GAB) dependent species; or the likelihood that the *E. raveretiana* is much more widespread than just the alignment, are not supported by any evidence. There has been insufficient survey effort for the Myall Woodlands and listed flora species. Surveys for these species and ecological communities will be required once the final alignment is identified, including a greater understanding of the level of impact to occur on the Eucalyptus species.

PROPONENT RESPONSE

The rail does not interact with the GAB or any GAB dependent species (this is also documented in Vol 3 Chapter 6 Section 6.3.1.4 of the EIS).

See response to Issue Reference 21009 regarding *E. raveretiana*.

With regard to Weeping Myall woodlands and other listed flora species along the rail corridor, a targetted survey program will be undertaken during or immediately after the 2012/2013 wet season to ensure suitable conditions, and hence adequate survey data, can be collected from all vegetation communities along the rail corridor. Primary resources for the location and identification of Weeping Myall woodlands will be aerial photograph interpretation using known areas of the two main regional ecosystems within which Weeping Myall occurs, being 11.3.2 – *Eucalyptus populnea* woodland of alluvial plains and 11.3.28 – *Casuarina cristata* ± *Eucalyptus coolabah* open woodland on alluvial plains.

For other significant species such as those listed in Table 4 of Appendix 11 of the EIS, additional effort will also be made to determine if any of these species do, or have to potential to, occur within the final proposal rail corridor.

Flora and vegetation assessment methodologies for both rail and mine have been discussed and agreed upon with the relevant officers from (the former) Queensland DERM.

Submitter No.	1841	Issue Reference:	21022
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)**
Name	**Commonwealth DSEWPaC**	Relevant EIS Section	Volume 5C – Appendix 11 – Terrestrial Ecology – Rail

DETAILS OF THE ISSUE

Suitable habitat for listed species will need to be further defined and mapped showing where and how the rail corridor will fragment these habitats and management measures identified. The department does not support the report's conclusions regarding potential impacts on listed MNES as there is insufficient information on which to base these conclusions.

PROPONENT RESPONSE

At the time of writing this SEIS, the additional survey work was being undertaken. This work is due to be reported upon and delivered to the Coordinator-General in April 2013.

Submitter No.	1841	Issue Reference:	21023
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)** / Coastal Environment
Name	**Commonwealth DSEWPaC**	Relevant EIS Section	Volume 5C – Appendix 12A – Black-throated Finch and Water Mouse

DETAILS OF THE ISSUE

This report was undertaken by Waratah at the request of the department. Advice from the department indicated that previous reports had found suitable habitat along certain areas but that surveys had not yet been adequate to sufficiently rule out concerns regarding it presence. This advice reflected other advice coming from Qld State government agencies suggesting the same issue. As a result, the department requested that further surveys be undertaken for the Black-throated Finch and Water Mouse. It is concerning that Unidel did not look for the species, especially as there is a potential for indirect impacts. The department does not support the conclusions that as no mangrove communities would be directly affected indirect impacts could be adequately managed.

PROPONENT RESPONSE

Waratah Coal acknowledged the Departments concerns regarding *Xeromys myoides* by commissioning AustEcology to produce the report contained in Appendix 12A of the EIS. The report concluded that there would be no direct impacts as the nearest mangrove community is at least two kilometres north of the study site, and that potential indirect impacts associated with degradation of water quality and sedimentation could be managed through appropriate practices within the EMPs. Hence comments regarding Unidel's (earlier) work are addressed by the work presented in Appendix 12A.

In addition, as described in the EIS, Waratah Coal has removed port elements from the Project and will utilise facilities within the Port of Abbot Point and the APSDA that will be the subject of assessment by others. Waratah Coal's assessment stops at the boundary of the APSDA. Hence, now that port elements have been removed from the project, there is no potential for the project to impact upon Water Mouse.

Submitter No.	1841	Issue Reference:	21026
Submitter Type	Government	TOR Category	Nature Conservation (Terrestrial Ecology)
Name	Commonwealth DSEWPaC	Relevant EIS Section	Appendix 26 – MNES report – Section 3.1.2.3 Fauna

DETAILS OF THE ISSUE

SEWPaC advised the proponents (via phone 10 September 2011) that the department had received confirmation from Birds Australia accepting the Black-throated Finch records and on that basis considered it a confirmed record as well. Not reflected in the document.

PROPONENT RESPONSE

As the EIS was submitted to DSEWPAC on 9 September, the EIS was already printed, bound and issued at this time, hence it was not possible to amend the document to reflect the confirmation of the sighting. The sighting is well documented in the draft EIS as a putative record (which it still was at the time of writing).

Submitter No.	1841	Issue Reference:	21027
Submitter Type	Government	TOR Category	Nature Conservation (Terrestrial Ecology)
Name	Commonwealth DSEWPaC	Relevant EIS Section	Appendix 26 – MNES report

DETAILS OF THE ISSUE

According to the report, Squatter Pigeon has been recorded in the vicinity of the mine site. Don't think this is described as a confirmed record elsewhere in other reports.

PROPONENT RESPONSE

This comment was made in reference to a record of Squatter Pigeon (southern) from Hancock Coal's mine leases (Alpha Coal EIS), which are located to the near north of Waratah Coal's mine leases.

Section 2.5 and 6.1.3 of the *Fauna Assessment Report* (contained in *Appendices – Volume 2* of this SEIS) provide detailed information on the records of Squatter Pigeon in and around the mine site. However, in summary, surveys of the mine site by DERM, EPA, CSIRO, Birds Australia, Unidel, AustEcology and WorleyParsons have not recorded Squatter Pigeons. There is however, one record of Squatter Pigeon noted in DERMs submission to the EIS[33]. The submission notes the following "The landholders have recorded an instance of squatter pigeon *Geophaps scripta* nesting on the property. Records at this latitude are referrable to the Vulnerable nominate subspecies *G. s. scripta*". Table 2 of the DERM report, titled "Fauna detected on Bimblebox Nature Refuge" attributes the record source as DERM Wildnet data. No other information is provided in the report.

33 DERM (2011a). *Nature Refuge Branch response re Bimblebox to China First EIS.* Report prepared as part of the DERM submission to the Galilee Coal Project EIS 14 December 2011. Department of Environment and Resource Management, Brisbane.

Submitter No.	1841	Issue Reference:	21028
Submitter Type	Government	TOR Category	Nature Conservation (Terrestrial Ecology)
Name	Commonwealth DSEWPaC	Relevant EIS Section	Appendix 26 – MNES report – Table 4 Flora

DETAILS OF THE ISSUE

Flora species potentially occur within the rail corridor, but due to lack of detailed survey it is largely unknown what they may be other than *Eucalyptus raveretiana,* which is a large tree easily identified. Either more surveys are required or a better analysis of the information provided, to better understand what the likelihood is of other listed flora species occurring on the site.

There are assumptions being made about the amount of *Eucalyptus raveretiana* likely to be found elsewhere which are being used to downplay the significance of the loss associated with the rail corridor. However, these assumptions are not support by any evidence or strong survey data.

PROPONENT RESPONSE

Table 4 of Appendix 11 of the EIS lists a number of flora species which have a potential distribution over the rail corridor. It is acknowledged by Waratah Coal that the survey effort to date has been limited due to a number of factors and hence there are assumptions with regard to presence and impacts to those species which reflect this level of field data.

Further survey work is planned to test those assumptions. Depending upon the results of the survey those assumptions regarding presence, possible impacts and magnitude may be retained or altered to reflect the existing and new data collected.

As such, the information presented in future documentation will be sufficient to support any existing or revised impact and mitigation measures.

Submitter No.	1841	Issue Reference:	21029
Submitter Type	Government	TOR Category	Nature Conservation (Terrestrial Ecology)
Name	Commonwealth DSEWPaC	Relevant EIS Section	Appendix 26 – MNES report

DETAILS OF THE ISSUE

Rail: In the Star Finch Overview map, the vegetation layer ends abruptly and doesn't make sense. It appears that the likely habitat hasn't been properly mapped.

PROPONENT RESPONSE

Waratah Coal acknowledge that is an error. A planned survey program for flora and fauna along the rail corridor will be undertaken during or immediately after the 2012/2013 wet season to ensure suitable conditions, and hence adequate survey data can be collected from all vegetation communities along the rail corridor. All mapping will be revised in the future reporting on this work.

Submitter No.	**1841**	Issue Reference:	21030
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)**
Name	**Commonwealth DSEWPaC**	Relevant EIS Section	Appendix 26 – MNES report – Table 17

DETAILS OF THE ISSUE

Black Throated Finch: Overview Map shows a band of habitat going north south. The EIS needs some discussion about the implications of the mining projects to the north of this corridor. It needs to identify how this mine will contribute to the cumulative impacts of all the mines in the area.

Table 17 states the species is highly mobile. This is misleading since most accounts of this species describe it as being sedentary with movements up to 3km when dispersing.

PROPONENT RESPONSE

Waratah Coal can find no reference in Table 17 that states that the BTF is "highly mobile". In fact, Table 17 does note the following: "Relatively sedentary species but thought able to move up to 3km …". This accurately reflects information on life history and ecology as presented in the Department's background paper on BTF (see DEWHA 2009[34]). However, the BTF report (Appendix 10) does note that observations show that BTF can be highly mobile, at least during non-breeding periods or in response to drought (see section 3.2.7 and references cited). This again, accurately reflects the information summarised in DEWHA (2009).

A *Fauna Assessment Report* and two *Flora and vegetation assessment* reports have recently been completed for the mine site (see *Appendices – Volume 2* of this SEIS). The *Draft EM Plan* (also contained in *Appendices – Volume 2* of this SEIS) provides a consolidated description of the impacts of the project on nature conservation values around the mine site.

Submitter No.	**1841**	Issue Reference:	21031
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)**
Name	**Commonwealth DSEWPaC**	Relevant EIS Section	Appendix 26 – MNES report

DETAILS OF THE ISSUE

Northern Quoll: Habitat not showing up in watercourses – more information is required for this species to explain how the mapping layers have been determined and what there error margins are.

PROPONENT RESPONSE

Whilst the report does identify the sources of the data used (e.g. DERM Regional Ecosystems), the report does not provide an explanation of how the mapping for each species was derived. "Potential habitat" for each species was derived from data provided in the Vegetation Management Act Essential Habitat Version 3.1 Essential Habitat Database which is maintained by DERM. Any error margins are those associated with the positional accuracy of the habitat mapping as sourced from the certified Regional Ecosystem and Remnant Map supplied by DERM.

34 DEWHA (2009). *Background Paper – Significant impact guidelines for the endangered black-throated finch (southern) (Poephila cincta cincta)*. Background Paper to the EPBCA Policy Statement 3.13 Nationally Threatened Species and Ecological Communities guidelines. Department of the Environment, Water, Heritage and the Arts, Canberra.

Submitter No.	1841	Issue Reference:	21032
Submitter Type	Government	TOR Category	Nature Conservation (Terrestrial Ecology)
Name	Commonwealth DSEWPaC	Relevant EIS Section	Appendix 26 – MNES report – Section 4.2.2.4

DETAILS OF THE ISSUE

Despite being contacted by the Department to inform that Birds Australia has now vetted the records and accepted them – there is no evidence of this conversation which happened early September 2011.

PROPONENT RESPONSE

As the EIS was submitted to DSEWPAC on 9 September and the conversation referred to happened on the 10 September, it was not possible to include confirmation of the sighting as the EIS was already printed, bound and issued at this time. The sighting is well documented in the EIS as a putative record (which it still was at the time of writing).

Submitter No.	1841	Issue Reference:	21033
Submitter Type	Government	TOR Category	Nature Conservation (Terrestrial Ecology)
Name	Commonwealth DSEWPaC	Relevant EIS Section	Appendix 26 – MNES report – Table 18

DETAILS OF THE ISSUE

Mitigation measures are not adequate and need further elaboration.

PROPONENT RESPONSE

Impact mitigation strategies for fauna species will be devised following completion of the rail fauna survey program, which was being undertaken at the time of writing this SEIS. This work is due to be reported upon and delivered to the Coordinator-General in April 2013. Refer also to the *Rail Fauna Position Paper* contained in *Appendices – Volume 2* of this SEIS.

Submitter No.	1841	Issue Reference:	21034
Submitter Type	Government	TOR Category	Nature Conservation (Terrestrial Ecology)
Name	Commonwealth DSEWPaC	Relevant EIS Section	Appendix 26 – MNES report – Table 19

DETAILS OF THE ISSUE

Animal death-a mitigation measure may be construction of culverts or identifying fauna passages and corridors.

PROPONENT RESPONSE

Concept design of the proposed railway has already occurred (see *Railway Concept Design Report* contained in *Appendices – Volume 2* of this SEIS). Minimum culvert diameters of 1200 mm have been adopted to allow for fauna passage in accordance with the Queensland Department of Main Roads *Drainage Design Manual*[35]. In addition, culverts located within the main channel of rivers and creeks will depressed below the natural surface to facilitate fish

35 Queensland Department of Main Roads. 2002. *Road Drainage Design Manual.* Queensland Government. Department of Main Roads

passage in accordance with the *Queensland Fisheries Act 1994*. Bridge crossings of major waterways will be designed to facilitate fauna passage in overbank areas. Additional fauna crossings will also be provided in selected locations where connectivity of habitat is to be maintained. Design will take into account guidelines for fauna sensitive design, such as those published by the Department of Main Roads[36].

Submitter No.	**1841**	Issue Reference:	21035
Submitter Type	Government	TOR Category	**Nature Conservation (Terrestrial Ecology)**
Name	**Commonwealth DSEWPaC**	Relevant EIS Section	Appendix 26 – MNES report – Proposed offsets

DETAILS OF THE ISSUE

We note the offset ratios proposed in your offset strategy and believe these can form the basis of ongoing discussions regarding offset areas. I recommend that you review some earlier approvals for similar situations. I refer you to other similar approvals where, in the absence of adequate survey data or records, areas were mapped for suitability of habitat and offsets determined accordingly. In particular, the Santos decision had offsets ranging from 8:1 up to 10:1, these offset ratios included potential suitable habitat for listed species. [2008/4059 Santos Coal Seam Gas in the Surat and Bowen Basin].

PROPONENT RESPONSE

Refer to the *Biodiversity Offset Proposal* in *Appendices – Volume 2* of this SEIS for information regarding the project's offsets, including a discussion on determining the suitable size of an offset.

Submitter No.	**664**	Issue Reference:	17050
Submitter Type	Council	TOR Category	**Nature Conservation**
Name	**Whitsunday Regional Council**	Relevant EIS Section	

DETAILS OF THE ISSUE

Vegetation and Fauna

Terrestrial flora and fauna of the rail corridor was assessed by helicopter with 57 sites ground-truthed. The rail corridor traverses the Brigalow Belt North bioregion and Desert Uplands bioregion. The proposed rail corridor is to intersect Category B Environmentally Sensitive areas which are Regional Ecosystems listed as Endangered under the DERM Biodiversity status. These include Brigalow (*Acacia harpophylla*) communities, Black gidgee (*Acacia argyrodendron*) woodlands, False sandalwood (*Eromophila mitchellii*) open woodlands on alluvial plains.

The construction of the rail corridor will require the clearing of two Environmental Protection and Biodiversity Conservations (EPBC) listed Threatened Ecological Communities including 81ha of Brigalow and 48ha of natural grasslands of the Queensland Central Highlands and the northern Fitzroy Basin. Five (5) Threatened Ecological Communities were identified under the EPBC Act Protected Matters Search. Regional Ecosystem mapping identified 61 RE's occurring within the rail corridor study area; 45 Least Concern, 15 Of Concern and 3 Endangered and numerous sections of High Value Regrowth. Three endangered Brigalow RE's will be cleared of 60.57ha remnant vegetation and 5.4ha of HVR. Thirteen Of Concern RE's will be cleared of approximately 97.71ha, 48 Least Concern RE's will be cleared

36 Queensland Department of Main Roads. 2002. *Fauna Sensitive Road Design* (volumes 1 and 2). Queensland Government. Department of Main Roads

of 2691ha. The rail corridor transects 50ha of High Value Regrowth as mapped by DERM. Searches identified 35 terrestrial Threatened and Near Threatened fauna species listed as follows: 5 Endangered and 13 Vulnerable under the EPBC Act and 5 Endangered, 13 Vulnerable and 12 Near Threatened under the Nature Conservation Act. There another 26 Migratory Species under the EPBC Act.

Clearing will impact both the terrestrial flora and fauna present by fragmenting ecosystems, altering the drainage regime of surface water, increasing edge effect, loss of habitat, installation of barriers to migration of species and impact to riparian habitat. Of particular concern for the local community is the impact on the listed Vulnerable black ironbox that occurs along water courses to be crossed by the railway within Whitsunday Regional Council. *Eucalyptus raveretiana* occurs fringing watercourses such as Bogie and Bowen Rivers and tributaries. Large stands of this threatened species may be removed for the rail corridor in particular surrounding waterways where bridges will be constructed. Detailed surveys of the final route will need to be undertaken to assess how many *Eucalyptus raveretiana* will be removed and how the communities may be fragmented.

The exact route of the railway corridor has not yet been decided therefore assessments of the disturbance to Regional Ecosystems will need to be reassessed and recalculated and supplied in a supplementary study. Weeds such as parthenium, prickly acacia, rubber vine, harrissa cactus and some lantana are present along the proposed rail corridor. Weed management plans will need to be developed to prevent the spread of weeds along the corridor during construction and limit the spread of weeds laterally into ecosystems. Further assessment of the flora and fauna by groundtruthing is required. It is unlikely that vegetation communities and fauna habitats could be accurately assessed by helicopter.

PROPONENT RESPONSE

The rail alignment has now been finalised – see the *Rail Concept Design Report and Drawings* contained in *Appendices – Volume 2* of this SEIS.

The flora, fauna and vegetation assessments conducted for the EIS provide a good base line of data with respect to the flora, fauna and vegetation assemblages and regional ecosystems along the rail corridor, however Waratah Coal acknowledge that further ecological assessment work is necessary and will undertake this work during or immediately after the 2012/2013 wet season to ensure suitable conditions (ie. when most plant species are flowering or producing seed and most migratory species are present), and hence adequate survey data can be collected from all ecological communities along the rail corridor. See also the *Rail Fauna Position Paper* contained in *Appendices – Volume 2* of this SEIS for more information. A Biosecurity Management Strategy will be prepared for the rail alignment once the ecological investigations have been completed to a point to provide meaningful inputs. See the *Mine Site Initial Biosecurity Management Strategy* contained in *Appendices – Volume 2* of this SEIS for an example of the strategy to be prepared for the rail.

Submitter No.	**466, 566, 518, 586, 201, 370, 578, 758, 906, 879, 783, 779, 468, 388, 401, 708, 269, 558, 565, 533 437, 8, 496, 509, 283, 760, 607, 741, 90, 366, 201, 370, 388, 401, 578, 750, 518, 700, 415, 758, 409, 737, 742, 24, 46, 269, 533, 773, 774, 804, 812, 833, 907, 218, 496, 519, 477, 768, 13, 772, 375, 738, 739, 813, 695**	Issue Reference:	**17052, 17053, 17054, 17067, 17055, 17056, 17057, 17058, 17059, 17068, 17060, 17061, 17062, 17063, 17064, 17066, 17069, 17071, 17076, 17077, 17078, 17079, 17070, 17065, 17072, 17084, 17089, 17090, 17100, 17101, 17102, 17103, 17104, 17105, 17106, 17107, 17108, 17109, 17110, 17111, 17112, 17113, 17114, 17115, 17116, 17117, 17118, 17119, 17120, 17121, 17122, 17123, 17124, 17125, 17126, 17127, 17128, 17129, 17130, 17131, 17132, 17133, 17134, 17135, 17136, 17137, 17138, 17139, 17140, 17141**
Submitter Type	Individuals / NGOs	TOR Category	**Nature Conservation**
Name	**Individuals names withheld; Wildlife Preservation Society of QLD (Upper Dawson); Lock the Gate Alliance Inc.; Capricorn Conservation Council; Gympie WASP; Cairns and Far North Environment Centre Inc; Birds Australia; Wildlife Preservation Society of Queensland (Sunshine Coast); GECKO; The Wilderness Society Newcastle; Wildlife Preservation Society of QLD; Mackay Conservation Council; National Parks Association of Queensland Inc; The Hut Environmental and Community Association Inc**	Relevant EIS Section	

DETAILS OF THE ISSUE

The following provides a summary of the issues raised in the majority of submissions received from the public and the NGOs in relation to Nature Conservation values.

Issues for the government regarding mining in nature refuges and the offsets policies

- General opposition to mining in the BNR
- Approval would contravene the National Reserve System (NRS) agreement in that the recommendations outlined by the International Union for Conservation of Nature (IUCN) state that no more than 25% of a protected area may be managed for other purposes and then only when they are compatible with the primary objective of the protected area
- Approval would set a precedent for mining in other nature refuges
- Approval of the project will deter future participation in NRS schemes.

Mine Specific Conservation significant species and ecology

- Loss of biodiversity values including endangered species such as Black-throated Finch and Squatter Pigeon and their habitats
- Renders likely the local extinction of BTF, squatter pigeon and black-chinned honeyeater
- More work required to describe values for rare and threatened species

- No systematic or regular surveys in regards to BTF in the Desert Uplands with most data derived opportunistically and descriptive in nature
- Resident species have their own established ecological balance and would not allow be able to absorb displaced fauna.
- Subsidence causing substantial interference with natural hydrology that supports overlying ecology.
- Lack of acknowledgement in the EIS of the values of the BNR.

Offsets

- Offset could be mined in the future
- Indirect offsets no replacement for habitat
- Offsetting is a controversial and uncertain option for protected areas
- Offsetting will result in a net loss of biodiversity for the state
- Issues with the use of regrowth areas for offsets
- The commitment, land management practices and research projects in operation on the BNR are unlikely to be represented in future offset strategies
- EIS does not present evidence that appropriate offset areas exist in the vicinity
- Lack of evidence that offsets can be provided that have ecological equivalence.

History of the BNR and it's value as a research site

- EIS does not recognise the history of the BNR
- The value of BNR as a long-term site for research cannot be easily replaced
- Waste of taxpayers money to acquire refuge and other funds spent on scientific research on the BNR
- BNR has agricultural, ecological and educational significance as an example of integrated conservation and production management
- BNR is a highly significant instance of minimal-impact sustainable grazing.
- BNR has high and unique conservation values due to interaction of the history and management of property, size and condition of the habitat and the component species
- Because of the aforementioned interactions, values at the BNR are unlikely to be repeated elsewhere, any offset areas could never compensate for the loss of these conservation values
- BNR will become more important as a refuge in the future if other coal mining projects in the region are approved
- BNR is a working example of integrated conservation and agriculture

Rail Specific

- Inadequate research into impacts of rail corridor on local ecosystems and communities.
- Rail line will contribute to fragmentation of the landscape
- Rail line will break up habitats, deliver weeds and coal dust en route.

Rehabilitation

- Mine will cause extended habitat not to be rehabilitated.
- Rehabilitation does not restore land to original condition.

Other non relevant to the project

- The proposed water pipeline will disturb the Epping Forest National Park
- The coal stockyard could leach pollutants into the Caley Valley Wetland
- Expansion of Abbot Point will put further stress on the GBR.

PROPONENT RESPONSE

Issues for the government regarding mining in nature refuges and the offsets policies

Development of a major mine or mineral development project within a Nature Refuge is assessed on a case-by-case basis by DEHP and DSEWPAC, so is a matter for them to address. In this case, an Environmental Impact Statement is required to assist the government in their assessment.

Precedence for mining in Nature Refuges, contravention of the IUCN guidelines and approval of this project acting as a deterrent to participation in NRA schemes are matters for the State and Commonwealth Governments to address.

Mine Specific Conservation significant species and ecology

Since submission of the EIS in September, Waratah Coal have commissioned extensive ecological works at the mine, including further specific Black-throated Finch work as well as work on other conservation significant fauna, and further work on vegetation and flora mapping and assessment. The fauna work is presented in the *Fauna Assessment Report* and the flora and vegetation work is presented in two Flora and Vegetation reports. All are contained in the *Appendices – Volume 2* of this SEIS.

Offsets

The possibility of offsets being mined in the future, offsetting resulting in a net loss of biodiversity, issues with the use of indirect offsets and regrowth vegetation etc. are matters for the State and Commonwealth Governments to address.

Whether the commitment, land management practices and research projects in operation on the BNR are unlikely to be represented in future offset strategies, is unknown and cannot be labeled unlikely at this stage.

Through discussions with the Department of Environment and Heritage Protection's Nature Refuges Branch, Ecofund, on behalf of Waratah Coal, has identified several properties with the potential to be secured as an offset to counterbalance the loss of the Bimblebox Nature Refuge. Ecofund has assessed the environmental values of these properties and their suitability to be secured as offsets has been determined. The results of Ecofund's assessment and details of potential options to offset impacts of the project on the Bimblebox Nature Refuge are outlined in Section 8 of the *Biodiversity Offset Proposal* (see *Appendices – Volume 2* of the SEIS). Based on discussions with the Nature Refuges Branch and the Office of Coordinator-General, properties that provide for an impact to offset ratio of 1:2 will be pursued as a priority.

Legally binding mechanisms which will be considered to ensure the long term protection of the offset area include national park, national park (recovery), conservation park, nature refuge, conservation agreement under the *Environment Protection and Biodiversity Conservation Act 1999*. The *Biodiversity Offset Proposal* outlines details of the suggested legally binding mechanisms to secure offsets. The appropriate mechanism for each offset will be determined through negotiation with regulators, Waratah Coal and the landholder.

Ecological equivalence assessments of offset sites will be undertaken post landholder engagement. Ecological equivalence will be determined based on the Ecological Equivalence Methodology Guideline (Version 1) to ensure that the offset sites have ecological functionality.

See also the *Biodiversity Offset Proposal* contained in *Appendices – Volume 2* of this SEIS.

History of the BNR and its value as a research site

It is not a requirement of the ToR for the EIS to recount the history of the BNR or the factors that gave rise to the BNR.

Waratah Coal acknowledges that loss of the BNR will mean discontinuation of various currently occurring research projects. Whilst acknowledging that this will produce spatial variability in the datasets, Waratah Coal would welcome the opportunity to discuss with DEHP, and other stakeholder agencies and NGOs, the potential to transfer these projects to Waratah Coal's proposed offsets area/s. The proposed offsets will provide the same values as those currently contained within the BNR and will be located as close as possible to the BNR, within the Desert Uplands Bioregion.

Rail Specific

Inadequate research into impacts of rail corridor on local ecosystems and communities:

The flora, fauna and vegetation assessments conducted for the EIS provide a good base line of data with respect to the flora, fauna and vegetation assemblages and regional ecosystems along the rail corridor, however Waratah Coal acknowledge that further ecological assessment work is necessary and, at the time of writing this SEIS the work was being undertaken. This work is due to be reported upon and delivered to the Coordinator-General in April 2013. See also *Rail Fauna Position Paper* contained in *Appendices – Volume 2* of this SEIS for more information.

Concept design of the proposed railway has occurred (see *Railway Concept Design Report* contained in *Appendices – Volume 2* of this SEIS). Minimum culvert diameters of 1200mm were adopted to allow for fauna passage in accordance with the Queensland Department of Main Roads Drainage Design Manual[37]. In addition, culverts located within the main channel of rivers and creeks will depressed below the natural surface to facilitate fish passage in accordance with the *Queensland Fisheries Act 1994*. Bridge crossings of major waterways will be designed to facilitate fauna passage in overbank areas. Additional fauna crossings will also be provided in selected locations where connectivity of habitat is to be maintained. Design will take into account guidelines for fauna sensitive design, such as those published by the Department of Main Roads[38]. This will provide mitigation for fragmentation.

Coal dust will be a negligible issue, as Waratah Coal have committed to covering their wagons to mitigate coal dust emissions. See response to Issue Reference 12004 in Part C – 06 – Air Quality for more information regarding the covers.

Weeds and pest species will be managed with management objectives and measures provided in a Biosecurity Management Strategy. See the *Initial Biosecurity Management Strategy* for the mine contained in *Appendices – Volume 2* of this SEIS for an example of what will be contained in the rail strategy.

Rehabilitation

The mine site will be rehabilitated. See the *Rehabilitation and Decommissioning* section of the *Draft Mine EM Plan* contained in *Appendices – Volume 2* of this SEIS for more information.

Other – Not relevant to the project

No aspect of the project impacts upon Epping Forest National Park. Pipelines for water will be the subject of their own EISs.

As described in the EIS, Waratah Coal has removed port elements from the Project and will utilise facilities within the Port of Abbot Point that will be the subject of assessment by others. Waratah Coal's assessment stops at the boundary of the APSDA.

37 Queensland Department of Main Roads. 2002. *Road Drainage Design Manual.* Queensland Government. Department of Main Roads.

38 Queensland Department of Main Roads. 2002. *Fauna Sensitive Road Design* (Volumes 1 and 2). Queensland Government. Department of Main Roads.

Submitter No.	283	Issue Reference:	17073
Submitter Type	NGO	TOR Category	Nature Conservation (Aquatic Ecology)
Name	Capricorn Conservation Council	Relevant EIS Section	Aquatic Ecology

DETAILS OF THE ISSUE

High Ecological Significance wetlands and QLD wetland mapping needs field investigation and mapping at 1:25000 scale based on presence of wetland/riparian plant species.

PROPONENT RESPONSE

Monitoring was undertaken in a wetland corresponding to the area where the water supply dam was proposed (see the *Mine Site Aquatic Ecology and Water Quality* report contained in *Appendices – Volume 2* of this SEIS) to help characterise the aquatic habitat and flora and fauna associated with this wetland.

Note also that additional surface water aquatic ecology and groundwater dependant ecosystems (GDE) sampling was undertaken in Tallarehna and Lagoon Creeks (see *Mine Site Aquatic Ecology and Water Quality* report and the *Subterranean Fauna Survey* report contained in *Appendices – Volume 2* of this SEIS). This work provides an improved basis for understanding the key ecological components immediately downstream of the mine site potentially at risk from altered hydrology-associated impacts.

Submitter No.	768	Issue Reference:	17074
Submitter Type	NGO	TOR Category	Nature Conservation
Name	Mackay Conservation Group	Relevant EIS Section	

DETAILS OF THE ISSUE

This submission is in the main a lengthy dissertation on the nature conservation values of the BNR and offsets, with tens of pages of information from government websites on birds. The main points seem to be the following:

- Not enough ecological work done by Waratah Coal,
- Waratah Coal consultants failed to locate the BTF which calls into question whether they missed other species
- Not clear why a 500m wide corridor is needed as this will cause more environmental and ecological impacts, and
- Approval of the project would be in violation of the NRS agreement.

PROPONENT RESPONSE

Not enough ecological work

Prior to submission of the EIS in September, Waratah Coal had already commissioned extensive ecological works at the mine, including further specific Black-throated Finch work as well as work on other conservation significant fauna, and further work on vegetation and flora mapping and assessment. The fauna work is presented in the *Fauna Assessment Report* contained within the *Appendices – Volume 2* of this SEIS, and there are two *Flora and Vegetation* reports also contained in *Appendices – Volume 2* of this SEIS.

Fauna

The fauna survey program undertaken for the EIS provided coverage of both dry and wet season conditions. The survey program comprised an eight-day survey in October 2009 (dry season) and a 12-day program in April 2010 (wet season). Both surveys included standardised site-based survey approach at eight locations where a suite of survey

methodologies and survey effort was replicated in a systematic manner. The eight sites in the EIS were representative of the primary fauna habitat types on the study site, and provided coverage by way of four remnant open woodland sites, one remnant open woodland/riparian site, one remnant riparian site, and two non-remnant grassland sites. Subsequent to the EIS submission, a series of meetings were undertaken in early 2012 with DERM representatives from Threatened Species Partnerships (Brisbane), Biodiversity Planning (Emerald), and the Environmental Performance and Coordination Branch (Brisbane). The purpose of these meetings was to identify the nature and extent of additional fauna surveys which would satisfy DERM requirements.

As a result of that series of meetings, the approved outcome comprised two main survey approaches. The first involved the implementation of a suite of standardised techniques at a variety of survey sites which replicated the protocols and effort applied previously for the EIS survey work. The survey program was to be implemented under late wet season conditions. The key objectives of this work was to intensify survey coverage within the Bimblebox Nature Refuge, and to expand site survey coverage to specifically include fauna habitats on the western side of Lambton Meadows.

The second key outcome required by DERM was to implement target surveys for a suite of threatened reptiles. DERM recommended additional targeted surveys for at least three reptile species, though others were included by the SEIS study team. Reptile species targeted during these surveys were the Common Death Adder *(Acanthophis antarciticus)*, Yakka Skink *(Egernia rugosa, Ctenotus capricorni)*, Brigalow Scaly-foot *(Paradelma orientalis)*, and Ornamental Snake (*Denisonia maculata)*.

The *SEIS Fauna Assessment Report* provides details of how the DERM survey requirements were executed during the April 2012 survey program. See *SEIS Fauna Assessment Report* in *Appendices – Volume 2* of this SEIS.

Flora and Vegetation

As for the fauna work, the proposed methodology for the flora and vegetation surveys was discussed with DERM representatives from Threatened Species Partnerships (Brisbane), Biodiversity Planning (Emerald), and the Environmental Performance and Coordination Branch (Brisbane) in early 2012. The purpose of these meetings was to identify the nature and extent of additional flora and vegetation surveys which would satisfy DERM requirements.

As a result of these discussions, additional flora and vegetation surveys were undertaken at 80 sites throughout the Mining Lease Application area during the 2012 dry season (over four separate survey events in May, June, July and October 2012).

Flora and vegetation assessments undertaken as part of these additional studies include secondary, tertiary and quaternary level Corveg assessments (Neldner *et al.* 2012[39]), BioCondition assessments (Eyre *et al.* 2011[40]), targeted rare plant searches and traverses. Corveg assessments were employed as the most appropriate method for assessing vegetation communities at the site and validating the certified Regional Ecosystem (RE) mapping (v 6.0b). The BioCondition method was applied to determine the condition of the vegetation at the sampling site and for use as part of ecological equivalency for determining environmental offsets. See the two *Flora and Vegetation* reports contained in *Appendices – Volume 2* of this SEIS.

Black-throated Finch

Since lodgment of the EIS considerable work (equating to 65 survey person days) has been undertaken on BTF and BTF habitat values at the mine site. The work is presented in the *Fauna Assessment Report* contained in *Appendices – Volume 2* of this SEIS.

39 Neldner, V.J., Wilson, B.A., Thompson, E.J. and Dillewaard, H.A. (2012) *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland.* Version 3.2. Updated August 2012. Queensland Herbarium – Queensland Department of Science, Information Technology, Innovation and the Arts, Brisbane.

40 Eyre, T.J., Kelly, A.L., Neldner, V.J., Wilson, B.A., Ferguson, D.J., Laidlaw, M.J. and Franks, A.J. (2011) *Biocondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland Assessment Manual.* Version 2.1. Department of Environment and Resource Management (DERM), Biodiversity and Ecosystem Sciences, Brisbane.

500m wide corridor

It is clearly stated in the Ecology Chapter of the Rail Volume of the EIS (Chapter 6, Volume 3) that, except in areas of cut and fill where earthwork requirements will dictate widths, the clearance footprint will be no more than 100m wide and as little as 40m in sensitive areas. Since lodgment of the EIS Waratah Coal has commissioned a concept design of the vertical alignment of the 453km of rail corridor (from the boundary of the APSDA to the beginning of the rail loop at the mine site) – see *Railway Concept Design Report* in *Appendices – Volume 2* of this SEIS.

This engineering provides the vertical alignment of the rail, which in turn provides the width required for the rail easement. At present, 421km of the rail vertical alignment has been engineered (with the balance 32km awaiting the completion of the Digital Terrain Model (DTM)), which will be completed as soon as possible.

The final railway easement will be an average width of 49.5m[41]. In relatively flat terrain the rail will be 40m wide and in areas where cross-slope cuttings are required the width of the easement will be wider – up to a maximum width of 184m (however there are only two areas exceeding 150m). The easement includes both the rail and a service road. In the 32km of the corridor which have not yet been engineered, a footprint area of 40m was assumed based upon the relatively flat topography.

Minimum culvert diameters of 1200mm were adopted to allow for fauna passage in accordance with the Queensland Department of Main Roads *Drainage Design Manual*[42]. In addition, culverts located within the main channel of rivers and creeks will depressed below the natural surface to facilitate fish passage in accordance with the Queensland *Fisheries Act 1994*. Bridge crossings of major waterways will be designed to facilitate fauna passage in overbank areas. Additional fauna crossings will also be provided in selected locations where connectivity of habitat is to be maintained. Design will take into account guidelines for fauna sensitive design, such as those published by the Department of Main Roads[43]. This will provide mitigation for fragmentation.

NRS agreement

This is a matter for the State and Commonwealth Governments.

Submitter No.	**779**	Issue Reference:	**17075**
Submitter Type	Individuals	TOR Category	**Nature Conservation**
Name	**Names withheld**	Relevant EIS Section	

DETAILS OF THE ISSUE

- Submitter raises concerns as to the assessment of impacts on BTF and the work undertaken by the ecologists employed by Waratah Coal
- EIS failed to provide a realistic and comprehensive assessment of likely impact on migratory and regionally significant species
- Desert mouse
- Unidel report contained a photo captioned great brown broodfrog that was not a great brown broodfrog.
- Questions as to treatment of the Troughton's sheathtail bat.

41 Average width calculated by dividing the total area of the rail footprint (2215ha) by the length of the rail (453km)

42 Queensland Department of Main Roads. 2002. *Road Drainage Design Manual.* Queensland Government. Department of Main Roads.

43 Queensland Department of Main Roads. 2002. *Fauna Sensitive Road Design* (Volumes 1 and 2). Queensland Government. Department of Main Roads.

PROPONENT RESPONSE

Prior to submission of the EIS in September, Waratah Coal had already commissioned extensive ecological works at the mine, including further specific Black-throated Finch work as well as work on other conservation significant fauna, and further work on vegetation and flora mapping and assessment. The fauna work is presented in the *Fauna Assessment Report* contained within the *Appendices – Volume 2* of this SEIS, and the flora work is presented in the Mine Site Flora and Vegetation reports contained within the *Appendices – Volume 2* of this SEIS.

The fauna survey program undertaken for the EIS provided coverage of both dry and wet season conditions. The survey program comprised an eight-day survey in October 2009 (dry season) and a 12-day program in April 2010 (wet season). Both surveys included standardised site-based survey approach at eight locations where a suite of survey methodologies and survey effort was replicated in a systematic manner. The eight sites in the EIS were representative of the primary fauna habitat types on the study site, and provided coverage by way of four remnant open woodland sites, one remnant open woodland/riparian site, one remnant riparian site, and two non-remnant grassland sites. Subsequent to the EIS submission, a series of meetings were undertaken in early 2012 with DERM representatives from Threatened Species Partnerships (Brisbane), Biodiversity Planning (Emerald), and the Environmental Performance and Coordination Branch (Brisbane). The purpose of these meetings was to identify the nature and extent of additional fauna surveys which would satisfy DERM requirements.

As a result of that series of meetings, the approved outcome comprised two main survey approaches. The first involved the implementation of a suite of standardised techniques at a variety of survey sites which replicated the protocols and effort applied previously for the EIS survey work. The survey program was to be implemented under late wet season conditions. The key objectives of this work was to intensify survey coverage within the Bimblebox Nature Refuge, and to expand site survey coverage to specifically include fauna habitats on the western side of Lambton Meadows.

The second key outcome required by DERM was to implement target surveys for a suite of threatened reptiles. DERM recommended additional targeted surveys for at least three reptile species, though others were included by the SEIS study team. Reptile species targeted during these surveys were the Common Death Adder *(Acanthophis antarciticus)*, Yakka Skink *(Egernia rugosa, Ctenotus capricorni)*, Brigalow Scaly-foot *(Paradelma orientalis)*, and Ornamental Snake (*Denisonia maculata)*.

Considerable work (equating to 65 survey person days) has been undertaken on BTF and BTF habitat values at the mine site. The work is presented in the *Fauna Assessment Report* contained in *Appendices – Volume 2* of this SEIS.

The other species mentioned in this Issue Reference are discussed in detail within the SEIS *Fauna Assessment Report* contained in the *Appendices – Volume 2* of this SEIS.

Submitter No.	**779**	Issue Reference:	**17080**
Submitter Type	Individuals	TOR Category	**Nature Conservation**
Name	**Names withheld**	Relevant EIS Section	V2, Chapter 6, 6.3.1.3

DETAILS OF THE ISSUE

- The submitter provides a quote regarding the fact that DERM have successfully conditioned mining on a number of nature refuges in the past from the EIS that they believe is highly misleading as from their perspective the conditions are not successful as they believe they are not reliably adhered to.
- The submitter believes the proponent has failed to assess and report upon medium to long term ecological health trends with reference to management regimes in the project area

- Inadequate number and spread of terrestrial ecological survey sites on BNR
- Unrepresentative sampling of flora
- The extent and significance of large podded tick trefoil has not been adequately addressed
- Submitter requests a regional survey and habitat assessment for BTF
- Sighting of black throated finch was reported in the EIS as a putative finding
- EIS failed to adequately address the likely changes in fire regimes in and around the mine site and potential follow on effects on terrestrial ecology.

PROPONENT RESPONSE

Conditioned mining on a number of nature refuges

It is not required, nor would it be appropriate, for Waratah Coal to provide details of exploration conditions on other nature refuges. The term 'successfully conditioned' relates to the fact that DERM have been quoted as saying that they have successfully conditioned exploration on nature refuges in the past (see the 'mining nature refuges' page on www.agforceqld.org.au for a quote from DERM regarding this). Hence, the statement provided in the EIS is true and not in any way misleading.

Medium to long term ecological health trends

It is not a requirement of the ToR to provide an assessment of the different management practices on ecological health in the region. However, management practices are assessed in a *de facto* sense in that they influence the ecological health of the landscape, which in turn is reported upon in the ecological habitat assessments.

Inadequate number and spread of terrestrial ecological survey sites on BNR

FAUNA

The fauna survey program undertaken for the EIS provided coverage of both dry and wet season conditions. The survey program comprised an eight-day survey in October 2009 (dry season) and a 12-day program in April 2010 (wet season). Both surveys included standardised site-based survey approach at eight locations where a suite of survey methodologies and survey effort was replicated in a systematic manner. The eight sites in the EIS were representative of the primary fauna habitat types on the study site, and provided coverage by way of four remnant open woodland sites, one remnant open woodland/riparian site, one remnant riparian site, and two non-remnant grassland sites.

Subsequent to the EIS submission, a series of meetings were undertaken in early 2012 with DERM representatives from Threatened Species Partnerships (Brisbane), Biodiversity Planning (Emerald), and the Environmental Performance and Coordination Branch (Brisbane). The purpose of these meetings was to identify the nature and extent of additional fauna surveys which would satisfy DERM requirements.

As a result of that series of meetings, the approved outcome comprised two main survey approaches. The first involved the implementation of a suite of standardised techniques at a variety of survey sites which replicated the protocols and effort applied previously for the EIS survey work. The survey program was to be implemented under late wet season conditions. The key objectives of this work was to intensify survey coverage within the Bimblebox Nature Refuge, and to expand site survey coverage to specifically include fauna habitats on the western side of Lambton Meadows.

The second key outcome required by DERM was to implement target surveys for a suite of threatened reptiles. DERM recommended additional targeted surveys for at least three reptile species, though others were included by the SEIS study team. Reptile species targeted during these surveys were the Common Death Adder *(Acanthophis antarciticus)*, Yakka Skink *(Egernia rugosa, Ctenotus capricorni)*, Brigalow Scaly-foot *(Paradelma orientalis)*, and Ornamental Snake (*Denisonia maculata)*.

The SEIS *Fauna Assessment Report* provides details of the fauna assessment. See SEIS *Fauna Assessment Report* in *Appendices – Volume 2* of this SEIS.

Flora and Vegetation

As for the fauna work, the proposed methodology for the flora and vegetation surveys was discussed with DERM representatives from Threatened Species Partnerships (Brisbane), Biodiversity Planning (Emerald), and the Environmental Performance and Coordination Branch (Brisbane) in early 2012. The purpose of these meetings was to identify the nature and extent of additional flora and vegetation surveys which would satisfy DERM requirements.

As a result of these discussions, additional flora and vegetation surveys were undertaken at 80 sites throughout the Mining Lease Application area during the 2012 dry season (over four separate survey events in May, June, July and October 2012).

Flora and vegetation assessments undertaken as part of these additional studies include secondary, tertiary and quaternary level Corveg assessments (Neldner *et al.* 2012[44]), BioCondition assessments (Eyre *et al.* 2011[45]), targeted rare plant searches and traverses. Corveg assessments were employed as the most appropriate method for assessing vegetation communities at the site and validating the certified Regional Ecosystem (RE) mapping (v 6.0b). The BioCondition method was applied to determine the condition of the vegetation at the sampling site and for use as part of ecological equivalency for determining environmental offsets. See the two *Flora and Vegetation* reports contained in *Appendices – Volume 2* of this SEIS.

Unrepresentative sampling of flora and *Desmodium macrocarpum*

Waratah Coal has undertaken four surveys of properties over which the mine sites is located.

1. Worley Parsons (2009)[46]
2. Unidel (2010)[47]
3. Rob Friend & Associates Pty Ltd (RF&A) (2012)[48], and
4. O2 Ecology (2012)[49].

The Worley Parsons (2009) report mostly focused on Glen Innes Station, otherwise known as the Bimblebox Nature Refuge (BNR). The Unidel (2010) dealt with the whole of the Mining Lease Application site area, and the two Mine Site Supplementary EIS *Flora and Vegetation* reports (RF&A 2012 and O2 Ecology 2012) also collectively covered the whole of the Mining Lease Application area.

All four flora and vegetation surveys used the methodology devised by the Queensland Herbarium (Neldner *et al.*, 2012)[50] (v3.2) as the basis for the vegetation surveys. The Worley Parsons and Unidel work used tertiary level surveys, whilst the RF&A work primarily used secondary level surveys complimented with quaternary level surveys. The O2 Ecology work primarily used secondary sites with four tertiary sites. During the RF&A surveys, random meander

44 Neldner, V.J., Wilson, B.A., Thompson, E.J. and Dillewaard, H.A. (2012) *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland.* Version 3.2. Updated August 2012. Queensland Herbarium – Queensland Department of Science, Information Technology, Innovation and the Arts, Brisbane.

45 Eyre, T.J., Kelly, A.L., Neldner, V.J., Wilson, B.A., Ferguson, D.J., Laidlaw, M.J. and Franks, A.J. (2011) *Biocondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland Assessment Manual.* Version 2.1. Department of Environment and Resource Management (DERM), Biodiversity and Ecosystem Sciences, Brisbane.

46 Worley Parsons (2009). *Flora and Fauna Survey Report – EPC 1040 Glen Innes, Central Queensland.* A report prepared by WorleyParsons for Waratah Coal.

47 Unidel (2010). *Waratah Coal China First Project Mine site terrestrial flora and fauna assessment.* A report prepared by the Unidel Group for Waratah Coal Pty Ltd.

48 Rob Friend and Associates Pty Ltd. (2012). *Flora and Vegetation Report – Galilee Coal Project (Northern Export Facility).* A report prepared by Rob Friend and Associates for Waratah Coal.

49 O2 Ecology. 2012. *Spring Creek (Galilee Coal Project) Supplemental Flora and Vegetation Assessment.* A report prepared for Waratah Coal.

50 Neldner, V.J., Wilson, B.A., Thompson, E.J. and Dillewaard, H.A. (2012) *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland.* Version 3.2. Updated August 2012. Queensland Herbarium – Queensland Department of Science, Information Technology, Innovation and the Arts, Brisbane.

surveys were also undertaken in known habitat of the only threatened flora species recorded within the mine site area, *Desmodium macrocarpum*, to seek to improve the knowledge of the occurrences of this species within the study area.

In addition to these surveys undertaken by Waratah Coal, other surveys for a range of purposes have also been undertaken by the State Government as well CSIRO. See the RF&A and O2 Ecology *Flora and Vegetation Assessments* contained in the *Appendices – Volume 2* of this SEIS.

Therefore based on the work undertaken to date Waratah Coal believes it has a high level of scientific information about the flora and vegetation communities, as well as interpretive data on declared and environmental weeds species throughout the mine site area.

It is important to note that the secondary level survey data has also assisted the Fauna Ecologists, Austecology, to improve their modeling of suitable habitat for Black-throated Finch and Squatter Pigeon (see SEIS *Fauna Assessment Report* contained in *Appendices – Volume 2* of this SEIS).

Regional survey and habitat assessment for BTF

This is not a requirement of the ToR.

Sighting of black throated finch was reported in the EIS as a putative finding

SEWPaC advised Waratah Coal on 10 September 2011 (via phone) that they had received confirmation from Birds Australia accepting the Black-throated Finch records and on that basis they considered it a confirmed record. As the EIS was submitted to DSEWPAC and the Queensland Coordinator-Generals Office on 9 September, the draft EIS was already printed, bound and issued at this time, hence it was not possible to amend the document to reflect the confirmation of the sighting. The sighting is well documented in the draft EIS as a putative record (which it still was at the time of writing).

Changes in fire regimes in and around the mine site and potential follow on effects on terrestrial ecology

See the *Initial Bushfire Management Planning Framework* contained in *Appendices – Volume 2* of this SEIS.

Submitter No.	**1840**	Issue Reference:	**17082**
Submitter Type	Council	TOR Category	**Nature Conservation**
Name	**Barcaldine Regional Council**	Relevant EIS Section	3.1.11

DETAILS OF THE ISSUE

It appears that only Summer field surveys were performed? Winter field studies are also required.

PROPONENT RESPONSE

Additional dry season surveys at the mine site have been undertaken. See the *Fauna Assessment Report* and the two *Flora and Vegetation* reports contained in *Appendices – Volume 2* of this SEIS for more information.

Submitter No.	**1840**	Issue Reference:	17083
Submitter Type	Council	TOR Category	**Nature Conservation**
Name	**Barcaldine Regional Council**	Relevant EIS Section	

DETAILS OF THE ISSUE

Terrestrial ecology – More information is required.

PROPONENT RESPONSE

Supplementary flora, fauna and vegetation assessments have been undertaken at the mine site. See the *Fauna Assessment Report* and the two *Flora and Vegetation* reports contained in *Appendices – Volume 2* of this SEIS for more information.

Submitter No.	**779**	Issue Reference:	10004
Submitter Type	Individuals	TOR Category	Land / **Nature Conservation (Terrestrial Ecology)**
Name	**Names withheld**	Relevant EIS Section	V2, ch 6, 6.4.1.2; V 1, ch 1, 1.3.6; exec summary 3.1.8.2, App 10. 9.1; 4.5;

DETAILS OF THE ISSUE

The EIS has not presented some of the potential impacts on ecology from subsidence. Paucity of information and discrepancy in information with reference to subsidence.

PROPONENT RESPONSE

The underground mining activities will result in surface subsidence that will develop progressively within each longwall mining block and present on the surface as a series of trough like depressions. The maximum subsidence (i.e. in the centre of the longwall panels) will range from 1.6m in standalone mines to 3.2m in areas of cumulative subsidence where underground mine 4 lies above underground mine 1. Refer to Figure 2 (in this chapter).

Longitudinal tension cracks of 2.5mm to 20mm are predicted to occur at the edge of the longwall mining panel, parallel to the chain pillar areas, where the depth of cover between the surface and the underground mines is less than 180m. Refer to Figure 3 (in this chapter).

Depressions in the surface from subsidence can lead to ponding if unmanaged, however the longwall mining panels are aligned longitudinally with the natural fall of the land within the MLA, which drains freely to the east and is sufficient to minimise subsidence troughs. In flatter area, reshaping of any internally draining areas will be done by the construction of contour drains and appropriate rehabilitation measures.

As no underground coal mines currently exist in the Galilee Basin, there is no precedence to use as a guide to the expected impacts on ecological values from subsidence. There are relatively few published studies of the impacts of subsidence on native vegetation, and those that are available, have typically described local and specific issues (Frazier et al., 2010[51]), mostly from the NSW coalfield areas. The potential consequences of subsidence on vegetation

51 Frazier P, Jenkins R, Trotter T. 2010. *Monitoring the Effect of Longwall Mine Subsidence on Native Vegetation and Agricultural Environments*. (ACARP C15013). Report prepared for ACARP January 10 by Ecological Australia.

are likely to be indirect and heterogeneous (Frazier et al., 2010). Possible changes to near-surface regolith and soil that could affect vegetation include:

- Soil fractures causing changes to the hydrological properties of soils, which could promote local dessication
- Soil fractures could act as macropores that increase hydraulic connectivity
- High flow in fractures could lead to increased erosion
- The availability of groundwater for vegetation may be markedly changed in areas where shallow groundwater systems are within two metres of the surface.

In addition root-ball disturbance could arise from the soil rupture and shaking associated with subsidence.

As mentioned above, fracturing will only occur longitudinally parallel to the chain pillar areas where depth of cover between the surface and the mine is less than 180m. Furthermore, given the alluvial nature of the surface material in the MLA area, the cracking is not expected to exceed 20mm. Remedial works for longitudinal surface fractures from subsidence may include ripping, recompacting, seeding of the cracks and reshaping.

Waratah Coal will develop a subsidence management plan to mitigate and manage the effects of subsidence on hydrology and native vegetation as much as possible (see *Longwall Mining Subsidence Report* in the *Appendices – Volume 2* of this SEIS). For residual impacts, Waratah Coal will provide offsets in accordance with the State and Commonwealth offsets policies. Given that the potential impacts of subsidence on vegetation in the Galilee are unknown, but that it is likely that not all vegetation overlying subsidence areas will be impacted, Waratah Coal have adopted a staged approach to offset delivery for residual impacts. This approach will still involve upfront delivery of offsets for the project's rail component, open cut pits, coal preparation plants and underground mining activities proposed to occur in years 0 to 5. However, to allow for information gained from monitoring of the impacts of subsidence between years 0 and 5 to inform the offset requirements for impacts arising from underground mining activities that may occur between years 5 and 30, offsets for underground mining activities will be delivered in five yearly stages that correspond with the underground mining development sequence. Waratah Coal consider it likely that offsets provided for the first five years of mining will be in excess of that required.