environmental management

saunders havill group

Carmichael Coal Rail Project
SP- 2

Regional Vegetation Management Code Response

Adani Mining Pty Ltd
6396
24 October 2012

surveying town planning urban design environmental management landscape architecture

Document Control

Title	**Carmichael Coal Rail Project – Regional Vegetation Management Code Response (SP2)**
Bioregions	Brigalow Belt and New England Tablelands
Job Number	**6396**
Client	Adani Mining Pty Ltd

Document Issue

Issue	Date	Prepared By	Checked By
Draft- Internal	15.10.2012	Stevie Armstrong	Nick Christofis
Draft - Client	24.10.2012	Nick Christofis	Ross Marshall

Disclaimer

This report has been prepared for Adani Mining Pty Ltd. Saunders Havill Group cannot accept responsibility for any use of or reliance upon the contents of this report by any third party.

Reports and/or Plans by Others

Reports and/or plans by others may be included within this Environmental Management report to support the document.

Table of Contents

Tables

Plans

I. Introduction

The Environmental Management Division of the Saunders Havill Group was engaged by Adani Mining Pty Ltd to prepare applications for native vegetation clearing permits under the *Vegetation Management Act 1999* for Separable Portion 2 of the Carmichael Coal Rail Project (referred to within this report as the rail alignment). This includes a response to the relevant Regional Vegetation Management Codes and PVMPs for the 95m wide corridor within **Separable Portion 2** (SP-2). This report addresses Part S of the Regional Vegetation Management Code for the Brigalow Belt and New England Tablelands Bioregions.

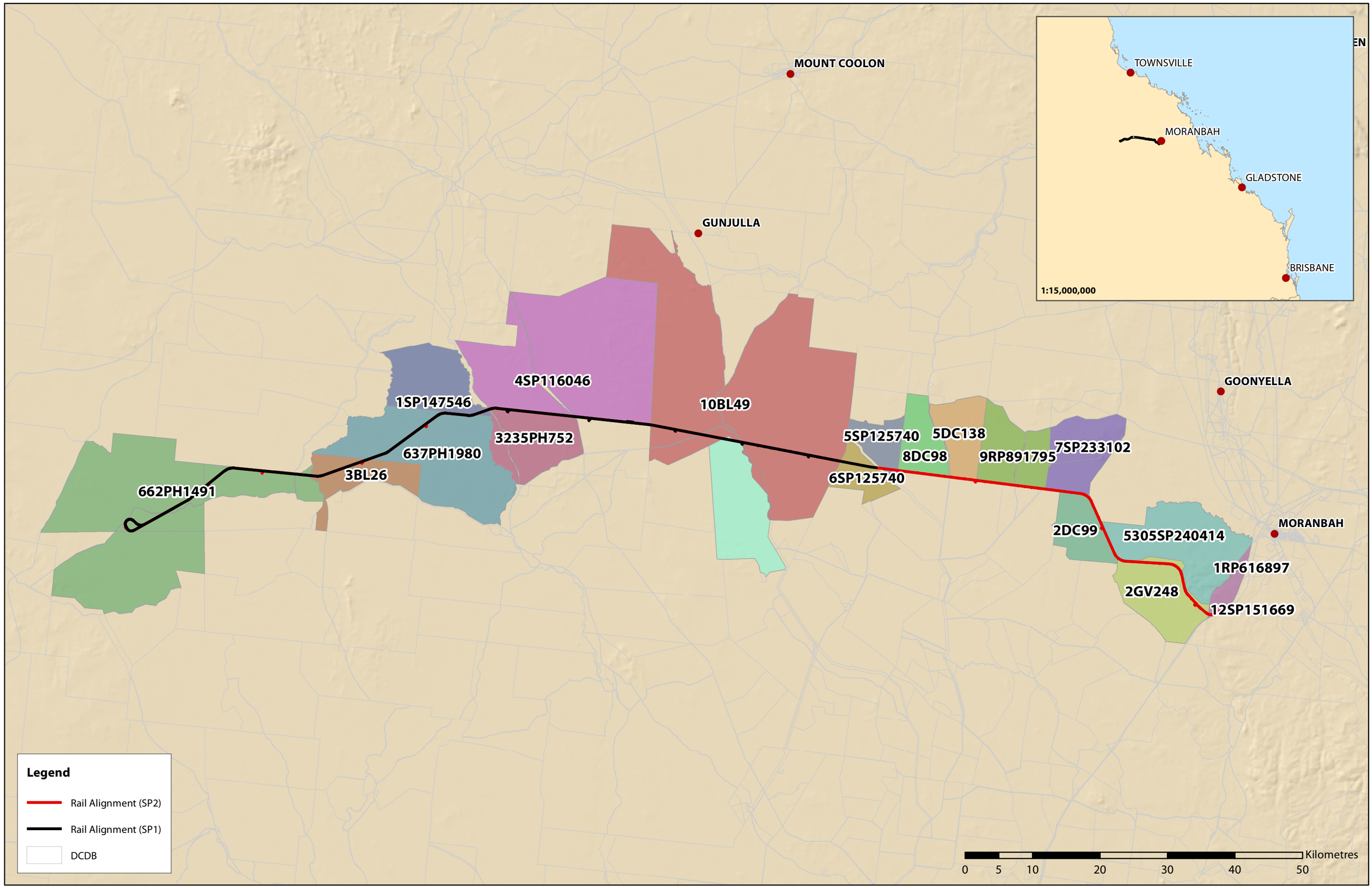
Adani propose a coal mine on their coal tenement (Exploration Permit for Coal (EPC) 1690) in the Galilee Basin, west of Moranbah in central Queensland. The proposed Carmichael Rail links the mine to the ports of Dudgeon Point and Abbot Point. The rail line is divided as follows:

- **Separable Portion 1 (SP1)** – known as 'west rail' which traverses approximately 120km from the Mine site east towards Moranbah; and
- **Separable Portion 2 (SP2)** – known as 'east rail' which connects 'west rail' with the existing Goonyella rail system and provides access to Dalrymple Bay and Hay Point coal terminals.

The Carmichael Coal Rail Project has been declared a 'significant project' under the *State Development and Public Works Organisation Act 1971* and as such, an Environmental Impact Statement (EIS) is required for the Project. This report is prepared to accompany EIS documentation to seek approval to clear 'Assessable Vegetation' under the provisions of the *Vegetation Management Act, 1999*. Specifically an approval is sought for the clearing of a 95m wide corridor required to facilitate the construction and operation of the Carmichael Coal Rail Line.

This application covers the clearing of assessable vegetation within **Separable Proportion 2** (SP2) which is made up of the following properties Plan 1):

1. Lot 5 on SP125740;
2. Lot 8 on DC98;
3. Lot 5 on DC138
4. Lot 9 on RP891795
5. Lot 7 on SP233102
6. Lot 2 on DC99;
7. Lot 5305 on SP240414
8. Lot 2 on GV248;
9. Lot 12 on SP151669; and
10. Lot 1 on SP616897



saunders havill group
web www.saundershavill.com
phone (07) 3251 9444 fax (07) 3251 9455
address 9 Thompson St Bowen Hills Q 4006
surveying town planning urban design environmental management landscape architecture

Carmichael Coal Rail Project

Property Overview (SP1 & SP2)

SHG File | 6396
Date | 24/10/2012
Scale | 1:500,000@ A3
Data Information:
Universal Transverse Mercator
GDA 1994 MGA Zone 55

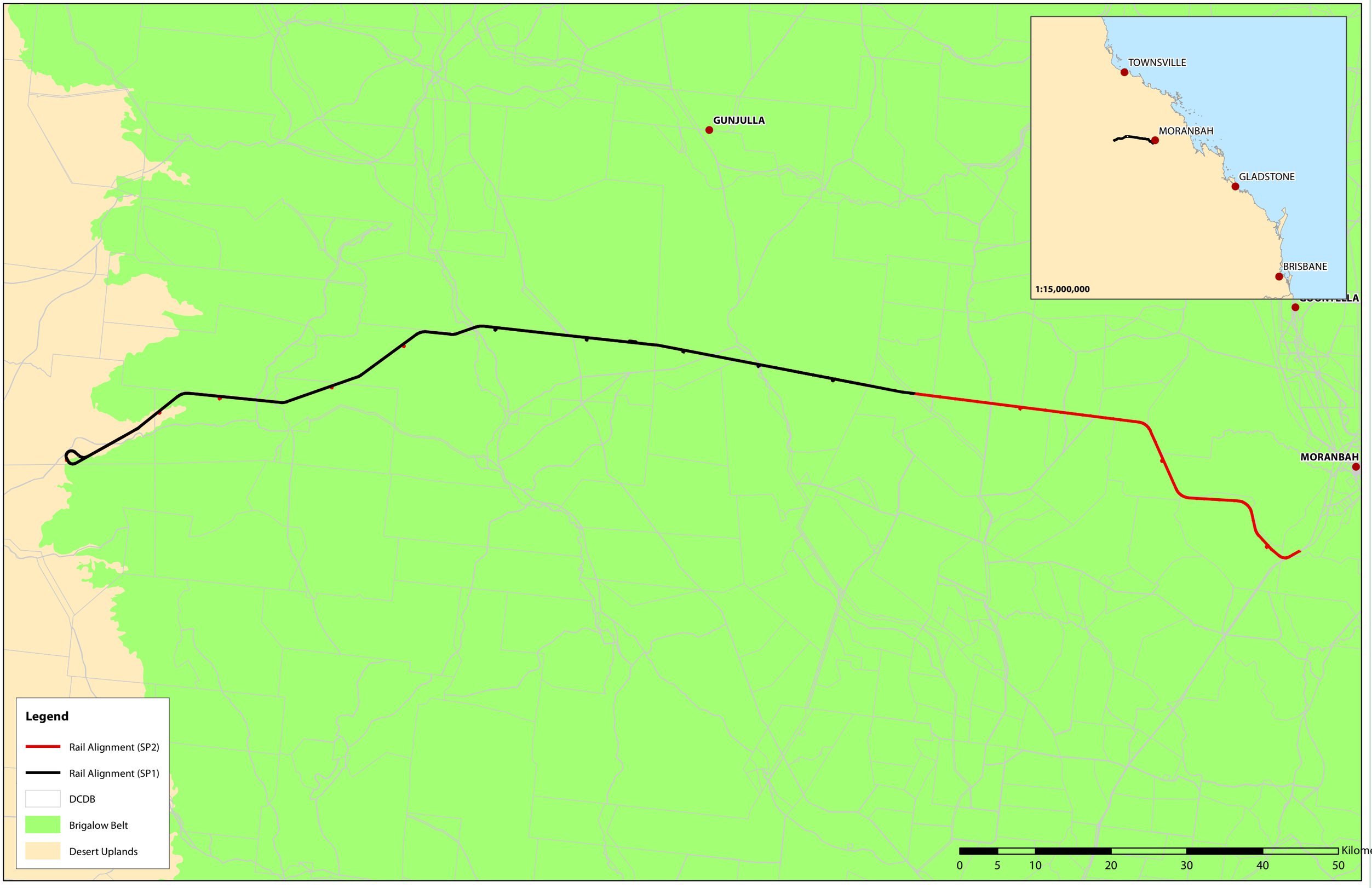
Client | Adani Mining Pty Ltd
Project | Carmichael Coal Rail Project
Source | DCBD (Derm 2012)

Plan 1

2. Bioregions

Queensland is divided into 13 Bioregions based on broad landscape patterns of the area including the major geological structure, climate patterns and broad groups of plants and animals. SP2 of the Carmichael Coal Rail alignment traverses the Brigalow Belt North bioregion (Plan 2). The Brigalow Belt northern bioregion is approximately 60,000km^2 in central east Queensland. The bioregion is characterised by rugged ranges and alluvial plains. Vegetation is mainly acacia open forest and eucalypt woodlands.

Regional Ecosystem descriptions vary subject to the Bioregion and associated landzone and vegetation characteristics. Each bioregion has its own Regional Vegetation Management Code (RVMC) and performance requirements which have been addressed within this report. The Brigalow Belt and New England Tablelands Regional Vegetation Management Code will be applicable to the rail alignment (SP2).



saunders havill group
web www.saundershavill.com
phone (07) 3251 9444 fax (07) 3251 9455
address 9 Thompson St Bowen Hills Q 4006
surveying town planning urban design environmental management landscape architecture

Carmichael Coal Rail Project

Queensland Bioregions of SP1 & SP2

N

SHG File | 6396
Date | 24/10/2012
Scale | 1:443,57@ A3
Data Information:
Universal Transverse Mercator
GDA 1994 MGA Zone 55

Client | Adani Mining Pty Ltd
Project | Carmichael Coal Rail Project
Source | DCBD (Derm 2012)

Plan 2

3. Carmichael Coal Rail Corridor

The Project (Rail) alignment is located within a nominal 95 metre (m) wide corridor that runs from the terminal facilities within the boundary of the Mine approximately 189 km eastwards to connect with existing QR National Goonyella Coal Rail System (Plan 1).

The Rail (west) portion is designed to accommodate a dual gauge (i.e. narrow gauge and standard gauge) with a capacity up to 100 Mtpa. This will allow for future connections to other existing and/or proposed third party rail infrastructure via standard and/or narrow gauge lines. The Rail (east) will be a narrow gauge track with capacity assessed at 60 Mtpa.

The 95 m wide rail corridor is required to facilitate the construction of the rail including earthworks (cut and fill), drainage, associated utilities, access roads and fencing. Example sections detailing the 95 m wide corridor are presented in Appendix A.

Other components of the rail include areas for the establishment of construction camps, maintenance yards, temporary works areas (concrete batching plants, ballast stockpiles etc). These areas have been planned outside of mapped remnant areas and therefore clearing is not assessable under the *Vegetation Management Act, 1999*. Information presented in this application only relates to the clearing required to facilitate the construction of the rail (95 m wide corridor).

3.1. Construction

It is expected that construction of the Project (Rail) will commence in the third quarter of 2013 for a period of approximately two years. The construction schedule currently indicates that construction activities in the first year are largely concerned with the undertaking of civil works (earthworks and structures), such as the establishment of watercourse crossings. Yard works are also scheduled during this period. Earthworks are planned to commence in 2013 and continue through 2014. Track laying, followed by ballasting and tamping, will commence in 2014 and is scheduled for completion in 2015.

The Construction Environmental Management Plan will detail the various requirements for the clearing, earthworks and construction phase aspects of the project relevant to meeting the requirements of the *Vegetation Management Act, 1999*. Specific to the requirements of the VMA are:

- Planning and sequencing of clearing activities;
- Requirements for site stabilization and erosion and sediment control; and
- Specific management strategies within sensitive areas (e.g watercourse and wetland areas).

4. Ecological Assessments

To describe the ecological values along the rail alignment and to verify the desktop assessment results, extensive field surveys have been undertaken along the corridor and surrounding area.

4.1. Property Map of Assessable Vegetation

The Saunders Havill Group was engaged by Adani Mining Pty Ltd to prepare Complex Property Maps of Assessable Vegetation (PMAV) to support Regional Ecosystem (RE) mapping changes for the SP-1 of the Carmichael Coal Rail Project investigation corridor.

Desktop assessment and field surveys were carried out within the 95m wide investigation area along the proposed rail corridor to map and define vegetation into categories as defined by the Queensland Herbarium. Field surveys noted significant variations in current RE mapping, with single RE codes assigned to surveyed polygons (where possible). In locations were vegetation communities have mixed, or are not easily discernible, mapping retains a composite RE description.

The PMAV report should be read in conjunction with this application to clear assessable vegetation. Responses to relevant RVMC Performance Requirements (PR) are based on the findings of the PMAV survey.

The Qld Government does not have a recognised process for the remapping of grassland REs at the property scale. However decision makers should consider levels of weed invasion and overall conditions when reviewing these areas.

4.2. Geotechnical Site Investigations

Detailed field geotechnical surveys have been completed along the Carmichael Coal Rail project alignment. To support geotechnical works ecological field surveys were completed and a number of *Vegetation Management Act 1999* (VMA) and *Nature Conservation Act 1992* (NCA) permits obtained (VMA permit already issued 2012/005626 and 2012/005659). The RVMC responses included in this report build on the information provided during extensive negotiations with NRM officers from the Mackay office.

4.3. Environmental Impact Statement

Field surveys were conducted by GHD to identify the existing terrestrial and aquatic ecological values along the rail alignment for the Ecological Impact Assessment technical study. An autumn survey was undertaken in dry conditions between 16 May 2011 and 20 May 2011 and a spring survey was undertaken in dry conditions between 5 September 2011 and 9 September 2011. For further details refer to 'Report for Carmichael Coal Mine and Rail Project: Rail Technical Report Ecology" prepared by GHD.

5. Regional Vegetation Management Code for Brigalow Belt and New England Tablelands Bioregions

SP2 is located within the Brigalow Belt North Bioregion and as such a response has been prepared to the Regional Vegetation Management Code for Brigalow Belt and New England Tablelands Bioregions.

Extensive vegetation surveys have been completed along the SP2 rail corridor resulting in the reclassification of remnant vegetation at the property scale. A Property Map of assessable Vegetation (PMAV) report is submitted within EIS documentation demonstrating proposed changes to RE mapping and should be read in conjunction with this report.

Property Vegetation Management Plans (PVMP) contained within this report reflect Version 6.1 of Regional Ecosystem mapping, however responses to the RVMC take into consideration the results of the PMAV survey. Refer to Appendix B for PVMP mapping.

Refer to the PMAV document for regional ecosystem changes, and remnant polygon size and boundary changes.

5.1. Performance Requirement 1 – Limits to Clearing

Table 1: Limits to Clearing (PRS1) Performance Requirements and Acceptable Solutions

Performance Requirement
PR S.1: Limits to clearing To regulate the clearing of vegetation in a way that conserves remnant vegetation that are regional ecosystems, does not cause land degradation, prevents the loss of biodiversity and maintains ecological processes—subject to the limitations required to meet PR S.2 to PR S.10—clearing is limited to the extent that is necessary for the project, any associated ancillary works, and the operation of works that comprise a project declared to be a significant project under the *State Development and Public Works Organisation Act 1971*, section 26.

5.1.1 Response

The Carmichael Coal Rail Project is a declared significant project under the *State Development and Public Works Act 1971*, section 26.

The Project (Rail) alignment was the subject of detailed rout analysis which examined environmental and engineering criteria. The Project (Rail) concept design is based on:

- Minimising environmental impact;
- Minimising disturbance to existing infrastructure;
- Limiting fragmentation of landholdings; and
- Meeting engineering design criteria.

The subsequent alignment requires a 95m wide corridor in order to facilitate the construction and ongoing operation of the rail. This construction width has been selected post detailed survey and analysis of a 500m wide investigation corridor. Section 3 and Appendix A summarise the requirements of the rail corridor

5.2. Performance Requirement 2 – Wetlands

Table 2: Wetlands (PRS2) Performance Requirements and Acceptable Solutions

Performance Requirement	Acceptable Solutions
PR S.2: Wetlands To regulate the clearing of vegetation in a way that prevents the loss of biodiversity and maintains ecological processes—maintain the current extent of assessable vegetation associated with any natural significant wetland and/or natural wetland to provide— a) water quality by filtering sediments, nutrients and other pollutants; and b) aquatic habitat; and c) terrestrial habitat.	AS S.2 S.2.1 Clearing does not occur— a) in any natural wetland; and b) within 100 metres from any natural wetland; and c) in any natural significant wetland; and d) within 200 metres from any natural significant wetland.

5.2.1 Response

The RVMP includes a comprehensive definition as to what constitutes a Wetland or a Significant Wetland. These definitions were consulted to identify areas along SP1 that require consideration against PR S.2.

Natural Significant Wetland

- The project area is located within the Burdekin and Fitzroy catchments and therefore part A of the definition applies when determining the presence of a significant wetland.
- In pockets along watercourses, dams and other drainage features areas of land are assessed as supporting plants which have adapted to or are dependent on living in wet conditions. However no Vegetation Management Wetland map exists for the area and thus it is impossible to identify if any Great Barrier Reef Wetlands are present. In the absence of this mapping category, existing searches have been completed against the mapping in State Planning Policy (SPP) 4/11 – Protecting wetlands of High Ecological Significance (HES) catchment. A search of the Vegetation Management Act Great Barrier Reef Wetlands v2.1 also shows no wetlands along the alignment.
- Based on the above explanation, the rail line will not result in the clearing of assessable vegetation in or within 200m of a natural significant wetland.

Wetland

- None of the Regional Ecosystems mapped within the study area and identified on-site are listed in Table 14 of the RVMC.
- The rail alignment does not contain a natural spring listed within the Queensland Springs Database.
- Queensland Wetland Data Version 3.0 within the Department of Environment and Heritage Protection Wetland *Maps* a lacustrine wetland within the area defined by PVMP 6. This area requires consideration against PR S.2

In some locations wetland features on the ground consistent with the definition provided in the RVMC and overlapping with DERM mapping will trigger the need for wetland offsets. In these areas the precise extent of Assessable Vegetation associated with the "Natural Wetland" (as defined) will be offset using the following criteria from the 30th of September 2011 Policy for Vegetation Management Offsets.

An offset for Wetlands must:

a) Be located within the same bioregion
b) Have the same or higher wetland status(either as a wetland or significant wetland) as identified in the relevant part of the regional vegetation management code
c) Be a wetland area or regional ecosystem listed in the regional vegetation management code
d) Be a regional ecosystem associated with a wetland or significant wetland which assists with maintaining water quality, aquatic habitat and terrestrial habitat.

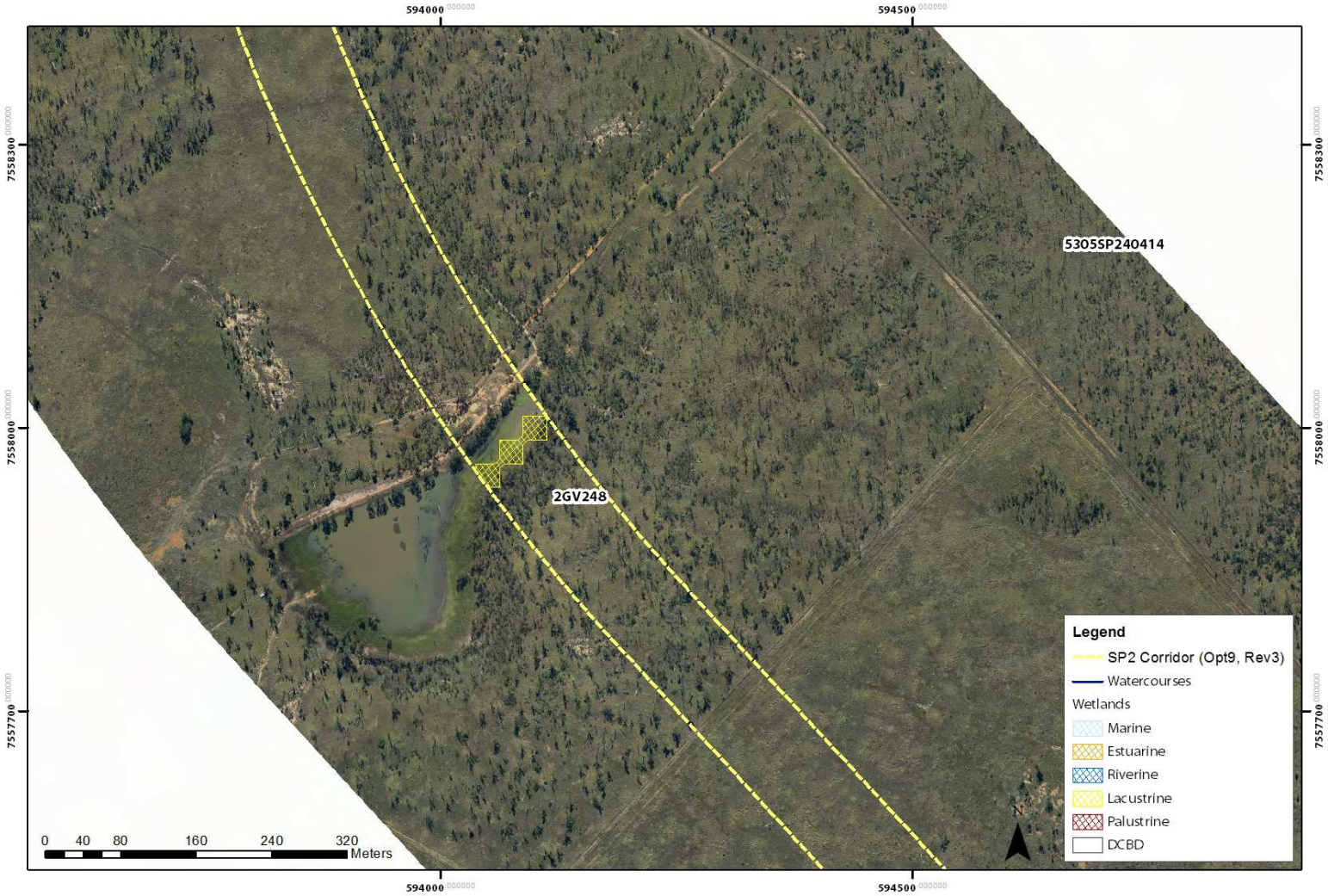
5.2.2 Response PVMP 6 (Lot 2 on GV248)

A mapped lacustrine wetland intersects with the SP2 rail corridor within Lot 2 on GV248. The PMAV assessment of this area observed a vegetation composition and structure that was consistent with the regional ecosystem mapping of RE11.5.3/11.5.9c. The canopy was dominated by *Eucalyptus populnea* and *Corymbia clarksonia,* with *Petalostigma pubsecens, Alphitonia excelsa* and *Acacia excelsa* within the T2 and shrub layers. Ground layer was dominated by *Pennisetum ciliare* and *Themeda triandra.* Moderate levels of disturbance were observed within the survey area including weed invasion, grazing and historical clearing.

Clearing will be required within these areas to facilitate the construction of the rail.

Photo: mapped lacustrine wetland

Figure 1: **Mapped Wetlands within PVMP 6 (Queensland Wetland Data Version 3.0)**



5.3. Performance Requirement 3 – Watercourses

Table 3: Watercourses (PRS3) Performance Requirements and Acceptable Solutions

Performance Requirement	Acceptable Solutions
PR S.3: Watercourses To regulate the clearing of vegetation in a way that does not cause land degradation, prevents the loss of biodiversity and maintains ecological processes—maintain the current extent of assessable vegetation associated with any watercourse to provide— a) bank stability by protecting against bank erosion; and b) water quality by filtering sediments, nutrients and other pollutants; and c) aquatic habitat; and d) terrestrial habitat.	AS S.3 S.3.1 Clearing does not occur— a) in any watercourse; and b) within the relevant distance stipulated in Table 2, of each high bank of each watercourse.

5.3.1 Response

Due to the linear nature of the proposed infrastructure, the rail alignment intersects with mapped watercourses at seven (7) locations. Five (5) of these watercourses are located within remnant vegetation. The remaining watercourses occur within areas mapped as regrowth or non-remnant and are therefore not assessable against the RVMC.

For the remaining seven locations the proposed clearing of remnant vegetation requires consideration against Acceptable Solution AS S.3. Each area is addressed in Table 4 below.

Where the through specific construction methods the AS cannot be achieved and offset will be provided for the clearing of all "assessable Vegetation" within or associated with the defined watercourse area. The offset will achieve the criteria from the 30th of September 2011 Policy for Vegetation Management Offsets.

An offset area for a watercourse must be:

a) Be located within the same bioregion
a) The same or higher stream order as the watercourse proposed for clearing
b) A regional ecosystem associated with a watercourse which assists with maintaining bank stability, water quality, aquatic habitat and terrestrial habitat.

Table 4: Requirements of PR S.3 Watercourses

PVMP	Lot	RE observed	Stream order
4	Lot 2 on GV248	Endangered RE11.3.1	3
5	Lot 2 on GV248	Least Concern RE11.5.3/11.4.9c	1
6	Lot 2 on GV248	Least Concern RE11.5.3/11.4.9c	1
6	Lot 2 on GV248	Least Concern RE11.5.3/11.4.9c	1
7	Lot 2 on GV248	Least Concern 11.5.9c/11.5.3	1

5.4. Performance Requirement 4 – Connectivity

Table 5: Connectivity (PRS4) Performance Requirements and Acceptable Solutions

Performance Requirement	Acceptable Solutions
PR S.4: Connectivity To regulate the clearing of vegetation in a way that prevents the loss of biodiversity and maintains ecological processes—areas of mapped remnant vegetation are— a) of sufficient size and configured in a way to maintain ecosystem functioning; and b) of sufficient size and configured in a way to remain in the landscape in spite of any threatening processes; and c) located on the lot(s) that are the subject of the application to maintain connectivity to mapped remnant vegetation on adjacent properties.	AS S.4 S.4.1 Where clearing is less than — a) 10 metres wide in the coastal subregions of the Brigalow Belt Bioregion; or b) 2 hectares in the coastal subregions of the Brigalow Belt Bioregion; or c) 25 metres wide in the non-coastal subregions of the Brigalow Belt and the New England Tableland Bioregion; or d) is less than 5 hectares in the non-coastal subregions of the Brigalow Belt and the New England Tableland Bioregion; clearing does not— a) reduce the width of mapped remnant vegetation to less than 200 metres; and b) occur where the width of mapped remnant vegetation is less than 200 metres; AND S.4.2 Clearing does not— a) reduce areas of contiguous mapped remnant vegetation to less than 10 hectares, in the coastal subregions of the Brigalow Belt Bioregion; and b) occur in areas of contiguous mapped remnant vegetation that are less than 10 hectares, in the coastal subregions of the Brigalow Belt Bioregion; and c) reduce areas of contiguous mapped remnant vegetation to less than 50 hectares, in the non-coastal subregions of the Brigalow Belt and the New England Tableland Bioregion; and d) occur in areas of contiguous mapped remnant vegetation that are less than 50 hectares, in the non-coastal subregions of the Brigalow Belt and the New England Tableland Bioregion; and e) reduce the width of mapped remnant vegetation to less than 200 metres; and f) occur where the width of mapped remnant vegetation is less than 200 metres; and g) reduce the total extent of mapped remnant vegetation to less than 30%; and h) occur where the total extent of mapped remnant vegetation is less than 30%. AND S.4.3 Where clearing is for a significant community project, maintain the current extent of mapped remnant vegetation where the vegetation is— a) of sufficient size and configured in a way to maintain ecosystem functioning; and b) of sufficient size and configured in a way to remain in the landscape in spite of any threatening processes; and c) located on the lot(s) that are the subject of the application to maintain connectivity to mapped remnant vegetation on adjacent properties.

5.4.1 Response General

The location of the rail alignment took into consideration the impact on property owners, and a range of other social, environmental, and technical constraints. In considering these constraints, the alignment has been located wherever possible in areas that have been cleared or degraded

through historical or current land uses. Volume 1 Section 3 of the Environmental Impact Statement provides a discussion on the alternatives for the project.

The majority of the SP2 rail alignment is within disturbed agricultural areas identified as non-remnant on Regional Ecosystem mapping. In some locations the alignment intersects with areas mapped as containing remnant vegetation (Refer Table 6). The majority of these areas coincide with thin isolated polygons of vegetation generally retained along fence lines or adjoining drainage features within the landscape.

These highly fragmented strips of vegetation are not of a size or configured in a way that allows the retention of high biodiversity values. These areas are subjected to weed invasions and hold limited floral diversity. In addition many of these vegetated areas occur along existing fence lines and property boundaries and therefore could be cleared under common landholder clearing exemptions.

Areas of more intact vegetation are present toward the eastern end of the alignment associated with Mount Diligen (PVMP 5-8). These areas require more detailed consideration against PRS.4.

Table 6: Requirements of PR S.4 Connectivity

PVMP	Lot (s)	RE observed	Comment
1	Road and Lot 5 on SP125840	Of Concern RE11.4.11	Refer to SP1 RVMC Response Section 6.4.11
2	Road Reserve	Endangered RE11.4.8	Refer to Section 5.4.2
3	Lot 9 on RP891795	Non remnant	Refer to Section 5.4.3
4	Lot 5305 on SP240414	Endangered RE11.3.1	Refer to Section 5.4.4
5-8	Lot 2 on GV248, and Lot 12 on SP151669	Least Concern RE11.5.3/11.4.9c	Refer to Section 5.4.5

5.4.2 PVMP 2 (Road Reserve)

The proposed rail corridor intersects the narrow strip of road reserve vegetation associated with Kilcummin Diamond Downs Road. This area forms part of a thin linear patch of vegetation that extends north south in the landscape. .

Based on the fragmented nature of this mapped remnant polygon, it is determined that the Carmichael Coal Rail Project will not impact on connectivity within this location.

5.4.3 PVMP 3 (Lot 9 on RP891795)

The rail corridor is located within the northern extents of an area of mapped Endangered vegetation. Field observations identified this vegetation to be non-remnant and as such the rail corridor will not impact on connectivity values in this location.

5.4.4 PVMP 4 (Lot 5305 on SP240414)

The location is associated with a mapped watercourse (SO3). Contextually the relatively narrow area of vegetation associated with this watercourse forms part of a fragmented north south corridor.

As can be seen within aerial photography, much of the area is already disturbed. The implementation of fauna sensitive crossing methods within this location will provide opportunity for on-going fauna movement. As such the Carmichael Coal rail project will maintain connectivity within this location.

5.4.5 PVMP 5-8 (Lot 2 on GV248, and Lot 12 on SP151669)

The corridor alignment is located within Least Concern mapped vegetation community described as Least Concern RE11.5.3/11.4.9c. The area was described within the field survey as approximately 50% Least Concern RE 11.5.3 and 50% Least Concern RE11.4.9c. Species observed include *Eucalyptus populnea, Eucalyptus crebra* and *Corymbia clarksonia* within the T1 layer and *Petalostigma pubsecens* and *Acacia excelsa* within the T2 and shrub layers.

The rail alignment through this area has been designed where possible to avoid existing vegetation and maintain connectivity. However it is noted that the alignment is dictated by the requirement to connect to the existing network and where possible follow property boundaries to limit landholder access. As such total avoidance of this vegetated area is not possible.

Given the rail corridor is located on the western edge of the mapped polygon and the overall reduction in size is limited it is argued that the rail will not impact on ecosystem function. In addition the area will be robust enough to remain unaffected by threatening processes.

5.5. Performance Requirement 5 – Soil Erosion

Table 7: Soil Erosion (PRS5) Performance Requirements and Acceptable Solutions

Performance Requirement	Acceptable Solutions
PR S.5 Soil erosion To regulate the clearing of vegetation in a way that does not cause land degradation and maintains ecological processes—the effect of clearing does not result in— a) mass movement, gully erosion, rill erosion, sheet erosion, tunnel erosion, stream bank erosion, wind erosion, or scalding; and b) any associated loss of chemical, physical or biological fertility—including, but not limited to water holding capacity, soil structure, organic matter, soil biology, and nutrients, within and/or outside the lot(s) that are the subject of the application.	AS S.5 S.5.1 Mechanical clearing only occurs on— a) very stable soils on a slope less than 15%; and b) stable soils on a slope less than 12%; and c) unstable soils on a slope less than 8%; and d) very unstable soils on a slope less than 5%.

5.5.1 Response

Erosion and sediment control measures will be undertaken within and adjacent to cleared areas in accordance with an Erosion and Sediment Control Plan and the Construction Environmental Management Plan for the rail alignment. This will include both temporary and permanent measures to limit land degradation, particularly in proximity to waterways, drainage lines and floodplains. Measures will be implemented to reduce sedimentation within these systems and disturbance to watercourse bed and banks.

Performance Requirement S.5: Soil Erosion is met using an alternative solution.

5.6. Performance Requirement 6 – Salinity

Table 8: Salinity (PRS6) Performance Requirements and Acceptable Solutions

Performance Requirement	Acceptable Solutions
PR S.6: Salinity To regulate the clearing of vegetation in a way that does not cause land degradation and maintains ecological processes—clearing does not contribute to— a) waterlogging; or b) the salinisation of groundwater, surface water or soil.	AS S.6 S.6.1 Where clearing is less than— a) 2 hectares; or b) 10 metres wide; clearing does not occur in any discharge area. AND S.6.2 Where clearing is less than— a) 5 hectares; or b) 50 metres wide— clearing does not occur— i. in any discharge area; and ii. within 200 metres of any discharge area. AND S.6.3 Clearing does not occur in areas greater than 5 hectares

5.6.1 Response

EIS documentation provides a detailed analysis of impacts to ground and surface water as a result of the Carmichael Coal Rail project. Due to the linear nature of vegetation clearing it is not expected that the clearing will result in waterlogging or the salinization of groundwater, surface water or soil.

5.7. Performance Requirement 7 - Conserving remnant vegetation that are endangered regional ecosystems and of concern regional ecosystems

Table 9: Conserving Remnant vegetation that are Endangered regional ecosystems and Of Concern regional ecosystems (PRS7) Performance Requirements and Acceptable Solutions

Performance Requirement	Acceptable Solutions
PR S.7 Conserving remnant vegetation that are *endangered* regional ecosystems and *of concern* regional ecosystems To regulate the clearing of vegetation in a way that conserves remnant vegetation that are *endangered* regional ecosystems and *of concern* regional ecosystems—maintain the current extent of *endangered* regional ecosystems and *of concern* regional ecosystems.	AS S.7 S.7.1 Clearing— a) does not occur in an *endangered* regional ecosystem or an *of concern* regional ecosystem that is listed in Table 4; and b) in an *endangered* regional ecosystem or an *of concern* regional ecosystem that is not listed in Table 4 only occurs where the clearing is less than 10 metres wide or 0.5 hectares.

5.7.1 Response

The majority of the vegetation identified within the rail alignment is not listed within Table 4 as dense regional ecosystems and mid-dense wet sclerophyll, melaleuca, mangrove and wetland regional ecosystems.

No Table 4 regional ecosystems are mapped along the SP-2 rail corridor.

Where clearing of Endangered or Of Concern regional ecosystems is proposed in excess of 0.5ha, an offset will be provided in accordance with the Carmichael Coal Rail Project Offset Strategy thereby maintaining the current extent of these regional ecosystems. Refer to Table 10 for further detail.

Table 10: Endangered and Of Concern RE's along SP1 Rail Corridor

PVMP	Lot	Mapped RE	RE Observed	Area of Clearing within an Endangered or Of Of Concern RE
1	Lot 5 on SP125740	Endangered RE11.4.11/ 11.4.9	Of Concern RE11.4.11	0.6ha
2	Lot 5 on DC138	Endangered RE11.4.8	Non remnant	NA
3	Lot 9 onRP891795	Endangered RE11.4.11/11.4.9/11.4.5	Non remnant	NA
4	Lot 2 on GV248	Endangered RE11.3.1	Endangered RE11.3.1	1ha
8	Lo9t 12 on SP151669	Endangered RE 11.5.3/11.5.9c/11.4.9/ 11.3.25	Endangered RE 11.5.3/11.5.9c/11.4.9/11.3.25	0.4ha (below threshold)

5.8. Performance Requirement 8 – Essential Habitat

Table 11: Essential Habitat (PRS8) Performance Requirements and Acceptable Solutions

Performance Requirement	Acceptable Solutions
PR S.8: Essential habitat To regulate the clearing of vegetation in a way that prevents the loss of biodiversity—maintain the current extent of essential habitat.	AS S.8 S.8.1 Clearing does not occur in an area shown as essential habitat on the essential habitat map.

5.8.1 Response

The proposed clearing will not occur in an area shown as essential habitat on an essential habitat map. Refer to Appendix B for the SP2 essential habitat maps.

Performance requirement S.8 is met using Acceptable Solution S8.1

5.9. Performance Requirement 9 – Conservation Status thresholds

Table 12: Conservation Status Thresholds (PRS9) Performance Requirements and Acceptable Solutions

Performance Requirement	Acceptable Solutions
PR S.9: Conservation status thresholds To regulate the clearing of vegetation in a way that prevents the loss of biodiversity and conserves remnant vegetation that are regional ecosystems— maintain the current extent of regional ecosystems listed in Table 5.	AS S.9 S.9.1 Clearing in a regional ecosystem listed in Table 5 does not occur unless the clearing is less than— 10 metres wide; or 2 hectares.

5.9.1 Response

None of the vegetation is identified within Table 5 of the Regional Vegetation Management Code as a regional ecosystem that is at risk of the remnant extent fallow below 30% of its pre-clearing extent, or having a remnant extent of less than 10, 000 hectares.

The vegetation within PVMP 3 is mapped as 11.4.11 which is listed within Table 5 of the RVMC. However field surveys confirmed this area to be non-remnant as demonstrated within the Property Map of Assessable Vegetation (PMAV) for the Carmichael Coal Rail corridor.

Performance requirement S.9 is met using Acceptable Solution AS9.1

5.10. Performance Requirement 10 – Acid Sulfate Soils

Table 13: Acid Sulfate Soils (PRS10) Performance Requirements and Acceptable Solutions

Performance Requirement	Acceptable Solutions
PR S.10: Acid sulfate soils To regulate the clearing of vegetation in a way that does not cause land degradation and maintains ecological processes in the coastal subregions of the Brigalow Belt Bioregion, and the Marlborough Plains subregion (11.14)—clearing activities do not result in disturbance of acid sulfate soils or changes to the hydrology of the location that will either— a) aerate horizons containing iron sulfides; or b) mobilise acid and/or metals.	AS S.10 S.10.1 In the coastal subregions of the Brigalow Belt Bioregion, and the Marlborough Plains subregion (11.14), clearing in land zone 1, land zone 2 or land zone 3 in areas below 5 metre Australian Height Datum— a) is carried out in accordance with an acid sulfate soils environmental management plan as outlined in the *State Planning Policy 2/02 Guideline: Planning and Managing Development involving Acid Sulfate Soils*; and *b)* follows management principles in accordance with the Soil Management Guidelines in the *Queensland Acid Sulfate Soil Technical Manual.*

5.10.1 Response

The rail alignment is predominantly located within land zone 3 (Alluvium river and creek flats), landzone 4 (clay plains not associated with current alluvium), landzone 5 (old loamy and sandy plains), and a small section of landzone 10 (course grained sedimentary rocks).

The proposed clearing will not occur within areas below 5 metres (Australian Height Datum).

Performance requirement S.10 is met using Acceptable Solution AS10.1

6. Appendices

Appendix B

Engineering Plans

Appendix A

Property Vegetation Management Plans

Appendix C

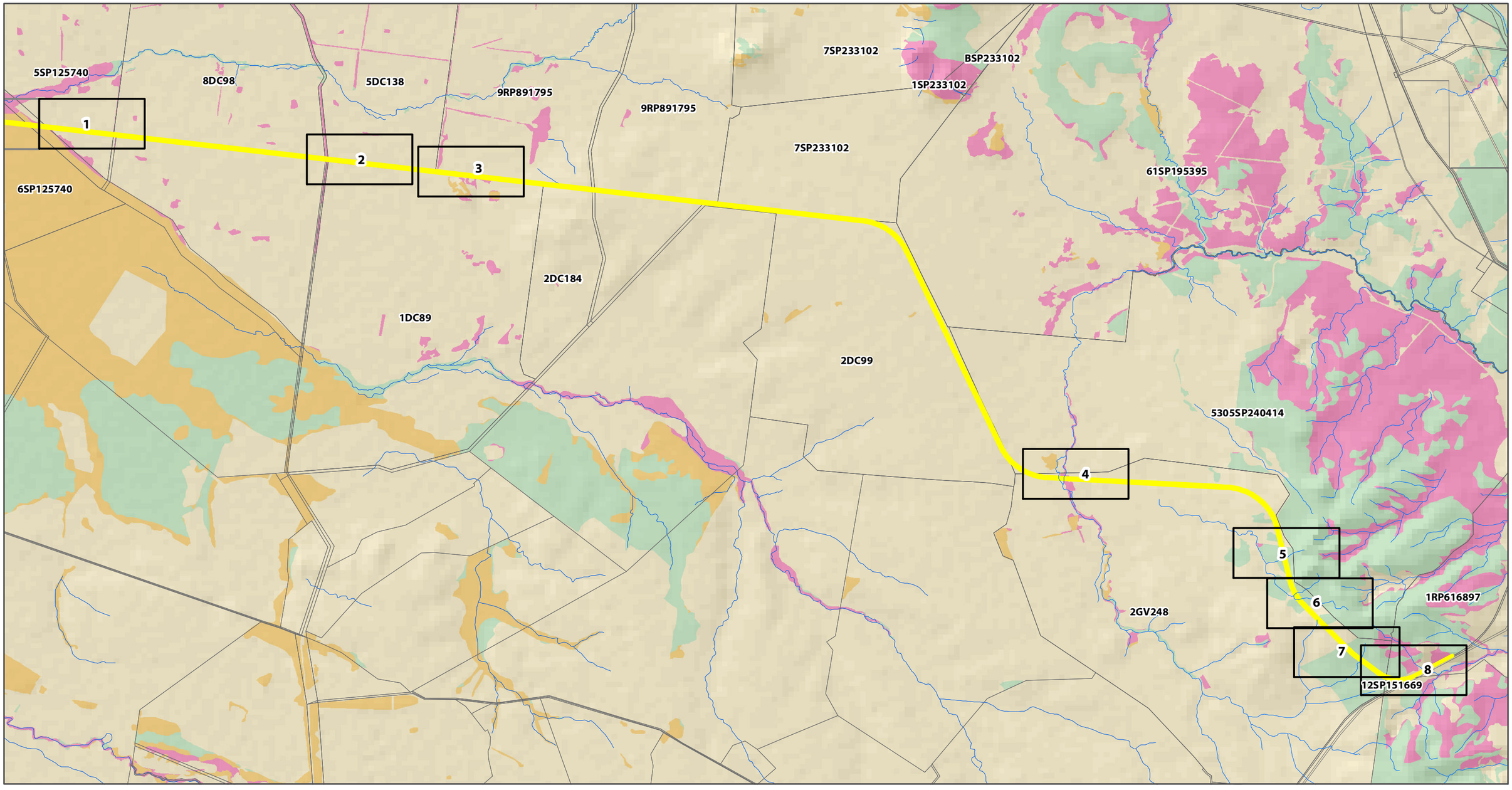
Essential Habitat Maps

Appendix A

Engineering Plans

Appendix B

Property Vegetation Management Plans



Kilometres

0 2.5 5 10

N

SP1 Corridor - Vekta (2012)
Regional Ecosystem v6.1 - DERM (2011)
DCDB - QLD Gov (2012)
Datum & Map Grid - GDA94 MGA Zone 55
Scale @ A3 1:10,000

Scale 1:10,000@ A3
Data Information:
Universal Transverse Mercator
GDA 1994 MGA Zone 55

Legend

- PMAV Coordinates
- DCDB
- Adani Mine EPC
- 95m Clearing Corridor
- Watercourses

Regional Ecosystem v6.1

- Remnant vegetation containing Endangered REs
- Remnant vegetation containing Of Concern REs
- Remnant vegetation that is a Least Concern RE

saunders havill group
web www.saundershavill.com
phone (07) 3251 9444 fax (07) 3251 9455
address 9 Thompson St Bowen Hills Q 4006
surveying town planning urban design environmental management landscape architecture

adani

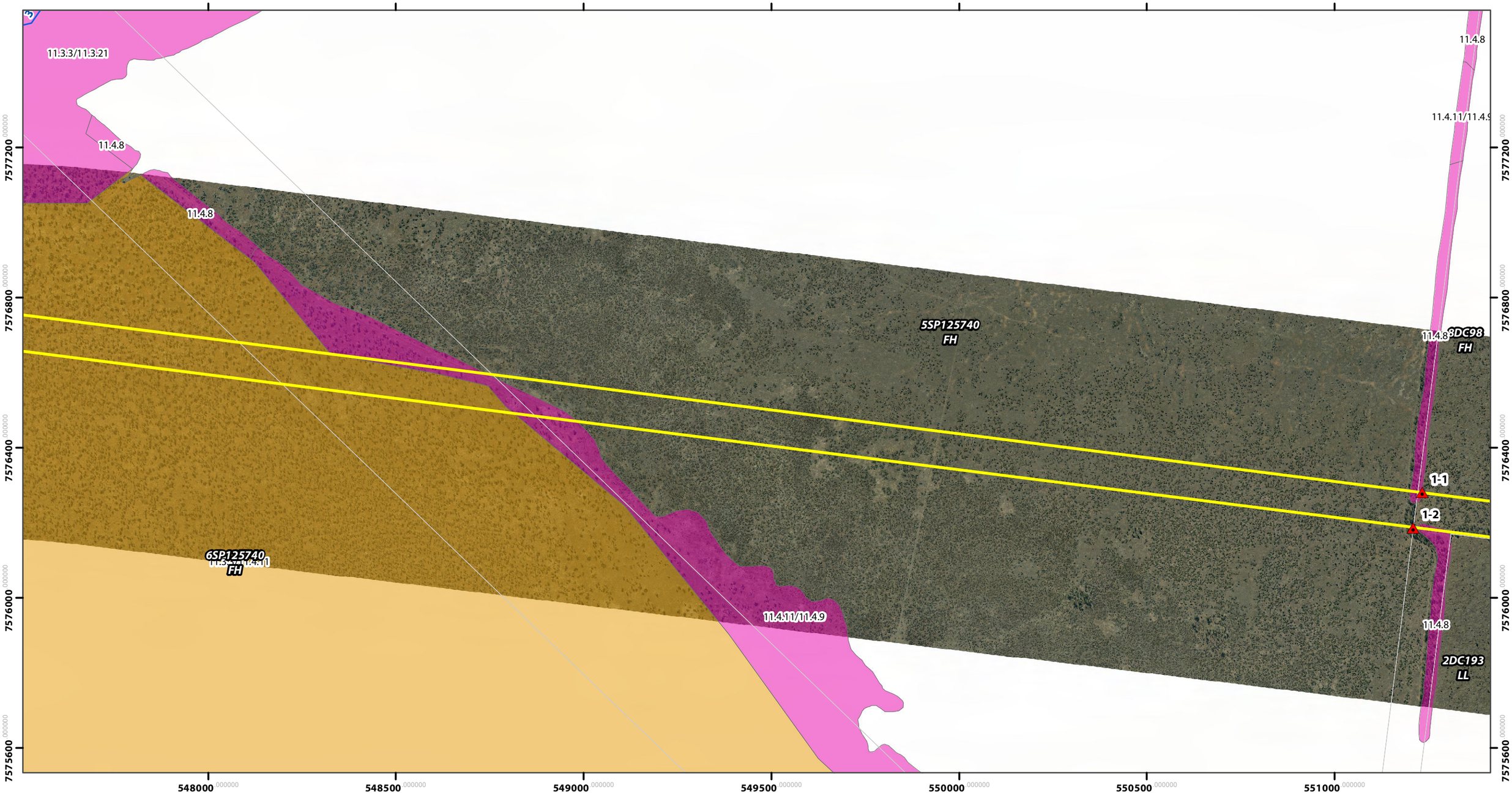
AMENDMENTS:

Issue	Date	Description	Checked
A	19/10/2012	PVMP	RM

CLIENT: Adani Mining Pty Ltd
PROJECT: Charmichael Coal Rail Project
DATE: August 2012
CHECKED: -
CLIENT REF.: 6396
DRAWN: SA

PLAN OF: Property Vegetation Management Plan

PLAN No.: 6396 E PVMP SP2 CONTEXT A



0 50 100 200 300 400 500 600 700 800 Metres

N

SP1 Corridor - Vekta (2012)
Regional Ecosystem v6.1 - DERM (2011)
DCDB - QLD Gov (2012)
Datum & Map Grid - GDA94 MGA Zone 55
Scale @ A3 1:10,000

Scale 1:10,000@ A3
Data Information:
Universal Transverse Mercator
GDA 1994 MGA Zone 55

PVMP Coordinate Table:

ID	Description	Easting (m)	Northing (m)
1-1	Property Boundary	551235.200456	7576280.39671
1-2	Property Boundary	551211.063182	7576185.88994
1-3	Property Boundary	554855.20333	7575820.85138
1-4	Property Boundary	554845.643406	7575721.716
1-5	Clearing Boundary	552987.890474	7575962.13709

Legend

- PMAV Coordinates
- DCDB
- 95m Clearing Corridor
- Adani Mine EPC
- Watercourses

Regional Ecosystem v6.1

- Remnant vegetation containing Endangered REs
- Remnant vegetation containing Of Concern REs
- Remnant vegetation that is a Least Concern RE

saunders havill group
surveying ■ town planning ■ urban design ■ environmental management ■ landscape architecture
web www.saundershavill.com
phone (07) 3251 9444 fax (07) 3251 9455
address 9 Thompson St Bowen Hills Q 4006

adani

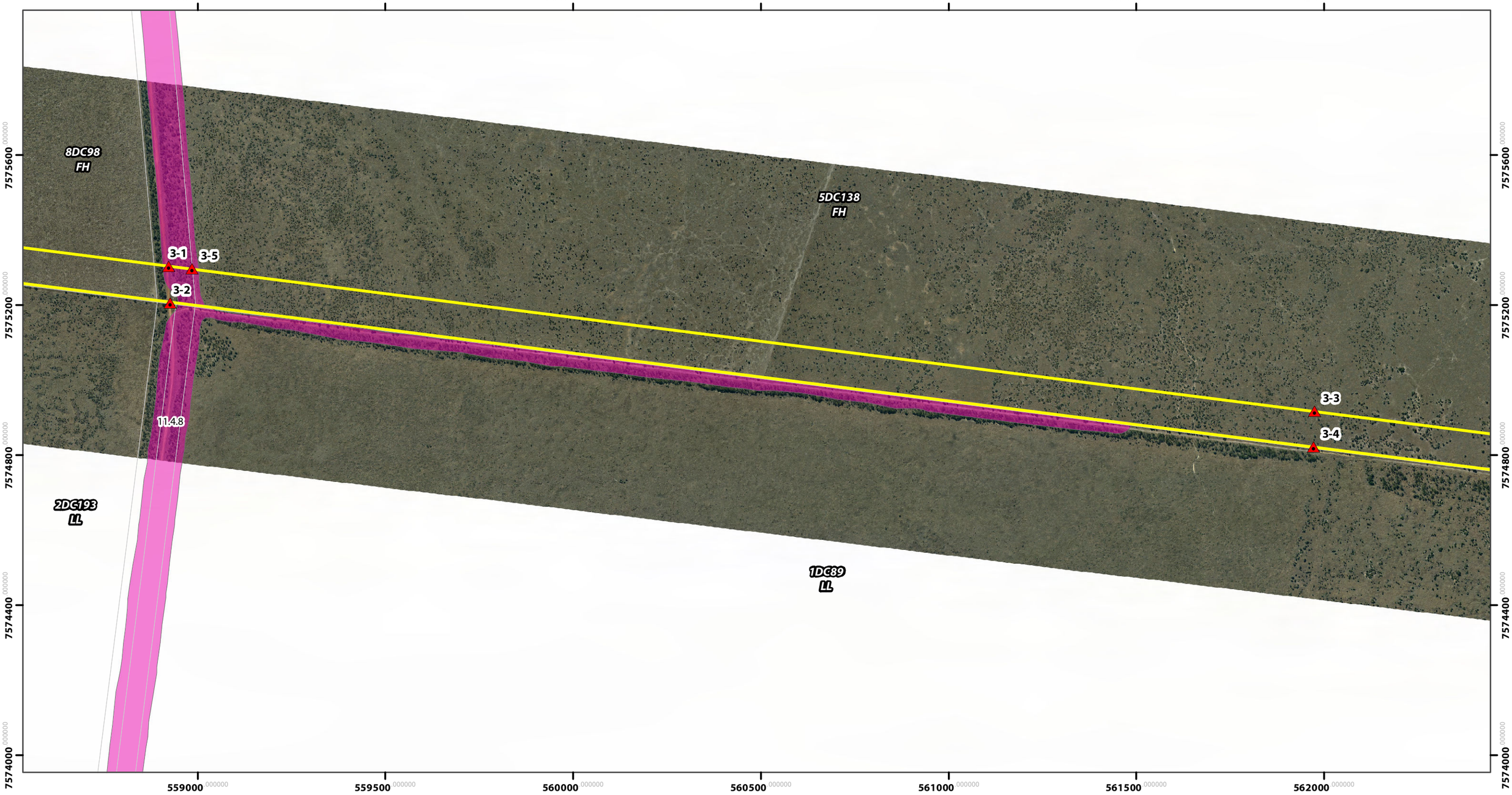
AMENDMENTS:

Issue	Date	Description	Checked
A	19/10/2012	PVMP	RM

CLIENT: Adani Mining Pty Ltd
PROJECT: Charmichael Coal Rail Project
DATE: October 2012
CHECKED: -
CLIENT REF.: 6396
DRAWN: SA

PLAN OF: Property Vegetation Management Plan

PLAN No.: 6396 E 1 PVMP SP2 A



Metres
0 50 100 200 300 400 500 600 700 800

N

SP1 Corridor - Vekta (2012)
Regional Ecosystem v6.1 - DERM (2011)
DCDB - QLD Gov (2012)
Datum & Map Grid - GDA94 MGA Zone 55
Scale @ A3 1:10,000

Scale 1:10,000@ A3
Data Information:
Universal Transverse Mercator
GDA 1994 MGA Zone 55

PVMP Coordinate Table:

ID	Description	Easting (m)	Northing (m)
3-1	Road	558923.213	558923.213
3-2	Road	558926.112	558926.112
3-3	Clearing Boundary	561974.973	561974.973
3-4	Clearing Boundary	561973.197	561973.197
3-5	Road Reserve Boundary	558985.391	558985.39159

Legend

- PMAV Coordinates
- DCDB
- 95m Clearing Corridor
- Adani Mine EPC
- Watercourses

Regional Ecosystem v6.1
- Remnant vegetation containing Endangered REs
- Remnant vegetation containing Of Concern REs
- Remnant vegetation that is a Least Concern RE

saunders havill group
surveying town planning urban design environmental management landscape architecture
web www.saundershavill.com
phone (07) 3251 9444 fax (07) 3251 9455
address 9 Thompson St Bowen Hills Q 4006

adani

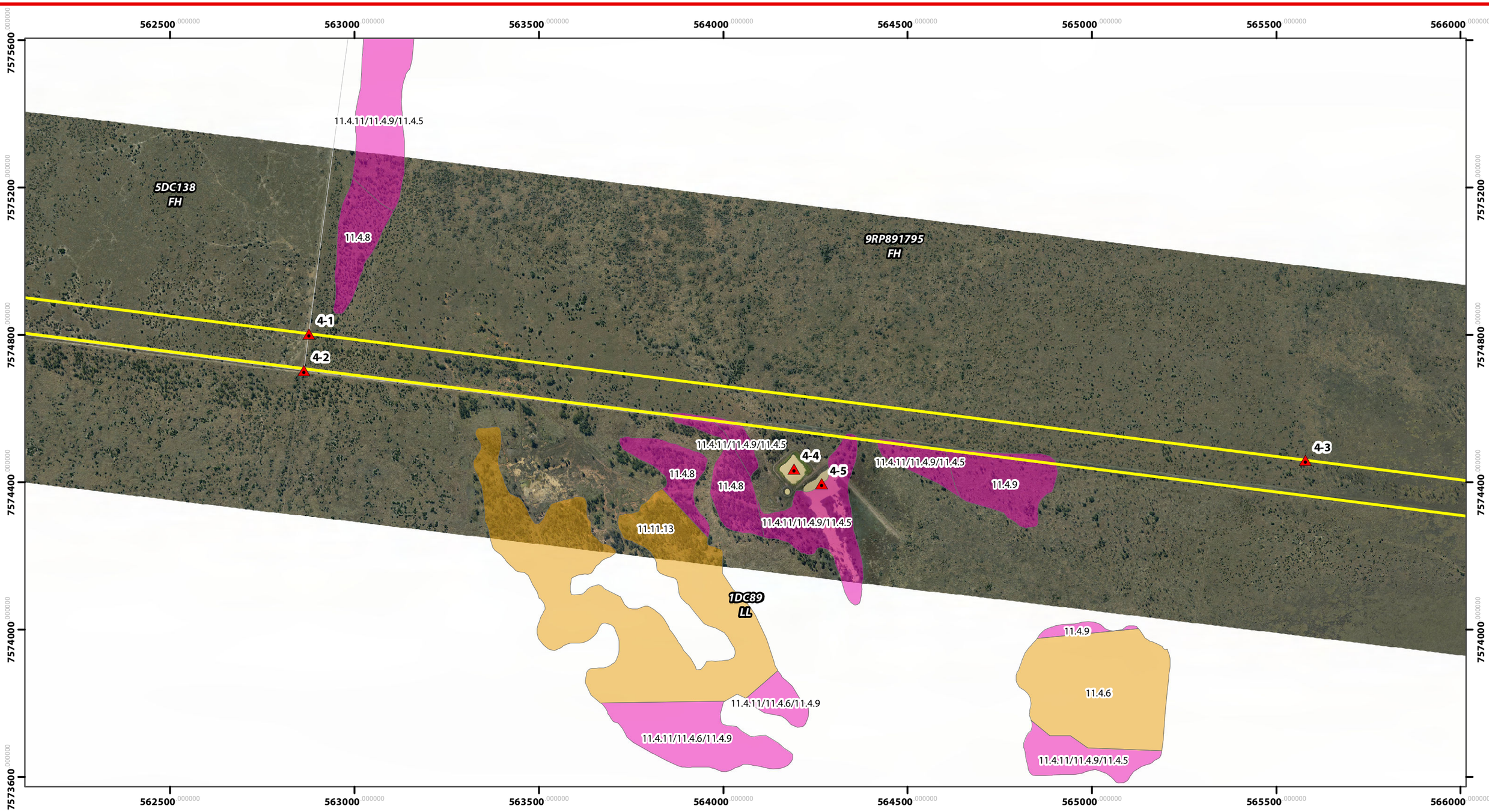
AMENDMENTS:

Issue	Date	Description	Checked
A	19/10/2012	PVMP	RM

CLIENT: Adani Mining Pty Ltd
PROJECT: Charmichael Coal Rail Project
DATE: October 2012
CHECKED: -
CLIENT REF.: 6396
DRAWN: SA

PLAN OF: Property Vegetation Management Plan

PLAN No.: 6396 E 2 PVMP SP2 A



Metres

0 50 100 200 300 400 500 600 700 800

N

SP1 Corridor - Vekta (2012)
Regional Ecosystem v6.1 - DERM (2011)
DCDB - QLD Gov (2012)
Datum & Map Grid - GDA94 MGA Zone 55
Scale @ A3 1:10,000

Scale 1:10,000@ A3
Data Information:
Universal Transverse Mercator
GDA 1994 MGA Zone 55

PVMP Coordinate Table:

ID	Description	Easting (m)	Northing (m)
4-1	Property boundary	562876.187	7574802.618
4-2	Property boundary	562863.159	7574704.002
4-3	Clearing Boundary	565580.163	7574459.359
4-4	Dam	564192.439	7574435.738
4-5	Dam	564267.321	7574395.577

Legend

- PMAV Coordinates
- DCDB
- 95m Clearing Corridor
- Adani Mine EPC
- Watercourses

Regional Ecosystem v6.1

- Remnant vegetation containing Endangered REs
- Remnant vegetation containing Of Concern REs
- Remnant vegetation that is a Least Concern RE

saunders havill group
surveying town planning urban design environmental management landscape architecture
web www.saundershavill.com
phone (07) 3251 9444 fax (07) 3251 9455
address 9 Thompson St Bowen Hills Q 4006

adani

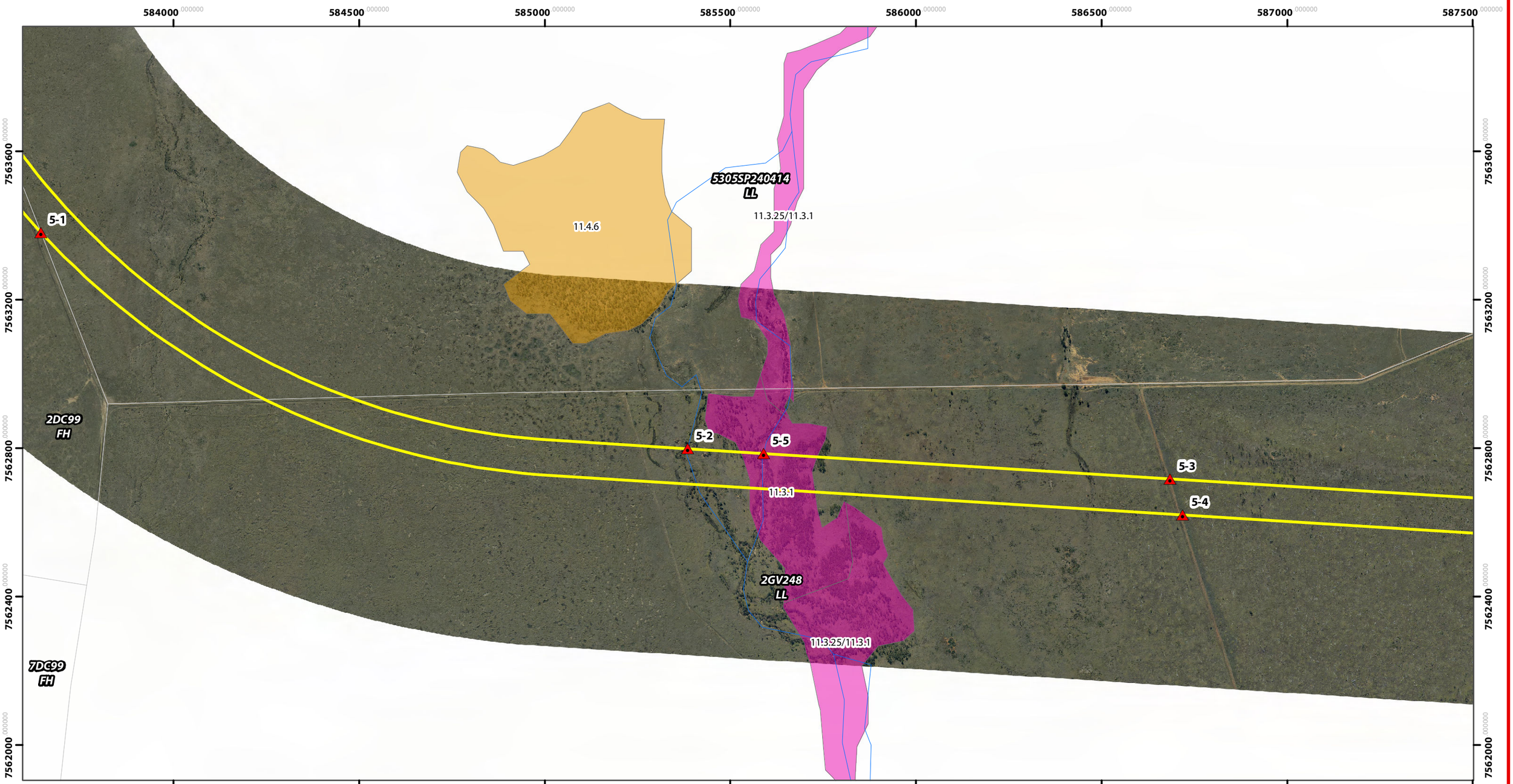
AMENDMENTS:

Issue	Date	Description	Checked
A	19/10/2012	PVMP	RM

CLIENT: Adani Mining Pty Ltd
PROJECT: Charmichael Coal Rail Project
DATE: October 2012
CHECKED: -
CLIENT REF.: 6396
DRAWN: SA

PLAN OF: Property Vegetation Management Plan

PLAN No.: 6396 E 3 PVMP SP2 A



0 50 100 200 300 400 500 600 700 800 Metres

N

SP1 Corridor - Vekta (2012)
Regional Ecosystem v6.1 - DERM (2011)
DCDB - QLD Gov (2012)
Datum & Map Grid - GDA94 MGA Zone 55
Scale @ A3 1:10,000

Scale 1:10,000@ A3
Data Information:
Universal Transverse Mercator
GDA 1994 MGA Zone 55

PVMP Coordinate Table:

ID	Description	Easting (m)	Northing (m)
5-1	Property boundary	583642.107	7563382.030
5-2	Mapped watercourse	585385.050	7562798.747
5-3	Mapped watercourse	586685.483	7562717.225
5-4	Track	586719.813	7562619.887
5-5	Track	585589.999	7562785.899

Legend

- PMAV Coordinates
- DCDB
- 95m Clearing Corridor
- Adani Mine EPC
- Watercourses

Regional Ecosystem v6.1
- Remnant vegetation containing Endangered REs
- Remnant vegetation containing Of Concern REs
- Remnant vegetation that is a Least Concern RE

saunders havill group
web www.saundershavill.com
phone (07) 3251 9444 fax (07) 3251 9455
address 9 Thompson St Bowen Hills Q 4006
surveying town planning urban design environmental management landscape architecture

adani

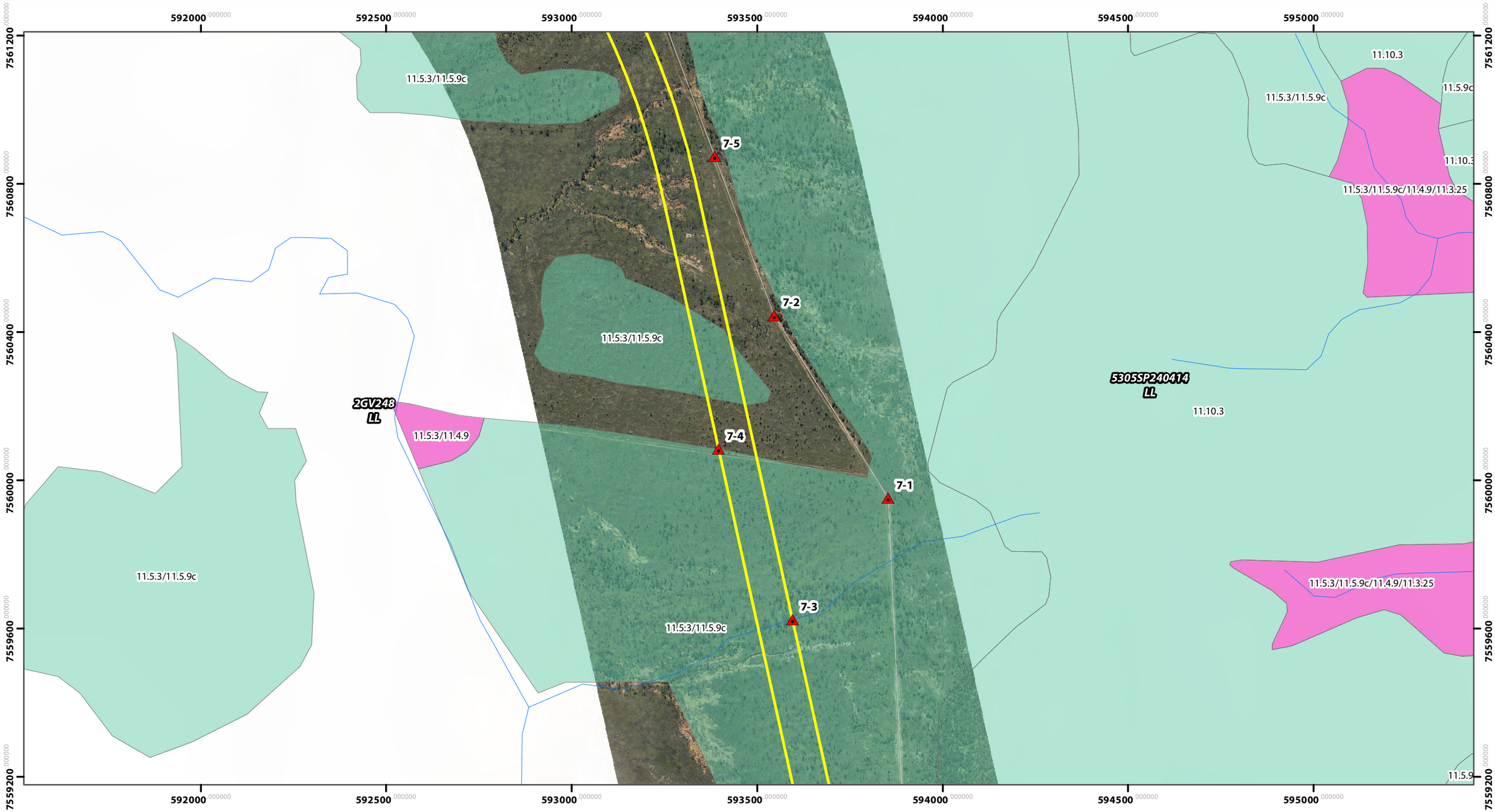
AMENDMENTS:

Issue	Date	Description	Checked
A	19/10/2012	PVMP	RM

CLIENT: Adani Mining Pty Ltd
PROJECT: Charmichael Coal Rail Project
DATE: October 2012
CHECKED: -
CLIENT REF.: 6396
DRAWN: SA

PLAN OF: Property Vegetation Management Plan

PLAN No.: 6396 E 4 PVMP SP2 A



0 50 100 200 300 400 500 600 700 800 Metres

N

SP1 Corridor - Vekta (2012)
Regional Ecosystem v6.1 - DERM (2011)
DCDB - QLD Gov (2012)
Datum & Map Grid - GDA94 MGA Zone 55
Scale @ A3 1:10,000

Scale 1:10,000@ A3
Data Information:
Universal Transverse Mercator
GDA 1994 MGA Zone 55

PVMP Coordinate Table:

ID	Description	Easting (m)	Northing (m)
7-1	Property boundary	593853.606	7559950.865
7-2	Property boundary	593546.671	7560444.305
7-3	Mapped watercourse	593595.210	7559623.018
7-4	Clearing boundary	593396.012	7560083.937
7-5	Property boundary	593385.941	7560874.668

Legend

- PMAV Coordinates
- DCDB
- 95m Clearing Corridor
- Adani Mine EPC
- Watercourses

Regional Ecosystem v6.1

- Remnant vegetation containing Endangered REs
- Remnant vegetation containing Of Concern REs
- Remnant vegetation that is a Least Concern RE

saunders havill group
surveying town planning urban design environmental management landscape architecture
web www.saundershavill.com
phone (07) 3251 9444 fax (07) 3251 9455
address 9 Thompson St Bowen Hills Q 4006

adani

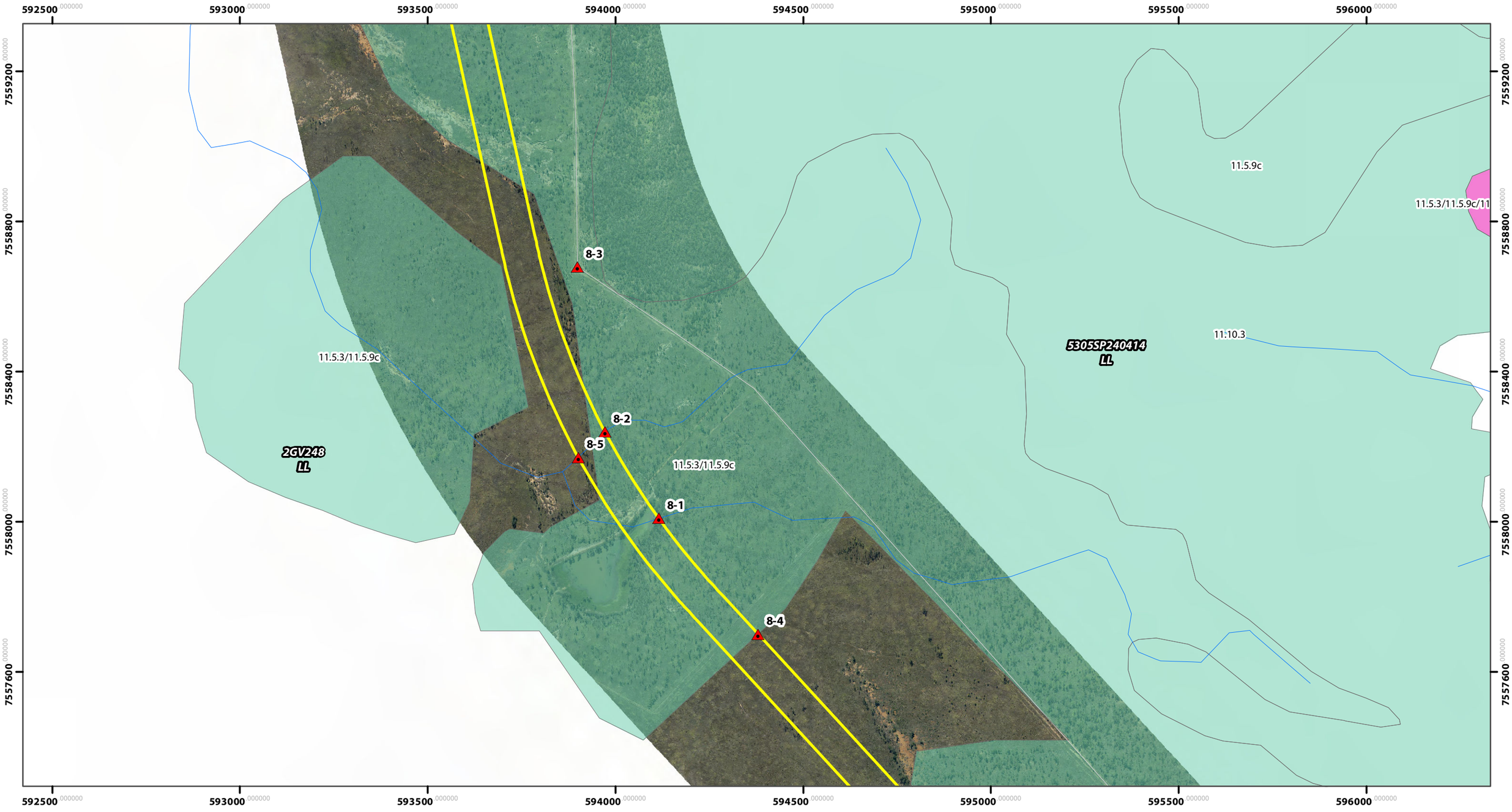
AMENDMENTS:

Issue	Date	Description	Checked
A	19/10/2012	PVMP	RM

CLIENT: Adani Mining Pty Ltd
PROJECT: Charmichael Coal Rail Project
DATE: October 2012
CHECKED: -
CLIENT REF.: 6396
DRAWN: SA

PLAN OF: Property Vegetation Management Plan

PLAN No.: 6396 E 5 PVMP SP2 A



0 50 100 200 300 400 500 600 700 800 Metres

N

SP1 Corridor - Vekta (2012)
Regional Ecosystem v6.1 - DERM (2011)
DCDB - QLD Gov (2012)
Datum & Map Grid - GDA94 MGA Zone 55
Scale @ A3 1:10,000

Scale 1:10,000@ A3
Data Information:
Universal Transverse Mercator
GDA 1994 MGA Zone 55

PVMP Coordinate Table:

ID	Description	Easting (m)	Northing (m)
8-1	Mapped watercourse	594115.690	7558008.206
8-2	Mapped watercourse	593972.206	7558239.529
8-3	Mapped watercourse	593900.786	7558171.715
8-4	Clearing boundary	594379.878	7557700.424
8-5	Property boundary	593898.388	7558679.004

Legend

- PMAV Coordinates
- DCDB
- 95m Clearing Corridor
- Adani Mine EPC
- Watercourses

Regional Ecosystem v6.1

- Remnant vegetation containing Endangered REs
- Remnant vegetation containing Of Concern REs
- Remnant vegetation that is a Least Concern RE

saunders havill group
web www.saundershavill.com
phone (07) 3251 9444 fax (07) 3251 9455
address 9 Thompson St Bowen Hills Q 4006
surveying ■ town planning ■ urban design ■ environmental management ■ landscape architecture

adani

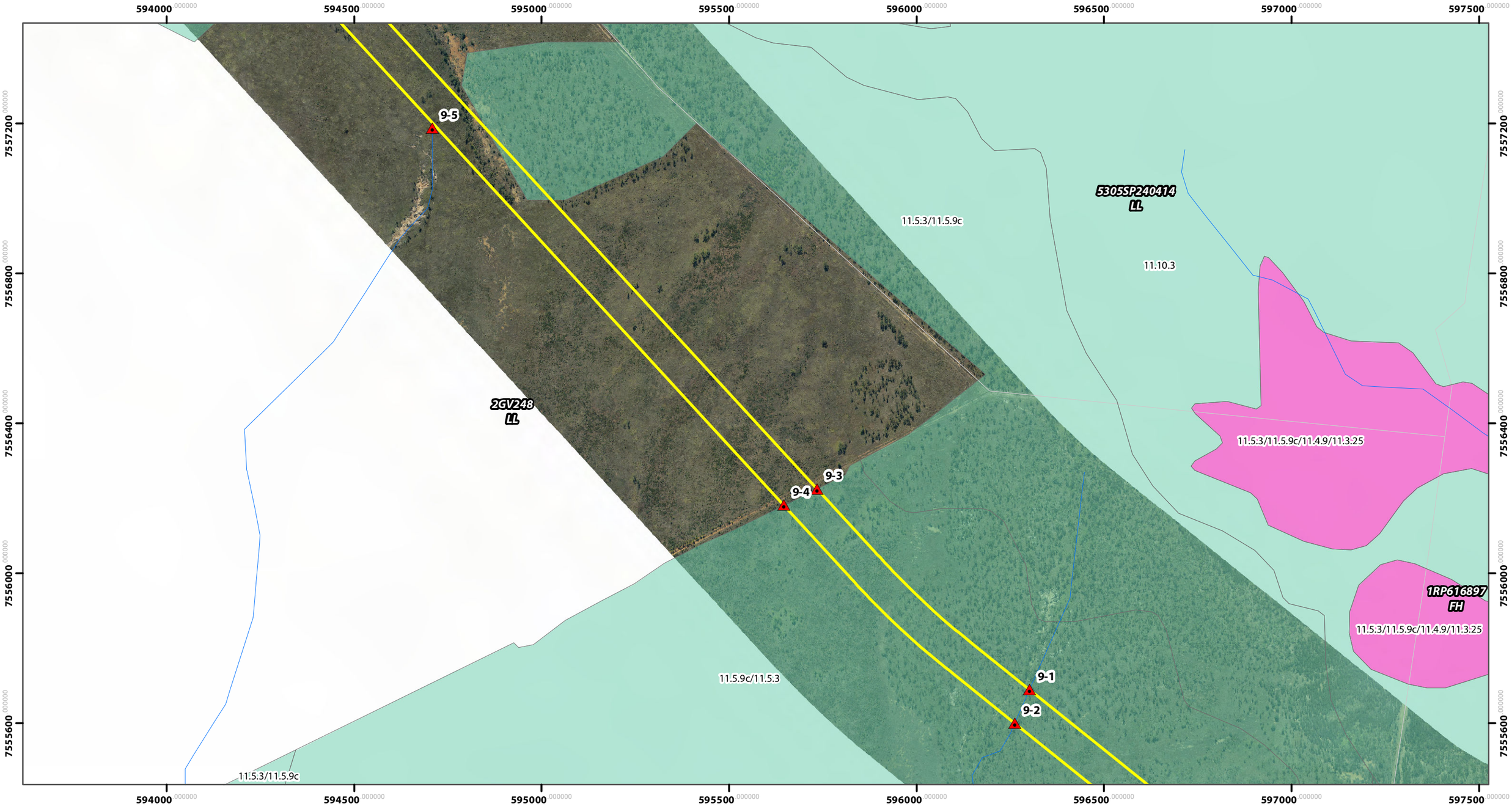
AMENDMENTS:

Issue	Date	Description	Checked
A	19/10/2012	PVMP	RM

CLIENT: Adani Mining Pty Ltd
PROJECT: Charmichael Coal Rail Project
DATE: October 2012
CHECKED: -
CLIENT REF.: 6396
DRAWN: SA

PLAN OF: Property Vegetation Management Plan

PLAN No.: 6396 E 6 PVMP SP2 A



Metres
0 50 100 200 300 400 500 600 700 800

N

SP1 Corridor - Vekta (2012)
Regional Ecosystem v6.1 - DERM (2011)
DCDB - QLD Gov (2012)
Datum & Map Grid - GDA94 MGA Zone 55
Scale @ A3 1:10,000

Scale 1:10,000@ A3
Data Information:
Universal Transverse Mercator
GDA 1994 MGA Zone 55

PVMP Coordinate Table:

ID	Description	Easting (m)	Northing (m)
9-1	Mapped watercourse	596301.909	7555689.570
9-2	Mapped watercourse	596262.124	7555599.433
9-3	Mapped watercourse	595734.940	7556225.173
9-4	Clearing boundary	595646.686	7556181.046
9-5	Property boundary	594708.666	7557187.504

Legend

- PMAV Coordinates
- DCDB
- 95m Clearing Corridor
- Adani Mine EPC
- Watercourses

Regional Ecosystem v6.1
- Remnant vegetation containing Endangered REs
- Remnant vegetation containing Of Concern REs
- Remnant vegetation that is a Least Concern RE

saunders havill group
surveying town planning urban design environmental management landscape architecture
web www.saundershavill.com
phone (07) 3251 9444 fax (07) 3251 9455
address 9 Thompson St Bowen Hills Q 4006

adani

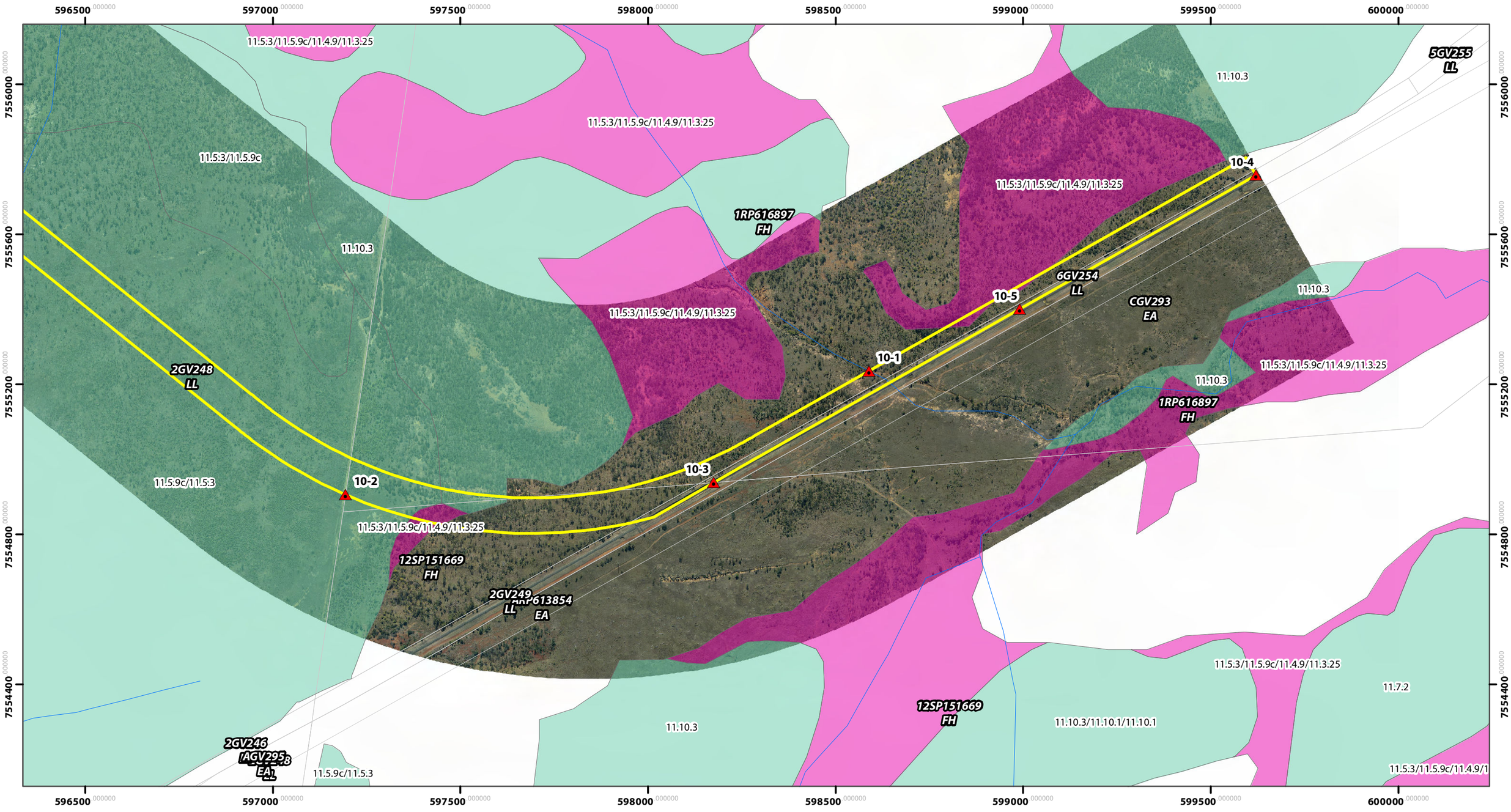
AMENDMENTS:

Issue	Date	Description	Checked
A	19/10/2012	PVMP	RM

CLIENT: Adani Mining Pty Ltd
PROJECT: Charmichael Coal Rail Project
DATE: October 2012
CHECKED: -
CLIENT REF.: 6396
DRAWN: SA

PLAN OF: Property Vegetation Management Plan

PLAN No.: 6396 E 7 PVMP SP2 A



Metres
0 50 100 200 300 400 500 600 700 800

N

SP1 Corridor - Vekta (2012)
Regional Ecosystem v6.1 - DERM (2011)
DCDB - QLD Gov (2012)
Datum & Map Grid - GDA94 MGA Zone 55
Scale @ A3 1:10,000

Scale 1:10,000@ A3
Data Information:
Universal Transverse Mercator
GDA 1994 MGA Zone 55

PVMP Coordinate Table:

ID	Description	Easting (m)	Northing (m)
10-1	Mapped watercourse	598589.508	7555236.251
10-2	Property boundary	597193.767	7554906.270
10-3	Existing Rail	598175.7166	7554938.607
10-4	End of SP-2	599621.477	7555757.722
10-5	Existing Rail	598991.222	7555400.990

Legend

- PMAV Coordinates
- DCDB
- 95m Clearing Corridor
- Adani Mine EPC
- Watercourses

Regional Ecosystem v6.1
- Remnant vegetation containing Endangered REs
- Remnant vegetation containing Of Concern REs
- Remnant vegetation that is a Least Concern RE

saunders havill group
surveying town planning urban design environmental management landscape architecture
web www.saundershavill.com
phone (07) 3251 9444 fax (07) 3251 9455
address 9 Thompson St Bowen Hills Q 4006

adani

AMENDMENTS:

Issue	Date	Description	Checked
A	19/10/2012	PVMP	RM

CLIENT: Adani Mining Pty Ltd
PROJECT: Charmichael Coal Rail Project
DATE: October 2012
CHECKED: -
CLIENT REF.: 6396
DRAWN: SA

PLAN OF: Property Vegetation Management Plan

PLAN No.: 6396 E 8 PVMP SP2 A

Appendix C

Essential Habitat Plans