MATRIX CONSULTING

ISAAC PLAINS COAL PTY LTD
&
AMCI (ISAAC PLAINS) PTY LTD

INITIAL ADVICE STATEMENT
INTEGRATED ISAAC PLAINS PROJECT

26 OCTOBER 2006
REVISED FINAL V7.0

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

The existing approved Isaac Plains Coal Mine is located in the northern end of EPC755 over which ML70342 and Environmental Authority (EA) (Permit # MIN100329505, dated 25/08/05) have been granted. The Isaac Plains Coal Mine currently has approval to mine at a rate of 2 million tonnes per annum (Mtpa). Isaac Plains Coal Management Pty Ltd (IPCM) have commenced development of the Isaac Plains Coal Mine.

IPCM, through the Joint Venture Partners, is planning to secure mining leases (MLs) under the *Mineral Resources Act 1989* (MRA) for an extension to the existing Isaac Plains Coal Mine onto the southern part of Exploration Permit for Coal 755 (EPC755) and an adjoining area to the west known as the Kumba Designated Area (KDA). These areas are collectively referred to as the "Expansion Area". The proposed project, referred to throughout this document as "the Integrated Isaac Plains Project (IIPP)", will comprise some changes to the existing mine, and activities within the Expansion Area.

The major components of the existing Isaac Plains Coal Mine include:

- 5 contiguous open cut pits;
- out-of-pit spoil dumps;
- access and haul roads;
- a Run-of-Mine (ROM) coal stockpile;
- a coal handling and preparation plant (CHPP) area including crushing facility, coal stockpile pad, temporary reject stockpiles, rail loop and rail loading facilities;
- mine infrastructure areas including office buildings, workshops, controlled access gate and a sewage treatment system; and
- water management structures.

The major components of the IIPP located either wholly or partially within the Expansion Area, in addition to those identified above, will include:

- open cut pit(s);
- out-of-pit spoil dumps;
- access and haul roads;
- ROM coal stockpile;
- a small mine infrastructure area including office buildings, controlled access gate and sewage treatment plant;
- a low level crossing of the Isaac River;
- a crossing of the Peak Downs Highway;
- water management structures; and
- installation of flood levees (progressively installed with the staged development of the open cut pit(s) in the Expansion Area).

The IIPP also includes the diversion of three waterways, namely Smoky Creek and Billy's Gully within the existing Isaac Plains Coal Mine site, and Conrock Gully within the Expansion Area. Billy's Gully and Conrock Gully are the names adopted for the formerly unnamed watercourses which traverse ML70342 and the Expansion Area respectively, and are consistent with those used by the landholders. The diversions within ML70342 are not currently approved activities.

Based on the current resource estimates and mine planning, ROM coal production from the IIPP will increase from the currently approved rate of 2 Mtpa to approximate 4 Mtpa for a period of approximately 15 years. IPCM commenced development of the Isaac Plains Coal Mine in late 2005 and coal production commenced in the third quarter of 2006. Mined coal from the Expansion Area will be hauled north across the Isaac River via a new low level crossing, and through an underpass of the Peak Downs Highway to the CHPP on ML70342. Processed and washed coal from the IIPP will be railed to Dalrymple Bay Coal Terminal and exported. The existing Isaac Plains Coal Mine CHPP has the capacity to accommodate the planned ROM coal production of 4 Mtpa, with the increased throughput from the IIPP being achieved through increased operational hours, i.e. the CHPP will not require an upgrade to process the increased volume of coal.

Once the MLs are secured for the Expansion Area, IPCM will integrate the activities in all of its MLs into a single Project Authority through an application to amend the existing approved EA for Isaac Plains Coal Mine, under the *Environmental Protection Act 1994* (EP Act).

The existing Isaac Plains Coal Mine, as originally planned, was referred under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 5 April 2005 and was decided by the delegate of the Federal Minister for Environment and Heritage from the Commonwealth Department of the Environment and Heritage (DEH) not to be a controlled action.

In the period since that referral, IPCM have identified coal reserves in the Expansion Area of sufficient quantity that now deem it feasible to proceed with the development of the Expansion Area. Furthermore, as the coal reserves under Smoky Creek and Billy's Gully have now been deemed economic to exploit from both an engineering and economic perspective, it is proposed to divert Smoky Creek and Billy's Gully to mine the underlying coal. An EPBC Act referral for the IIPP has also been assessed by the DEH and on the 10 October 2006 was decided by the delegate of the Federal Minister for Environment and Heritage from DEH not to be a controlled action.

1.2 Purpose and Scope of Document

This Initial Advice Statement (IAS) has been prepared in order for the Environmental Protection Agency (EPA) to determine whether the development of the IIPP would trigger a requirement to prepare an Environmental Impact Statement (EIS) and to support the development of the draft Terms of Reference (ToR) for the EIS. Based on the assessments made in this IAS, and from previous experience, IPCM lodged an application to prepare a voluntary EIS for the IIPP which was accepted by the EPA on 21 June 2006.

1.3 The Proponent

The IIPP is operated as an unincorporated joint venture with Isaac Plains Coal Management Pty Ltd (IPCM) (Manager) being the management company responsible for all operations undertaken as part of the IIPP on behalf of the joint venture participants, i.e. IP Coal Pty Ltd and AMCI (IP) Pty Ltd. For the sake of simplicity, the term IPCM is used throughout this document to refer to the joint venture participants and the Manager.

1.4 IAS Outcome

The EPA has published several Guidelines for assisting in the environmental management of mining operations. EPA's *Guideline 4 - Deciding the Level of Impact Assessment for the Mining Industry* (December 2000), provides guideline trigger criteria for 'greenfield' mining projects to be used when assessing whether an application for a new or amended EA requires an EIS.

Two of the eleven EPA triggers in EPA's Guideline 4 have been assessed in this report as likely to trigger the EIS criteria, namely:

(i) the development of the Expansion Area will involve a significant impact on a Category B Environmentally Sensitive Area (clearing of Brigalow which is an endangered regional ecosystem (RE)); and

(ii) the total combined production from the IIPP will approximate 4 Mtpa of coal, thereby exceeding the 2 Mtpa threshold.

In addition to these likely triggers, the proposed IIPP includes the diversion of Smoky Creek and Billy's Gully within ML70342, and Conrock Gully within the Expansion Area. Based on previous experience, diversion of waterways is also a likely informal trigger for an EIS.

2 PROJECT DESCRIPTION

2.1 PROJECT SITE

The Expansion Area is located at the southern end of EPC755 on the Winchester Downs property, south of the Peak Downs Highway in the Moranbah region of the central western Queensland coalfields (refer **Figure 2-1**). A significant portion of the proposed Expansion Area is located in the KDA. The existing Isaac Plains Coal Mine is located on ML70342 in the northern end of EPC755 (refer **Figure 2-2** and **Figure 2-3**).

Arrow Energy NL Pty Ltd (Arrow) holds Petroleum Lease (PL) 222 over the KDA, and PL191 over a section of the proposed access/ haul road intersection with the Peak Downs Highway. An authority to prospect, EPP364 (held by BHP Coal Pty Ltd) covers the remainder of the Expansion Area. The occurrence of petroleum tenements over the proposed MLs has relevance to the ML process under the MRA whereby IPCM needs to negotiate coal seam gas agreements with the tenement holders.

The Expansion Area is located within the Nebo Shire Council local government area, while the existing Isaac Plains Coal Mine, on ML70342, is located within the Belyando Shire Council local government area.

The existing Isaac Plains Coal Mine is located on Lot 3 GV252, Lot 2 RP90445, Lot 4 CP903282 and an unnamed road. Lots 3 and 2 are freehold, while Lot 4 is State leasehold land.

The Expansion Area traverses Lot 5 GV132, Lot 6 SP174999, Lot 9 GV33 and Lot 8 GV196. Lots 5 and 6 are freehold; Lot 9 is reserve land for camping, water and roads and Lot 8 is reserve land for a quarry. The principal landholdings are Lot 5 and Lot 6. Smoky Creek and Billy's Gully are located on Lot 3 GV252 (refer **Figure 2-4**).

Within the Expansion Area, the local topography generally grades from the west to the east towards the Isaac River, with the topography characterised by a small ridge/plateau in the centre, running almost north-south. The ridge rises from 200-206 m on the western boundary to 224 m, dropping down to 200-210 m on the eastern boundary (refer **Figure 2-3**).

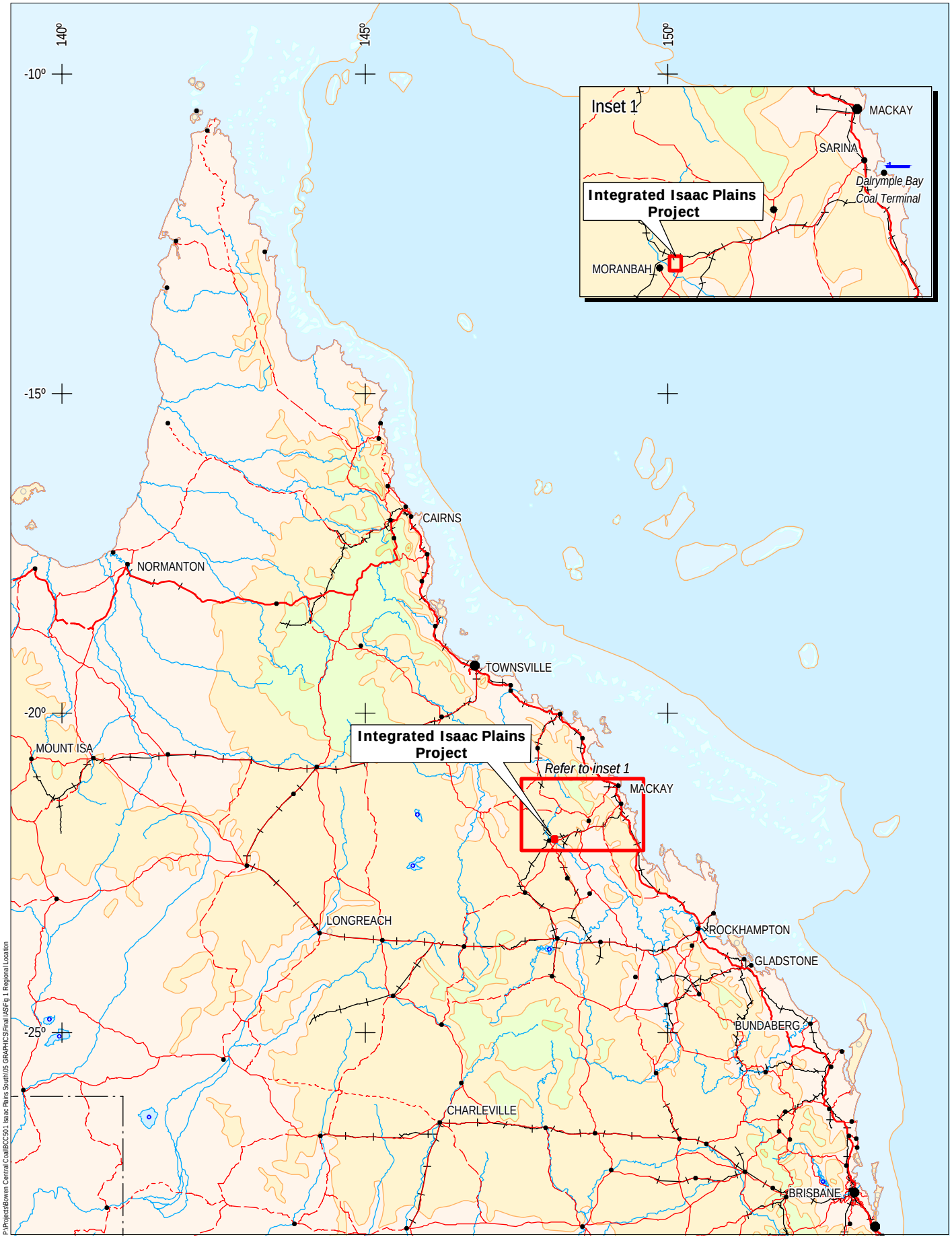
The Expansion Area is bisected by the Isaac River, with the area south of the Isaac River currently accessed via Winchester Road. No mining within the Expansion Area is currently proposed to the north of the Isaac River: the mine pits within the Expansion Area will be located south of the Isaac River. However, a crossing of the Isaac River will be required to provide access from the Peak Downs Highway and to transport coal to the Isaac Plains Coal Mine CHPP. The access/haul road will also require the construction of an underpass of the Peak Downs Highway.

The southern boundary of the Expansion Area is bordered by Cherwell Creek, a tributary of the Isaac River. Neither Cherwell Creek nor the Isaac River will require diversion. Conrock Gully, also a tributary of the Isaac River, passes through the middle of the Expansion Area in a general west-east direction, and will require diversion.

The Winchester Downs homestead is located south of Cherwell Creek, less than 1 km south of the proposed Expansion Area boundary and approximately 1 km from the planned southern extent of the open cut development (refer **Figure 2-2**). The Wotonga homestead is located approximately 1-1.5 km north-east of the proposed access/haul road crossing of the Peak Downs Highway. The derelict Poitrel homestead is located approximately 3 km east of the Expansion Area, on the Poitrel ML. The Morambah homestead is located about 4-5 km to the north-west of the Expansion Area. The township of Moranbah is located approximately 10-12 km to the north-west.

The Expansion Area covers an area of approximately 3,425 ha. Based on current mine plans, an area in the order of approximately 1,000 ha will be subject to disturbance associated with open cut operations, roads, water management structures and mine infrastructure.

There are no areas designated as National Parks or State Forests on the Expansion Area, or within the adjacent area.



P:\Projects\Bowen Central Coal\BCC501 Isaac Plains South\05 GRAPHICS\Final IASIFig 1 Regional Location

Legend

- City
- Town
- Road
- Track
- Railway line

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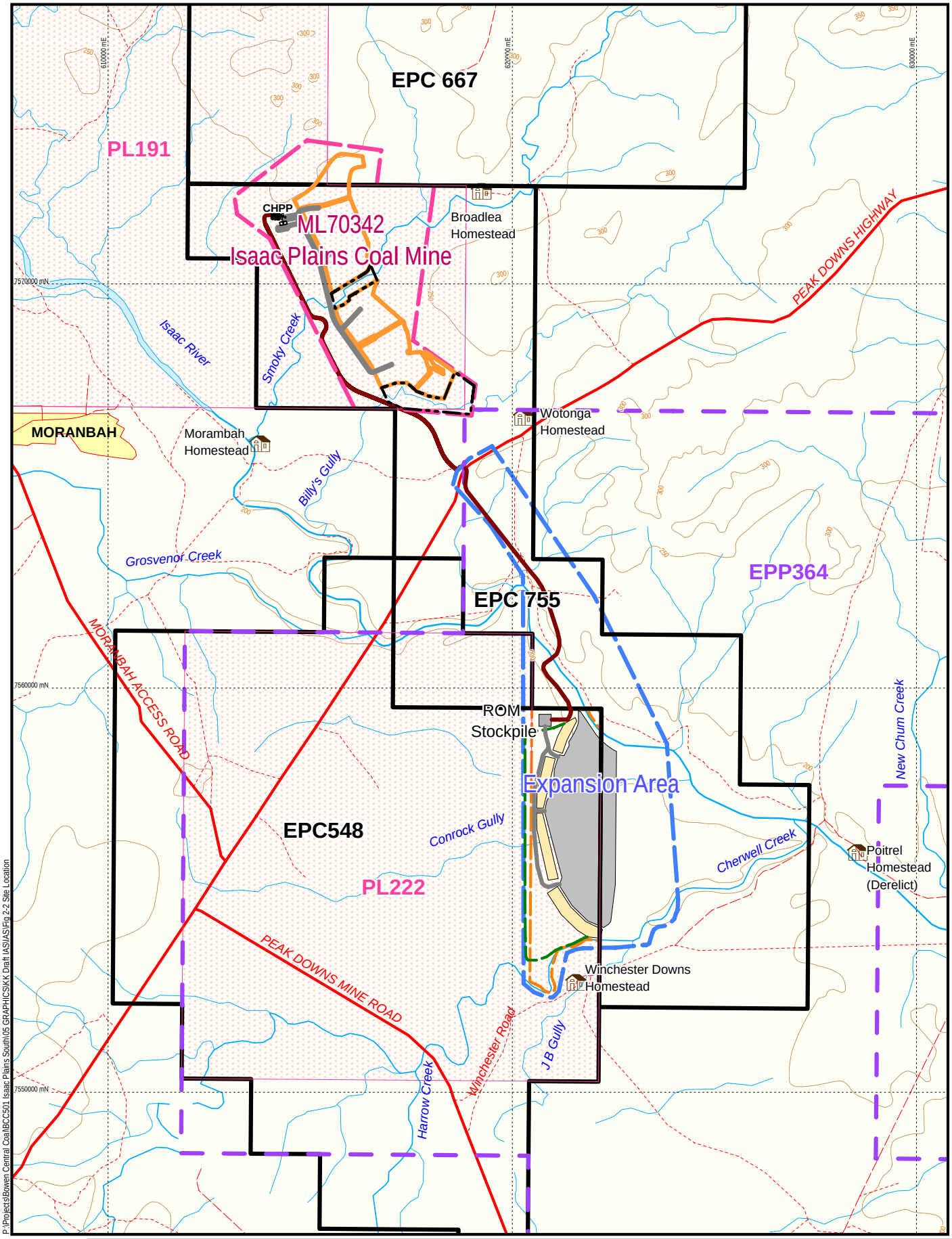
Regional Location

Datum: WGS84
Projection: Lat/Long

0 250 500
kilometres

FIGURE 2-1



P:\Projects\Bowen Central Coal\BCC501 Isaac Plains South\05 GRAPHICS\KK Draft IAS\IAS\Fig 2-2 Site Location

Drainage
50m topographic contour
Road
ML boundary (ML70342)
Proposed ML Boundary
MLA boundary (including the KDA)
EPC boundary
Out-of-Pit Spoil
Pit Outline
Haul Road
Access / Haul Road
Potential Out-of-Pit Spoil Dump Extension
EPP boundary
PL boundary
Pit / Out-of-pit spoil
Additional Pit / Out-of-Pit Spoil (waterway diversion area)

Datum: GDA94
Projection: MGA Zone 55

2 0 2
kilometres

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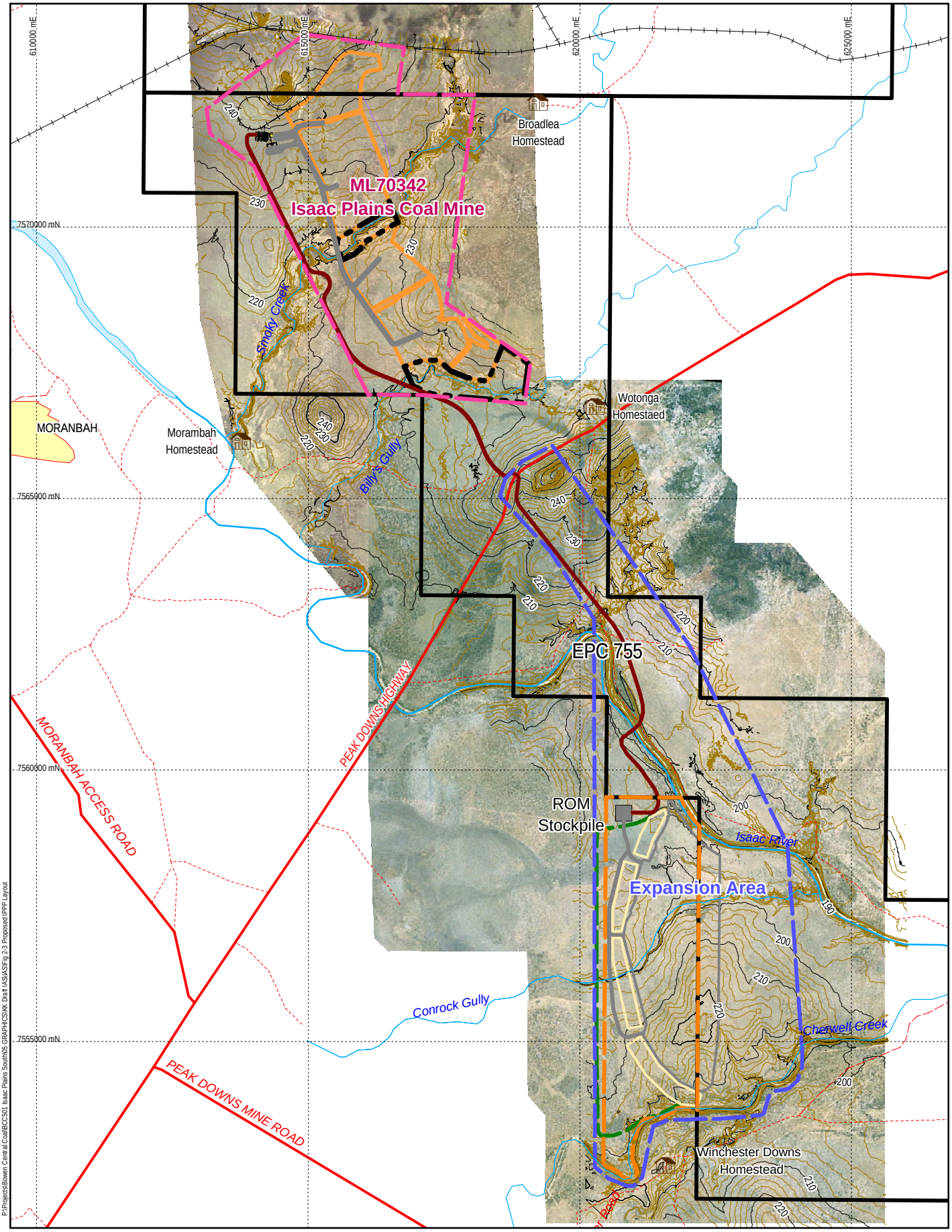
Site Location

FIGURE 2-2



P:\Projects\Bowen Central Coal\BCC501 Isaac Plains South\05 GRAPHICS\WK Draft IA\SIA\SIFig 2-3 Proposed IPPP Layout

Drainage
Rail line
Road
ML boundary (ML70342)
Proposed ML Boundary
MLA boundary (including the KDA)
EPC boundary
Access / Haul Road
Potential Out-of-Pit Spoil Dump Extension
Out-of-Pit Spoil
Pit Outline
Pit / Out-of-pit spoil
Additional Pit / Out-of-Pit - Spoil (waterway diversion area)

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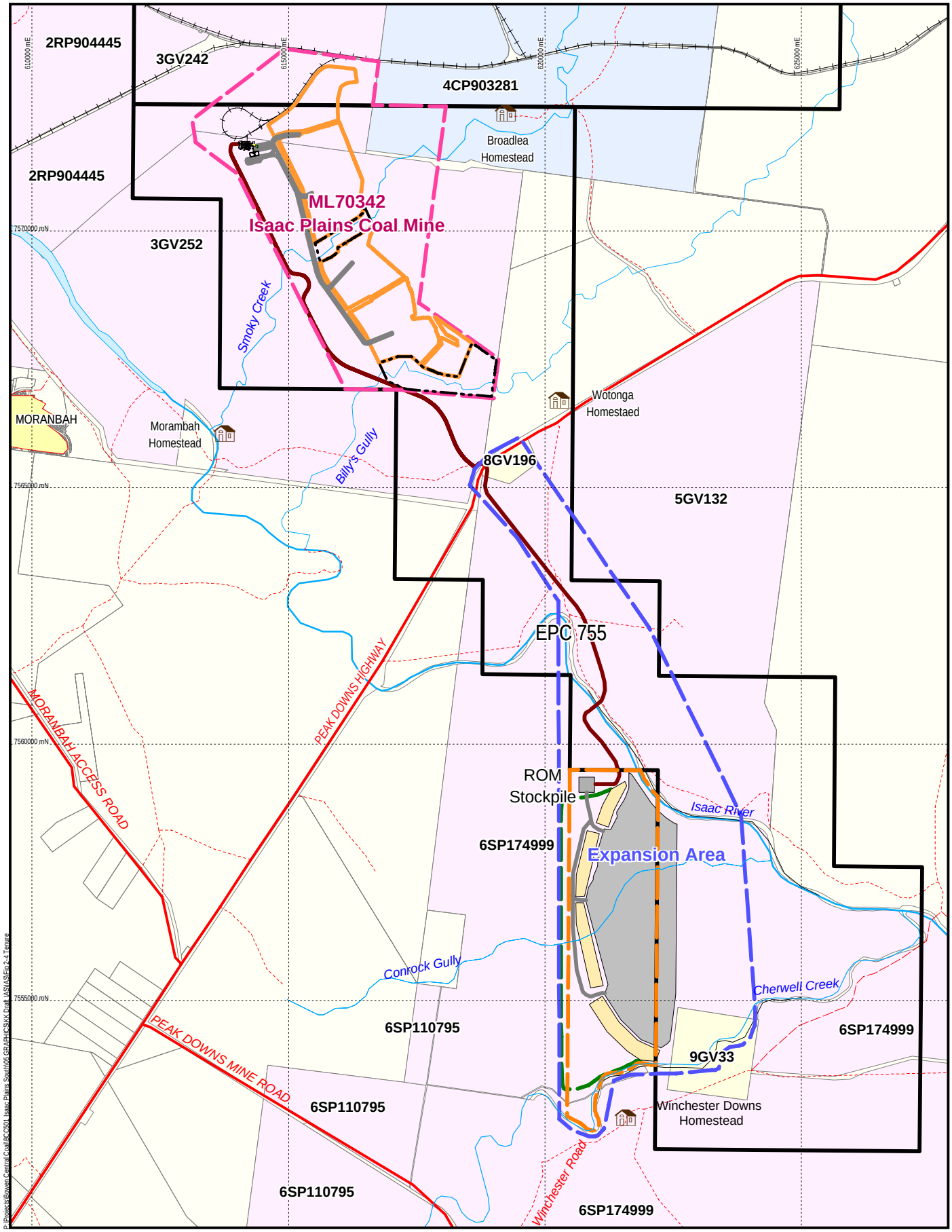
Proposed Layout

Datum: GDA 94
Projection: MGA, zone 55

1 0 1 2 3
kilometres

FIGURE 2-3



Drainage
Rail line
Road
ML boundary (ML70342)
Proposed ML Boundary
MLA boundary (including the KDA)
EPC boundary
Out-of-Pit Spoil
Pit Outline
Haul Road
Access Road / Haul Road
Potential Out-of-Pit Spoil Dump Extension

Freehold
Reserved
Lands Lease
Pit / Out-of-pit spoil
Additional Pit / Out-of-Pit Spoil (waterway diversion area)

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Integrated Isaac Plains Project

Tenure

Datum: GDA 94
Projection: MGA, zone 55

2 0 2
kilometres

FIGURE 2-4

2.2 MINING ACTIVITIES

The IIPP will be developed as an open cut coal mine involving the production of ROM coal from one or more active mining areas concurrently. The ROM coal will be transported to the CHPP at the Isaac Plains Coal Mine to be crushed, sized and washed, before being railed to Dalrymple Bay Terminal for export. Approximately 75% of the coal produced will be coking coal with the remaining 25% of coal being thermal coal.

Detailed mine planning is currently being finalised for the IIPP. Truck and shovel and dragline methods will be used to achieve the planned 4 Mtpa of production.

The proposed mining operations will entail:

- progressive clearing of the vegetation occurring on those areas to be disturbed;
- salvage and stockpiling of topsoil from disturbed areas for future use in rehabilitation;
- blasting and removal of waste rock;
- removal of coal; and
- site rehabilitation.

Mining within the Expansion Area will require the development of an initial boxcut/out of pit spoil dump in order to open up the pit. Subsequent removal of the overburden will be carried out by dragline and truck and shovel methods. The full coal seam will be extracted from north to south. Overburden material will initially be placed out-of-pit, with in-pit emplacement undertaken once an adequate area of mined-out pit, is available. A residual void will be left after mining has been completed.

2.3 COAL PROCESSING AND HANDLING FACILITIES

Mined coal from the Expansion Area will be hauled north across a low level crossing of the Isaac River, and through an underpass of the Peak Downs Highway, to the CHPP at the Isaac Plains Coal Mine. The approved CHPP has the capacity to accommodate the planned ROM coal production of 4 Mtpa from the IIPP.

A tailings dam is not required for the IIPP as the CHPP has a belt filter press which eliminates tailings. Coarse and fine rejects will be co-disposed back into the pit.

2.4 TRANSPORT ACTIVITIES

Coal mined within the Expansion Area will initially be stockpiled to the south of the Isaac River and then hauled by truck to the CHPP via an access/haul road which incorporates a low level crossing of the Isaac River and an underpass of the Peak Downs Highway. Options are being investigated in relation to the type of crossing for a range of flood events to determine an optimal design and acceptable level of risk of not being able to use the crossing for a given event. Stockpiling of ROM coal will be required at the CHPP to enable its continuous operation in the event of flooding the access/haul road crossing of the Isaac River. Both coal haulage and processing of coal from the Expansion Area will be undertaken on a campaign basis.

Once processed, the coal will then be railed from the Isaac Plains Coal Mine loading facility to the Dalrymple Bay Coal Terminal for export.

2.5 SUPPORT ACTIVITIES

Development of the Expansion Area will provide IPCM with an increased coal reserve which can be accessed largely utilising infrastructure and services that have or are currently being developed for the Isaac Plains Coal Mine.

Overburden blasting will be conducted in the Expansion Area to expose coal for mining (as is the case of the Isaac Plains Coal Mine). Blasting materials, i.e. explosives, detonators, delays etc will be transported to site by a specialist contractor prior to each blast to minimise storage requirements. It is proposed that the explosives will be stored on ML70342, with the location of the storage dependent on the arrangements with the contractor.

IPCM propose to construct crib rooms and associated support infrastructure in the Expansion Area. Sewage will be managed by:

- treatment in a small package sewage treatment plant, with on-site irrigation; or
- containment in a tank from which it will be regularly removed and transported to Moranbah for treatment in the Moranbah sewage treatment plant.

2.6 WORKFORCE REQUIREMENTS

An operational workforce of 80 is employed at the existing Isaac Plains Coal Mine for its 2 Mtpa operation, with the majority of personnel working on a two shift roster, five days per week.

With the introduction of mining in the Expansion Area, the increase in production from 2 Mtpa to 4 Mtpa and increased hours of CHPP operations, the workforce required will increase to a total of 120. Mining and associated activities will be undertaken 24 hours per day, seven days per week, with the majority of personnel working on a four shift per day rotation.

In addition to staff required for mining operations, approximately 20 persons (potentially peaking at 40 persons for a very short period) will be required for the construction of the haul/access roads within the Expansion Area and between the Expansion Area and the Isaac Plains Coal Mine (including contruction of the underpass of the Peak Downs Highway); construction of the low level crossing of the Isaac River and the development of the mine infrastructure area within the Expansion Area. Construction activities will be completed in a period of approximately three months.

2.7 WORKFORCE ACCOMMODATION

Accommodation for the majority of operational and construction personnel will be at the Coppabella camp on the Peak Downs Highway, approximately 25 km east of the IIPP and 35 km east of the township of Moranbah. A small number of personnel may reside in the township of Moranbah.

2.8 WORKFORCE TRANSPORT

Buses seating 20 to 30 people will transport the majority of the workforce to and from the mining and construction operations. Approximately 10 light vehicle trips are currently made per day between Coppabella and the existing operations at the Isaac Plains Coal Mine. This will increase to approximately 20 per day with extension of mining operations into the Expansion Area.

2.9 NOTIFIABLE ACTIVITIES

In accordance with Schedule 2 of the EP Act, the expansion of the Isaac Plains Coal Mine may require the introduction of notifiable activities to the proposed MLs, e.g. petroleum product and oil storage and chemical storage etc. A number of other notifiable activities will occur as part of the approved Isaac Plains Coal Mine on ML70342 and will support the operations within the Expansion Area.

3 COMMUNITY CONSULTATION

IPCM will undertake an extensive community consultation program in order to address the various environmental, social and economic interests of both Nebo and Belyando Shires during and beyond the EIS process. This program will involve community representatives working with IPCM to identify and work towards the objective of providing the best possible environmental, social and economic outcomes for the local community.

The community representatives, working with IPCM and with the support of the EPA, will seek to achieve the following broad objectives.

1. Provide opportunities and seek community input into future uses for different types of land (or domains) on site which would provide the best possible environmental, economic and social outcomes for the local community.
2. Ensure an open and accountable community consultation program is undertaken which meets, and where possible, exceeds all requirements under the EP Act (i.e. schedule of public advertisements).
3. Ensure all feedback is captured and incorporated to help develop criteria that could be used to judge whether future rehabilitation efforts for the IIPP site are successfully progressing towards developing that land (or domain) for its proposed future use.
4. Develop a review process that:
    - provides the broader community with opportunities to provide ongoing input; and
    - ensures the various management plans developed for the IIPP evolve over time to reflect changing community values and advances in scientific knowledge.

The formal EIS process is a public process that requires public notices and requests for comments from the community, initially on the draft ToR and then the draft EIS. As IPCM has agreed to conduct a voluntary EIS, community consultation will become an integral component in the development of drafts for both the ToR and EIS. The community consultation process requires the early identification of stakeholders and engagement of these stakeholders to manage the comments on the EIS process.

3.1 AFFECTED AND INTERESTED PERSONS/PARTIES

The following is a list of *affected* and *interested* persons/parties who will be notified.

An ***affected person/party*** is:

- "a person on the operational land or any land adjoining it;
- a registered native title body corporate;
- a registered native title claimant;
- a representative Aboriginal/ Torres Strait Islander body; or
- a relevant local government for the operational land".

An ***interested person/party*** is:

> "a person proposed under Section 41(3)(b) of the EP Act; i.e. an unincorporated community or environmental body with a financial or non-financial interest in the local government area that the operational land is in"

To identify and manage potential stakeholder input, the following consultation program has been commenced

1. Meet with the DEH in Canberra to discuss EPBC Referral prior to lodgement (complete).
2. Pre-lodgement meetings with the EPA Emerald to discuss IPCM's intentions and proposed process (complete).
3. Consult with the EPA, DNRW, DME, Councils, Traditional Owners (TOs) and landholders during preparation of the draft ToR.
4. Publicly notify the release of the draft ToR for comment and post on the Matrix+ Consulting website.
5. Contact those who provided comments on the draft ToR to explain how their submission was considered in finalising the ToR.
6. Consult with EPA, DNRW, DME, Councils, TOs and landholders during preparation of the draft EIS.
7. Publicly notify the release of the draft EIS and post on Matrix+ Consulting website.
8. Provide a hard copy of the draft EIS to directly *affected persons/parties*. Copies of the draft EIS will be available to the broader community by downloading from an EPA or Matrix+ Consulting dedicated website as directed through a public notice in the Daily Mercury.
9. Contact those who provided comments on the draft EIS to explain how their submission was considered in finalising the EIS.
10. Include a report on the consultation process in the final EIS.

An EPBC Act referral has been assessed by the DEH and on the 10 October 2006 was decided by a delegate of the Federal Minister for Environment and Heritage not to be controlled action.

4 ENVIRONMENTAL VALUES AND POTENTIAL IMPACTS

The environmental values and potential impacts from the activities associated with the IIPP are presented in this section.

4.1 FLORA AND FAUNA

Based on the EPBC Protected Matters Search Tool, there are no World Heritage properties, National Heritage places, Ramsar wetlands, Commonwealth marine areas and Commonwealth land, listed Commonwealth Heritage places or conservation reserves/parks within or adjacent to the IIPP site.

Detailed ecological investigations have been undertaken on both the existing Isaac Plains Coal Mine and the Expansion Area using desk-based assessments, literature reviews and field assessments. Ground truthing of REs and fauna habitat assessments were undertaken on the existing Isaac Plains Coal Mine in June 2004 and within the footprint of the Expansion Area in May 2005. Detailed fauna species surveys were conducted over an 11 day period (7th to 17th February 2006) along Smoky Creek and Billy's Gully in the existing Isaac Plains Coal Mine, and Conrock Gully in the Expansion Area.

Ecological investigations focused on:

- isolating or identifying the biodiversity and general patterns of fauna occurrence;
- presumed or known occurrences of flora and fauna species and ecological communities with conservation significance (as per State and Commonwealth legislation); and
- the values of vegetation communities for species of conservation significance and sources of biodiversity.

Salient findings of the surveys have been summarised below.

4.1.1 Vegetation

4.1.1.1 Current Condition of Vegetation

The majority of the areas to be disturbed are highly modified, i.e. cleared grazing land, providing limited habitat opportunities for native woodland fauna. These cleared areas provide habitat for some native grassland species but do not (or are unlikely to) exhibit the characteristics required for them to qualify as native grassland communities given the dominance of the introduced pasture species, Buffel Grass (*Cenchrus ciliaris*), and the low diversity of other grasses and herbs.

Remnant vegetation is restricted largely to relatively robust tracts of riparian and frontage woodland along the Isaac River and Cherwell Creek, a narrow band of riparian vegetation along Conrock Gully, and a riparian corridor along Smoky Creek which is 'of concern' (under the *Vegetation Management Act 1999* (VMA)). The limited riparian vegetation which exists along Billy's Gully is 'not of concern' (under the VMA). Remnant vegetation within the areas is in poor-moderate ecological condition with the impacts of grazing evident, i.e. reduced groundcover and shrub diversity, replacement of the native groundcover flora with Buffel Grass in most areas, and replacement of native groundcover along Isaac River with Guinea Grass.

Canopy dieback is widespread throughout the Expansion Area. It is especially prolific within the woodland in the southern part of the Expansion Area (i.e. along Conrock Gully and adjacent to Cherwell Creek) and has had a profound effect on the vegetation in some areas where major, and in some cases total, canopy dieback has recently occurred, thereby removing the remnant status of the vegetation. The woodland along the Isaac River is in the best ecological condition when compared to the remainder of the Expansion Area. Some dieback occurs along the river but it restricted to isolated trees or groups of trees. The Isaac River habitats retain diversity of canopy, shrubs and, in places, ground flora which provide a greater number of shelter and feeding opportunities for fauna in comparison with the remainder of the IIPP site. The riparian corridor of the Isaac River is especially significant as it provides a continuous vegetated corridor through and beyond the Expansion Area which is likely to provide a regional wildlife corridor function for native fauna. Throughout all woodland areas, ground habitat values are diminished by the virtual monoculture of Buffel Grass and the consequent lack of floristic and structural diversity.

Given the limited extent and poor condition of remnant habitats in those components of the Expansion Area to be disturbed and areas to be disturbed along Smoky Creek and Billy's Gully, it is not anticipated that these areas represent any critical habitat.

4.1.1.2 Regional Ecosystems

During field surveys in the Expansion Area, isolated discrepancies were identified in the land zone type and the floristic composition of the dominant stratum in the current Queensland Herbarium (QH) (Version 4.0) RE mapping, primarily due to the large scale used in the QH mapping. Anomalies with the existing QH Version 4.0) mapping include the incorrect mapping of "endangered" (RE 11.4.9 *Acacia harpophylla* – Brigalow) and "of concern" RE polygons.

QH RE mapping of the Expansion Area includes RE types which were not present on site, and conversely, there are two RE types identified during field surveys which were not included. **Table 4-1** lists REs that are mapped but not present, mapped and are present, and those that were found but not mapped, including their conservation status under the VMA. Endangered REs were found within the proposed Expansion Area, some of which lie within the footprint of the proposed area of disturbance and in an area to the south of the pit. In addition, some areas of Brigalow occurring as a mosaic with other vegetation types will be impacted by infrastructure required as part of the Expansion Area development.

Table 4-1 Mapped REs – Expansion Area

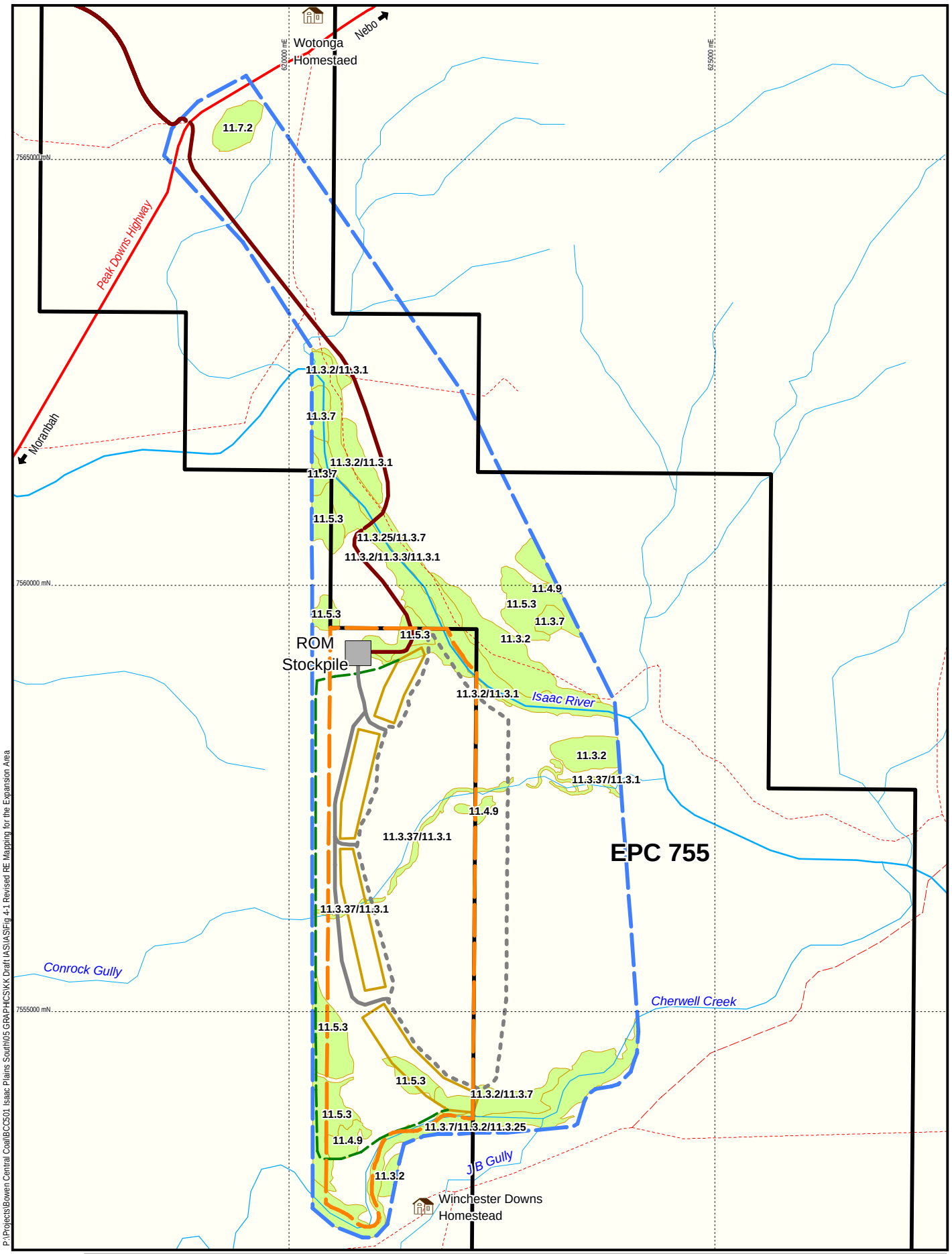
RE	Description	VMA Status	Field verification of presence within the Expansion Area
REs mapped but not present			
11.4.4	*Dichanthium* spp., *Astrebla* spp. grassland on Cainozoic clay plains	*not of concern*	This RE is mapped as a mosaic with RE 11.4.9 and 11.5.3. for a small area on the eastern side of the Isaac River. The area was severely eroded and a native grassland was not present.
11.4.8	*Eucalyptus cambageana, Acacia harpophylla* and/or *Acacia argyrodendron* woodland on cainozoic clay plains.	*Endangered*	Three small areas of this RE are mapped in the southern part of the Expansion Area. It is anticipated that this RE did occur within the Expansion Area prior to clearing (based on the presence of regrowth *E. cambageana*). However, ground truthing results indicate that there are no remnant areas of this RE left in the Expansion Area.
REs mapped and found to be present			
11.3.1	*Acacia harpophylla* and/or *Casuarina cristata* open forest on alluvial plains.	*Endangered*	This RE is mapped in a mosaic with RE 11.3.2 along Conrock Gully, and with RE 11.3.2 and 11.3.25 along Cherwell Creek. It was not found along Cherwell Creek, but does occur along Conrock Gully and on the western side of the Isaac River.
11.3.2	Woodland to open woodland of *Eucalyptus populnea* (Poplar Box) on Cainozoic alluvial plains.	*of concern*	This RE is mapped in a number of locations as a mosaic with other REs, especially RE 11.3.7. The field survey found a number of these polygons to contain only RE 11.3.2, and others to indeed comprise a mosaic within the REs.
11.3.7	*Corymbia spp.* (Bloodwoods) woodland on alluvial plains on sandy soils.	*not of concern*	This RE is mapped mainly as a mosaic with RE 11.3.7. Field verification revealed that many of these areas did not contain RE11.3.7. However, there were some areas where this RE occurred including as a mosaic with RE11.3.25 along the banks of the Isaac River and Cherwell Creek, and as a discrete patch on an alluvial bench adjacent to the Isaac River.
11.3.25	*E. camaldulensis* (River Red Gum), *Casuarina cunninghamiana* fringing woodland on alluvial plains.	*not of concern*	Field inspections confirmed the mapped occurrence of this RE along watercourses. However, it occurs predominantly as a mosaic with RE 11.3.7 along the Isaac River, and as a mosaic with RE11.3.7 and 11.3.2 along Cherwell Creek.

RE	Description	VMA Status	Field verification of presence within the Expansion Area
11.4.9	*Acacia harpophylla* (Brigalow) shrubby open forest to woodland with *Terminalia oblongata* and *Eremophila mitchellii* on clay plains or weathered basalt.	*endangered*	This RE is mapped in a number of locations throughout the Expansion Area as a sub-dominant RE in a mosaic with RE11.5.3. Most of these polygons do not support RE11.4.9. However, there is one small polygon occurring on the western side of the Isaac River. Another area of Brigalow occurring on the southern side of Conrock Gully was mapped for the map amendment but was not allocated a proposed RE code. This is a rather enigmatic area of vegetation that may represent a transitional community between Land Zone 4 and 5. Identification of the correct RE type has been left to the QH. The area may be identified as RE11.4.9 or another brigalow RE type. Regardless of the RE type finally assigned, the RE will be endangered due to the presence of Brigalow as a dominant species.
11.5.3	Shrubby woodland with *Eucalyptus populnea* (Poplar Box) and/or *E. melanophloia* (Silver Ironbark) and/or *Corymbia* spp. (Bloodwood) on sand plains.	*not of concern*	Field inspections confirmed the occurrence of this RE in most of the currently mapped polygons.
11.7.2	*Acacia* spp. woodland on lateritic duricrust. Scarp retreat zone.	*not of concern*	Occurs on the small esscarpment area in the northern part of the Expansion Area, adjacent to the Peak Downs Highway.
REs not mapped but found to be present			
11.3.3	*Eucalyptus coolabah* woodland on alluvial plains	*of concern*	This RE has been proposed in map amendment. It occurs in association with REs 11.3.2 and 11.3.1 on the narrow alluvial band along the western bank of the Isaac River.
11.3.37	*Eucalyptus coolabah* fringing woodland on alluvial plains	*not of concern*	This RE has been proposed in the map amendment to reflect the mosaic co-dominance of *Eucalyptus coolabah* with *Acacia harpophylla* (RE11.3.1) along Conrock Gully.

Figure 4-1 illustrates revised RE mapping in accordance with field survey results. A map amendment request has been made to the former Queensland Department of Natural Resources, Mines and Water[1] (DNRMW) to rectify the anomalies in the current QH RE mapping[1].

[1] Now known as Department of Natural Resources and Water (DNRW)

[1] REs identified in field surveys by specialist consultant. Map amendment yet to be confirmed by QH.



P:\Projects\Bowen Central Coal\BCC501 Isaac Plains South\05 GRAPHICS\KK Draft IAS\IAS\Fig 4-1 Revised RE Mapping for the Expansion Area

Proposed ML Boundary
EPC Boundary
MLA Boundary (including the KDA)
Pit Outline
Out-of-Pit Spoil
ROM Stockpile
Haul Road
Access / Haul Road
Potential Out-of-Pit Spoil Dump Extension
Remnant Vegetation (Version 5.0 Mapping)

MATRIX CONSULTING

Isaac Plains Coal Management Pty Ltd

Integrated Isaac Plains Project

Revised RE Mapping for the Expansion Area

Datum: GDA94
Projection: MGA Zone 55

2 0 2
kilometres

FIGURE 4-1

No endangered REs (including Brigalow) were found to occur in the existing Isaac Plains Coal Mine. However, two small "of concern" REs were identified along Smoky Creek as outlined in **Table 4-2**.

Table 4-2 Mapped REs – Isaac Plains Coal Mine

RE	Description	VMA Status	Field verification of presence within the Isaac Plains Coal Mine area
REs mapped but not present			
11.4.9	*Acacia harpophylla* (Brigalow) shrubby open forest to woodland with *Terminalia oblongata* and *Eremophila mitchellii* on clay plains or weathered basalt.	*endangered*	This RE is mapped as a sub-dominant mosaic on the eastern and southern boundaries of the study area. Field verification revealed that the portions of the polygons within the study area do not include RE11.4.9. This RE is also mapped as a dominant mosaic with RE 11.8.5 in small areas in the southern part of the area. However, field observations show these polygons to be incorrectly mapped.
11.8.5	*Eucalyptus orgadophila* (Mountain Coolibah) open woodland on igneous rocks	*not of concern*	This RE is mapped as a sub-dominant mosaic with RE 11.4.9 in small areas in the southern part of the study area. Field observations show these polygons to be incorrectly mapped. RE 11.8.5 does not occur in the area.
REs mapped and found to be present			
11.3.2	Woodland to open woodland of *E. populnea* (Poplar Box) on Cainozoic alluvial plains.	*of concern*	This RE is mapped as a mosaic with RE 11.3.7 in a relatively large remnant polygon in the northern central part of the study area. This area is dominated by Poplar Box however it is Land Zone 5 not LZ3 (alluvium) therefore the RE type assigned to this polygon is incorrect and is more correctly attributed to RE11.5.3 (*not of concern*). There is an unmapped area of RE 11.3.2 adjacent to the riparian corridor of Smokey Creek. This area is mapped in the revised RE map.
11.3.7	*Corymbia spp.* (Bloodwoods) woodland on alluvial plains on sandy soils.	*not of concern*	This RE is mapped as a mosaic with RE 11.3.2 in a relatively large remnant polygon in the northern central part of the study area. This area is dominated by Poplar Box on Land Zone 5 not LZ3 (alluvium) and does not contain any RE 11.3.7. This RE type does occur as a mosaic with RE 11.3.25 along the smaller tributary on the southern boundary of the study area. This has been mapped in the revised RE map.
11.3.25	*E. camaldulensis* (River Red Gum), *Casuarina cunninghamiana* fringing woodland on alluvial plains.	*not of concern*	Field inspections confirmed the mapped occurrence of this RE along watercourses; however, it occurs predominantly as a mosaic with RE 11.3.7 and RE 11.3.4 on the narrow alluvial terrace adjacent to the watercourses in the area.
11.5.3	Shrubby woodland with *E. populnea* (Poplar Box) and/or *E. melanophloia* (Silver Ironbark) and/or *Corymbia* spp. (Bloodwood) on sand plains.	*not of concern*	Field inspections confirmed the occurrence of this RE in polygons mapped as other RE's. This RE is also incorrectly mapped as a mosaic with RE 11.4.9 on the southern boundary of the area where the access road enters the site.
11.5.9	*Eucalyptus crebra* (Narrow leaved ironbark) and other *Corymbia* species woodland on sand plains including plateaus and broad crests.	*not of concern*	This RE is mapped on the south-western boundary of the study area. However, the portion of the polygon within the area does not include RE11.5.9. This RE does occur along the southern boundary of the area where the access road enters the site.

RE	Description	VMA Status	Field verification of presence within the Isaac Plains Coal Mine area
REs not mapped but found to be present			
11.3.4	Tall woodland of *E. camaldulensis* (River Red Gum) on alluvial terraces and plains, with mixed eucalypts including *C.tessellaris* (Carbeen), *Eucalyptus coolabah* (Coolabah), *E. populnea* (Poplar Box).	*of concern*	Occurs as a mosaic with RE 11.3.25 along Smoky Creek.
11.5.12	*Corymbia clarksoniana* woodland and other *Corymbia* spp. and *Eucalyptus* spp. on sand plains/remnant surfaces.	*not of concern*	Occurs on the small mesa near the rail loop.
11.7.2	*Acacia* spp. woodland on lateritic duricrust. Scarp retreat zone.	*not of concern*	Occurs on the small mesa near the rail loop.

RE mapping amendments for the Isaac Plains Coal Mine area, according to the field assessment findings, have been accepted by the QH and are presented in **Figure 4-2**.

4.1.2 Endangered Ecological Communities under the EPBC

The EPBC interactive search utility indicates the presence of three Endangered Ecological Communities (EECs) on or in the vicinity of the IIPP site, namely:

- Bluegrass (*Dichanthium* spp.) dominant grasslands of the Brigalow Belt Bioregion [*endangered*];
- Brigalow (*Acacia harpophylla* dominant and co-dominant) [*endangered*]; and
- Semi-evergreen vine thickets of the Brigalow Belt and Nandewar Bioregions [*endangered*].

The field inspections confirmed that neither Bluegrass grasslands nor Semi-evergreen vine thicket communities occur in the Expansion Area. However, based on available mapping, Brigalow communities are present within Expansion Area, as illustrated in **Figure 4-3**.

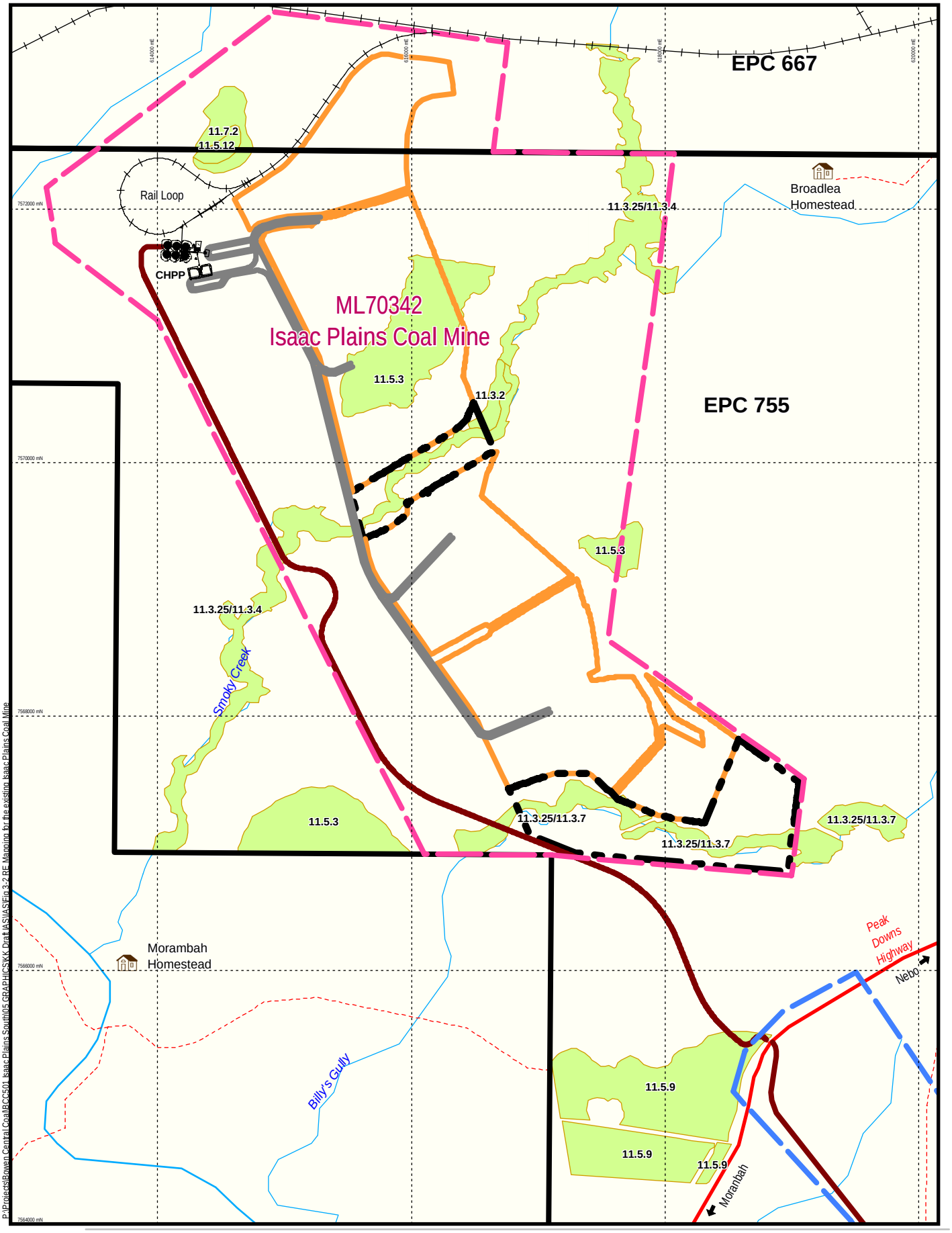
Field inspections confirmed that no EECs are present on the existing Isaac Plains Coal Mine.

4.1.3 Flora

Detailed surveys of the Expansion Area, Smoky Creek and Billy's Gully were undertaken to detect any rare or threatened flora. Five species were listed under the EPBC Act or the *Nature Conservation Act 1992* (NCA) as potentially occurring in the abovementioned survey area, one *possible* and four *unlikely*.

- ***Possible***
  - *Desmodium macrocarpum* [Fabaceae]
- ***Unlikely***
  - *Bertya pedicillata* [Euphorbiaceae]
  - *Dichanthium queenslandicum* [Poaceae]
  - *Digitaria porrecta* [Poaceae]
  - *Persoonia amaliae* [Proteaceae]

No rare or threatened flora species listed were detected during the field surveys. One species, *Desmodium macrocarpum,* is known to occur in the Poplar Box woodland with a shrubby groundcover such as RE 11.5.3 (refer **Table 4-1**). It is not expected that this species occurs in the area proposed to be disturbed by the IIPP.



P:\Projects\Bowen Central Coal\BCC501 Isaac Plains South\05 GRAPHICS\KK Draft IAS\IAS\Fig 3-2 RE Mapping for the existing Isaac Plains Coal Mine

MATRIX CONSULTING

- EPC Boundary
- ML Boundary (ML70342)
- Proposed ML Boundary
- Pit / Out-of-pit spoil
- Haul Road
- Access Road / Haul Road
- Revised Regional Ecosystems
- Additional Pit / Out-of-Pit Spoil (waterway diversion area)

Isaac Plains Coal Management Pty Ltd

Integrated Isaac Plains Project

RE Mapping for the existing Isaac Plains Coal Mine

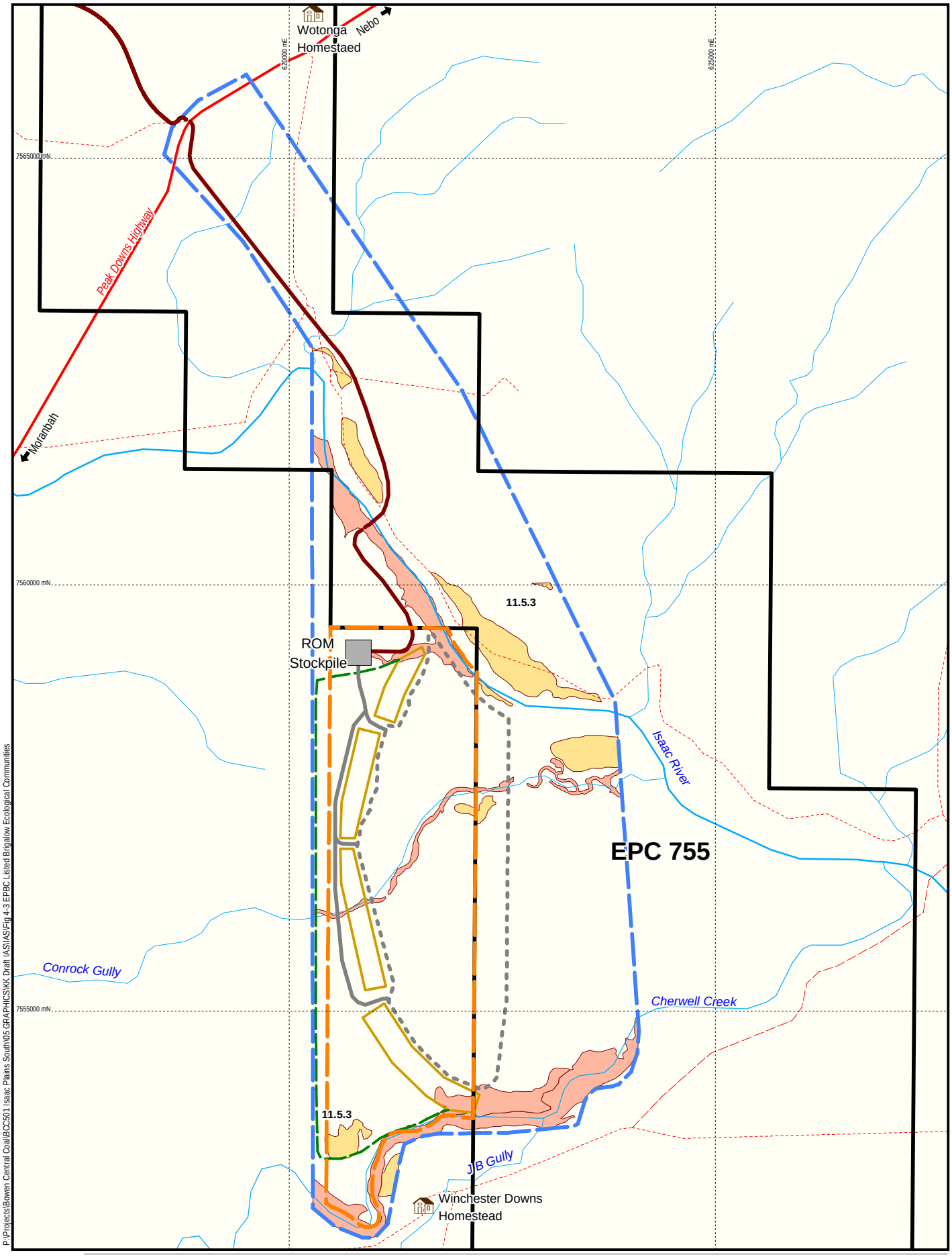
Datum: GDA94
Projection: MGA Zone 55

0 1000 2000

metres

FIGURE 4-2

Source: Isaac Plains Fauna and Flora Assesment, Ecotone Environmental Services PTY LTD; February 2005



P:\Projects\Bowen Central Coal\BCC501 Isaac Plains South\05 GRAPHICS\KK Draft IAS\IAS\Fig 4-3 EPBC Listed Brigalow Ecological Communities

MATRIX CONSULTING

- Proposed ML Boundary
- EPC Boundary
- MLA Boundary (including the KDA)
- Pit Outline
- Out-of-Pit Spoil
- ROM Stockpile
- Haul Road
- Access / Haul Road
- Potential Out-of-Pit Spoil Dump Extension
- Brigalow Low Open Forest
- Brigalow as Mosaic with other Vegetation

Isaac Plains Coal Management Pty Ltd

Integrated Isaac Plains Project

EPBC Listed Brigalow Ecological Communities

2 0 2

kilometres

Datum: GDA94
Projection: MGA Zone 55

FIGURE 4-3

4.1.4 Fauna

4.1.4.1 Rare and Threatened Fauna

Table 4-3 details the rare or threatened fauna that are known to occur or potentially occur within the IIPP site and surrounding area and provides an assessment of the likely occurrence of each species. The species evaluated were compiled from the results of database searches and also includes additional species that were regarded as potentially occurring in the study region. This list includes species scheduled as rare, vulnerable, or endangered.

The search of the Queensland Museum database did not identify any rare or threatened fauna specimens within or in the vicinity of the IIPP site. The Wildnet database contained observation records of three rare species, while the EPBC search tool indicated eight species as potentially occurring in the vicinity of the IIPP site.

Assessment of the likely occurrence of each species is based on the known habitat preferences of each species and the availability and condition of potential habitat within the IIPP site. Assessments of the potential presence of species were tempered by the general paucity of published knowledge regarding the distribution and abundance of rare and threatened species in the Queensland Central Highlands. Where a species has been observed it has been noted as *present*. Other species listed are assessed as being *likely*, *possible* or *unlikely*.

Table 4-3 Rare or Threatened Fauna – IIPP

Species *Source of Record*	NCA Status	EPBC Status	Key Resources	Habitat	Likelihood of occurrence within the IIPP site
Birds					
Erythrotriorchis radiatus Red Goshawk *epbc*	E	V	Trees > 20m high for nesting within 1km of a watercourse or wetland. Abundance of passerine prey.	Coastal and sub-coastal forests and riparian forests.	***Possible;*** the species may utilise the riparian forest along the Isaac River and Cherwell Creek, Smoky Creek and Billy's Gully. However, it is unlikely that the majority of the IIPP site provides significant habitat for the species due to the extent of clearing of adjoining timbered habitats. The Smoky Creek corridor may provide a local movement corridor for the species. Due to the disturbed nature of the study area it is highly unlikely that the species breeds in the local area.
Accipiter novaehollandiae Grey Goshawk *epa*	R		Availability of prey items.	Closed forest, tall wet forest, and riparian forest amid disturbed areas. Tends to utilise lowland riparian forest during winter.	***Possible;*** as with Red Goshawk this species may utilise the riparian corridors within the IIPP site but the balance of the site provides little habitat values. The Smoky Creek corridor may provide a local movement corridor for the species. Due to the disturbed nature of the study area it is highly unlikely that the species breeds in the local area. Also, this species is seldom encountered west of coastal ranges.
Ephippiorhynchus asiaticus Black-necked Stork (Jabiru) *epa*	R		Availability of wetland habitats.	River pools, permanent and ephemeral wetlands, tidal flats.	***Unlikely;*** there do not appear to be any ephemeral wetlands in the study area, and the waterways that are present are relatively small and incised and unlikely to provide accessible habitat for this species.
Lophoictinia isura Square-tailed Kite *epa*	R		Availability of small passerine prey, including eggs and nestlings. Presence of large wooded areas in close proximity to breeding sites.	Eucalypt forest and woodlands, not generally encountered in more open habitats.	***Possible;*** as with the Goshawks (above) this species may utilise the riparian areas but unlikely to utilise the balance of the site, with the exception of some areas of woodland habitat. Due to the disturbed nature of the study area it is highly unlikely that the species breeds in the local area.
G. scripta scripta Squatter Pigeon (southern subsp.) *epbc*	V	V	Availability of grass seed and grassy ground cover for shelter.	Prefers woodland with a grassy understorey close to water.	***Present***; observed during the summer survey in the Poplar Box patch to the north of Smoky Creek and observed in grassy woodland adjacent to the Isaac River. Also likely to utilise other grassy areas adjacent to waterways, and Poplar Box woodland in non-riparian areas.

Species *Source of Record*	NCA Status	EPBC Status	Key Resources	Habitat	Likelihood of occurrence within the IIPP site
Neochmia ruficauda ruficauda Star Finch (southern subsp.) *epbc*	E	E	Require proximity to water.	Inhabit grasslands or grassy woodlands close to water. Very few records of the species in recent years.	***Unlikely;*** this species is largely sedentary and in order to successfully inhabit an area requires persistence of suitable habitat throughout the year. The cleared areas within the site, when coupled with consistent grazing pressure, do not provide suitable habitat for the species. There is also a lack of permanent natural surface water on the IIPP site.
Rostratula australis* Australian Painted Snipe *epbc*	V	V	Vegetated ephemeral wetlands.	Inhabits shallow vegetated ephemeral wetlands in coastal and inland areas.	***Unlikely;*** suitable wetland habitat for the species does not occur within the site.
Mammals					
C. picatus Little Pied Bat *+*	R		Availability of roost sites including tree cavities, mines and buildings.	Forage in a wide variety of habitats including dry eucalypt open forest, woodland, shrublands and mallee.	***Present,*** recorded along Conrock Gully, Smoky Creek and Billy's Gully and also likely to utilise the riparian woodlands along the Isaac River and Cherwell Creek which provide potential roosting and foraging habitat.
N. timoriensis Eastern long-eared Bat (southeastern form) *epbc*	V	V	Availability of roost sites in tree hollows or under hanging bark on trees.	In the Central Queensland area occurs in drier woodlands and open woodlands. May forage on the ground.	***Unlikely***, this is a poorly known species and it is difficult to confidently predict its occurrence in the IIPP site. However, the Expansion Area is beyond the northern extent of the currently known distribution of the species. There are currently no Wildnet records of the species from Belyando Shire. On the basis of a lack of records of the species from the study region, and the failure of the Anabat survey to locate the species, it is not anticipated that the species occurs within the IIPP site.
Reptiles					
Anomalopus brevicollis Short-necked Worm-skink *+*	R		Availability of leaf litter, rocks and fallen timber for shelter and foraging.	Known from a range of vegetation including dry eucalypt woodlands, monsoon rainforest and brigalow scrubs.	***Possible;*** the remnant riparian and eucalypt woodland habitats provide potential habitat but there is a general paucity of the preferred ground habitat (leaf litter, fallen timber).

Species *Source of Record*	NCA Status	EPBC Status	Key Resources	Habitat	Likelihood of occurrence within the IIPP site
Acanthophis antarcticus Common Death Adder *+*	R		Prefers availability of leaf litter and ground cover such as shrubs and tussock grass.	Known from a wide range of timbered and treeless habitats including eucalypt woodland and forest, grasslands and heath.	***Possible;*** the remnant riparian and eucalypt woodland habitats provide potential habitat but there is a general paucity of the preferred ground habitat (leaf litter, fallen timber).
Egernia rugosa Yakka Skink *epbc*	V	V	Availability of logs or rocks or surface roots of trees on better drained soils.	Occurs in a variety of habitat types including Acacia shrublands, and eucalypt forest and woodlands on sandy plains.	***Possible;*** the remnant riparian and eucalypt woodland habitats provide potential habitat but there is a general paucity of the preferred ground habitat (leaf litter, fallen timber).
Paradelma orientalis Brigalow Scaly-foot *epbc*	V	V	Availability of ground habitats for shelter including rock slabs, rocky outcrops, bark and fallen timber.	Known from eucalypt woodlands, vine thicket and Brigalow.	***Unlikely;*** the study area does not provide sufficient amounts of the ground habitat features typically utilised by this species. Also, the IIPP site is beyond the northern limit of the currently known distribution of this species.
Rheodytes leukops Fitzroy Tortoise *epbc*	V	V	Availability of permanent aquatic habitat.	Prefers shallow, clear, fast flowing sections of rivers and creeks that are connected to large deep pools.	***Unlikely***; suitable aquatic habitat is not available within or adjacent to the IIPP site. The IIPP site is outside of the known distribution of this species.

* The schedules of the NCA list this species as *Rostratula benghalensis* rather than the recently proposed species *R. australis*, formerly considered as a subspecies of *R. benghalensis*.

Key to Source of Record codes:

epbc	potential species from the EPBC database
qm	records of specimens held at the Queensland Museum
epa	recorded observations from the Wildnet database (Environmental Protection Agency, 2004)
+	assessed as potentially present based on known distribution and available habitats

Key to Status:

E	endangered
V	vulnerable
R	rare

Key to Likelihood:

Present	Recorded in databases and observed during surveys
Likely	Suitable habitat; found in the local area
Possible	Suitable habitat; not recorded in local area/region OR sub-optimal habitat; may use infrequently
Unlikely	no suitable habitat present; not noted in the local area/region

Two rare or threatened fauna species, the Squatter Pigeon (Vulnerable) and Little Pied Bat (Rare)[2], were observed or detected within the IIPP site during fauna field assessments.

The Squatter Pigeon was observed in riparian woodland adjacent to the Isaac River and is also likely to utilise riparian and non-riparian grassy woodland habitats throughout the Expansion Area. It was also observed foraging along Billy's Gully and is expected to utilise the small alluvial pockets along Smoky Creek.

The Little Pied Bat was detected along Conrock Gully, Smoky Creek and Billy's Gully during Anabat surveys conducted as part of the riparian fauna surveys in these areas. Given the vegetation present, it is likely to also be present in the general vicinity of the Isaac River.

Of the *possible* species, the Grey Goshawk, Red Goshawk and Square-tailed Kite possibly utilise the IIPP site as part of a wider habitat area but are not expected to use it for nesting. Smoky Creek, Billy's Gully, Cherwell Creek and the Isaac River riparian vegetation corridors may represent a significant habitat feature for these species which utilise riparian corridors as foraging areas and movement corridors.

Three bird species have been identified as *unlikely* inhabitants of the IIPP site, namely the Black Necked Stork, Star Finch and Australian Painted Snipe. The habitats required for these species do not occur within the area of the IIPP site therefore it is unlikely that they will occur on the site.

Reptile species which are *unlikely* to occur on the IIPP site include the Short-necked Worm Skink, Common Death Adder and the Yakka Skink. However, as the observed condition of the woodland habitats is not ideal for supporting any of these species, it is highly unlikely they would occur in these areas. Other reptilian species classed as *unlikely* to occur on the IIPP site are the Brigalow Scaly-foot and the Fitzroy Tortoise. There is insufficient ground habitat features for the Brigalow Scaly-foot and a lack of suitable aquatic habitat for the Fitzroy Tortoise.

The habitat requirements of the Eastern long-eared Bat, also listed as *unlikely*, are less well known. Not much is known about this species and it is therefore difficult to confidently predict its occurrence in the IIPP site. Most areas proposed to be cleared are unlikely to represent significant habitat for this species, given the quality of the vegetation in these areas observed during field surveys, but the riparian woodlands areas may provide some potential habitat due to the presence of tree hollows. However, given their predominantly aerial habitat, they are unlikely to be affected by the condition of the ground habitat, that is, with the exception of its capacity to produce potential prey.

Signs of recent occupation by Koalas were located within the riparian woodland along the Isaac River in the Expansion Area and Koalas are likely to routinely utilise River Red Gums (*Eucalyptus camaldulensis*) within the fringing riparian vegetation along both the Isaac River and Cherwell Creek. Based on the findings of the ecological surveys, Koalas are not likely to utilise vegetation along Conrock Gully due to its poor condition. The vegetation within ML70342 along Smoky Creek and Billy's Gully is unsuitable for Koalas.

4.1.4.2 Migratory and other EPBC Species

Assessments of migratory species against Commonwealth significant species (other than vulnerable or endangered species) known from the region have been undertaken by compiling a list of species and undertaking an assessment of the likely occurrence of each species within the IIPP site. This list includes:

- species covered by migratory provisions of the EPBC Act comprising species listed under CAMBA and/or JAMBA; and
- species covered by marine and wetland provisions of the EPBC Act.

[2] It is understood that the EPA is in the process of amending the Nature Conservation Regulation, including the change to the status categories. The rare category will be phased out by 2010 and replaced with a number of different categories. At present, the Little Pied Bat is listed as rare. However, with the changes to the regulation its status is likely to change to common due to its apparent frequency in the Bowen Basin.

Table 4-4 lists the migratory and other Commonwealth significant species known within the study region and provides an assessment of the likely occurrence of each species within the IIPP site.

The assessment of the likely status of each of the species is based on their known habitats, the occurrence of the habitat within the IIPP site and the condition of the habitat, if/where it occurs, within the IIPP site. Other studies conducted in the region and database searches have also been used in the assessment of species presence/absence. Where a species has been observed it has been noted as *present*. Other species listed are assessed as being *likely*, *possible* or *unlikely*.

Table 4-4 Migratory, Marine and Wetland EPBC Species – IIPP

Species ***Common Name*** *EPBC Status* *Source of Record*	**Key Resources**	**Habitat**	**Likelihood of occurrence within the IIPP site**
Nettapus coromandelianus albipennis Cotton Pygmy-goose w, m *epbc*	Deep water with vegetation	Deep lagoons, wetlands and dams with floating marcophytes.	***Unlikely***, suitable deep water habitat does not occur within the IIPP site.
Anseranas semipalmata Magpie Goose m *epbc*	Availability of required wetland habitats.	Rush and sedge dominated swamps and floodplains. Predominantly coastal distribution but may appear further inland.	***Unlikely;*** suitable wetland habitats do not occur within the IIPP site.
Ardea ibis Cattle Egret m +	Availability of habitats.	Pasture especially among cattle, occasionally wetlands.	***Likely***, the open grazing lands in the IIPP site provide suitable habitat for the species.
Gallinago hardwickii Latham's Snipe w, m *epbc*	Availability of preferred habitats.	Wetland grasses, open, wooded swamps, ephemerally inundated grasslands.	***Unlikely;*** suitable ephemeral wetland habitats are unlikely to occur within the IIPP site.
Numenius minutus Little Curlew m, w *epbc*	Availability of preferred habitats.	Habitats include open plains and grasslands.	***Possible;*** may utilise the cleared open grassy areas within the IIPP site.
***Rostratula benghalensis* s. lat.** Painted Snipe w, m *epbc*	Vegetated ephemeral wetlands.	Inhabits shallow vegetated ephemeral wetlands in coastal and inland areas.	***Unlikely,*** suitable natural wetland habitat for the species does not occur within the IIPP site.

Species ***Common Name*** *EPBC Status* *Source of Record*	**Key Resources**	**Habitat**	**Likelihood of occurrence within the IIPP site**
Haliaeetus leucogaster White-bellied Sea-eagle t, m *epbc*	Availability of prey and nesting sites.	Large rivers including inland, fresh and saline lakes, coastal seas and shoreline, islands.	***Possible;*** may intermittently utilise the riparian habitats within the IIPP site, particularly during the wet season.
Merops ornatus Rainbow Bee-eater m +	Availability of habitat.	Most habitats apart from closed forest.	***Present;*** observed in riparian habitats of the IIPP site.
Monarcha melanopsis Black-faced Monarch t, m *epbc*	Availability of forest habitat.	Forest habitats including riparian forest. Predominantly coastal and sub-coastal distribution.	***Possible***; may utilise the riparian woodlands within the IIPP site but at the western extent of its range.
Myiagra cyanoleuca Satin Flycatcher t, m *epbc*	Availability of habitat	Tall forests, riparian forest, and woodland. Not usually encountered to the west of the Great Dividing Range in Qld.	***Possible***; may utilise the riparian woodlands within the IIPP site but at the western extent of its range.
Hirundapus caudacutus White-throated Needletail t, m *epbc*	Availability of high-flying insect swarms.	Aerial habit over coastal habitats and mountain ranges.	***Likely*** to intermittently forage over the IIPP site.

Key to Status:

w	wetland species covered by migratory provisions of EPBC
m	species covered by marine provisions of EPBC
t	terrestrial species covered by migratory provisions of EPBC

Key to Source of Records:

epbc	EPBC database search records for the study region
+	assessed as potentially present based on known distribution

Key to Likelihood:

Present	Recorded in databases; observed during surveys
Likely	Suitable habitat; found in the local area
Possible	Suitable habitat; not recorded in local area/region OR sub-optimal habitat; may use infrequently
Unlikely	no suitable habitat present; not noted in the local area/region

The Rainbow Bee-eater utilises a wide range of habitats for foraging including both riparian and non-riparian habitats. The riparian corridors within the IIPP site are not regarded as especially significant for the species and extensive areas of feeding habitat occur in the study region. This is a highly mobile species that will not be impacted by disturbance of the riparian areas.

The Cattle Egret utilises open grazing areas in association with cattle, while the White-throated Needletail forages well above the ground and tree canopy on insect swarms and has only a tenuous linkage with the habitat above which it feeds.

The Little Curlew utilises open grassland areas, and the Black-faced Monarch and Satin Flycatcher possibly utilises the riparian woodland along the Isaac River. The White-bellied Sea-eagle may intermittently use the riparian habitats within the areas during the wet season.

Based on the ecological assessments conducted and given the limited extent and poor condition of remnant habitats, the IIPP site and surrounding area is not likely to represent especially significant feeding or breeding habitat for any of the migratory or other EPBC listed species regarded as likely or possible inhabitants.

4.1.5 Potential Impacts

4.1.5.1 General Impacts on Flora and Fauna

The mine layout will largely avoid the remnant vegetation along the Isaac River, i.e. the vegetation in the best ecological condition within the Expansion Area. However, a low level crossing of the Isaac River will be required for the access/haul road. This is likely to result in the disturbance of less than 1 ha of the riparian corridor which includes sub-dominant Brigalow. Minimising the extent of disturbance to the riparian corridor will be considered in the crossing location selection process.

The majority of the pit and spoil dump areas in the Expansion Area is to be located within highly modified non-remnant grazing lands. However, some small areas of remnant vegetation will be disturbed under the currently proposed mine layout. Remnant areas that will be disturbed comprise:

- woodland areas adjacent to Cherwell Creek that may be disturbed by spoil dumps;
- the riparian corridor of Conrock Gully that will be disturbed by the pit and spoil dumps;
- an area of Brigalow to the south of Conrock Gully which is likely to be impacted by spoil dumps;
- small areas of woodland adjacent to the Isaac River that will be disturbed by the northern end of the pit, spoil dumps and the ROM stockpile; and
- riparian and alluvial woodland adjacent to the Isaac River which will be traversed by the access/ haul road. NB: A number of alternative routes for the access/haul route are being considered to reduce impacts on matters of national environmental significance (MNES), the surrounding environment, and to reduce potential impacts on affected landholders.

In addition, the diversion of Smoky Creek and Billy's Gully will require the removal of riparian corridor vegetation to access the identified coal reserves.

Approximately 145 ha (maximum including potential out-of-pit spoil areas) of remnant vegetation will be affected by the IIPP, representing approximately 14% of the total area to be disturbed. Approximately 14 ha of Brigalow is likely to be affected (both dominant and subdominant), which represents approximately 9.5% of the remnant vegetation to be disturbed.

Noise, lighting and vehicles may have the potential to impact on fauna. However, it is not anticipated that these factors will substantially affect the overall native fauna biodiversity supported in habitat areas within the Expansion Area. Depending on the final location of major mine infrastructure, mitigation of mine site noise may not be required. Where noise impacts in the vicinity of riparian habitat corridors appear likely, the feasibility of strategic placement of spoil to provide a noise barrier will be investigated. Provision will be made for safe movement of fauna in the vicinity of the low level crossing of the Isaac River. Where warranted, low speed limit zones (e.g. 20km/h) will also be established and enforced.

Changes to the natural hydrology or water quality in the Isaac River and Cherwell Creek have the potential to affect the values of the stream habitat for native fauna, including:

- the quality of waters flowing into the creek;
- the formation and persistence of pools following flows; and
- the quality of water within pools and waterholes following flows.

There is some potential for degradation of the water quality at the Isaac River crossing point due to spilt coal. To reduce the potential impact from spilt coal, speed limits will be enforced and the overloading of trucks discouraged. Potential impacts from this source will be assessed as part of the surface water studies for the EIS.

4.1.5.2 Impacts on Regional Ecosystems under the VMA

Areas of endangered Brigalow, both sub-dominant RE 11.3.1 and dominant RE 11.4.9, occur within the disturbance zone of the proposed Expansion Area. Some Brigalow, both dominant and sub-dominant, lies within the proposed pit and cannot be avoided. Consequently, no mitigation measures are possible, apart from the provision of compensatory habitat. An area of endangered sub-dominant RE 11.3.1 and endangered dominant RE 11.4.9 will be disturbed along, and adjacent to, Conrock Gully. This vegetation is in very poor condition and continuing to decline under the effects of serious canopy dieback. It is anticipated that under the current rate of decline, the majority of the area will slip from remnant status within the next 5 years. As it is not anticipated that the vegetation will recover naturally, an area of habitat will be designated as compensation for this loss.

Another area of sub-dominant Brigalow is located along the Isaac River. In this area, it is likely that less than 1will be disturbed for the low level crossing required for the access from the Expansion Area to the existing Isaac Plains Coal Mine. Options will be investigated to minimise impacts on this area. Where an ERE will be impacted, it is proposed to provide compensation/offset by fencing off regrowth areas.

An area of RE 11.3.2 (refer **Table 4-1**) adjacent to Cherwell Creek will be disturbed by the spoil dumps. This RE is currently listed as '*of concern'* under the VMA and has been identified by the DNRMW[3] as a threshold RE. Threshold REs comprise REs which have been cleared to the extent that further clearing will cause a change in their conservation status, meaning that RE 11.3.2 is close to becoming an endangered RE.

The diversion of Smoky Creek will require the removal of '*of concern'* riparian vegetation to access economic coal reserves.

The balance of vegetation to be disturbed in the Expansion Area and the vegetation along Billy's Gully is '*not of concern'* or non-remnant.

4.1.5.3 Impacts on Endangered Ecological Communities under the EPBC Act

No EECs will be impacted as a result of the diversions of Smoky Creek and Billy's Gully or from other activities at the existing Isaac Plains Coal Mine site as no EECs were identified in this area. Field surveys have confirmed the occurrence of the Brigalow EEC within the Expansion Area (refer **Figure 4-3**). These remnant areas are in poor to moderate ecological condition, with the impacts of grazing evident as reduced groundcover and shrub diversity. Furthermore, the replacement of the native groundcover flora with Buffel Grass in most areas, and the occurrence of Guinea Grass along the Isaac River, has further degraded the condition of the EEC. Severe canopy dieback occurs within the woodland in the southern part of the Expansion Area, i.e. along Conrock Gully and Cherwell Creek.

On the basis of the DEH MNES assessment guidelines, the impacts on the Brigalow EEC would be regarded as significant as the IIPP will "...reduce the extent of a community..". However, this assessment needs to be considered in the context of its condition and likely status. The Brigalow communities occurring along Conrock Gully within the footprint of the pit area are in very poor condition and not expected to retain remnant status. Therefore, protection under the EPBC Act is likely to be relevant for a limited time only. The Brigalow which will be disturbed at the northern edge of the pit and spoil dumps is also subject to decline due to dieback, and is in poor condition.

[3] Now known as the Department of Natural Resources and Water (DNRW)

If the degraded areas were being considered for listing in accordance with the new approach set out in the relevant fact sheet and the report entitled "Ecological Communities: A Way Forward" of September 2004, it is unlikely that they would be protected. This approach takes into account the impacts of degradation and regional variation in widespread ecological communities. Significantly degraded (low condition) areas, such as areas of Brigalow EEC along Conrock Gully and at the northern edge of the pit and spoil dumps, would not be regarded as part of an ecological community.

7.6 ha of RE 11.3.1 and 6.34 ha of RE 11.4.9 are likely to be cleared within the Expansion Area. **Table 4-5** provides a comparison of the area of Brigalow to be disturbed with the mapped areas that occur within the bioregion and sub-region.

Table 4-5 RE Remaining vs Proposed RE Clearing

RE	Area (ha) occurring in the IIPP site	Area (ha) of Brigalow RE to be cleared	Approx % of Brigalow RE occurring within the IIPP site to be cleared	Area (ha) remaining in Bioregion (Brigalow Belt)	Approx % of RE to be cleared of that remaining in the bioregion	Area (ha) remaining in sub-region (Northern Bowen Basin)	Approx % of RE to be cleared of that remaining in the subregion
RE 11.3.1- occurs as sub-dominant along the periphery of Conrock Gully and the Isaac River	21.16	7.6	36%	79,364	0.01%	7,400	0.1%
RE 11.4.9 - occurs adjacent to the southern side of Conrock Gully	23.18	6.34	27%	100,830	0.01%	10,603	0.05%

Source: Accad, A. *et al* 2006 (utilising 2003 remnant vegetation statistics).

4.1.5.4 Impacts on NCA listed Rare or Threatened Flora

Impacts on any rare or threatened flora listed under the NCA are not anticipated.

Only one flora species listed under the NCA, *Desmodium macrocarpum* (rare) is a *possible* inhabitant of the Expansion Area. Targeted field surveys did not locate the species and, based on the poor condition of these habitats, it is anticipated that it is not present. Consequently, it is not anticipated that *Desmodium macrocarpum* will be affected by the proposed activities.

No rare or threatened flora was identified during field assessment of ML70342.

4.1.5.5 Impacts on EPBC listed Threatened Flora

Impacts on threatened flora listed under the EPBC Act are not anticipated with no suitable habitat for any of the threatened flora potentially occurring in the Expansion Area or on ML70342.

4.1.5.6 Potential Impacts on NCA and EPBC Listed Fauna

Table 4-6 outlines the potential impacts on those EPBC species which use and are likely to use the habitats within the IIPP site. Based on the surveys conducted, the potential for impacts from the IIPP on those species listed as unlikely or possible has been assessed as negligible.

Table 4-6 Potential Impacts on Present and Likely NCA/EPBC Fauna Species - IIPP

Species	Comments
Rare and Threatened Species	
Squatter pigeon (southern subsp.) *Geophaps scripta scripta* ***Present***	The occurrence of this species in the areas affected by the IIPP was confirmed by field surveys. The Squatter Pigeon prefers open grassy habitats for foraging and requires access to free water. Impacts to the species in the Isaac Plains Coal Mine area are likely to be limited given the already impacted grasslands in this part of the IIPP site. Disturbance of the Smoky Creek riparian corridor is unlikely to impact significantly on this species. The Squatter Pigeon prefers open grassy habitats for foraging and requires access to free water. The closed riparian habitat along Smoky Creek does not provide favoured foraging habitat for this species and there are no permanent waterholes within the reach to be disturbed. Riparian corridors are not required by this species for movement through foraging habitat, and it is not anticipated that this species nests in the vicinity of Smoky Creek due to the disturbance provided by high cattle activity in the area. Disturbance of the Billy's Gully riparian corridor is not anticipated to result in a significant impact on this species, but does represent an incremental loss of its potential habitat for this species. The riparian corridor along Billy's Gully constitutes the favoured foraging habitat for this species, i.e. grassy woodland on alluvial terraces, although the tributary does not support permanent waterholes. There are, however, extensive tracts of this habitat in the surrounding area and Billy's Gully is not anticipated to provide especially significant habitat for this species. Approximately 125 ha of the potential woodland habitat of this species will be removed from within the Expansion Area. However, more extensive areas of potential woodland habitat occur in the surrounding area, particularly the broad band of riparian woodlands along the Isaac River upstream and downstream. When viewed in the context of the surrounding areas available for this species, the area to be removed is relatively small. This species is not expected to nest in the IIPP site due to disturbance by cattle.
Little Pied Bat (Chalinolobus picatus) ***Present***	The Little Pied Bat is known to inhabit the IIPP site having been observed along Smoky Creek and Billy's Gully. The suitable woodland habitat within the IIPP site, including the continuous riparian woodland along the Isaac River and Cherwell Creek, is unlikely to be affected by the proposed expansion, with the exception of a small amount of vegetation in the Isaac River at the location of the proposed low level crossing. When viewed in the context of the surrounding habitat areas available for the species, the area of habitat to be removed is relatively very small, constituting a very small contribution to an ongoing incremental loss of grassy woodland habitat within the region. The Little Pied Bat is likely to preferentially forage amongst the riparian woodland habitats, although other woodland areas would be used on a seasonal basis when invertebrate populations peak in response to rainfall or flowering periods of plants. The species is likely to utilise the riparian corridors for both foraging and roosting. Tree hollows within both the Smoky Creek and Billy's Gully riparian corridors provide potential roost habitat for the species. Disturbance of the riparian corridors will reduce the availability of foraging habitat for the species however there are extensive foraging habitat occurs upstream and downstream of the areas, and in association with the nearby Isaac River. Disturbance of the riparian corridor is not anticipated to result in a significant impact on the species, but does represent some loss of potential habitat for the species.
Migratory, Marine and Wetland species	
Rainbow Bee-eater *Merops ornatus* ***(Present)***	This species was observed in the riparian areas of Smoky Creek, Billy's Gully and Conrock Gully but is a highly mobile species that will not be impacted by disturbance of the areas within the IIPP site. It utilises a wide range of habitats for foraging including both riparian and non-riparian areas. The riparian corridors are not regarded as especially significant for this species and extensive areas of feeding habitat occur in the region of the IIPP site.
Cattle Egret *Ardea ibis* ***(Likely)***	The Cattle Egret is most strongly associated with the areas of improved pasture (Buffel Grass) adjacent to the riparian corridors. Disturbance of the riparian corridors will not significantly impact on this species.
White-throated Needletail *Hirundapus caudacutus* ***(Likely)***	Disturbance of the riparian corridors will not significantly affect the foraging opportunities for this species as it is an aerial feeder that forages high above terrestrial habitats.

Given the minimal proposed disturbance to remnant habitats and the poor condition of habitats within the proposed extent of disturbance within the Expansion Area, it is not anticipated that the IIPP will lead to significant impacts on rare or threatened or migratory species, communities or populations listed under the NCA or *EPBC Act*.

4.2 SURFACE WATER

4.2.1 Overview

The proposed Expansion Area is located west of the Isaac River. The proposed active mining area within the Expansion Area is bordered by Cherwell Creek in the south and the Isaac River in the north. The central section of the Expansion Area is traversed by Conrock Gully. The catchment area of Conrock Gully is estimated as 7,190 ha as illustrated by **Figure 4-4** (the catchment boundary outside the Expansion Area has been estimated from the 1:100,000 topographical map).

The eastern section of the Expansion Area is low lying and is likely to be prone to flooding by the Isaac River and Cherwell Creek and will need to be protected from flooding using a series of flood levees. A key component of the EIS phase will be to determine a suitable flood protection standard.

Mined coal from the Expansion Area will be processed through the CHPP on ML70342. An access/ haul road crossing of the Isaac River will be required to link the proposed southern MLs and ML70342 operations. The Isaac River is a major river system and it will require substantial civil works to construct the crossing. A low level crossing is being considered, with stockpiling of ROM coal at the CHPP to cater for the probability of crossing inundation. The proposed Isaac River crossing would be designed to satisfy both operational, e.g. flood immunity, and environmental, e.g. provision of flow, fish migration, requirements etc.

The mine water management system will comprise clean stormwater diversions, treatment of runoff from land disturbance areas in sediment dams and containment of mine water in release dams, with controlled releases when stream flows are sufficient to achieve the design dilution ratio and ensure downstream beneficial water uses are protected. Surplus water may be pumped north to the CHPP to maximise reuse opportunities. The layout of the water management infrastructure will be developed during the studies to support the EIS. The mine water management system may include discharges to either Cherwell Creek or directly to the Isaac River, subject to the findings of investigations for the EIS, i.e. in addition to the currently approved discharges to Smoky Creek and Billy's Gully (for the existing Isaac Plains Coal Mine). The mine water management system will be designed to be effective under a range of climatic conditions. External water demands will be quantified to demonstrate that sufficient water is available for the operations under drought conditions.

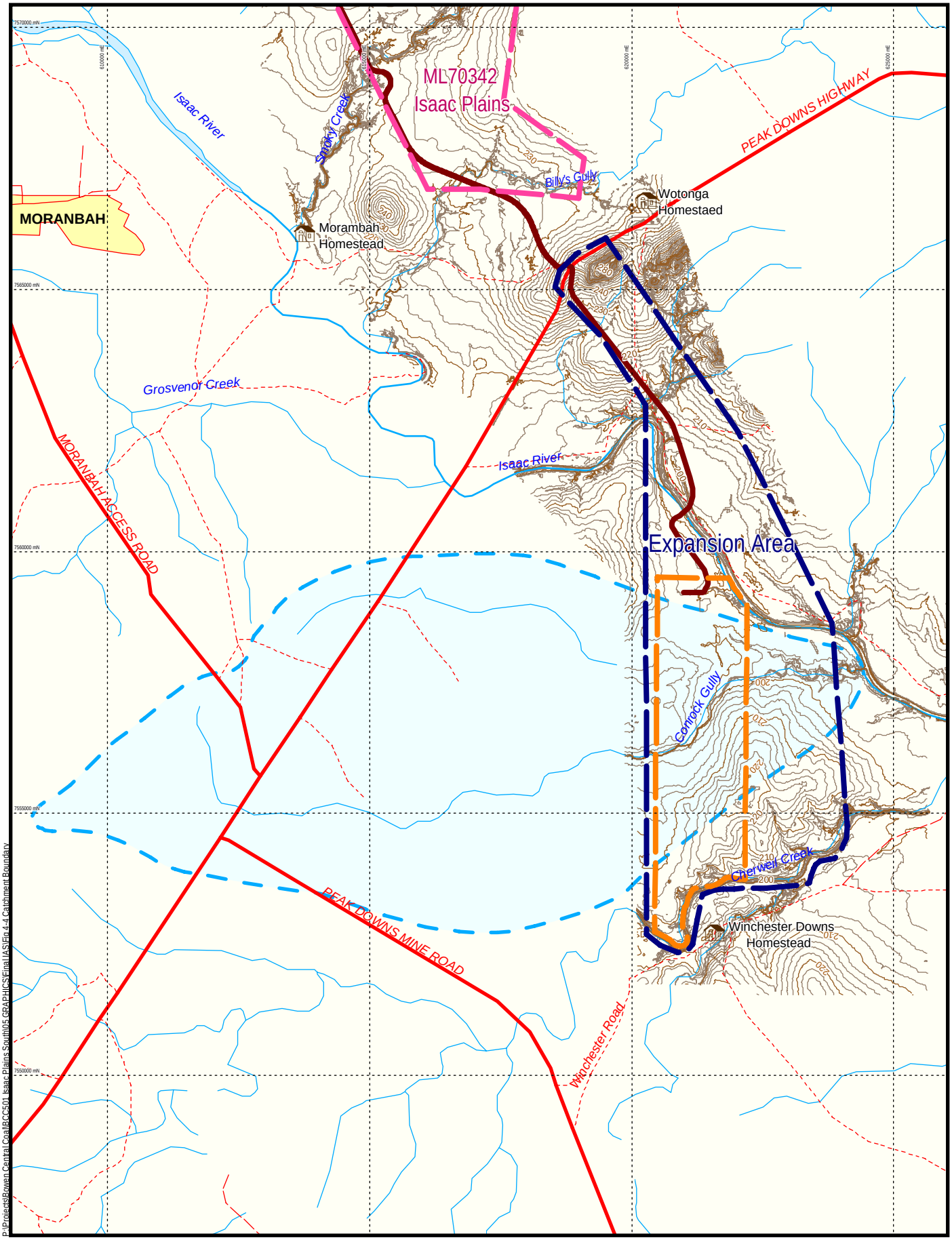
The proposed Expansion Area for the Isaac Plains Coal Mine will require a diversion of Conrock Gully, a small tributary of the Isaac River which traverses the middle of the proposed Expansion Area in a west to east direction. In addition, Smoky Creek and Billy's Gully in ML70342 will require diversion to allow access to commercially viable coal. The diversion of Smoky Creek will be through the mine spoil. Both diversions will be designed to ensure they are geomorphically stable and will not affect the sediment loads or stability of downstream waterways.

The relevant permits under the *Water Act 2000* will be obtained for any watercourse crossings and stream diversions.

4.2.2 Background Data

Extensive background data was collected and analysed during the approval process for ML70324. The following information from these studies will be used in the surface water assessment for the IIPP.

- Analysed rainfall and evaporation data for the area.
- Analysed streamflow and water quality data in the vicinity of the Isaac Plains Coal Mine area. During the initial studies for the Isaac Plains Coal Mine, it was identified that there was a lack of site specific water quality data.
- Contour data over the Isaac Plains Coal Mine area at a minimum 1 m contour intervals.
- Calibrated stream flow models.
- Flood gauging data and peak flood heights for the Isaac River.



P:\Projects\Bowen Central Coal\BCC501 Isaac Plains South\05 GRAPHICS\Final IAS\Fig 4-4 Catchment Boundary

Drainage
Catchment Boundary
2m Contour
Road / Track
Access Road
ML Boundary (ML70342)
Proposed ML Boundary
MLA Boundary (including the KDA)

Isaac Plains Coal Management Pty Ltd

Isaac Plains Project

Conrock Gully Catchment Boundary

Datum: GDA 94
Projection: MGA Zone 55

2 0 2
kilometres

FIGURE 4-4

4.2.3 Further Work

4.2.3.1 Baseline Descriptions

Baseline descriptions of the watercourses potentially impacted by the IIPP mining operations will be prepared including:

- beneficial water uses;
- water quality;
- range of stream flows; and
- physical characteristics of the watercourses.

The following surface hydrology works will be conducted for the Expansion Area.

- Cross-sectional surveys of Cherwell Creek, Conrock Gully and the Isaac River for the geomorphic assessment and flood studies.
- Obtaining broader contour data extending to the west of the site covering the Conrock Gully catchment, i.e. to more accurately delineate the catchment area.
- Local water quality data collection and analysis. Samples will be collected and analysed at a NATA accredited laboratory.
- A field geomorphic assessment of the sections of creeks potentially impacted by the planned diversions. This assessment will map the creek profiles, meanders, deposition zones, scour and erosion zones, and pools and riffles.
- Collection of sediment samples from the creeks beds for particle size analysis to determine the grading curve for the sediments).

4.2.3.2 Flood Studies

A hydrologic model will be created for the Isaac River, Conrock Gully and Cherwell Creek catchments using the XP-RAFTS software. This model was previously used for the Isaac Plains Coal Mine studies of Smoky Creek and Billy's Gully. The model, which will be calibrated to the peak flows recorded at the Isaac River gauging stations, will be used to generate peak 50%, 20%, 10%, 5%, 1% and 0.5% annual exceedance probability (AEP) flows.

A Hec-Ras hydraulic model will be used to calculate peak flood levels, extents and velocities for the range of flood events. The models will be used to prepare conceptual designs of the flood levees, diversions and river crossing. As part of the final mine plan, appropriate levels of flood protection for the various infrastructure elements will be determined. Issues for consideration will include the period of operation, the risk of failure during that period and the consequences of failure.

The model will also be used to assess the impact of the crossings, levees and diversions on upstream and downstream flood levels and velocities. The conceptual design of the crossing of the Isaac River will be a major issue in terms of potential infrastructure costs and flooding impacts. As the estimated 1% AEP flow in the river is 8,500 m^3/s, even a low level crossing will be a substantial structure.

Rather than constructing the full extent of flood levees from the outset, the levees may be progressively installed with the staged development of the open cut pit(s) within the Expansion Area.

4.2.3.3 Waterway Diversions

The three waterway diversions will be a significant environmental consideration for the EIS.

Diversion of Smoky Creek and Billy's Gully are being considered to allow access to the additional economic coal resources identified in ML70342. The Smoky Creek diversion will be required once coal has been mined south of the creek. The diversion of Smoky Creek will be stable and not cause excessive seepage losses or contaminants to be discharged. Structural stabilisation of the channel may be required to prevent these impacts. Billy's Gully will require diversion prior to mining in the area. The extent of the engineering works for each of the diversions will depend on the properties of the underlying materials.

Detailed surveys will be undertaken for the affected reach of proposed diversions, and upstream and downstream for some 100 m, to allow conceptual designs of the diversions and the transitional structures.

As the mining method will likely necessitate working the entire length of the pit in the Expansion Area at one time, it will not be possible to have a temporary diversion of Conrock Gully through spoil. Therefore, the only options are a diversion to the north to the Isaac River or south to Cherwell Creek. Preliminary details of the two options are presented below.

Northern Option

- Diversion length - approximately 6 km.
- Maximum excavation depth – 8-10 m.
- Approximate volume of material to be removed – 400,000 to 600,000 m^3. Note the excavation depths mean that part of the excavation will be in rock. Geological logs will be assessed to determine the depth to rock along the proposed diversion. The diversion would be located adjacent to the infrastructure area, the pit and access/ haul road.
- Flows from the northern diversion option would enter the Isaacs River upstream of the current confluence location. Design of the diversion and outlet would be undertaken to minimise erosion and scour.

Southern Option

- Diversion length - 2.5 km.
- Maximum excavation depth - 12-14 m.
- Given the depth of excavation, a significant portion could be within rock.
- Approximate excavation volume to be removed 600,000 -700,000 m^3.
- The stability of the Cherwell Creek downstream of the confluence with the diversion will be assessed in detail.

The key design objectives for either diversion option will include:

- a stable diversion;
- similar pre and post mining velocity profiles;
- a waterway area equivalent to the existing watercourse – this may be difficult in areas of excavation in rock; and
- annual sediment loads for the diversion similar to those of the existing watercourse.

The following tasks will be undertaken for the conceptual design and assessment of the diversion in the EIS.

- The existing geomorphology of the waterways will be described.
- Hydraulic and sediment transport modelling of the waterways will be used to establish the existing velocity, shear stress and sediment transport regimes for the waterways.
- Suitable locations for the diversion will be established using the topographic data.
- Conceptual designs will be prepared of the diversions. These designs will, as far as is feasible, attempt to retain similar hydraulic characteristics, including:
  - stream gradients;
  - cross sectional area; and
  - sinuosity.
- The hydraulic and sediment models will be used to assess the stability of the diversions and the conceptual designs will be adjusted until they are similar to the existing conditions and/or stable.

The technical assessment and predicted impacts will be summarised in a technical report for inclusion in the EIS.

Dam Option

An additional option is also being considered which would involve the construction of a dam on Conrock Gully upstream of the pit to provide sufficient hydraulic head to minimise the required depth of excavation for either of the diversion options. The extent of the earthworks can be significantly reduced if a dam can be constructed upstream of the pit. Additional aerial surveys are currently being interpreted to define the topography in the area upstream of the dam where there is potential for ponding. As this area lies outside EPC755 and the KDA, options to source tenure for an easement for the area required for the dam are also being investigated. Ponding will be investigated for a range of dam wall heights.

4.2.3.4 Mine Water Management Systems

A mine water management system will be prepared for the Expansion Area. Water management plans will be prepared for various stages of the mining operations, likely to be nominal years 1, 5 and 10. Conceptual designs of the sediment dams, drains, pumps, pipelines and mine water management dams will also be prepared.

The mine water management system will be separated into clean water, dirty water and mine water management systems. Preferential reuse of the mine water will be used to limit discharges. A monthly water balance model will be prepared for each mine plan and used to quantify the potential water surplus or deficit for a range of climatic conditions at each time step.

Processing of the coal from the Expansion Area will be undertaken at the CHPP in ML70342. To minimise mine water releases, consideration will be given to linking the mine water management systems from both ML70342 and the Expansion Area operations. One means to achieve this could be the construction of a pipeline in the proposed access/haul road corridor linking the two operations. In addition, the water balance assessment for the northern and southern operations will be linked to quantify overall demands and surpluses.

4.2.3.5 Pit Water Management

Pit water can be generated from a number of sources including:

- direct rainfall on mining pit area;
- catchment runoff; and
- groundwater inflows.

Mine pit water management for the Expansion Area may include:

- development of short-term dedicated mine water storage dams within the proposed pit disturbance footprint (storages would be located ahead of mining such that they would remain operational for approximately 6-12 months);
- pit water pumping to the mine water storage dams via suitably sized pit pumps; and/or
- use of stored pit water for the Expansion Area mining operation, including for access/haul road watering and general dust suppression. Any discharge from the mine water storage dams will be carried out in a manner which complies with the EA conditions for discharges from open cut operations.

4.2.3.6 Overburden Dump – Water Management

Runoff from overburden dumps will be considered as part of the mine water management system. Rehabilitation of overburden dumps is likely to include graded banks and collection drains which will divert runoff to suitably sized sediment dams designed in accordance with the *Soil and Sediment Control Guidelines for Queensland Construction Sites* (Institute of Engineers, Australia – Queensland Division, 1996). Dams will be designed to contain a nominal Annual Exceedance Probability (AEP) 1 in 10 flood event for an appropriate sediment particle size.

4.3 GROUNDWATER

An initial scoping study for the Expansion Area has found that the groundwater environment will be similar to that on ML70342 due to the similar geological setting for both areas. The hydrogeological studies conducted for the approval process for ML70342 determined that the groundwater is saline with a low likelihood of impact on groundwater users or natural ecosystems. Accordingly, and given the low risk, a conceptual model/empirical technique was used to quantify potential impacts rather than detailed finite difference numerical modelling. A similar technique will be undertaken for the Expansion Area given the similarly low risk. This approach is further supported by the fact that no groundwater bores occur within the proposed Expansion Area or in the immediate surrounding area.

The initial scoping study identified two distinct aquifers that occur within the Expansion Area.

- Quaternary alluvial unit consisting of clay, silt, sand and gravel, occurs predominantly in the north of the Expansion Area in association with the Isaac River. The alluvial deposits, associated with the river, are generally less than 20 m in thickness. Groundwater use is limited from these deposits as the quality of the groundwater is fair and generally only suitable for stock watering purposes.
- Permian age Coal Measures, i.e., the Rangal Coal Measures, underlie the Quaternary age alluvial unit. This unit consists of sandstone, siltstone, mudstone, shale and coal. In general, the formation does not yield significant volumes of groundwater. Groundwater extraction from the various Permian units is limited where faulting is not present. Groundwater extraction rates in the majority of ML70342 were found to be limited to 0.5L/s, whereas drill holes indicate that in faulted areas groundwater extraction rates could range up to 5L/s. Similar yields and quantities are expected in the Expansion Area but are yet to be verified.

  Information gathered from the Isaac Plains Hydrogeological Assessment (Matrix+ Consulting Consulting, April 2005) indicates the spatial occurrence of groundwater within the Permian sandstone/siltstone aquifer within ML70342 is limited. This unit contains an unconfined to semi-confined water table. The potentiometric head is typically located at a depth of approximately 30 m and transmissivity of the sandstone/siltstone aquifer is low. The quality of the groundwater is fair and generally suitable only for stock purposes.

Groundwater is more readily available within the Leichhardt and Vermont Coal Seams which lie within the Rangal Coal Measures. These aquifers are likely to act as confined to semi-confined aquifers. Bores screened within these two distinct aquifers in the Expansion Area indicate that the piezometric head of water rises above the top of the aquifer to approximately 30 m below the ground surface. Transmissivity of these aquifers are higher than the surrounding sandstone/siltstone aquifers.

4.3.1 Potential Impacts on Groundwater Resources

Hydrogeological assessments for ML70342 found that advanced dewatering of the mine pit area was not likely to be required due to the low transmissivity of the aquifers, depth to the water table and depth of the proposed pits. Similar conditions are expected within the Expansion Area due to the similarity of both the geological settings. However, extensive faulting has been identified throughout the Expansion Area and may result in variable permeabilities which may impact on the groundwater environment. These will be investigated. In-pit seepage of groundwater will be managed by pumping to surface water infrastructure. Removal of groundwater from pits will inevitably result in some lowering of water tables surrounding the mine site.

Previous predictions of groundwater drawdown surrounding the mine pits in ML70342 indicated that drawdown was not laterally extensive. A similar situation is likely for the groundwater environment within the Expansion Area due to the similarity of both geological settings. However, due to the proximity of the proposed Expansion Area to the Isaac River and the potential for creek diversions in other areas of the mine, groundwater/surface water interactions will be investigated in detail, including the disturbance of the groundwater baseflow to the Isaac River and Cherwell Creek. Groundwater monitoring bores have been installed near the Isaac River to facilitate characterisation of the alluvial aquifers.

Baseflow of groundwater to these watercourses needs to be understood, particularly during the current drought conditions. Investigating groundwater/surface water processes may also contribute to a greater understanding of issues such as the current die-back of vegetation within the Expansion Area.

4.3.2 Potential Impacts on Groundwater Users

A bore census conducted north of the Isaac River, i.e. surrounding ML70342, indicated that groundwater use by regional landholders is limited. A similar conclusion was reached following a bore census conducted for the Expansion Area. Due to the limited groundwater resources and poor water quality, most regional landholders rely on surface water storages to supply their domestic and stock water requirements. Potential impacts to landholders are therefore likely to be limited.

4.3.3 Groundwater Monitoring

A field program to assess groundwater in the Expansion Area to maximise the timeframe for data collection commenced in June 2006. The groundwater monitoring program surrounding the Expansion Area has been designed to assess the effects of groundwater inflow to the mine pit on the local and regional groundwater environments. This field test program will be used to define the conceptual models of the hydrogeological regime and assess the hydraulic characteristics, water quality differences between the aquifers and connection between aquifers.

A total of 13 monitoring bores have been installed within the two aquifer types. These bores are located at six nested monitoring bore sites. Information used to site these bores included a review of lithological logs, geophysical logs from selected representative drill holes, IPCM fault interpretation for the site (from seismic surveys) and the results of water level and water quality monitoring within open holes.

Matrix+ Consulting is currently analysing the initial data collected from the six monitoring sites. Water level fluctuation within the newly installed monitoring bores will be measured to determine pre-mining water level fluctuations within each aquifer providing baseline groundwater information for the site.

In conjunction with the monitoring program, and as discussed above, a census of groundwater use (landholders) within and directly adjoining the Expansion Area was conducted, The census involved recording information on bore location, usage, depth to water table, pump setup, casing type and size, total depth of bore, age, basic water chemistry (pH and EC) and yield. This information is currently under review, and will be used in documenting pre-mining water characteristics.

The following schedule outlines the steps of the ongoing groundwater monitoring program.

4.3.3.1 Field Work for Baseline Groundwater Data

- Water samples will be taken and analysed for water chemistry including cations, anions, EPA priority metals and nutrients. This will provide pre-mining water quality for the site and will identify any water quality differences between the aquifers in the Expansion Area. Several water samples will also be collected from landholder bores at strategic locations surrounding EPC755.
- Testing will occur on a selection of monitoring bores to assess the hydraulic characteristics of the different aquifers in the proposed Expansion Area. This information will be used to determine natural flow characteristics.

4.3.3.2 Interpretation of Results (Conceptual Hydrogeology)

- Collate the results of the field program.
- Interpret the results of the field program and ensure that sufficient data has been obtained to provide baseline information on the groundwater environment in the vicinity of the Expansion Area.
- Determine the potential impacts of mining on the groundwater environment and groundwater users via conceptual modelling and empirical techniques. It is unlikely that advanced dewatering of the pit area will be required based on the aquifer characteristics of ML70342. Nevertheless, dewatering processes will be reviewed during this phase of the hydrogeological assessment for confirmation.
- Investigate any impacts caused by mining activities on the groundwater base flow supplying water bodies, especially Billy's Gully, Smoky Creek, Cherwell Creek, Conrock Gully and the Isaac River.
- Provide an assessment of all relevant Queensland legislation including any proposed changes to current laws. Pertinent issues include groundwater quality and quantity, abstraction etc.

A technical report of the work conducted, results, interpretation of potential impacts, mitigation options and conclusions will be produced and included in the EIS.

4.4 LAND

4.4.1 Soils

A soil survey of the Expansion Area was undertaken by GTES Pty Ltd, the salient findings of which are summarised below.

The survey conducted identified a total of seven major soil types and one variant (refer **Table 4-7**) within the Expansion Area. The principal soil types are non-cracking sandy clay Brigalow on gently undulating plains (B2) together with sandy duplex Poplar Box woodlands (E1). Deep sandy and duplex alluvia with mixed Poplar Box woodland (A1) occur in association with waterways in the Expansion Area. The variant in the survey consists of the shallower upper slopes of where the Ironbark vegetation community occurrs within the Poplar Box E1.

Table 4-7 outlines the various soil types identified in the Expansion Area, the Australian Soil Type (Isbell, 1998), a description of each soil unit and a comparison with soils described in the district by Gunn *et al* (1967) and Bourne and Tuck (1993).

Table 4-7 Soils within the Expansion Area

Soil Type	Description	Australian Soil Type (Isbell, 1998)	AMU (Bourne & Tuck, 1993)	CSIRO Land System / Soil Type (Gunn et al 1967)
A1	Alluvial sandy duplex of mixed Poplar Box and Brigalow.	Brown Sodosol	Isaac	Connors / Luxor
A3	Alluvial silty clay with open Poplar box with Brigalow and Flooded Coolibah.	Brown Sodosol	Moramana	Connors / Springwood
A4	Alluvial plain of dark cracking clay with Brigalow.	Black Vertisol	Moramana	
E1	Poplar Box sandy duplex on undulating plains.	Brown Sodosol	Lascelles	Monteagle / Luxor
E1 variant	Relic ridgelines above E1 with shallower duplex with Silver Leaf and Narrow Leaf Ironbark with Poplar Box.	Brown Sodosol	Lascelles	Monteagle / Luxor
B1	Uniform grey/brown clays with areas of gilgai on flat to gently undulating plains with Brigalow.	Vertisol	Springton	Daunia / Teviot
B2	Sandy uniform clay or thin red/brown duplex soils overlying weathered shale / mudstone with Brigalow on undulating plains. Sandy surface which is often gravelly.	Red Chromosol	Glen Idol	Daunia /Taurus
R1	Shallow gravely loamy sands to sandy clay loams with extensive outcropping rock.	Mixed	Highlands	nsg

Those sections of the Expansion Area to be disturbed by open cut mining are mostly contained within the E1, B1, B2, A3 and A4 soil types. Where such disturbance occurs, stripping of topsoil for reuse in rehabilitation will be conducted to ensure adequate soil resources are available for rehabilitation activities during and at the completion of mining.

4.4.2 Land Use

Other than works associated with the existing Isaac Plains Coal Mine, the current land use in the IIPP site is grazing, with no indication of cultivation for grain crops having been undertaken. The area was originally vegetated with mixed Brigalow and Poplar Box communities and associated grasslands but has almost been completely cleared to increase grazing capacity and for farm infrastructure including fencing, dams and water troughs. The proposed land use will be open cut mining and associated mining activities.

On completion of mining, the areas will be rehabilitated to a suitable post-mining land use. Factors that affect the post-mining land suitability include changes in physical, chemical and biological properties, soil slope angle and length and soil depth. The over-riding principles for the rehabilitation of the areas disturbed by the IIPP are that the land should be returned to a stable, self-sustaining and maintenance-free state.

It is currently proposed that the pit areas of the mine, including internal and external spoil dumps, ramps and final voids will be rehabilitated to a self-sustaining vegetation cover as approved for ML70342. However, the adopted final land rehabilitation suitability and associated rehabilitation activities/methods will be dependent on further investigations to be conducted as part of the EIS.

The soil characteristics identified in the field survey in the Expansion Area have been used to identify the land capability according to the Queensland Department of Primary Industries (DPI) land classification system. This information will form the basis for establishing the final land uses which will be incorporated into the overall IIPP rehabilitation program.

4.4.2.1 Agricultural Suitability

The land suitability classification identifies the types and severity of limiting factors for each land use on the different soil types present.

All of the soils have been used for beef cattle grazing for many years. Only the better, fine textured Brigalow scrub soils, *Picardy* Agricultural Management Unit (AMU), (Bourne and Tuck, 1993) are known to have cropping potential in the district. None of the *Picardy* type soils were identified in the Expansion Area.

Rainfed Cropping Suitability

This classification evaluates the broadacre potential for growing non-irrigated cash crops which would be mainly sorghum and wheat. Soils identified in the survey area indicate that the Brigalow clays of B1 (grazing limitation level m2[4]) hold significant water that can be effectively used for pastures. At the other end of the scale are the sandy duplex (E1, A1) and hard uniform clay (B5) soils which typically have less than 80 mm of plant available water capacity (PAWC) and are likely to have lower potential for suitable pastures.

Suitability for Beef Cattle Grazing

All soil units are suited to beef cattle grazing with potential for improved buffel pastures. Most soils do not have significant limitations to grazing uses with the incorporation of sound management practices and have the potential for pasture improvement. For these reasons, most of the survey area has long since been cleared.

4.4.2.2 Good Quality Agricultural Land

The Planning Guidelines: *The Identification of Good Quality Agricultural Land (GQAL)* (DLGP and DPI, 1993) establishes four classes of agricultural land for Queensland. Class A Land is considered to be GQAL in all areas. In some areas, Class B Land (where agricultural land is scarce) and better quality Class C land (where pastoral industries predominate) may also be considered to be GQAL.

In the Belyando Shire, DPI have identified the presence of:

- crop land: Class A Land - land suitable for current and potential crops with limitations to production which range from non to moderate levels;
- marginal crop land: Class B Land – land that is marginal for current and potential crops due to severe limitations; and suitable for pastures. Engineering and/or agronomic improvements may be required before the land is considered suitable for cropping; and
- land suitable for improved pastures Class C1: Class C Pasture Land suitable only for improved or native pastures due to limitations which preclude continuous cultivation for crop production. However, some areas may tolerate a short periods of ground disturbance for pasture establishment. C1 designates suitability for improved pastures while C2 designated land is suitable for native pasture.

About 60% of the Expansion Area has been categorised as Class C1 lands. There are no Class A or B GQAL cropping lands in the area. The C1 land which makes up most of the Expansion Area is considered to be suited for grazing under improved pasture.

SPP 1/92 provides a framework for development to be assessed that considers the value of GQAL. The policy acknowledges that there will be developments, such as the IIPP, that can legitimately alienate GQAL because they represent an overriding benefit to the community.

[4] Refers to the moisture class of the soil.

4.4.3 Overburden and Coal Rejects Characterisation

Development of the proposed Expansion Area will require the removal of overburden, i.e. the material overlying the coal seam and below the topsoil which is removed during open cut mining to allow coal extraction. From the processing of coal in the CHPP, coal rejects (coarse and fine) will be generated. The CHPP will use a belt filter press which eliminates the requirement for tailings dams.

Geochemical investigations are currently being undertaken to:

- determine the acid forming potential of overburden and coal rejects, and evaluate the salinity, sodicity and Acid Rock Drainage (ARD);
- determine the chemical composition of the overburden and coal rejects and their water extracts in order to identify any toxic element concerns for revegetation or to water resources; and
- identify any potential geochemical implications for overburden and coal reject disposal and mine operations, and provide recommendations for environmental management.

4.4.4 Rehabilitation and Post Mining Landform

A total disturbance projection (comprising out-of-pit spoil dumps, final voids and land for industrial and infrastructure purposes) is yet to be finalised but is likely to be in the order of 1,000 ha.

The post-mining rehabilitation objective is likely to be to rehabilitate the land to a stable landform with self-sustaining vegetation cover as approved for ML70342. However, this will be confirmed in the EIS.

4.5 NOISE/VIBRATION

The proposed Expansion Area development will have similar noise and vibration sources to those at the approved operation in ML70342, including:

- blasting;
- mining equipment, e.g. bulldozers, excavators, haul trucks, dragline;
- coal/overburden haulage; and
- light vehicle traffic movement.

The nearest town to the mine workings within the Expansion Area is Moranbah, approximately 10-12 km to the north-west. A small number of rural residences are located within 5 km of the Expansion Area (refer **Figure 2-2**), including Winchester Downs (3 residences), Wotonga and Morambah homesteads and a derelict homestead on the Poitrel ML.

The potential noise and vibration impacts of the mining operation on these residents will be modelled and discussed with reference to relevant Queensland legislation, EPA Guidelines and Australian Standards. Studies have commenced to document pre-mining background noise levels at locations surrounding the IIPP site including occupied homesteads. The study will describe the existing environmental values which may be affected by noise and vibration associated with the IIPP mining activities and will assess the cumulative noise level at the boundaries of the site and at the boundaries of existing and future land uses likely to be affected by noise and vibration. The study will concentrate on Winchester Downs, Wotonga and Morambah homesteads. Potential impacts of mining operations, blasting, impact of trucks hauling coal, CHPP operations, and vehicle movements on the access/haul route etc, on these residences and any other relevant noise sensitive places will be modelled in accordance with the relevant requirements.

The noise and vibration study will also assess the potential for impact on the Moranbah township. Appropriate mitigation measures will be developed as necessary.

4.6 AIR QUALITY

The potential impact of dust generated by the IIPP on the residents at Winchester Downs, Wotonga and Morambah homesteads, and the township of Moranbah, will be assessed using the relevant Queensland legislation, EPA Guidelines and Australian Standards. Studies have commenced to document pre-mining dust levels at the sensitive receptors surrounding the mining areas. The assessment will include a description of the existing environmental values which may be affected by air and greenhouse gas emissions associated with the proposed IIPP and an assessment of the cumulative dust and other air emission levels at the boundaries of the site and at the boundaries of existing and future land uses likely to be affected by these emissions. The assessment will concentrate on Winchester Downs, Wotonga and Morambah homesteads. Potential impacts of mining operations, i.e. extraction activities, trucks hauling coal, CHPP operations and vehicle movements on the access/haul route etc, on these residences and any other relevant places will be considered in accordance with the relevant requirements. With the addition of the Expansion Area, an assessment will also be conducted on the increased throughput in the CHPP and increased vehicle movements through ML70342, The air emission study will also assess the potential for any potential impact on the Moranbah township. Appropriate mitigation measures will be developed as necessary.

4.7 VISUAL ENVIRONMENT

The potential cumulative impact of the IIPP on the existing scenic values of the landscape will be assessed by considering the visual quality of the local landscape and identifying the potential visibility of the operation from the surrounding area. As the proposed mining activities within the Expansion Area are set back from the Peak Downs Highway (refer **Figure 2-2** and **Figure 2-3**), it is anticipated that vegetation associated with the Isaac River will screen the mine from the north. Vegetation along Cherwell Creek is likely to screen the Winchester Downs homestead. Views of the access/haul road underpass of the Peak Downs Highway and the access/ haul road leading to and from the underpass will be assessed, although the narrow vegetation line along the Peak Downs Highway is likely to provide some screening, and views will be of short duration. A visual assessment will be undertaken to confirm these initial findings. It should be noted that the Moranbah area supports numerous mines with several mines and associated infrastructure located near roads in visible areas.

4.8 TRAFFIC

Given that development of the Expansion Area will require an access/haul road connected to the CHPP via an underpass of the Peak Downs Highway, the impact of traffic/transport will be assessed. The traffic/transport impact assessment will be undertaken in accordance with the Department of Main Roads' *Guidelines for the Assessment of Road Impacts of Development Proposals*. This assessment will include a review of the IIPP during both construction and operational stages for external impacts on the existing local and State-controlled road network at the required design horizons, workforce access to the site via a designated intersection, and the development of appropriate mitigation measures.

4.9 NATIVE TITLE

With the exception of Lot 9 GV33, native title is extinguished.

4.10 ABORIGINAL AND CULTURAL HERITAGE

Under the *Aboriginal and Cultural Heritage Act 2003* (ACHA), IPCM has a duty of care to take all reasonable and practicable measure to avoid or minimise impacts on items of aboriginal cultural heritage significance. In demonstrating a duty of care, a cultural heritage field investigation will be conducted covering areas of planned disturbance within the Expansion Area, and any areas of planned disturbance within ML70342 not previously examined such as the proposed diversions of Smoky Creek and Billy's Gully. A Cultural Heritage Management Plan (CHMP), or agreement, will be prepared for the protection of items of aboriginal cultural heritage significance known or unknown with the relevant Traditional Owner (TO) group(s).

It is anticipated the cultural heritage investigation will be conducted following the finalisation of the Mine Plan in October 2006. Cultural heritage investigations will be undertaken with the relevant TO group(s) in order to locate any artefacts and identify locations of Aboriginal cultural significance. Although not legally required for the existing Isaac Plains Coal Mine, a CHMP has been developed and executed by IPCM and the Barada Barna, Kabalbara and Yetimarla People (BBYK), however is not formally registered in accordance with the ACHA.

Upon completion of the cultural heritage investigations, IPCM will work with the TOs to develop the CHMP for the IIPP in order to ensure that items of cultural heritage significance, should they be found to exist, are not disturbed or removed during the construction and operational phases of the mine, that is, without the consent of the TOs. The existing CHMP will be used in the development of the CHMP for the IIPP.

A survey and management plan for any items of European heritage significance will also be undertaken. The survey will be conducted in an attempt to locate any artefacts relating to early pastoral activities within the IIPP site.

Searches of the DEH Australian Heritage Register and the Queensland Heritage register did not list any heritage areas of interest in ML70342 or the Expansion Area.

5 EIS TRIGGERS AND THE ISAAC PLAINS COAL MINE PROJECT

The Expansion Area requires MLs under the MRA to secure tenure for the proposed mining activities. To obtain the MLs, an EA (non-standard mining activity) or an amendment to an existing EA is required under the EP Act. Depending on the scale of a proposed mining activity and environmental sensitivity of the site, the process for obtaining an EA (non-standard mining activity) may be assessed on application for a non-standard EA or may require a formal and public EIS process.

The criteria for determining whether or not an EIS is required and the relevance to the Expansion Area is presented in **Section 5.1** below.

5.1 EIS ASSESSMENT CRITERIA

Triggers for deciding whether a non-standard mining application requires an EIS are outlined in the EPA Guideline 4 *Deciding the level of impact assessment for the mining industry*. These triggers are reproduced below in **Table 5-1** with commentary provided on how the guideline criteria apply to the proposed Expansion Area.

Table 5-1 EIS Trigger Criteria

EPA Trigger	Y/N/U	Comment
Have a significant impact on... Category A and Category B environmentally sensitive areas (ESAs).	Y	Category B ESAs have been identified along Conrock Gully and near Cherwell Creek. Based on these findings and the proposed activities, the Project would involve a significant impact on a Category B ESA.
Involve mining in a marine area.	N	The proposal does not involve mining in a marine area.
Involve mining less than 500 m landward from the highest astronomical tide (HAT).	N	The Project location is in central western Queensland, therefore the proposal will not involve mining within 500 m of HAT.
Require construction of more than 150 new dwellings.	N	Unknown at present but unlikely that it will require construction of 150 dwellings on the site.
Include an ERA that would otherwise be a Level 1 ERA with an annual fee of greater than $4,000.	N	The Expansion Area is likely to require similar non-mining ERAs to the approved Isaac Plains Coal Mine which did not trigger any non-mining ERAs with an annual fee greater than $4,000.
Involve the mining of more than 2 million tonnes of mineral or run of mine ore per year.	Y	While the Expansion Area alone is below this threshold, the combined throughput from both the currently approved and the activities proposed for the Expansion Area will involve approximately 4 Mtpa which exceeds the 2 Mtpa threshold.
Involve the abstraction of more than 2 million m^3 of water per year from natural surface and/or groundwater.	N	While water demands are not known at this stage, it is assumed that demands from he Expansion Area will be less than previously calculated for the currently approved activities (540,000 m^3 per annum). The total combined water demand will therefore be less than 2 million m^3 per annum.
Result in more than 25 ha remaining post mining in a non-beneficial land capability where an acceptable alternative may be feasible.	N	No more than 25 ha of a non-beneficial land capability, where an acceptable alternative may be feasible, will remain.
Involve any non-standard mining activity less than 2 km from a town.	N	N/A. The site is located approximately 10-12 km south-east of Moranbah.
Contain a dam which requires a dam failure assessment under the *Water Act 2000.*	N	The proposal is not likely to involve a dam that requires a dam failure assessment under the *Water Act 2000*.
Include Mining for uranium or asbestos.	N	N/A. The proposal is for the mining of coal.

Y = yes
N = no
U = currently unknown/uncertain

Based on assessment provided in **Table 5-1**, EPA triggers are likely in two instances for this Project: the clearing of an area of Brigalow RE (the integrity of which is questionable), and mining of more than 2 Mtpa of coal, i.e. mining within ML70342 and the Expansion Area will produce approximately 4 Mtpa of coal, thereby exceeding the 2 Mtpa threshold. The diversion of the waterways (i.e. Smoky Creek, Billy's Gully and Conrock Gully) is also a likely informal EIS trigger. Considering these formal and informal triggers, IPCM lodged an application for a voluntary EIS which was accepted by the EPA on the 21 June 2006.

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