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Historic Heritage and Visual and Landscape Assessment

BYLONG COAL PROJECT
Supplementary Information

Hansen Bailey
ENVIRONMENTAL CONSULTANTS

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Bylong Coal Project
Hansen Bailey Pty Ltd
10-Jul-2018

Bylong Coal Project, Revised Mine Plan

Historic Heritage and Visual Impact Assessment

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Historic Heritage and Visual Impact Assessment

Client: Hansen Bailey Pty Ltd

ABN: 17 093 597 810

Prepared by

AECOM Australia Pty Ltd
Level 2, 60 Marcus Clarke Street, Canberra ACT 2600, Australia
T +61 2 6201 3000 F +61 2 6201 3099 www.aecom.com
ABN 20 093 846 925

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Prepared by Dr Susan Lampard & Mark Blanche

Reviewed by Luke Kirkwood & Paul Geehan

Revision History

Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
A	30-May-2018	Draft for client review	Susan Lampard Senior Heritage Specialist	
B	21-Jun-2018	Revised draft for KEPCO review	Susan Lampard Senior Heritage Specialist	
C	04-Jul-2018	Final	Susan Lampard Senior Heritage Specialist	
D	10-Jul-2018	Revised Final	Susan Lampard Senior Heritage Specialist	

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Executive Summary

KEPCO Bylong Australia Pty Limited (KEPCO) is seeking State Significant Development approval to construct the Bylong Coal Project (the Project) under the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Project entails the construction and operation of an open cut and underground coal mine for a period of approximately 25 years. The Project is located to the south of the Bylong Village, approximately 55 km to the north east of Mudgee in Central West Region of NSW. The Project is sited on and immediately adjacent to the property known as Tarwyn Park (including Iron Tank), which includes the 1920s sandstone homestead and stables. Tarwyn Park is historically connected with the breeding of shorthorn cattle and thoroughbred horses and, more recently, the implementation of a land management theory known as Natural Sequence Farming (NSF) by Peter Andrews OAM.

Based on detailed historical and comparative analysis, Tarwyn Park and Iron Tank have been assessed as being of local significance (AECOM Australia Pty Ltd, 2017c). It is noted that GML Heritage Pty Ltd (2017) (for the then Planning Assessment Commission) and Hector Abrahams Architects, 2018 (for the NSW Heritage Council) concluded that the NSF land management theory was of State Heritage Significance. However, it is of particular importance to note that the NSW Heritage Council "*has not formed a view on this ascribed value at this stage as there is a need for more established comparative evaluation*" (Heritage Council, 2018).

More broadly, the Project sits within a small portion (around 2.4%) of the Bylong Landscape Conservation Area (BLCA), identified on the non-statutory National Trust of Australia (NSW Branch) Register. Using the Heritage Division guidelines *Assessing Heritage Significance* (NSW Heritage Office, 2001), the BLCA has been assessed as meeting the criteria for listing on the State Heritage Register under the *Heritage Act 1977* (AECOM Australia Pty Ltd, 2017a; Hector Abrahams Architects, 2018). However, the Heritage Council has identified that they require a "more substantive, in depth assessment of like natural landforms (including the set of 'Ways' transecting the Great Dividing Range and the northern hinterland) to better understand the comparative heritage values of these landscapes to determine the level of this significance". The Heritage Council did note that an inadequate number of landscapes had been assessed to a degree that allowed for appropriate comparison.

AECOM Australia Pty Ltd (AECOM) were engaged to assess the potential historic heritage impacts associated with the Project through the preparation of a Historic Heritage Impact Assessment (HHIA) (AECOM Australia Pty Ltd, 2015), submitted to DPE with the Environmental Impact Statement (EIS).

In January 2017, the then Minister for Planning referred the Project to the Planning Assessment Commission (PAC) (now referred to as the Independent Planning Commission (IPC)) to conduct a review of the Project, including a public hearing. The IPC provided its Review Report to DP&E in July, 2017.

The NSW Department of Planning and Environment (DPE) subsequently sought advice from the Heritage Council in relation to the impacts of the Project on the heritage values associated with Tarwyn Park (including Iron Tank). In February, 2018 the Heritage Council provided its response to DPE on the heritage significance of the place and the proposed mitigation measures.

In letter correspondence from DPE dated 28 May 2018, KEPCO has been requested to provide information regarding the impacts of removing all open cut mining and Overburden Emplacement Areas (OEAs) from the Tarwyn Park property. Further, DPE has requested that the OEAs be redesigned to minimise visual impacts. This request follows DPE's consideration of the comments by the PAC and Heritage Council to ensure that the potential impacts on the heritage values of Tarwyn Park and surrounding landscape are further avoided and minimised. In response, KEPCO has developed a revised open cut mine plan and associated revised Project Disturbance Boundary (Revised Project Layout) to remove the open cut mining and OEAs off the Tarwyn Park property. Portions of the rail loop, Coal Handling and Preparation Plant (CHPP), East Link Road and some water bores would remain on Tarwyn Park, in line with the original Mine Plan.

This revised HHIA builds on the 2015 HHIA to assess the impacts associated with the Revised Project Layout and provide any updated management and mitigation measures to address the requested contractions to the Project. This HHIA concludes that the requested changes would reduce direct impacts to the heritage values associated with Tarwyn Park, the former Our Lady of the Sacred Heart Catholic Church and Cemetery and significantly reduce direct and indirect impacts on the BLCA as

well as further reduce the indirect impacts to other heritage items surrounding the Revised Project Layout, e.g. Bylong Station Farm Complex, Cheese Factory.

While the rail loop, Coal Handling and Preparation Plant (CHPP) and some water bores would remain as part of the Project, the Revised Project Layout steps the open cut mining and associated OEAs off Tarwyn Park. Therefore, the horse burials and the elements of the NSF land management system located in the south-western portion of the property would remain undisturbed. The system of NSF, initiated by Peter Andrews, would remain intact, and would be available for external study by applicable scientific organisations. The indirect vibration impacts on Tarwyn Park Homestead and Stables would also be reduced, as the closest blasting activities would be approximately 1.4 km from the structures.

The former Our Lady of the Sacred Heart Catholic Church and Cemetery would also remain undisturbed, and therefore the exhumation of the cemetery would not be progressed as part of the Project. The Church building would remain *in situ*. Additionally, there would be reduced impacts to Bylong Station Farm Complex, as the Workers Accommodation Facility has been removed from the Project following the Response to PAC Review Report and would now be utilised for car parking and first aid facilities only.

The reduction in the area of open cut mining would reduce the landscape impacts to the BLCA. Similarly, the retention of the former Our Lady of the Sacred Heart Catholic Church is also a positive impact reduction on the BLCA, as it allows for the retention of an element of the Upper Bylong Village that is visible from the Tarwyn Park Homestead. The retention of the visual link between the former Upper Bylong Village and Tarwyn Park Homestead is a positive contribution. The revised final landform has significantly reduced impacts to the shape of the Upper Bylong and Lee Creek Valleys as viewed from the Tarwyn Park Farm Complex.

The Revised Project Layout would require some minor amendments to the previously proposed mitigation and management measures, which includes:

- A vibration study for the former Our Lady of the Sacred Heart Catholic Church and Cemetery has been undertaken by Environmental Resource Management. The committed criteria within the Recommended Development Consent conditions remain appropriate to manage the vibration impacts.;
- Prepare a Conservation Management Strategy for the former Our Lady of the Sacred Heart Catholic Church and Cemetery;
- Review and update the draft *Tarwyn Park and Iron Tank: Conservation Management Plan* to include management measures for the site of horse burials and amend the visual mitigation and management measures according to the recommendations within this HHIA;
- KEPCO would (subject to consultation with Mid-Western Regional Council (MWRC) and agreement over the need for it at the time) construct an unsealed gravel road between the Upper Bylong Road and Lee Creek Road at mine closure. This road would aim to re-establish the connection between the Upper Bylong Road and the local road network to the south of the Project. The Upper Bylong Road Realignment (East Link Road), which is proposed as part of the Project, would provide an appropriate connection to the local road network to the east of the Project.
- Review and update of the draft Heritage Management Plan for the Project to address the above changes and the revised visual impacts.

1.0 Introduction

1.1 Project Background

KEPCO Bylong Australia Pty Limited (KEPCO) is seeking State Significant Development approval to construct the Bylong Coal Project (the Project) under the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Project entails the construction and operation of an open cut and underground coal mine for a period of approximately 25 years. The Project is located to the south of the Bylong Village, approximately 55 km to the north east of Mudgee in Central West Region of New South Wales (NSW). The Project is sited on and immediately adjacent to the property known as Tarwyn Park (including Iron Tank), which includes the 1920s sandstone homestead and stables. Tarwyn Park is historically connected with the breeding of shorthorn cattle and thoroughbred horses and, more recently, the development of a land management theory known as Natural Sequence Farming (NSF) by Peter Andrews OAM. More broadly, the Project sits within a small portion (around 2.4%) of the Bylong Landscape Conservation Area (BLCA), identified on the non-statutory National Trust of Australia (NSW Branch) Register.

Hansen Bailey has been engaged to prepare an Environmental Impact Statement (EIS), for which AECOM Australia Pty Ltd (AECOM) were engaged to assess the potential historic heritage impacts associated with the Project through the preparation of a Historic Heritage Impact Assessment (HHIA) (AECOM Australia Pty Ltd, 2015) – hereafter 2015 HHIA.

In January 2017, the then Minister for Planning referred the Project to the Planning Assessment Commission (PAC) (now referred to as the Independent Planning Commission (IPC)) to conduct a review of the Project, including a public hearing. The PAC's Review Report for the Project was finalised in July 2017 and suggested that further advice be sought from the Heritage Council of NSW (Heritage Council) regarding the potential impacts of the Project on the heritage values associated with Tarwyn Park. In response to the PAC's Review Report, Hansen Bailey commissioned AECOM to prepare a Conservation Management Plan for Tarwyn Park and Iron Tank and a Heritage Management Plan for the Project, which included an assessment of the heritage significance of the BLCA (AECOM Australia Pty Ltd, 2017a, 2017c). In September 2017, NSW Department of Planning and Environment (DPE) specifically requested independent comment from the Heritage Council over a range of matters regarding the Project and the heritage values associated with Tarwyn Park. In February, 2018 the Heritage Council provided its response to DPE on the heritage significance of the place and the proposed mitigation measures.

In letter correspondence from DPE dated 28 May 2018, KEPCO has been requested to provide information regarding the impacts of removing all open cut mining and Overburden Emplacement Areas (OEAs) from the Tarwyn Park property. Further, DPE has requested that the OEAs be redesigned to minimise visual impacts. This request DPE's consideration of comments by the PAC and Heritage Council to ensure that the potential impacts on the heritage values of Tarwyn Park and the surrounding landscape are further avoided and minimised. In response, KEPCO has developed a revised open cut mine plan and associated revised Project Disturbance Boundary (Revised Project Layout) to remove the open cut mining and OEAs off the Tarwyn Park property. This approach removes the portion of the Eastern OEA that impacted on the Tarwyn Park horse burial sites and former Our Lady of the Sacred Heart Catholic Church and Cemetery. However, the Coal Handling and Preparation Plant (CHPP), rail loop and other Project related infrastructure proposed on the north-eastern portion of Tarwyn Park would remain on the property as part of the Revised Project Layout.

This revised HHIA has been prepared to assess the historic heritage, archaeological, landscape and visual impacts associated with the Revised Project Layout.

1.2 Study Area

The Study Area encompasses a 6,958 hectare (ha) parcel of land located within the Bylong Valley, 55 km north-east of Mudgee and 53 km west of Denman, NSW (Figure 1). The Study Area is a retraction of the Project Disturbance Boundary used for the EIS, which previously encompassed all of the Authorisations. The Project would not impact on the entirety of the Authorisations and this is reflected in the Study Area used for this revised HHIA. Bylong Village is located to the north of the Study Area

and is accessed via Bylong Valley Way. The Sandy Hollow-Gulgong Railway Line travels east to west through the northern portion of the Project Boundary following the rocky escarpments of the Goulburn River National Park. The Bylong River is the principal watercourse within the Project Boundary, entering from the south-east and travelling northward before joining the Goulburn River.

The Project Disturbance Boundary for the surface disturbance for the Project has reduced in response to DPE's request to remove the open cut components from Tarwyn Park. The variation between the 2015 Project Disturbance Boundary and the Revised Project Disturbance Boundary is shown in Figure 2.

1.3 Assessment Objectives

The objective of the HHIA is to assess the historic heritage, archaeological and visual and landscape impacts associated with the Revised Project Layout. In doing so, this HHIA builds upon previous reports and, as such, should be read in conjunction with:

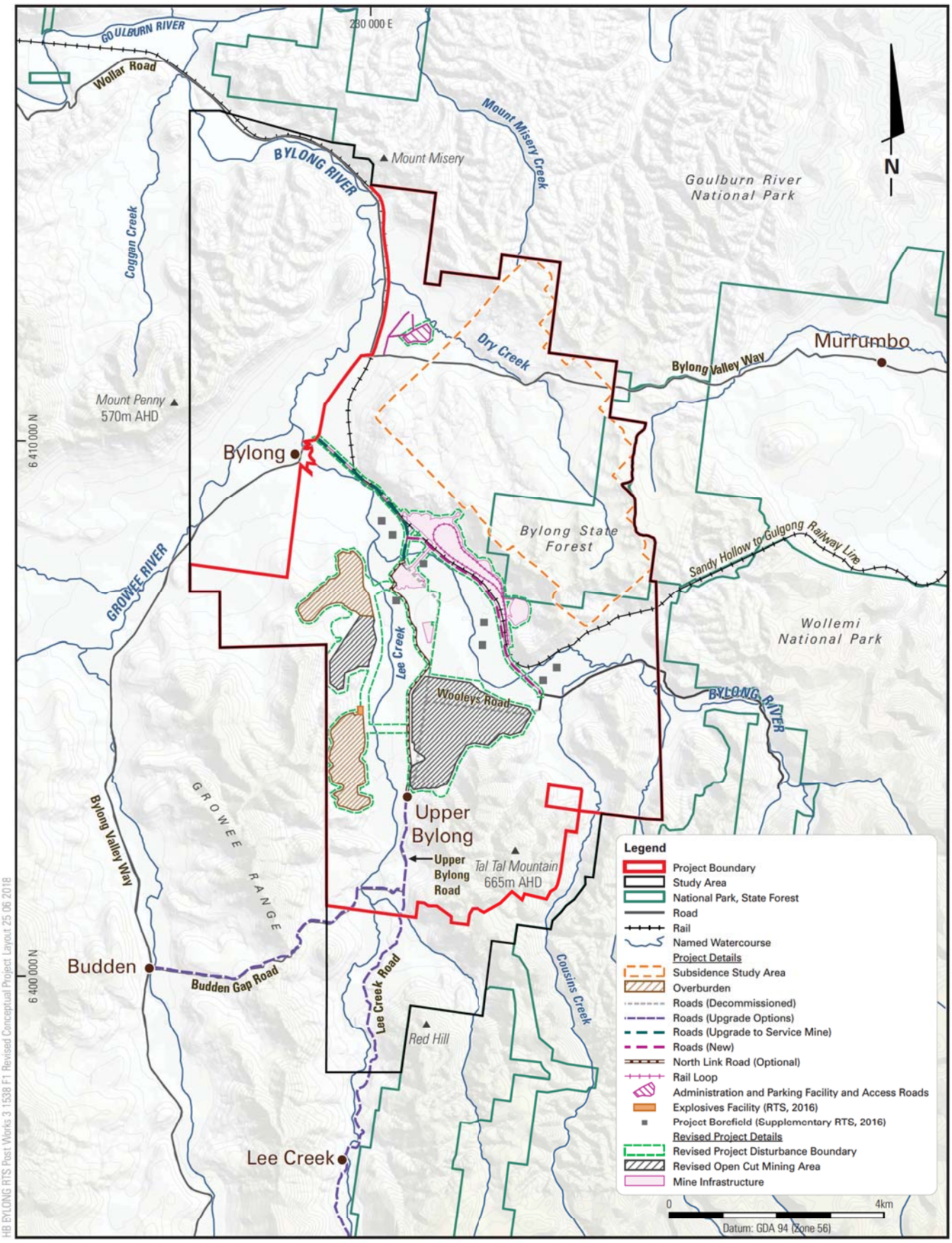
- AECOM Australia Pty Ltd. (2015). *Bylong Coal Project: Historic Heritage Impact Assessment*. Unpublished report for Hansen Bailey.
- JVP Visual Planning & Design. (2015) *Bylong Coal Project: Visual Impact Assessment.* Unpublished report for Hansen Bailey.
- Hansen Bailey (2015) *Bylong Coal Project Environmental Impact Statement.*
- Hansen Bailey (2016a) *Bylong Coal Project EIS: Response to Submissions.*
- Hansen Bailey (2016b) *Bylong Coal Project EIS: Supplementary Response to Submissions.*
- AECOM Australia Pty Ltd. (2017a). *Bylong Coal Project: Historic Heritage Management Plan* (Draft). Sydney, Australia. Hereafter HHMP.
- AECOM Australia Pty Ltd. (2017b). *Bylong Coal Project Landscape and Visual Analysis*. Prepared for Hansen Bailey on behalf of WorleyParsons and KEPCO (Bylong) Australia Pty Ltd. Appendix E of AECOM (2017c).
- AECOM Australia Pty Ltd. (2017c). *Tarwyn Park and Iron Tank: Draft Conservation Management Plan*. Sydney, NSW: Prepared for Hansen Bailey. Hereafter CMP.

1.4 Secretary's Environmental Assessment Requirements

DPE issued the Secretary's Environmental Assessment Requirements (SEARs) for the Project on 23 June 2014. A minor adjustment to the SEARs was made on 11 November 2014. In relation to historic heritage, the SEARs require:

"*Heritage – including an assessment of the likely Aboriginal and historic heritage (cultural and archaeological) impacts of the development having regard to OEH's and the Heritage Council of NSW's requirements (see Attachment 2)".*

The HHIA and associated approvals documentation described within Section 1.3 have addressed the historic heritage requirements within the SEARs for the Project. This assessment has specifically focussed on addressing DPEs request for additional information dated 28 May 2018.



HB BYLONG RTS Post Works 3 1538 F1 Revised Conceptual Project Layout 25 06 2018

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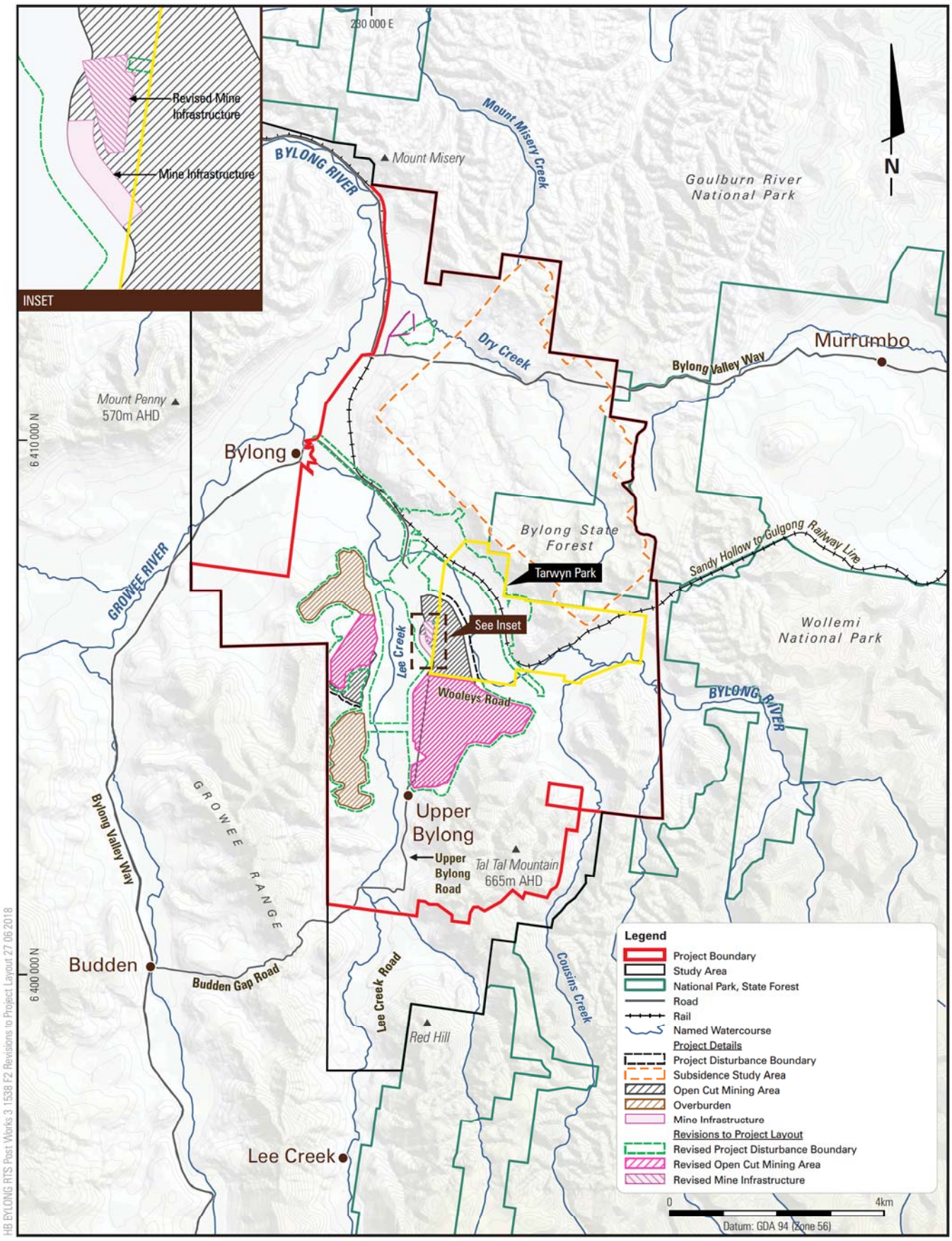
Revised Conceptual Project Layout

FIGURE 1



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Revisions to Project Layout

FIGURE 2

1.5 Project Team

Dr Susan Lampard (AECOM heritage specialist) undertook the heritage impact assessment and authored the heritage impact sections of this report, with support from Dr Darran Jordan. Mark Blanche and Jojo Navarro undertook the visual impact assessment and authored the relevant sections of this report. Technical and Quality Assurance reviews were undertaken by Luke Kirkwood (principal heritage specialist) and Paul Geehan (technical director – urban design and landscape).

1.6 Limitations

Within this HHIA, predictions have been made about the probability of subsurface archaeological materials occurring within the Project Disturbance Boundary, based on surface indications and environmental contexts. However, it is possible that materials may occur in areas without surface indications and in any environmental context.

A summary of the statutory requirements regarding historic heritage is provided in Section 2.0. This is provided based on AECOM's experience with the heritage system in NSW and does not purport to be legal advice. It should be noted that legislation, regulations and guidelines change over time and users of the HHIA should satisfy themselves that the statutory requirements have not changed since the HHIA was written.

2.0 Statutory Context

2.1 Introduction

A number of planning and legislative documents govern how heritage is managed in NSW and Australia. The following section provides review of heritage legislation to identify any amendments to legislative requirements since the preparation of the 2015 HHIA.

2.2 Federal Controls

2.2.1 Environment Protection and Biodiversity Conservation Act 1999

The heritage provisions of Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) have not been amended since 2015. An updated search of the heritage registers mandated by the EPBC Act have been consulted and there are no historic sites within the Revised Project Disturbance Boundary on these registers.

2.3 State Controls

2.3.1 Environmental Planning and Assessment Act 1979

The EP&A Act, as it relates to the management of heritage or State Significant Development (SSD) has not been materially amended since 2015.

The Heritage Act 1977

The *Heritage Act* 1977 has not been materially amended since the preparation of the 2015 HHIA.

2.3.2 Mid-Western Regional Local Environmental Plan 2012

The Project is located wholly within the Mid-Western Regional Local Government Area (Mid-Western Regional LGA) in which the relevant environmental planning instrument (EPI) is the *Mid-Western Regional Local Environment Plan 2012*. Section 5.10 of Part 5 of the Mid-Western Regional LEP 2012 provides specific provisions for the protection of Aboriginal and non-Aboriginal (historic) heritage across the Mid-Western Regional LGA, with heritage items being identified in Schedule 5. Section 5.10 and Schedule 5 have not been updated since 2015.

2.4 Summary

No legislative amendments have been made since 2015 that effect the manner in which historic heritage within the Revised Project Layout would be assessed. There remains no heritage items on statutory heritage lists within the Project Area.

3.0 Historical Context

3.1 Preamble

The 2015 HHIA, draft HHMP and draft CMP provide comprehensive histories of the Upper Bylong Valley and it's early residents (AECOM Australia Pty Ltd, 2015, 2017a, 2017c). Table 1 provides a brief overview of the key historical developments within the Bylong Valley. The reader is referred to the previously referenced documents for further details.

Table 1 Key Historical Developments

Pre-1820s	Occupation by the Wiradjuri speaking Aboriginal people
***c.*1823**	William Lee first explores and settles in Bylong Valley
***c.*1823**	John Tindale settles in Bylong and Widden Valley
1840s	John Lee, William's son takes over the Bylong properties
1840s	Cattle farming replaces sheep farming as the dominant industry within the valley
1840s	Thoroughbred horse breeding begins in the valley
1840s	Davis family arrives in the valley
1848	Construction of first stone building 'C1848 Lee Homestation'
1850s	John Mead settles in the valley
1860s	Captain Thunderbolt active in the area
1864	Tindale homestead 'Sunnyside' constructed
1866	Bylong (horse) wins the Great Metropolitan Handicap at Randwick
1876	St Stephens Anglican Church constructed
1880-1920s	Several schools operating
1890s	The Lees property holdings begin to diminish
1898	Harley Hill farm complex established
1908	Bylong Estate listed for sale, bought and subdivided
1910-1926	Cheese factory operational
1911	Bylong Station listed for sale
1912	Swiss Cottage constructed
1915	Bylong Post Office constructed
1915	Our Lady of the Sacred Heart Catholic Church Bylong constructed
1920s	Bylong Upper Hall constructed
1920s	Elizabeth "Jesse" Hickman (the Lady Bushranger) active in the area
1920	Tarwyn Park sandstone homestead and stables constructed
1921	Bylong Hall constructed
1927	Bylong Upper School constructed
1936	Railway construction begins
1940s	Quarrying begins at Bylong
1951	Railway construction stopped
1973	Peter Andrews purchased Tarwyn Park and begins exploring ways to improve the property, techniques that develop into Natural Sequence Farming (NSF)
1980	Railway construction restarted
1982	Railway completed
1983 and 1984	A287 and A342 granted to Austin and Butta in light of the identified coal resource within the region as proven by Government exploration in the 70s
2010	KEPCO acquired A287 and A342

4.0 Physical Description & Significance Assessments

4.1 Identified Heritage Sites

The historical heritage items shown in Table 2 and Figure 3 have been identified within the Study Area on the basis of background research, oral histories and archaeological survey. Detailed descriptions and significance assessments against the Heritage Branch guidelines (NSW Heritage Office, 2001) can be found in Appendix A.

Table 2 Historic Heritage Items

ID	Location	Date	Listing	Summary Description	Significance
Homestation					
1	Bylong Valley Way, near junction with Upper Bylong Road	1848	None	The house consists of a single square sandstone structure in Georgian style, divided into four rooms by a central hallway running from northeast to southwest and occupies a floor area of approximately 10 x 10 m. Prior to being purchased by KEPCO, the building had been derelict for some considerable time and had lost its roof, doors and windows.	Homestation is considered to be of local historical, associative, technical, social, contributory, rarity and representative significance. The house is of key importance to the early development of the Bylong area, being the first stone building constructed in the area and the first residence of the Lee family. As the earliest example of a Victorian era sandstone brick rural homestead in the Bylong region it is representative of an early, distinctively Australian, farmhouse vernacular. Scientifically, it has the potential to reveal information that could contribute to a better understanding of the lifestyles, building techniques and environmental adaptation of early settlers in a small rural pioneer settlement northwest of Sydney in the mid-nineteenth century. There is potential for subsurface archaeological deposit to be associated with the building which could reveal additional information about its construction, use and past occupants.
Bylong Station Farm Complex					
2	Bylong	Mid - late19th century	None	The original homestead was likely constructed in the mid to late nineteenth century and features two adjacent sandstone brick buildings with the kitchen detached from the living quarters. The complex includes a stable and multiple farm buildings.	Bylong Station Farm Complex is of local historical, associative, technical, social, contributory, rarity and representative significance. The farm complex is of key importance in the early development of the Bylong area due to its early construction and its association with the production of high quality cattle and horses. The farm complex was known historically, as was its owner John Lee, as a producer of some of the best cattle and thoroughbred horses in Australia throughout the mid to late nineteenth century and early twentieth century. The house and associated stables are early examples of sandstone farm buildings constructed in the Bylong region and are representative of distinctively Australian, rural adaptations. The house and stables are some of the earliest constructed sandstone buildings still standing and in use from the mid to late Victorian period in the local area and are good examples of their kind. Dating to the early period of settlement in the district, the buildings have the potential to reveal information that could contribute to a better understanding of lifestyle, building techniques and environmental adaptation in a small rural settlement west of Sydney in the mid-late nineteenth century. There is potential for subsurface archaeological deposit to be associated with the buildings, which could

ID	Location	Date	Listing	Summary Description	Significance
					reveal additional information about their construction, use and past occupants. The areas with potential for archaeological deposits are immediately surrounding the house and stables. The types of deposits that would have research potential, if present, would be historical refuse or deposits from an outdoor privy. The presence or absence of such deposits could only be determined by archaeological testing.
Sunnyside Homestead					
3	Sunnyside property	1864	None	The homestead "Sunnyside" is a sandstone structure with a green hipped corrugated iron roof and three chimneys. Various modern additions have extended the original historic structure, including a screened back room and side annex. The larger complex includes a number of associated buildings, such as a gazebo, stables, house round, shearing shed and shed.	The Sunnyside Homestead has local significance as a structure built using convict labour. It has further significance socially as a focal point for the local community as a place of worship in the 1850s with Anglican Church services held there every four weeks by a travelling minister. The first marriage in Bylong was also held at the homestead in 1856 between John Mead and Catherine Davis. Although it has been modified due to modern additions it retains local value in remnant historic features, with the overall complex of structures (including stables, horse round and shearing shed) providing evidence of past pastoral activities undertaken over various periods of time in the Bylong area.
Bylong St Stephen's Anglican Church and Cemetery					
4	Located in Bylong township	1876	Classified - National Trust of Australia	Bylong St Stephen's Anglican Church is a simple stone Early English Gothic Revival style church occupying a floor area of approximately 10 x 5 m. The church is a sandstone and rendered brick structure with a corrugated iron roof. The church entrance features an arched doorway and Gothic style lancet windows with stained glass. A cemetery lies to the eastern side of the church and contains 44 graves and churchyard monuments from the late nineteenth and twentieth centuries.	Bylong St Stephens Anglican Church is considered to be of local historical, associative, social and contributory significance. The church is one of the earliest sandstone brick structures built in Bylong and was the first church in the area. The church served as the focal point for Anglicans gathering and worship during the nineteenth and twentieth century. Notable local residents from the early settlement period of Bylong are buried within its cemetery and relatives still live in the local area. The church itself is representative of the Gothic revival style in a rural setting that was popular in the nineteenth century. There is potential for subsurface archaeological deposit to be associated with the building and associated graves which could reveal additional information about its construction and use, in addition to the lives of the people who are buried there.
Harley Hill Farm Complex					
5	South of Upper	1898	None	Harley Hill Farm Complex is composed of a modern farmhouse, slab dairy, cottage	Harley Hill Farm Complex is considered to be of local historical, contributory and representative significance. The farm complex is

ID	Location	Date	Listing	Summary Description	Significance
	Bylong			remains, blacksmith shed, shearing shed, farm buildings and an archaeological site.	representative of an early twentieth century rural pastoral station is NSW which has survived in its original layout. It is one of the few remaining farm complexes with extant buildings in the local area dating to this period. As such, it is an important representative component of the pastoral development in the local area. There is potential for subsurface archaeological deposit to be associated with the buildings that could reveal additional information about its construction and use. The farm complex has the potential to reveal information that could contribute to a better understanding of lifestyle, building techniques and environmental adaptation of settlers in a small rural settlement northwest of Sydney in the early twentieth century.
Bylong Trig Station					
6	West of Upper Bylong Road	1870	None	The trig station consists of a plinth with square concrete base and vertical concrete square column with metal cylindrical mounting. The vane, which should be mounted on the metal cylinder, is missing.	Bylong Trig Station is considered of local historical significance for its association with surveying and mapping of the Bylong area. However, its integrity and significance has been partially diminished due to its condition and missing vane. Currently, three trig stations are heritage listed in NSW, two have been assigned local significance and one listed on the CHL and RNE. These trig stations are considered significant due to their association with major surveying events. Bylong Trig Station is not associated with such an event and is of a common design with numerous other representative examples, in better condition, found throughout NSW.
Bylong Upper Provisional/Public School					
7	Upper Bylong	1911	None	The school consists of two detached buildings and associated grounds. Building 1, offset from Upper Bylong Road, consists of a simple square single storey detached building measuring approximately 10 x 10 m in size. The building rests on brick masonry stilts and features weatherboard cladded walls with a chimney on its western wall and a corrugated iron open gabled roof. Building 2 is located adjacent to Upper Bylong Road and consists of a simple rectangular single storey detached building measuring	Bylong Upper Public School is considered to be of local historical and social significance. The school is the oldest operational school in the Bylong area having originally opened in 1912. It is also the longest running school in the area operating almost continuously for 102 years. Building 1, the old school building, is a good example of a simple weatherboard structure in a rural setting with a functional focus dating to the early twentieth century (1927). The building is in good condition and offers local residents a tangible connection to the past.

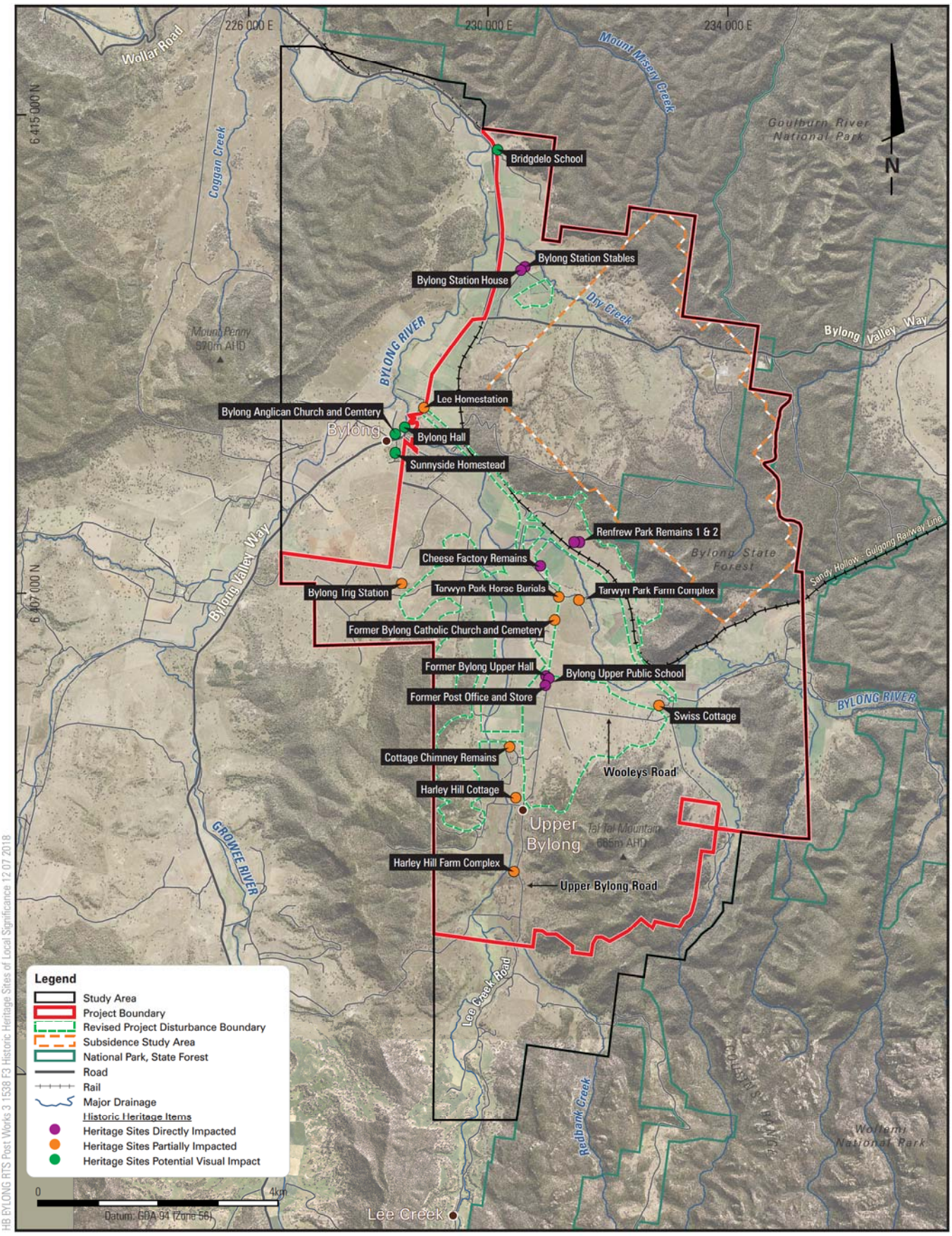
ID	Location	Date	Listing	Summary Description	Significance
				approximately 17 x 10 m and is similar in design to Building 1 but without chimney.	
Swiss Cottage					
8	Upper Bylong	c.1912	None	The cottage is part of the Helvetia farm and comprises a simple rectangular building with floor area measuring approximately 3 x 3 m. The building features sandstone brick walls and an open gable corrugated iron roof. The entrance is located on the northern side of the building and is timber framed. A small timber framed window is located in the southern wall. Engravings are evident on one of the sandstone bricks on the western wall featuring a date of 1912, the words 'NE CHATEL' and various insignias including a 'skull and crossbones'. Internally, the cottage is featureless but has a relatively modern gyprock ceiling. The internal walls have been plastered. Large structural cracks are evident on all walls. Modifications to the original building appear to include the roof with sapling supports and the gyprock ceiling. The building is in poor condition and has previously been used to store old furniture and farm equipment. This structure is currently empty.	The Swiss Cottage is considered to be of local historical significance. The building is demonstrative of an early twentieth century rural farm building and as such has the potential to reveal information that could contribute to a better understanding of lifestyle, building techniques and environmental adaptation in a small rural settlement northwest of Sydney in the early twentieth century.
Cheese Factory					
9	Upper Bylong	1912	None	Remnants present in the north-western corner consist of broken pieces of worked sandstone, scattered from the edge of the homestead to the base of slope. Two trenches excavated on the northern side of the property (likely for channelling water overflow) revealed subsurface deposits of	The Cheese Factory remains are considered to be of local historical and contributory significance. The Cheese Factory was the first major commercial operation in the Bylong Valley and operated for 14 years before closing. It provided employment for local residents and people in the region. The building originally contained modern cheese and butter making machinery that produced significant amounts of product that were sold in the regional area and Sydney. There is potential for

ID	Location	Date	Listing	Summary Description	Significance
				concrete and tile.	archaeological deposit to be present at the site that may yield information about the history of the area and more specifically the development of the dairy industry in Bylong.
Bridgelo Provisional School					
10	Bridgelo Property, northern Bylong	1914	None	The original school building was a single roomed vertical slab structure with a corrugated iron roof and a fireplace (Centenary Booklet Committee, 1984). An inspection of the school site indicates that the original slab structure, measuring approximately 4 x 4 m, was incorporated, probably in the 1950s, into a larger timber structure which was subsequently used as a cattle pen. The building was extended by approximately 8 m in a northerly direction using timber slabs and corrugated iron roofing. It is not currently in use and is in a state of disrepair.	Bridgelo Provisional School is considered to be of local historical and social significance. The school was one of the earliest provisional full-time schools within the local area and one of the longest running, operating from 1914 to 1927. The remains of the slab structure are still visible and are demonstrative of a type of early rural building in NSW.
Renfrew Park Remains 1 & 2					
11 & 12	East of Renfrew Park	1914	None	The remains consist of the remains of a building in an open paddock northeast of the Renfrew property and the rail line. Heaped sandstone blocks and sandstone footings are visible amongst a thick cover of waist high pasture grass. The building appears to have been demolished with the sandstone blocks collapsed inwards.	Renfrew Park Remains 1 & 2 is of local historical, associative and research significance. The Remains demonstrate the pattern of development in the Upper Bylong Valley during the subdivision of the larger land holdings, which lead to families purchasing land in the Valley to participate in the short-lived dairy industry. The Remains are associated with the Burke family, who were well known and respected in the community and actively involved in the establishment of the former Our Lady of the Sacred Heart Catholic Church. Archaeological investigations of the Remains have the potential to yield information regarding this period of Upper Bylong Valley's history that is not available elsewhere.
Upper Bylong Post Office and Store					
13	Upper Bylong	1915	None	The building is a single storey detached structure with a verandah with timber framed floors, walls and roof with brick masonry	Upper Bylong Post Office and Store is considered to be of local historical and social significance. The store was central to the economy of Bylong in the early and mid-twentieth century as a place to purchase

ID	Location	Date	Listing	Summary Description	Significance
				foundation footing. It has timber flooring and decking with weatherboard cladding and a green corrugated iron hipped roof with open gable feature on the southern side. Occupying a floor area of approximately 15 x 15 m, the building is representative of Australian rural Federation style.	goods and collect mail. The Post Office and Store is the only commercial structure still extant from the early twentieth century period with local residents being able to recall visiting the shop in their youth.
Former Our Lady of the Sacred Heart Catholic Church and Cemetery					
14	Upper Bylong.	1915	National Trust of Australia Register	The former Catholic Church site comprises a church building and associated graves located on a 4000 m² plot of land. Three mature camphor laurels trees are located on the western boundary at regular intervals, and five mature gum trees are found at the site – three along its western boundary, one on the northern and one on the southern boundary representing historical plantings. The church building is a simple Carpenter Gothic style church representative of vernacular timber rural churches in Australia.	The former Our Lady of the Sacred Heart Catholic Church is considered to be of local historical, social, contributory and representative significance. It is the only Catholic Church in the area and was a focal point for local social activity from 1915 to its closure in 2000. There are four known burials of local residents, from the 1930s and 1940s, in its cemetery, with distant relatives of the deceased who until recently, resided in the local area. In addition, three unmarked graves and five areas of disturbance, some of which may be tree roots, were identified during the use of Ground Penetrating Radar (GPR) at the site (Edward Higginbotham & Associates Pty Ltd, 2015b). The land was sold by the Diocese in 2008 into non ecclesiastical ownership. The former church building is representative of the Carpenter Gothic Revival vernacular which was popular in the late nineteenth and early twentieth centuries in Australia. There is potential for subsurface archaeological deposit to be associated with the building and associated graves which could reveal additional information about its construction, use and the people buried there.
Bylong Upper Bylong Hall					
15	Upper Bylong	1920	None	The former hall consists of a simple timber framed rectangular structure measuring approximately 14 x 10 m, with corrugated iron walls and an open gable corrugated iron roof. The original structure was built in the 1920s but was modified to include a skillion stables along its northern wall in the 1950s.	Bylong Upper Hall is considered to be of local historical and social significance. The hall was one of the earliest buildings constructed specifically for social activities in the area and was a focal point for shows and performances during the early and mid-twentieth century. Although currently in poor condition, the building offers local residents a tangible connection to an earlier period of Bylong's history.
Bylong Hall					

ID	Location	Date	Listing	Summary Description	Significance
16	Bylong	1921	None	The hall consists of a simple timber framed rectangular structure measuring approximately 20 x 12 m with corrugated iron walls and an open gable corrugated iron roof. The building sits on small concrete stilts, with the doorway and windows facing Bylong Valley Way.	Bylong Hall is considered to be of local historical and social significance. The hall was one of the earliest buildings constructed specifically for social activities and was used for important community social functions from the 1920s to 1980s. The building is in good condition and offers local residents a tangible connection to an earlier period of Bylong's history.
Tarwyn Park & Iron Tank Farm Complex					
17	Upper Bylong	1920	None	Tarwyn Park consists of nine parcels of land in the Upper Bylong Valley. The property is intersected by the Bylong River, and the Sandy Hollow to Gulgong Railway Line, which skirts the rise of foothills associated with the Great Dividing Range. The Complex consists of a sandstone Homestead, sandstone stables, various farm buildings and archaeological sites together with features associated with NSF.	Tarwyn Park is of State associative significance and local significance under the historical, associative, aesthetic/technical, social, research, rarity and representative criteria. As Tarwyn Park meets only one criterion at a State level, the site is not considered to meet the threshold for listing on the State Heritage Register.
Cottage Chimney Remains					
18	West of Upper Bylong Road	1940	None	The remains consist of a sandstone brick structure identified in a paddock 400 m west of Upper Bylong Road. The remains comprise of a standing layered sandstone brick chimney and attached fireplace in poor condition measuring 1.8 m wide and 2.7 m high. Scattered around the chimney are sandstone blocks, including a second collapsed chimney. A collapsed corrugated iron water tank and various other corroding metal fragments are found nearby. The remains were likely part of a small farmhouse or cottage that has been deliberately demolished.	This ruin may contribute information on land use and habitation at a local level through archaeological investigation.

ID	Location	Date	Listing	Summary Description	Significance
Bylong Landscape Conservation Area					
N/A	Bylong Valley	N/A	National Trust of Australia Register	The BCLA includes the Bylong Valley Way from its junction with Baerami Creek Road in the east to where it crosses the boundary of the localities of Growee and Upper Growee in the south-west occupying an area of approximately 486 km². It includes the valley and pasture landscapes beside the Bylong Valley Way, the valleys adjoining the Wollar Road westwards to Razorback Ridge, the valleys of the Growee River and Sawyers and Jumper Creeks, the valley of Cousins Creek, the valley of Kerrabee Creek and the valley of Baerami Creek.	The BLCA is of State historical, aesthetic, research and representative significance. Historically, the area can demonstrate the occupation of the land by the Wiradjuri people, followed by the early land holdings by European setters and sub-division and diversification in pastoral and agricultural pursuits. These historical themes are supported by physical evidence, including the sandstone outcrops and vegetation communities, Aboriginal sites and European homesteads. The area holds outstanding natural beauty, contrasted with the cleared valley floors, which contains structures associated with the various pastoral and agricultural enterprises operating within the Valley. Far from diminishing the natural beauty, these two elements compliment and contrast with each other in a most visually pleasing way. The BLCA holds research significance relating to its ability to provide on-going data relating to the effects of Natural Sequence Farming (locally significant) and the archaeological potential of both Aboriginal and historical sites (State significant). The BLCA is representative of a cultural landscape, demonstrating the interactions between the natural and the cultural (including Aboriginal and historic) elements. Additionally, the BLCA holds local associative, social and rarity significance. The area is associated with Peter Andrews, known within NSW as the originator of the NSF technique, as well settlers of note, including the Hungerford, MacDonald, Lee, Harris, Thompson and Tindale families. Socially, the BLCA undoubtedly holds strong and special associations for the local residents and Aboriginal community.



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Impacts to Historic Heritage Sites

FIGURE 3

4.2 Landscape and Visual Analysis

A Visual Impact Assessment (VIA) for the Project was undertaken by JVP Visual Planning and Design (2015) for inclusion within the Bylong Coal Project Environmental Impact Statement (EIS). The VIA identified the character of the existing visual landscape and determined the potential visual and landscape impacts associated with the Project.

In response to specific concerns raised by the PAC over the impacts of the Project to views from Tarwyn Park and the scenic landscape, AECOM was engaged to prepare a Landscape and Visual Analysis (AECOM Australia Pty Ltd, 2017c) which provides:

- Landscape Context for the Project, including discussion of:
  - the BLCA;
  - tourism located around Bylong Valley Way;
  - the relationship of the Project with the Upper Bylong Valley, within which it is located; and
- A description of the landscape character of the Upper Bylong Valley and adjacent environs, including identification and mapping of landscape character units.

The reader is referred to the above referenced VIA and the more specific Landscape and Visual Analysis for further details.

4.2.1 Revised Project Landform Design

KEPCO has proposed additional measures to be implemented to further mitigate the impacts of the rehabilitated landform on the BLCA, as requested by the DPE. This includes any new mitigations that may be required as a result of the reduced mining footprint within the Eastern Open Cut. The following measures have been identified:

a) Relevant adjustments to the OEAs, both within the mining areas and out of pit to reflect the Revised Project Layout;
b) Development of any further mitigations required for any additional visual amenity / landscape character impact which is created by the Revised Mine Plan (e.g. reduced mining area and lower OEA heights providing views from Tarwyn Park Homestead to a ridgeline to be mined);
c) Development of conceptual illustrations of the final landform which adopts detailed landform modelling and design features to minimise the uniform nature of the Conceptual Final Landform design in accordance with the Rehabilitation Objectives provided within the Recommended Development Consent Conditions.

The Revised Conceptual Final Landform which has been developed from standard mine planning principles is shown in Figure 4. In this regard, the revised Conceptual Final Landform Design accommodates similar attributes to the EIS mine plan, albeit with reduced footprints and other design principles.

The North Western OEA and South-Western OEA have adopted some additional design principles from those in the EIS in order to address concerns which have recently been raised by the Heritage Council in relation to the proposed landform. The North Western OEA will continue to occupy the same footprint as that proposed within the EIS. However, the revised landform has incorporated the existing valley which extends from the northern portion of the Growee Ranges down to Lee Creek floodplain on the south-eastern side of the Telstra Hill. The inclusion of this landscape feature aims to minimise the visual effects of the North Western OEA to views from Tarwyn Park and to blend the landform in with the natural topography to the greatest extent possible. Similarly, the South Western OEA has been designed with a reduced height to minimise the area of steeper sloping land on the western side of this landform.

Consistent with contemporary environmental assessment requirements, this Revised Conceptual Final Landform design (consistent with that developed for the EIS and subsequent approvals documentation) has been developed using standard mine planning design principles.

Schedule 4, Condition 63 of the Recommended Development Consent conditions prepared by DPE for the Project specifies the requirement for the final landform design to be developed to "*incorporate*

micro-relief and integrate with the surrounding natural landforms" and to "*minimise the visual impact of final landforms as far as is reasonable and feasible*". These specifications follow on from KEPCO's final landform rehabilitation objectives as described within the EIS and associated approvals documentation. As part of the Rehabilitation Management Plan and Mining Operations Plan to be prepared upon the receipt of planning approval, KEPCO would be required to develop strategies to address these committed rehabilitation objectives. This will entail detailed landform modelling which will be able to accommodate real mine planning data gained through the physical mining activities as opposed to standard mine planning design assumptions which are utilised at the EIS stage.

In light of the concerns raised within the PAC Review Report and subsequent Heritage Council correspondence in relation to the Conceptual Final Landform, KEPCO's mine planning team has completed some detailed landform design work to illustrate a Revised Conceptual Final Landform design which incorporates macro relief into the landform as above described. This landform design approach specifically replicates the shape and character of natural topographic features located outside of the mining area within the landform design. This assists in ensuring that the final landform better visually integrates with the surrounding landscape. This conceptual landform design should be considered an indicative representation of the intended outcome of the final landform for the Project and is subject to change as part of the more detailed mine planning work to occur during the initial years of mining operations.

4.2.1.1 Macro-Relief Design Principles

In order to better understand landform characteristics of the landscape surrounding the Project, including the BLCA, and thereby implement a more nuanced approach to the OEA landform design for the Project, the analogous regional landforms have been observed to identify characteristic landscape elements to guide the Revised Conceptual Final Landform design. The following elements were determined to be important in this regard:

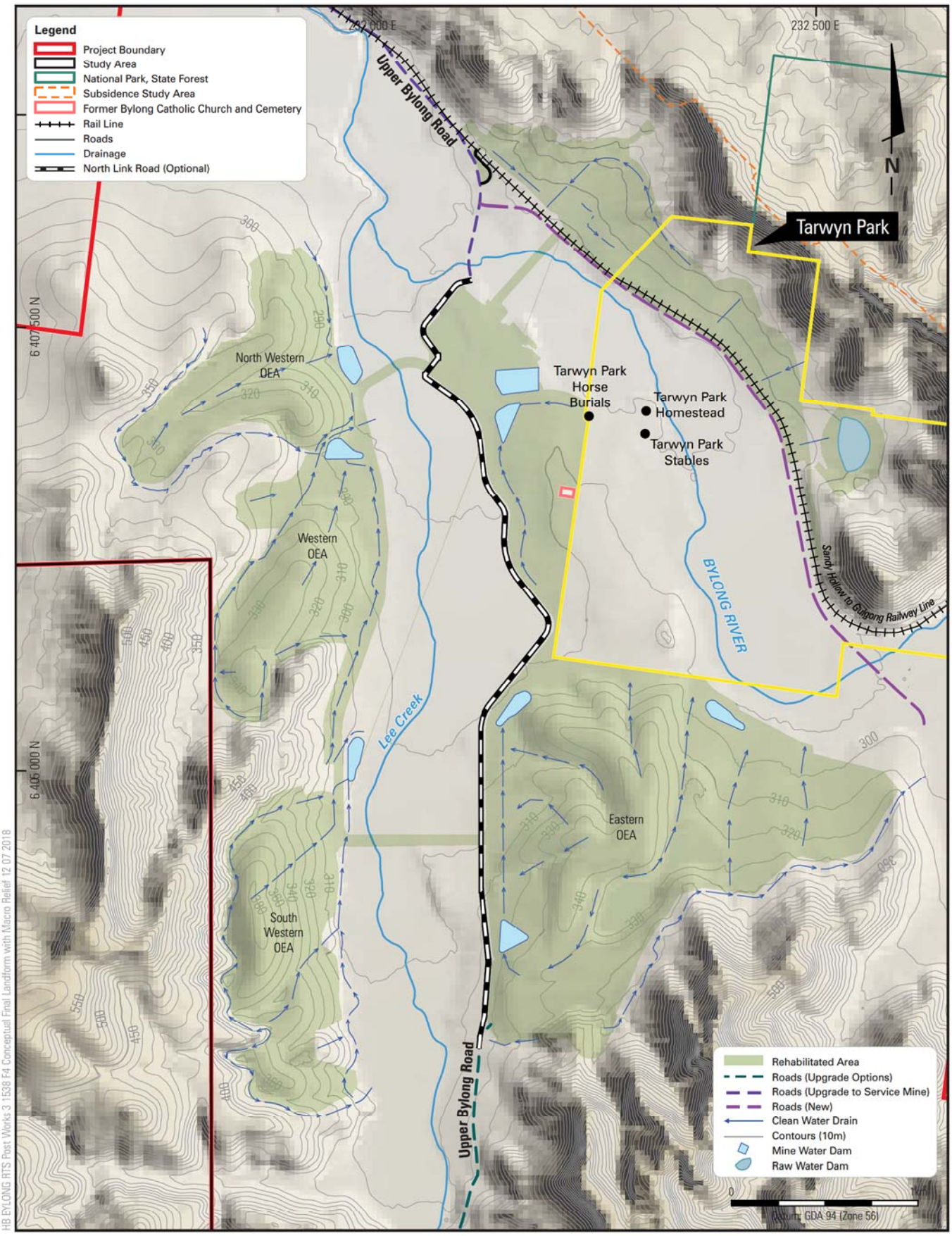
- Branching ridgelines;
- Ridgelines between 50 m and 130 m wide;
- Ridgelines having gentle grades, then steeper down to the valley floor; and
- Ridge side slopes generally >20 degrees.

The revised landform design incorporates:

- Branching ridgeline features;
- Various ridgeline widths between 60m and 85m;
- Ridge grades 0 to 2.5 degrees, then 2.5 to 7 degrees down to valleys;
- Maximum slope generally 10 degrees, with small areas 10 to 14 degrees (to merge with existing topography (refer to Figure 5); and
- Minimum 300m vertical radius on ridge crests to ensure no sharp crests are developed where multiple slopes intersect.

4.2.1.2 Forward Planning

Annual staging plans will be put in place to confirm shorter term dump balances to facilitate accurate landform design outcomes. Reject material from the underground mine will be used to fill the final void within the Eastern open cut mining area to original topography prior to this area being capped and rehabilitated to final landform.



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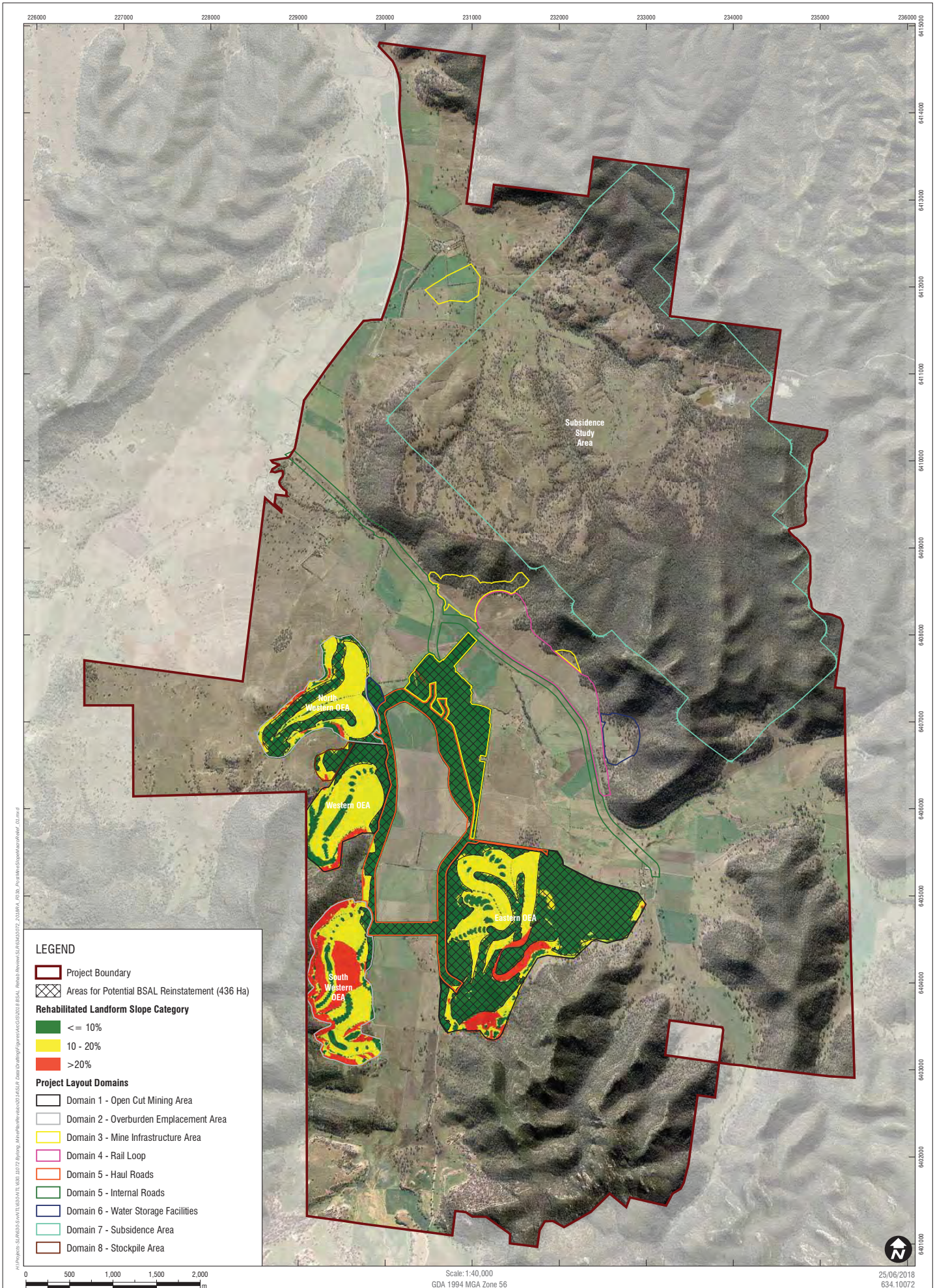
Conceptual Final Landform with Macro Relief

FIGURE 4



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Post-Mining Slope Analysis & Potential BSAL Reinstatement Macro Relief Landform Option

FIGURE 5

4.2.2 Improved Landscape Character and Visual Amenity Outcomes

The above initiatives have resulted in some significantly improved benefits to Landscape Character and Visual Amenity Outcomes for the Project. Key in this regard is the conservation of the view to the south and west from the Tarwyn Park Farm Complex due to the contracting the Eastern OEA footprint. This has enabled the retention of the existing view to the Growee Range, other than for a small distant portion located some 10 kilometres south within the Upper Lee Creek Valley. The retained view also includes Bald Hill, identified within the HAA report as comprising an important, distinctive landscape element, and the former Our Lady of the Sacred Heart Catholic Church building with associated graves and historical boundary tree planting located on a 4000 m² plot of land.

Importantly, the broad, open, low-lying pastoral nature of the valley floor with its gentle rise between Bylong River and Lee Creek has been substantially conserved, particularly when viewed from the north. Further, application of the above described Conceptual Final Landform Macro-Relief design principles has provided significant benefits for conservation of the Upper Bylong Valley landscape character through the provision of landforms that more closely reflect those existing and improve the visual integration of these with the ranges against which they sit.

Also, of importance in this regard is the retention of the substantial forested spurs adjoining the Western OEA (refer Figure 6 - the northern spur), and recreation of the forested spur within the South Western OEA (refer Figure 6 - the southern spur). Given the contraction of the Eastern OEA to the south under the Revised Mine Plan, the removal of the northern spur would be openly visible from the Tarwyn Park Homestead. The Revised Project Layout retains this spur and mining operations have been limited to lower than RL 350m, thereby reducing the size of the Western Open Cut. This approach provides the advantages of:

- conserving a visually uninterrupted horizontal expanse of forest cover to the Growee Range as seen from the Tarwyn Park Farm Complex; and
- facilitating a more nuanced visual integration of the Western OEA with the forested range, including:
    - retaining a section of forested steep slopes down to the interface with the Lee Creek floodplain; and
    - increasing the existing characteristic modulation of the forest edge, reflecting the existing interface with the various minor spurs and valleys of the pastoral lower slopes.

The recreation of the landform shapes within the southern spur within the South Western OEA has also facilitated a similar more nuanced visual integration of retained landform with the OEA.

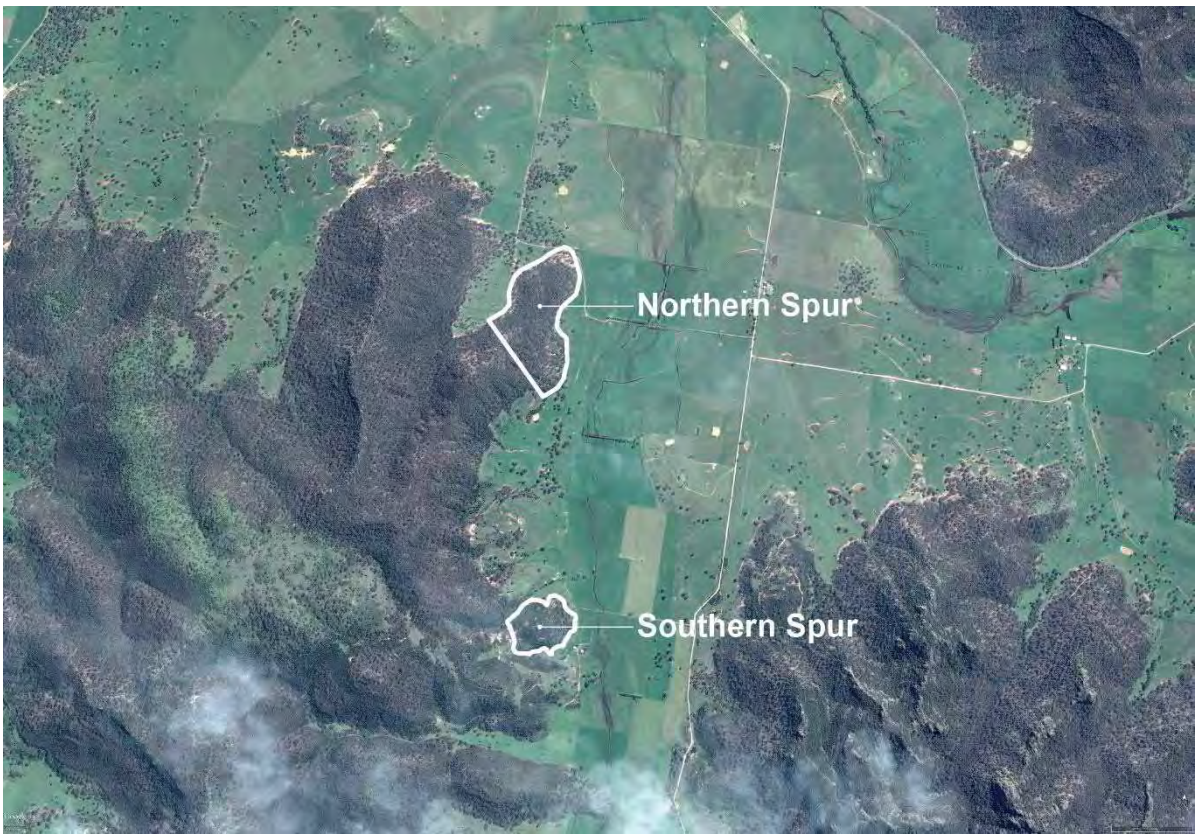

Figure 6 Integration of retained forested spurs

4.2.3 Revised Conceptual Landscape Design Overlay for Project Period

A Revised Conceptual Landscape Design has been prepared to address identified impacts on the significant heritage view towards the north-west from Tarwyn Park over the period of the Project's activities.

4.2.3.1 Conceptual Landscape Design

KEPCO is proposing to maintain those areas of the Tarwyn Park Farm Complex not affected by the Project as productive agricultural farming land in conjunction with its other landholdings within the Bylong Valley. KEPCO has committed to maintaining or enhancing the soil hydrology techniques (NSF) on the Tarwyn Park property. Furthermore, KEPCO is committed to making reasonable access to the Tarwyn Park property for external study (in accordance with the Recommended Development Consent Conditions). In this regard, KEPCO is currently investigating the feasibility of establishing a collaborative research and education centre at Tarwyn Park to facilitate practical field research on the property. Discussions have been held with a number of universities and educational institutions in this regard, some of which have expressed a preliminary interest.

Figure 7 shows the primary view cones (view orientation and field of view) that will be available from Tarwyn Park Homestead and from the Tarwyn Park Stables during the period of the Project. With regard to these views, impacts to View C (north-west through to north-east) effectively remain unchanged from the EIS Mine Plan. However, views A, B and D to the south and west for the Revised Mine Plan have improved in relation to the EIS Mine Plan as follows:

- For views to the south, the Project has moved south over a distance of 1.5 km, beyond which the Eastern Open Cut and the Eastern and South Western OEAs will be visible. Previously the eastern haul road passed within about 40 metres of the Stables, with the Eastern OEA set closely beyond this.

- For views to the west, the Project has moved west over a distance of 1 km to the eastern haul road (not openly visible from Tarwyn Park Homestead), beyond which the Western Open Cut and the Western and North Western OEAs will be visible.

These increased distances to the Project from the Tarwyn Park Farm Complex are considered to no longer warrant the provision of a temporary landscape screening treatment during the period of the Project.

A conceptual landscape design has been prepared for the Tarwyn Park Farm Complex to address the visual impacts to the north (View C), as shown in Figure 8.

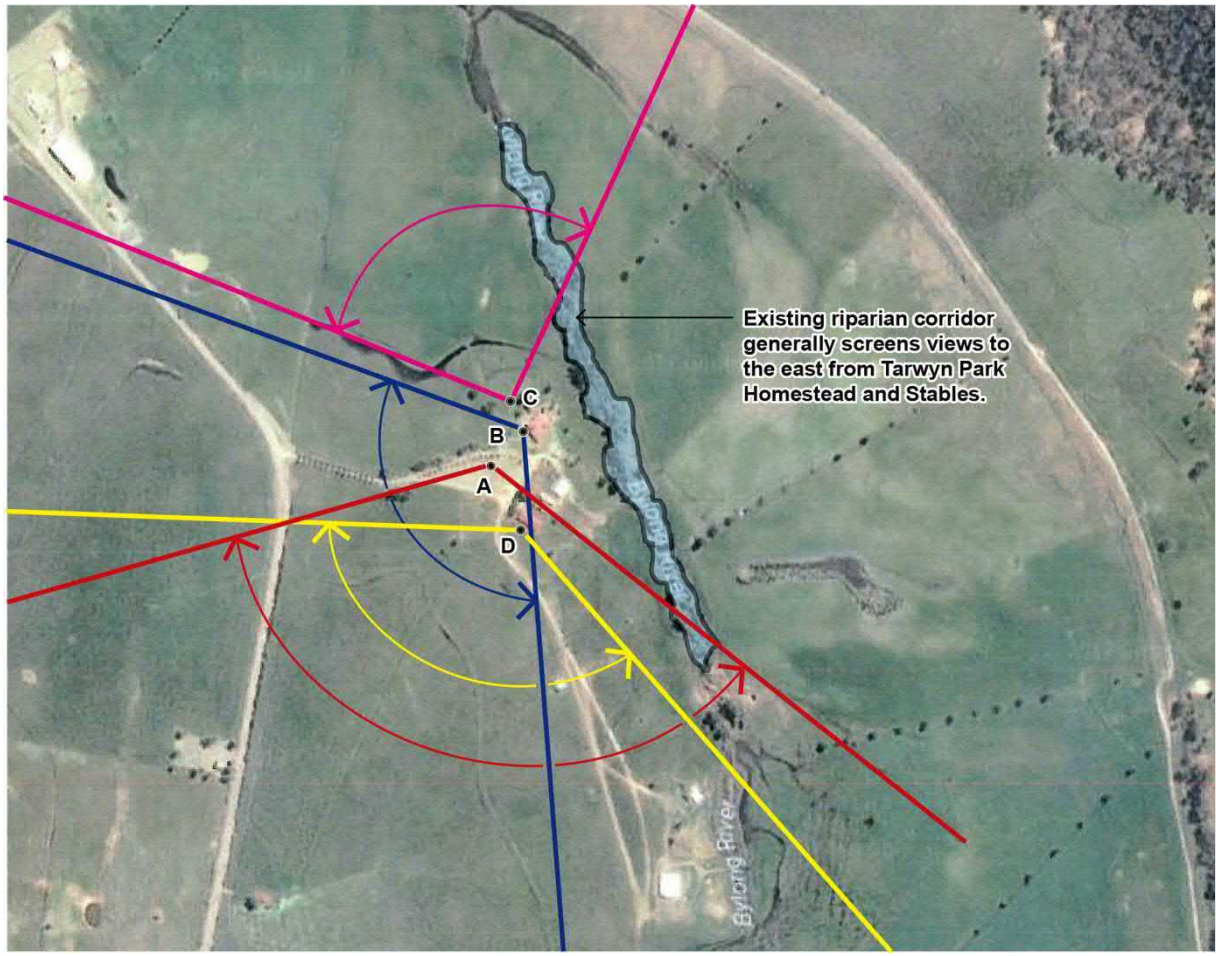

Figure 7 Locations of key representative viewing points for Tarwyn Park Homestead and Stables (Source: AECOM, 2017c)

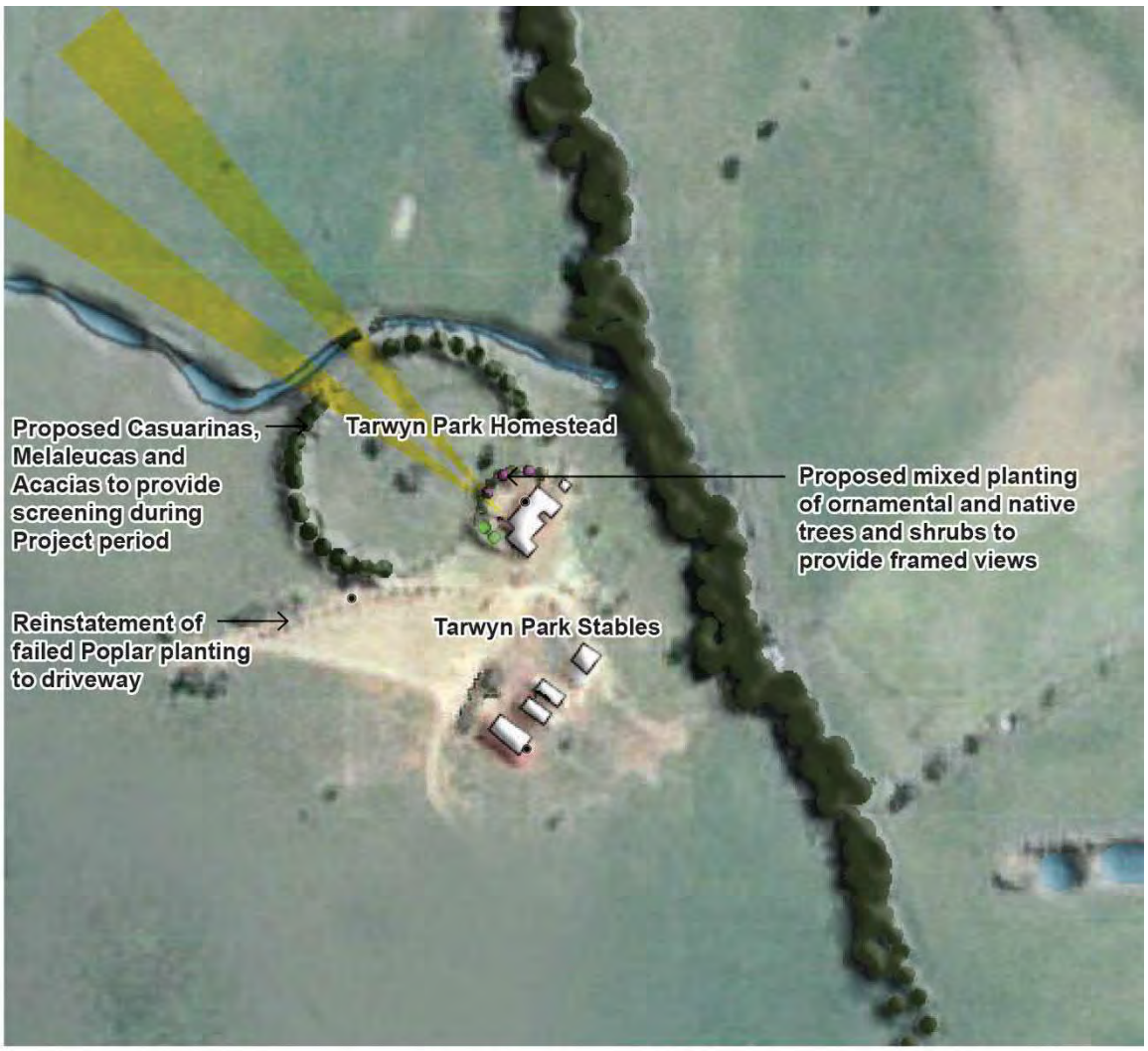

Figure 8 Revised conceptual landscape design overlay to Tarwyn Park Farm Complex

The key elements of the conceptual landscape design are as follows:

- A permanent garden design is proposed for the north-western fenced area in front of the house. The garden seeks to use a mixed planting of ornamental and native trees and shrubs to create a semi-formal entrance to the Homestead, which would comprise a historically and culturally appropriate response to the style and form of the building, as recommended within the draft CMP. The garden would provide framed views to the landscape of open paddocks, with the potential to selectively screen other areas, e.g. the Underground Mine Infrastructure Area (MIA) and CHPP.
- A temporary planting of semi-circular groves of quick growing endemic species such as casuarina, melaleuca and acacia species that would screen the Tarwyn Park Farm Complex from the Project components to the south and west, while still providing a sense of openness and space around the buildings and facilitating a 'window' out to the Bylong Valley landscape

for the view to the north-west. These trees would be gradually removed as longer-term permanent treatments to the final landform matured, i.e. land cover for cropping, grazing, and other stands of tree cover as described below.

- Poplar trees within the recently planted Tarwyn Park driveway avenue that have died or failed to thrive would be replaced.

4.2.3.2 Conceptual Landscape Design for Final Landform

As discussed within the Landscape and Visual Analysis (AECOM, 2017c), the Revised Conceptual Final Landform comprises gentle slopes that broadly reflect the Pastoral Lower Slopes Landscape Character Unit, of which most of the OEA represents. The design overlay for these slopes would comprise open stands of endemic woodland trees similar to that currently in place (refer Figure 9).

Figure 9 Typical view of pastoral lower slopes looking south-west along Wooleys Road (located within the mining area), with intermittent stands of open tree cover between the steep forested hills (left of frame) with the cleared agricultural floodplain (right of frame).

Tree species for the OEA within the Conceptual Landscape Design for Final Landform would typically comprise:

- Open stands of 'paddock' tree species from the Fuzzy Box Woodland community reinstated in variously sized patches along the toe of the lower slopes landscape; and
- Open stands of select 'paddock' tree species from the Coastal Grey Box Woodland community reinstated to areas up-slope of this.

Location and species composition of these landscape elements would be subject to a detailed design process.

Figure 10 illustrates for the proposed Conceptual Final Landform with Macro-Relief with Open Woodland Overlay. This overlay is then represented in a series of photomontages of key views in Section 5.3.

4.2.4 Initial Impact Assessment

The Landscape and Visual Analysis (2017c) report identified changes resulting from the Project in four views of heritage significance from Tarwyn Park Homestead as follows (refer Figure 7):

- View A: Looking south-east through west from Tarwyn Park Homestead driveway;
- View B: Looking south through west from Tarwyn Park Homestead;
- View C: Looking west through north-east within close proximity to Tarwyn Park Homestead; and
- View D: Looking south-east through west from Tarwyn Park Stables.

The report also identified changes resulting from the Project in three views of heritage significance to and from Iron Tank Farm House as follows:

- View looking north-east to Iron Tank Farm House from Wooleys Road (View 9);
- View looking south-west from Iron Tank Farm House towards Tal Tal Mountain and associated ranges (View 10); and
- View looking west from Iron Tank Farm House towards the Project (View 11).

A conceptual landscape design was then prepared to address visual impacts arising from the Project for views from Tarwyn Park Homestead and residual visual impacts assessed with the Conceptual Landscape Design in place.

This design overlay comprised the introduction of stands of endemic woodland communities periodically planted in bands along the contour to visually break-up the uniform profile of the Eastern OEA landform as seen from Tarwyn Park Homestead and minimise views of it being seen in strong profile against the skyline. The reader is directed to the Landscape and Visual Analysis (*ibid.*) for further detail of the above.

Refer to the *Landscape and Visual Analysis* (ibid.) for a summary of key elements of change to each of the above views arising from the EIS Final Landform, and then residual impacts once the additional overlay of the Conceptual Landscape Design was in place.

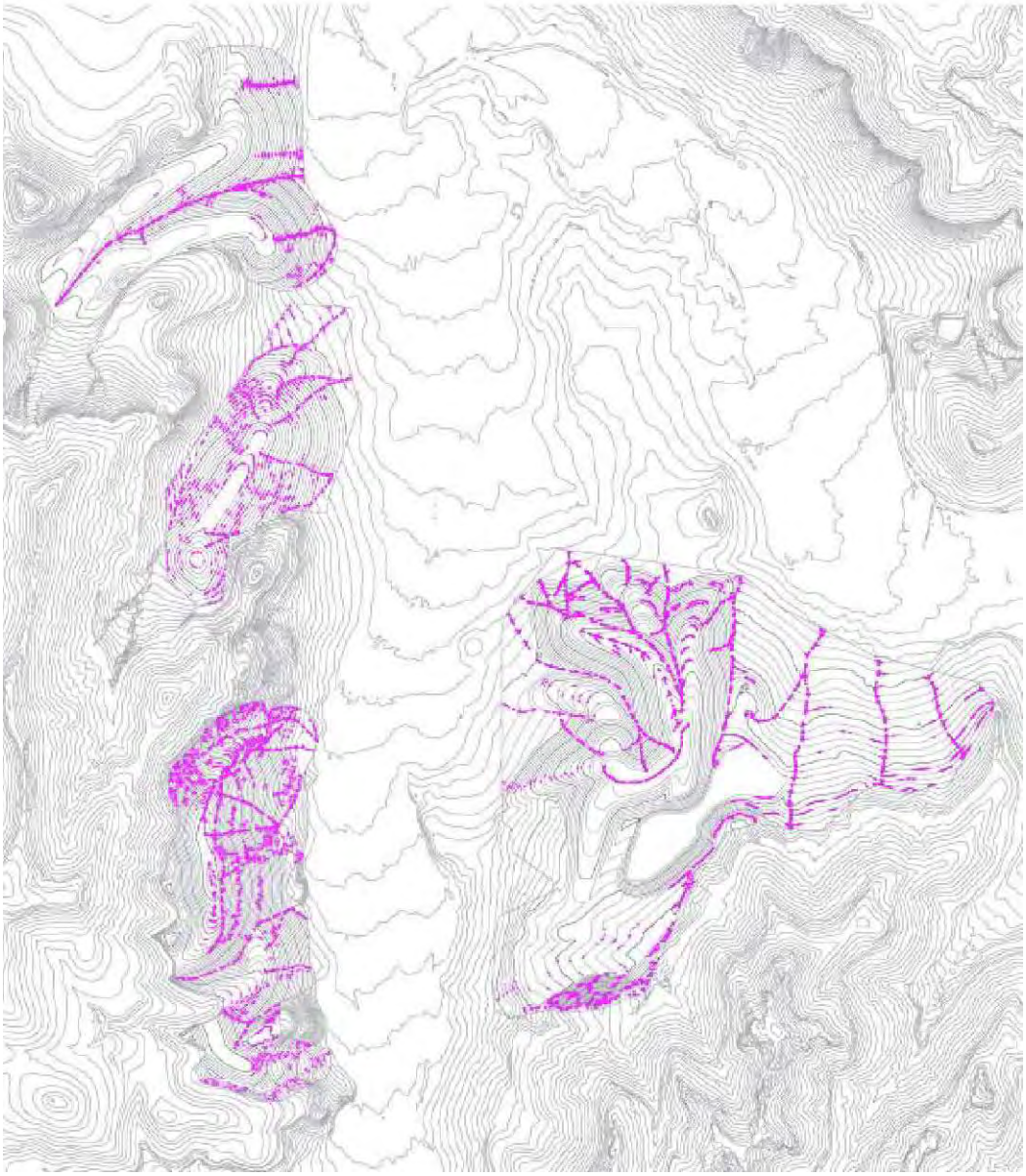

Figure 10 Revised Mine Plan Conceptual Landform (incorporating Macro-Relief) to overburden emplacement areas with open woodland cover

5.0 Revised Impact Assessment

5.1 Overview

Table 3 summarises the alterations to the potential impacts associated with the Revised Project Layout for Historic Heritage, which are discussed in Sections 5.2, 5.3 and 5.4.

Table 3 Summary of impacts

ID	Item	2015 Impact Assessment		Revised Impact Assessment		Impact Reduction[1]
		Impact	Degree	Impact	Degree	
1	Homestation	Visual	Partial	Visual	Partial	
2	Bylong Station Farm Complex	Direct Visual	Partial	Direct Visual	Partial	
3	Sunnyside Homestead	Visual	Partial	Visual	Partial	
4	Bylong St Stephen's Anglican Church and Cemetery	Visual	Partial	Visual	Partial	
5	Harley Hill Farm Complex	Visual Vibration	Partial Potential	Visual Vibration	Partial Potential	
6	Bylong Trig Station	Visual	Partial	Visual	Partial	
7	Bylong Upper Public School	Direct Demolition	Whole	Direct Demolition	Whole	
8	Swiss Cottage	Visual Vibration	Partial	Visual	Partial	
9	Cheese Factory	Direct Demolition	Whole	Direct Demolition	Whole	
10	Bridgelo Provisional School	No impact	n/a	No impact	n/a	
11	Renfrew Park Remains 1	Direct Demolition	Whole	Direct Demolition	Whole	
12	Renfrew Park Remains 2	Direct Demolition	Whole	Direct Demolition	Whole	
13	Upper Bylong Post Office and Store	Direct Demolition	Whole	Direct Demolition	Whole	
14	Former Our Lady of the Sacred Heart Catholic Church	Direct Demolition	Whole	Visual Vibration	Partial	
15	Bylong Upper Hall	Direct Demolition	Whole	Direct Demolition	Whole	
16	Bylong Hall	Visual	Partial	Visual	Partial	
17	Tarwyn Park Farm Complex	Visual Direct Vibration	Partial	Visual Direct Vibration	Partial	
18	Cottage Chimney Remains	Visual	Partial	Visual	Partial	
N/A	Bylong Landscape Conservation Area	Direct Visual	Partial	Direct Visual	Partial	

1. Blue = no change; Green = reduced impact; Red = increased impact

5.2 Direct Impacts

The Revised Project Layout reduces the wholly impacted items from seven to five. The 2015 HHIA identified direct impacts to:

- Bylong Upper Public School;
- Cheese Factory Remains;
- Former Our Lady of the Sacred Heart Catholic Church and Cemetery;
- Renfrew Remains 1 & 2;
- Upper Bylong Post Office & Store;
- Bylong Upper Hall; and
- Tarwyn Park horse burial location.

The former Our Lady of the Sacred Heart Catholic Church and Cemetery and the Tarwyn Park horse burial location would cease to be directly impacted and would not require removal for the purposes of the Project. The former Our Lady of the Sacred Heart Catholic Church and Cemetery would also be removed from the Revised Project Disturbance Boundary, and therefore the exhumation of the cemetery would not be progressed. The Church building would also remain in situ.

Additionally, the Revised Project Layout would reduce the severity of impacts to three partially impacted items identified in the 2015 HHIA:

- Bylong Station Farm Complex (partial, associated with construction of the Accommodation Facility);
- Tarwyn Park Farm Complex, including NSF farmland and features; and
- BLCA – removal of heritage items and landscape impacts.

The principal impact reduction achieved by the Revised Project Layout is that it steps the Eastern Open Cut Mining Area and associated OEAs off Tarwyn Park and therefore the horse burials and NSF farmland and features within this area would generally remain undisturbed. The system of NSF would remain intact, allowing for continued study of the technique on the site of its development.

Additionally, there would be reduced direct impacts to the Bylong Station Farm Complex as the Accommodation Facility has been removed from the Project. This area would still be utilised for car parking and first aid facilities, but would not be subject to the same level of impact that was anticipated in the 2015 HHIA. It is reiterated that there would be no direct impacts to heritage buildings, despite the curtilage of the property as a whole being impacted. The car parking facilities would be located to the south of the historic homestead and would be visually distinct.

The reduced area of open cut mining would further minimise the landscape impacts to the BLCA. This is addressed further in Section 5.4. Similarly, the retention of the former Our Lady of the Sacred Heart Catholic Church is also a positive impact reduction on the BLCA, as it allows for the retention of an element of the Upper Bylong Village.

In summary, wholly and partially direct impacts arising from the Revised Project Layout would be limited to:

- Bylong Upper Public School;
- Cheese Factory Remains;
- Renfrew Remains 1 &2;
- Upper Bylong Post Office & Store;
- Bylong Upper Hall;
- Tarwyn Park Farm Complex – CHPP, rail loop, Upper Bylong Road (Realignment) and water management infrastructure; and

- BLCA – removal of heritage items and landscape impacts.

5.3 Indirect Impacts

5.3.1 Vibration

A blasting assessment undertaken by Pacific Environment Limited (2015) for the Project identified that the following historic heritage items would experience blast impacts greater than the guideline limits (i.e., 15 mm/s) (with Maximum Instantaneous Charge of 410 kg):

- Tarwyn Park Homestead (31.7 mm/s);
- Tarwyn Park Stables (79.5 mm/s);
- Harley Hill Cottage Remains (34.6 mm/s); and
- Swiss Cottage (56.1 mm/s).

As a result of the Revised Project Layout, Tarwyn Park Homestead and stables would now be more than 1.4 kilometres from the nearest blasting activities. The original Mine Plan would have resulted in blasting within 190 and 107 metres of the Homestead and stables respectively.

Hansen Bailey commissioned Terrock (2017) to prepare a *Blast Management Strategy for Tarwyn Park Farm Complex* to develop an appropriate framework for the management of blast related impacts to the structures location on the Tarwyn Park Farm Complex. In light of the Revised Project Layout, it is unlikely that the intensive measures described within that strategy will now be required. In this regard, a Blast Management Plan to be prepared in accordance with Schedule 4, Condition 16 of the Recommended Development Consent conditions will consider measures required to minimise impacts on heritage items.

Assessments undertaken by ERM (formerly Pacific Environment Limited) (2018) of the blasting activities proposed as part of the Revised Project Layout indicates the revised vibration impacts to the above listed features would be:

- Tarwyn Park Homestead (2.1 mm/s) – a 93.4% reduction ;
- Tarwyn Park Stables (2.1 mm/s) – a 97.4% reduction;
- Harley Hill Cottage Remains (34.6 mm/s) - unchanged; and
- Swiss Cottage (56.1 mm/s) - unchanged.

Blasting activities associated with the Revised Project Layout will meet the relevant blast guideline limits (i.e., 15 mm/s) and would therefore significantly reduce the potential impacts associated with blasting vibrations to the Tarwyn Park Homestead and Stables. Harley Hill Cottage and Swiss Cottage would be managed in accordance with the mitigation and management measures described within the EIS and associated approvals documents.

Additionally, as the former Our Lady of the Sacred Heart Catholic Church would remain *in situ* under the Revised Project Layout, the potential vibration impacts have been assessed by ERM (2018). The former Our Lady of the Sacred Heart Catholic Church and associated cemetery will be located more than 1 km from the closest blasting activities. ERM (2018) has predicted that blast impacts will meet the relevant blast guideline limits.

5.3.2 Subsidence

A subsidence assessment completed for the Project by MSEC (2014) predicted the following maximum subsidence parameters as a result of longwall extraction:

- Vertical subsidence of up to 3,400 mm;
- Tilt of 66 mm;
- Hogging curvature of 3.6 km;
- Sagging curvature of 3.3 km; and
- Strains typically between 10 mm and 20 mm, with some isolated strains greater than 20 mm.

On the basis of these predictions, the assessment found that no built items would be impacted as a result of longwall extraction related subsidence, this includes identified historic heritage items.

This assessment is not altered under the Revised Project Layout and the prediction of no impact stands.

5.4 Visual Impacts

5.4.1 Tarwyn Park Farm Complex

Table 4, Table 5, Table 6 and Table 7 summarise key elements of change to each of the above views (refer Figure 7) arising from the Revised Conceptual Final Landform (incorporating Macro-Relief). Residual impacts are then assessed once the additional Conceptual Landscape Design Overlay has been put in place (refer s.4.2.3), comprising:

- permanent garden design for the Tarwyn Park House front garden;
- temporary screen planting to the north of the front garden; and
- landscape restoration of the pastoral lower slopes through re-introduction of open stands of endemic woodland trees reflective of that currently in place.

The four key views identified within the previous Landscape and Visual Analysis (*ibid*.) are re-assessed within this report, as described below, and as shown in the following figures (refer Figure 11 Figure 12, Figure 13, Figure 14, Figure 15, Figure 16,Figure 17 and Figure 18 for view A, Figure 19, Figure 20, Figure 21 and Figure 22 for view B, Figure 23 and Figure 24 for View C, Figure 25, Figure 26, Figure 27 and Figure 28 for view D). The reader is directed to the previous report to understand the existing characteristics of each view.

A new view taken from the north end of the Upper Bylong Valley has also been assessed as it encapsulates a ‘whole of valley’ (meaning Upper Bylong Valley) view. Refer Figure 29, Figure 30, Figure 31 and Figure 32.

5.4.1.1 View A: Looking south-east through west from Tarwyn Park Homestead driveway

Table 4 Summary of Landscape and Visual Impacts

Revised Conceptual Final Landform (incorporating Macro-Relief)
The Revised Conceptual Final Landform (incorporating Macro-Relief) provides a significantly improved landscape character and visual amenity outcome over that provided for the EIS due to the considerable step back of the Eastern OEA from this KEPCO owned property. Key beneficial elements comprise: • more nuanced landform design that better reflects the existing landscape morphology; • full retention of the forested spur within the south-eastern portion of the Western Open Cut mining area which conserves the landscape character of the range and reduces the seen extent of active mining and the final landform of the Western OEA; • retained landscape character of the Growee Range set across the (unseen) Lee Creek floodplain, and adjoining gently undulating lower slope and associated open woodland cover of Tal Tal Mountain; • retained views to the Catholic Church and grounds in the middle ground, and Bald Hill in the background; • reduced visual scale and prominence of the Project given the OEAs are a minimum of 1.5 km distant from Tarwyn Park Homestead and are subject to landform design that is more reflective of the existing pastoral lower slopes landform; • increased seen areas of encircling forested ranges, including low ranges within part of the western side of Upper Lee Creek Valley (visible due to contraction south of the former Eastern OEA); • improved conservation of landscape character for Growee Range; and • reduced extent of final cropping / pasture landform seen against the skyline from this view location.
Conceptual Landscape Design Overlay
The Conceptual Landscape Design Overlay substantially reduces the visual impact of the revised Conceptual Final Landform as it: • minimises the visual prominence of OEA landform, and particularly where it was seen on or close to the skyline; • provides stands of endemic tree cover that reflects other parts of the valley currently subject to stands of paddock trees, and highlights landform detail, e.g. the rounded ends of spurs; and • provides a modified view for the Tarwyn Park Farm Complex that is better integrated into the overall valley view, while still maximising views beyond it to Tal Tal Mountain and southern portions of the Growee Range, including Bald Hill. A further fine tuning of the landscape integration process could be achieved through the addition of strategically located open stands of trees to the Eastern, South West and Western OEA that: • emphasised the rounded form of the spurs (where present); • broke up the relatively flat line of the cleared high ridgelines where seen against steep forested slopes; and • provided open woodland cover to the brow of the Eastern OEA ridgeline where it is seen either close to or against the skyline.

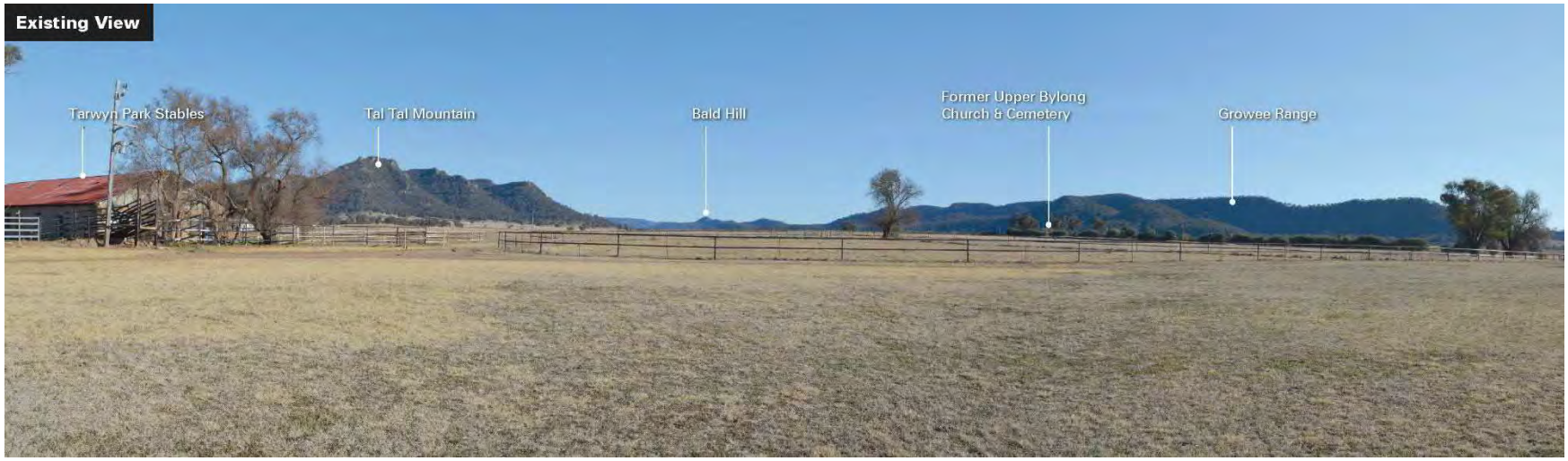

Figure 11 View A – Existing view taken from the driveway loop about 50 metres west of Tarwyn Park Homestead looking south-east (left of frame) through to west (right of frame)

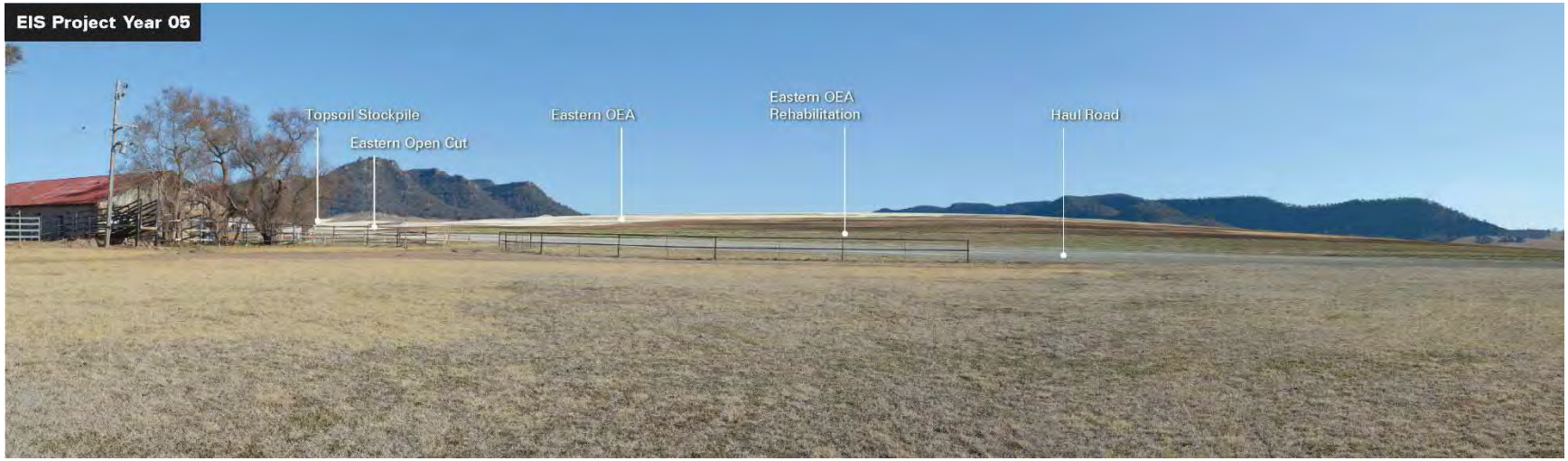

Figure 12 View A – View at 5 years into the Project as proposed within the EIS

Figure 13 View A – Existing view taken from the driveway loop about 50 metres west of Tarwyn Park Homestead looking south-east (left of frame) through to west (right of frame)

Figure 14 View A – Revised conceptual final landform (incorporating macro-relief) at 5 years into the Project, with Bald Hill to centre background, Catholic Church to centre right middle ground, and retained forested spur to centre right background

Figure 15 View A – Existing view taken from the driveway loop about 50 metres west of Tarwyn Park Homestead looking south-east (left of frame) through to west (right of frame)

Figure 16 View A – EIS final landform with conceptual tree planting shown at 5 years into the Project

Figure 17 View A – Existing view taken from the driveway loop about 50 metres west of Tarwyn Park Homestead looking south-east (left of frame) through to west (right of frame)

Figure 18 View A – Revised conceptual final landform (incorporating macro-relief) and conceptual open woodland overlay with Bald Hill to centre background, Catholic Church to centre right middle ground, and retained forested spur to centre right background

5.4.1.2 View B: Looking south through west from Tarwyn Park Homestead

Table 5 Summary of Landscape and Visual Impacts

Revised Conceptual Final Landform (incorporating Macro-Relief)
The Revised Conceptual Final Landform provides a significantly improved landscape character and visual amenity outcome over that provided for the EIS due to the considerable step back from this KEPCO owned property. Key elements comprise: • full retention of the forested spur within the south-eastern portion of the Western Open Cut mining area which conserves the landscape character of the range and reduces the seen extent of active mining and the final landform of the Western OEA; • more nuanced landform design that reflects existing landscape morphology; • retained landscape character of the Growee Range set across the (unseen) Lee Creek floodplain, and adjoining gently undulating lower slope and associated open woodland cover of Tal Tal Mountain; and • conservation of landscape character for Growee Range, with no interruption to view from the former northern section of the Eastern OEA.
Conceptual Landscape Design Overlay
The Conceptual Landscape Design Overlay substantially reduces the visual impact of the revised Conceptual Final Landform: • for the same reasons as above; • while also providing long views across open paddocks as recommended in the Tarwyn Park and Iron Tank Conservation Management Plan (AECOM, 2017(c)), from the south-east through to north-west, including to Telstra Hill and the more distant ranges on the western side of the Growee River valley (identified as Mount Penny Ranges in HAA Report).

Figure 19 View B – Existing view taken from the front verandah of Tarwyn Park Homestead, looking south-east (left of frame) through to west

Figure 20 View B – Final EIS landform with conceptual tree planting

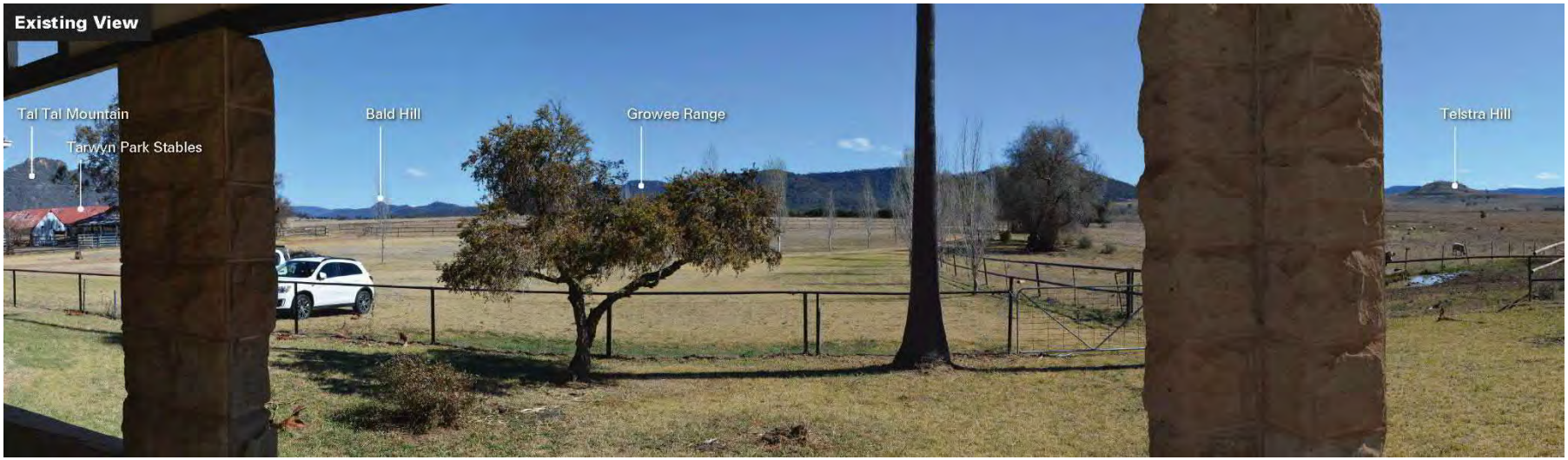

Figure 21 View B – Existing view taken from the front verandah of Tarwyn Park Homestead, looking south-east (left of frame) through to west

Figure 22 View B – Revised conceptual final landform (incorporating macro-relief) and open woodland overlay from above location with Bald Hill centre left in background and wooded ridgeline retained to centre of frame

5.4.1.3 View C: Looking west through north-east within close proximity to Tarwyn Park Homestead

Table 6 Summary of Landscape and Visual Impacts

Revised Conceptual Final Landform (incorporating Macro-Relief)
The Revised Conceptual Final Landform (incorporating Macro-Relief) does not result in any changes from that previously assessed within the Visual and Landscape Analysis.
Conceptual Landscape Design Overlay
No additional mitigation and management measures are required for this view.

Figure 23 View C – Existing view taken from the front garden of Tarwyn Park Homestead, looking west (left of frame) through to north-east

Figure 24 View C – Project infrastructure components seen from the front garden of Tarwyn Park Homestead, looking west (left of frame) through to north-east

5.4.1.4 View D: Looking south-east through west from Tarwyn Park Stables

Table 7 Summary of Landscape and Visual Impacts

Revised Conceptual Final Landform (incorporating Macro-Relief)
The view of the final landform would be expected to be similar to View A, albeit at a closer distance to the Eastern OEA and South Western OEA. The additional feature of the existing stand of open woodland at the southern boundary of Tarwyn Park would be seen from this location. The North Western OEA which now incorporates the valley landscape feature into the final landform design will also be visible from this location.
Conceptual Landscape Design Overlay
The Conceptual Landscape Design Overlay moderately reduces the visual impact of the final landform: • for the same reasons as listed for View A; • while also providing long views across the open paddocks toward Telstra Hill.

Figure 25 View D – Existing view from Tarwyn Park Stables looking south-east clockwise through to west

Figure 26 View D – Final EIS landform with conceptual tree planting from above location

Figure 27 View D – Existing view from Tarwyn Park Stables looking south-east clockwise through to west

Figure 28 View D – Revised Conceptual Final Landform (incorporating Macro-Relief) and open woodland overlay from above location

5.4.2 View E: Looking south from Upper Bylong Road adjacent Sandy Hollow to Gulgong Railway Line

Table 8 Summary of Landscape and Visual Impacts

Existing View
The EIS VIA assessed the visual impacts from the closest privately owned residence (now owned by KEPCO) to the Project, Refer to Location 2 within the VIA. The view represented in view E is from a location approximately 1.3 km further to the south east of the EIS Location 2. This provides a more open view of the Project. View E represents a new location which was not specifically provided within the EIS VIA or the later Landscape and Visual Analysis (*ibid*.). This panoramic view comprises an important introduction to the Upper Bylong Valley for both future residents (KEPCO now own the majority of land within the Upper Bylong Valley) and visitors, encapsulating the key landscape elements including the steep forested hills, the predominantly pastoral lower slopes with open woodland cover, and alluvial floodplain with areas of irrigated agriculture. Landscape features include: Tal Tal Mountain which is seen in stark relief against the skyline; the distinctive low, rounded forested hills seen in the in the central upper Lee Creek valley area, including Bald Hill; and sporadic cover of buildings including the small white residence seen in the middle ground (centre left of frame) and farm shed downslope of Tal Tal Mountain in the middle ground (left of frame).
Revised Conceptual Final Landform (incorporating Macro-Relief)
The view of the Revised Conceptual Final Landform (incorporating Macro-Relief) comprises a significant improvement over what would have been seen from this location with the EIS Mine Plan, including: retention of the northern spur and reinstatement of the southern spur of the Growee Range (centre right of frame); provision of OEA landforms more visually sympathetic to the existing morphology of the lower pastoral slopes. The forest edge line with the pastoral lower slopes would have been less modulated than that present in the existing view, and seen as a generally uncharacteristic, relatively 'flat' line.
Conceptual Landscape Design Overlay
The Conceptual Landscape Design Overlay significantly further reduces the visual impact of the final landform from this location for the same reasons as listed for View A, providing visually strong, naturalistic integration of OEA into the landscape.

Figure 29 View E – Existing view looking south from Upper Bylong Road adjacent Sandy Hollow to Gulgong Railway Line

Figure 30 View E – Final EIS landform with conceptual tree planting from above location

Figure 31 View E – Existing view looking south from Upper Bylong Road adjacent Sandy Hollow to Gulgong Railway Line

Figure 32 View E – Revised conceptual final landform (incorporating macro-relief) and open woodland overlay from above location

5.4.3 Iron Tank Farm House

Table 9, Table 10, and Table 11 summarise key elements of change to each of the below views (refer AECOM Landscape and Visual Analysis, 2017c) arising from the Revised Conceptual Final Landform (incorporating Macro-Relief). Where relevant, residual impacts are then assessed once the additional Conceptual Landscape Design Overlay has been put in place (refer s.4.2.3), comprising:

5.4.3.1 View looking north-east to Iron Tank Farm House from Wooleys Road (View 9)

Table 9 Summary of Landscape and Visual Impacts

Revised Conceptual Final Landform (incorporating Macro-Relief)
There would be no surface components of the Project located within the field of view for this receptor location. There may be some changes to the forested range to the north visible from this location due to potential subsidence effects on cliff faces, however any effects arising will not differ from those presented in the EIS.
Conceptual Landscape Design Overlay
n/a

5.4.3.2 View looking south-west from Iron Tank Farm House towards Tal Tal Mountain and associated ranges (View 10)

Table 10 Summary of Landscape and Visual Impacts

Revised Conceptual Final Landform (incorporating Macro-Relief)
There would be no change to the landform in this view.
Conceptual Landscape Design Overlay
n/a

5.4.3.3 View looking west from Iron Tank Farm House towards the Project (View 11)

Table 11 Summary of Landscape and Visual Impacts

Revised Conceptual Final Landform (incorporating Macro-Relief)
This view would be subject to a moderate level of improved landscape outcomes resulting from the Project, including: • change in the form of the valley floor, with the Eastern OEA reduced in extent / visible to the left hand side of the view, rather than extending further north across the middle ground field of view; • the Eastern OEA will continue to be seen with a high level of detail given the proximity of the heritage item to it, however with much smaller field of view; • Substantially more of the Growee Range will be visible, with better landscape integration of the Western and North Western OEA, including retention of the forested northern spur which will be seen from this location, which will comprise a significant benefit for landscape character and landform integration.
Conceptual Landscape Design Overlay
The Conceptual Landscape Design Overlay will provide a further moderate to potentially substantial improvement in the view of the Eastern OEA, and significant improvement to the Western OEA final landform.

5.4.4 EIS Visual and Landscape Impact Assessment

5.4.4.1 Visual Impact Assessment

The VIA prepared for the Project EIS (JVP Visual Planning and Design, July 2015) assessed visual impacts of the Project with regard to four view sectors (Northern, Eastern, Southern and Western View Sectors). Refer Figure 33. Key findings of the VIA report are summarised in the below tables and re-considered in light of the updated landownership (in line with KEPCO's acquisition since the EIS) and the landscape and visual impact effects identified within this report for the Revised Conceptual Final Landform (incorporating Macro-Relief) and Open Woodland Overlay. Refer Table 12, Table 13, Table 14 and Table 15.

Table 12 Northern View Sector

EIS Mine Plan Visual Impact Assessment	Revised Conceptual Final Landform (incorporating Macro-Relief) with Conceptual Landscape Design Overlay
• Visual impacts for the Northern View Sectors were generally *low* due to limited views from high sensitivity receptors such as Bylong Village and rural residences within 2.5 km of the Project.	• Visual impacts for the Revised Mine Plan would be lower than the VIA due to all private residences within 2.5 km of the Project having since been purchased by KEPCO. The Project will not be openly visible from the Bylong Village. The refinements included within the Revised Conceptual Final Landform will assist in the landform integrating with the surrounding natural landscape and therefore reduce any potential visual effects.
• *Moderate to high* impacts may be experienced from Bylong Valley Way, Wollar Road and Upper Bylong Road for short periods of time until rehabilitation measures are in place.	• Impacts from these locations would be *reduced, potentially significantly reduced* due the Revised Mine Plan keeping works below the Upper Bylong Valley ridge lines and being a further 1.4 km to the south. The refinements to the Western Open Cut Mining area to retain the northern spur will further reduce these potential impacts.

Table 13 Eastern View Sector

EIS Mine Plan Visual Impact Assessment	Revised Conceptual Final Landform (incorporating Macro-Relief) with Conceptual Landscape Design Overlay
• During initial years of the Project some rural residential properties, Upper Bylong Road and other local roads will experience *moderate to high* visual impacts based on distance and visibility of Project, including in relation to views of susceptible cliff lines.	• Visual impacts would be *lower* due to the reduced extents of the Eastern and Western Open Cut mining areas and refinements to the landforms. Further, all residences within 2.5 km of the Project have since been purchased by KEPCO. One private landholder remains to the east of the Project (more than 2.5 km away). There is no residence located on this property.
• Visual impact for the sector is low to moderate due to limited number of high sensitivity receptors.	• Visual impacts would be *lower* as above. There remains only one sensitive receptor (no residence) for this view sector.

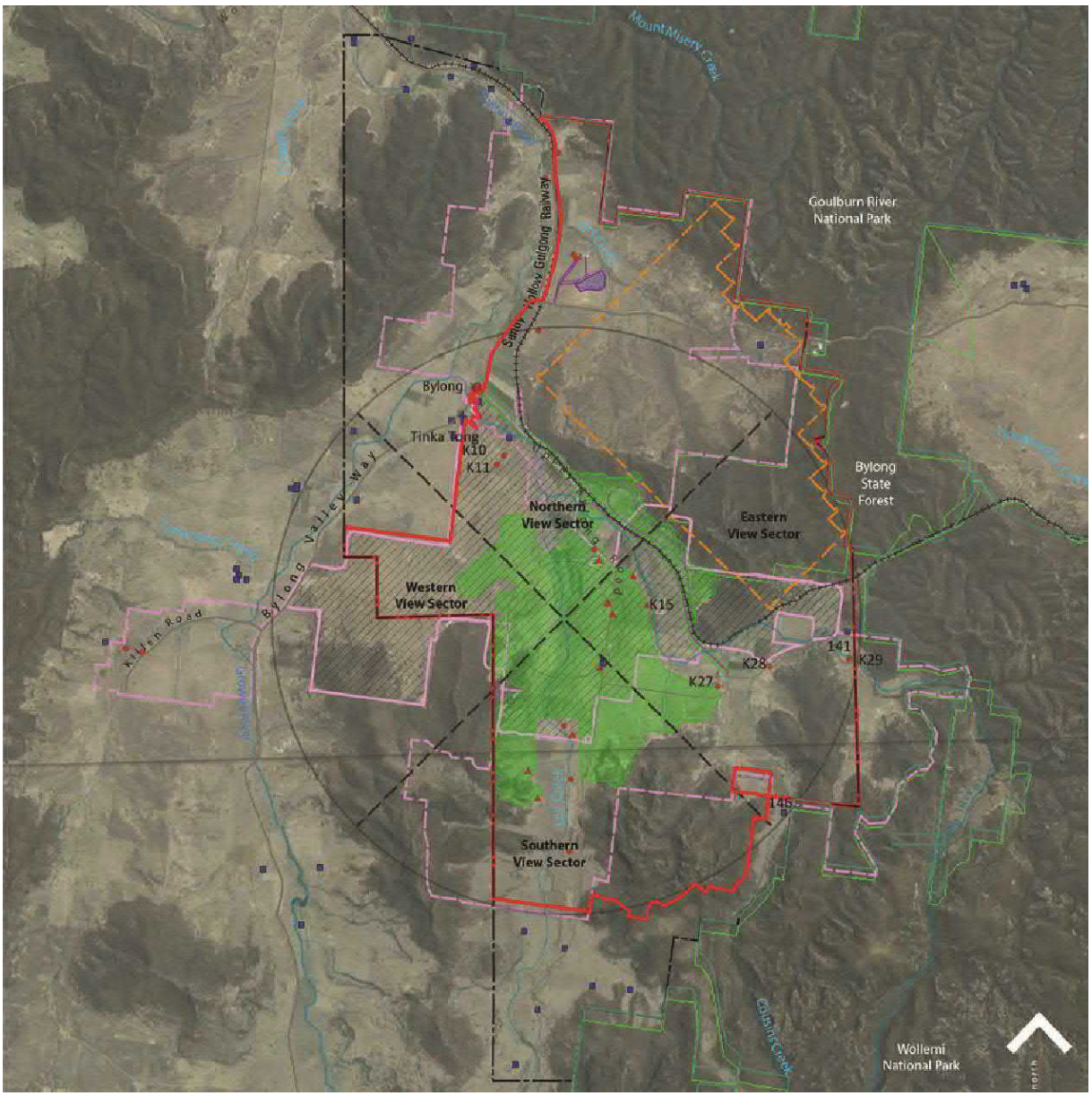

Figure 33 Excerpt from Visual Impact Assessment prepared for the EIS showing visual impact assessment view sectors (Source: JVP Visual Planning and Design, July 2015)

Table 14 Southern View Sector

EIS Mine Plan Visual Impact Assessment	Revised Conceptual Final Landform (incorporating Macro-Relief) with Conceptual Landscape Design Overlay
• All residences within this sector may experience *moderate to high* visual impact	• Visual impacts would be *lower* due to all residences within 2.5 km of the Project having since been purchased (or reached agreement to purchase) by KEPCO. All private freehold receivers up to 8 km south of the Project have since been purchased by KEPCO.
• Visual impact on the sector is *generally low* due to limited number of high sensitivity receptors.	• Visual impact now likely to be *lower* due to land acquisitions by KEPCO.

Table 15 Western View Sector

EIS Mine Plan Visual Impact Assessment	Revised Conceptual Final Landform (incorporating Macro-Relief) with Conceptual Landscape Design Overlay
• Visual impact on this sector will generally be *low* due to screening of sensitive visual receptors from major mining operation areas due to topography and vegetation.	• Visual impacts would be *lower* due to all residences within 2.5 km of the Project having since been purchased by KEPCO. • The reduced extent of the Eastern OEA to remain further south also reduces the potential visual impact on this view sector.

5.4.4.2 Landscape and Cumulative Impacts

The EIS Visual Impact Assessment report (*ibid.*) identified existing open cut coal mines at Wollar (Wilpinjong Coal Mine) and Ulan (Moolarben and Ulan coal mines). These mines are currently operational creating high visual effects and impact levels on the adjoining Wollar and Ulan Roads.

The VIA (*ibid.*) finds that the combination of the relative isolation of the Upper Bylong Valley from the rest of the BLCA, access to the Project being by minor local roads (most of which are not through roads), and the short-term operational life of the open cut mine life, the Project's landscape and cumulative visual impact is low.

Table 16 Landscape and Cumulative Impacts

EIS Mine Plan Visual Impact Assessment	Revised Conceptual Final Landform (incorporating Macro-Relief) with Conceptual Landscape Design Overlay
• The Project will have a *low* impact on the landscape of the Bylong Valley as experienced by the majority of residents and visitors to the valley. While impact on the locality of the upper catchment of Bylong River and Lees Creek may be periodically high for up to 10 years, the impact on the adjacent main valley will be low.	• The impact of the Revised Conceptual Final Landform (incorporating Macro-Relief) with Conceptual Landscape Design Overlay on the landscape of the Bylong Valley as experienced by the majority of residents and visitors to the valley is likely to be *similar* to but lesser than the EIS project, due to the Revised Mine Plan contracting the mining footprint and keeping all works below the ridgelines of the Upper Bylong Valley.
• Beyond the above timeframe, the impact on the landscape values of the region will be *minimal*.	• The impact of the Revised Mine Plan on the landscape values of the region is *likely to be less* due to reduced footprints and OEA extents and the enhanced landscape integration measures.
• The impact on the landscape of the Bylong Valley is *at most moderate* but *overall will be low to minimal, localised and of relatively short periods of time*.	• The impact on the landscape of the Bylong Valley is substantially improved over that provided for within the EIS Mine Plan, and as such will be *less* than that for the EIS Mine Plan.

5.4.4.3 Night Lighting Impacts

Night lighting is discussed within the VIA in regard to direct light effects and diffuse light effects. The assessment of these effects is generally consolidated into 'impact from light sources' within the impact assessment.

Table 17 Night Lighting Impacts

EIS Mine Plan Visual Impact Assessment	Revised Conceptual Final Landform (incorporating Macro-Relief) with Conceptual Landscape Design Overlay
• Potential for visual impact from light sources is minimised by key elements of Project infrastructure being located adjacent to the Bylong Range ridge line to the north of the Project, including elements such as the CHPP, rail loading and underground mine portals. This screens lighting impacts to the north, north-west and north-east.	• The closest private freehold receivers to the south of the Project are more than 8 km from the light sources located adjacent to the Bylong Range. • Private freehold receivers to the east are substantially screened by a combination of topography and vegetation. Southern residences are screened from less intensive pit lights by similar topographic features. • All residences within the Project Boundary are now owned by KEPCO, with the closest private freehold receivers being about 2 km north to north west of the Project.
	• Given the proposed contractions to open cut mining operations for the Revised Mine Plan, along with the increased ownership of land within the Upper Bylong Valley by KEPCO since the undertaking of the VIA, the visual impact of lighting on sensitive receivers is likely to be much *less*than that for the EIS Mine Plan.

6.0 Mitigation and Management

6.1 Previously Committed Mitigation & Management

The draft Recommended Development Consent Conditions were issued as part of the Assessment Report by DPE in March 2017 and incorporated the mitigation measures recommended in the 2015 HHIA. The draft Recommended Development Consent Conditions relevant to heritage items included:

"*46. Prior to carrying out any development under this consent, unless otherwise agreed by the Secretary, the Applicant must prepare an Historic Heritage Management Plan for the development to the satisfaction of the Secretary. This plan must:*

a. be prepared by suitably qualified and experienced persons whose appointment has been endorsed by the Secretary;

b. be prepared in consultation with the Heritage Branch, Council, and local historical organisations;

c. include:

i. a description of the measures that would be implemented for:

- *photographic and archival recording, test excavation and archaeological salvage of all historic heritage sites within the disturbance area;*
- *relocation of moveable historic heritage sites within the disturbance area, where reasonable and feasible;*
- *photographic and archival recording, dilapidation surveys, mitigation, monitoring and management/rectification for historic heritage sites within the blast affectation area, in accordance with the Blast Management Plan in condition 16 of this Schedule;*
- *further archaeological investigation of the Renfrew Park 1 and 2 heritage sites, prior to any disturbance of these sites;*
- *landscape treatments to mitigate visual impacts on historic heritage sites;*
- *protection, monitoring and management of historic heritage sites outside the disturbance area;*
- *managing the discovery of previously unidentified historic heritage sites; and*
- *storage and management of salvaged items;*

(ii) Conservation Management Plans for historic heritage sites owned by the Applicant outside the disturbance area, including provisions for assisting Council or other regulators with any proposal to list the sites on applicable heritage registers;

(iii) a Burials Management Plan, prepared in consultation with NSW Health, for the exhumation and reinterment of human burial sites in accordance with applicable statutory instruments such as the Public Health Regulation 2012, including provision for installation of a memorial in the local area in the event that reburials occur outside the locality;

(iv) a Horse Burial Management Plan for the exhumation and reinterment of horse burials; and

(v) an Interpretation Plan for the broader Bylong Valley locality, including provision for a detailed oral history prepared in consultation with the Bylong Valley community.

47. The Applicant must implement the approved Historic Heritage Management Plan for the development."

The mitigation and management measures by heritage item, as proposed in the EIS, are provided in Table 18, together with revised measures.

The following mitigation measures previously recommended within the Landscape and Visual Analysis report (AECOM, *2017b*) generally continue to remain appropriate:

- further modulation of the interface with the Lee Creek floodplain, potentially including a more visually pronounced interface between the cleared lower slopes and the steep, forested upper slopes, e.g. with patches of paddock trees as currently in place west of the former Our Lady of the Sacred Heart Church, along the western edge of Lee Creek Valley; and
- bringing open woodland patches further down the OEA slopes where practicable, to better reflect the existing character of the Bylong Valley.

6.2 Revised Mitigation & Management

The Revised Project Layout would result in the impacts being reduced or removed to several identified heritage items:

- Tarwyn Park, including:
  - Horse burials;
  - NSF features;
- Former Our Lady of the Sacred Heart Catholic Church and Cemetery;
- Reduction in the potential blast vibration impacts to:
  - Tarwyn Park Homestead;
  - Tarwyn Park Stables; and
- Reduced direct impacts to the BLCA through a reduction in surface disturbance for open cut mining operations and incorporation of landform design features within the Revised Conceptual Final Landform.

As such, the individual mitigation plans for these items would be altered although generally consistent with the previously proposed heritage mitigation measures. All other mitigation and management commitments remain relevant, particularly the revision and update to the overarching draft HHMP (AECOM Australia Pty Ltd, 2017a).The revised management for heritage items in the vicinity of the revised Project is shown in Table 18.

Further recommended landscape and visual mitigation and management measures are listed below:

- Consider more detailed micro-topography work at OEA final landform design stages, e.g. as shown in Figure 9, noting how the extended gently undulating low ridgeline projecting from the forested spur in the middle-ground extends out into the floodplain, and the gentle rolling of the road across this landform;
- Consider undertaking some refinement of the North-Western OEA landform during final landform design stages to reduce visual potential for symmetry when seen from Tarwyn Park Homestead;
- Detail design is required for the provision of the proposed woodland plantings with the landscape, which are reliant on sensitive design and implementation. This detailed work will be undertaken during the planning and undertaking of the final landform design stages; and
- Consider increased open woodland cover to the southern parts of the Eastern OEA to facilitate increased landform integration for future road users travelling south along Upper Bylong Road into the Upper Lee Creek Valley.

Table 18 Revised management and mitigation measures for heritage items

Item Name	Original Impact	Original Mitigation Measure	Revised Impact	Revised Mitigation Measure
Items to be demolished/destroyed				
Bylong Upper Public School	Direct/whole Demolition	• Archival recording (including scale drawing and photography) of original school building, prior to and during demolition, is to be undertaken in accordance with Heritage Branch guidelines *How to Prepare Archival Records of Heritage Items* (1998) and *Photographic Recording of Heritage Items using Film or Digital Capture* (2006). • A Memorandum of Understanding is under development between the NSW Department of Education and Communities and KEPCO in relation to the relocation of the School to another site...	No change	• KEPCO have purchased the site and a Memorandum of Understanding is no longer required. • Balance of original mitigation measures remain appropriate
Cheese Factory Remains	Direct/whole Destroyed	• Documentation followed by test excavation, and salvage excavation (as determined by testing) is to be undertaken prior to impact.	No change	• Original mitigation measures remain appropriate

Item Name	Original Impact	Original Mitigation Measure	Revised Impact	Revised Mitigation Measure
Former Our Lady of the Sacred Heart Catholic Church and Cemetery	Direct/whole Demolition	• Archival recording (including scale drawing and photography) of church building, marked burials and historical plantings prior to and during demolition/removal/relocation is to be undertaken in accordance with Heritage Branch guidelines *How to Prepare Archival Records of Heritage Items* (1998) and *Photographic Recording of Heritage Items using Film or Digital Capture* (2006). • Details for this procedure and additional management measures are provided in the Archaeological Assessment for Historical Burials (Edward Higginbotham & Associates Pty Ltd, 2015b). This includes the procedure for the removal and relocation of exhumed remains. • Rylstone Historical Society has expressed an interest in the potential donation and subsequent relocation of the former Our Lady of the Sacred Heart Catholic Church building. KEPCO is investigating this option further and is currently consulting with the Rylstone Historical Society.	No direct impacts	• Initiate appropriate measures to limit vibration impacts to the levels required under Condition 16 of the Draft Recommended Development Consent Conditions. These measures are to be inserted into the Blast Management Strategy. • Prepare a Conservation Management Strategy for the on-going conservation of the Church and Cemetery.
Renfrew Park Remains 1 and 2	Direct/whole Destroyed	• Documentation followed by test excavation, and salvage excavation (as determined by testing) is to be undertaken prior to impact.	No change	• Original mitigation measures remain appropriate
Upper Bylong Post Office and Store	Direct/whole Demolition	• Archival recording (including scale drawing and photography) of the building prior to and during demolition is to be undertaken in accordance with Heritage Branch guidelines *How to Prepare Archival Records of Heritage Items* (1998) and *Photographic Recording of Heritage Items using Film or Digital Capture* (2006).	No change	• Original mitigation measures remain appropriate

Item Name	Original Impact	Original Mitigation Measure	Revised Impact	Revised Mitigation Measure
Bylong Upper Hall	Direct/whole Demolition	• Archival recording (including scale drawing and photography) of building prior to and during demolition is to be undertaken in accordance with Heritage Branch guidelines *How to Prepare Archival Records of Heritage Items* (1998) and *Photographic Recording of Heritage Items using Film or Digital Capture* (2006).	No change	• Original mitigation measures remain appropriate • Relocation of the back wall containing 1920's graffiti
Tarwyn Park Horse Burials	Direct/whole Demolition	• Horse Burial Management Plan for the exhumation and reinterment of horse burials.	No direct impacts	• Add management measures for the horse burials into the *Tarwyn Park and Iron Tank: Draft Conservation Management Plan.* • The *Horse Burial Management Plan* (Edward Higginbotham & Associates Pty Ltd, 2015a) should be updated to address the retention of the burials. This may include the creation of a 'lawn cemetery'. The revised document would be appended to the CMP.
Items partially impacted				
Homestation	Visual	• A Conservation Management Plan (CMP) is to be prepared to guide the management of Homestation, which includes dilapidation, structural and vibration assessments.	No change	• Original mitigation measures remain appropriate

Item Name	Original Impact	Original Mitigation Measure	Revised Impact	Revised Mitigation Measure
Bylong Station Farm Complex	Direct Visual	• Impacts to Bylong Station House and Stables are to be avoided. • A Conservation Management Plan (CMP) is to be prepared to guide the management of the Bylong Station Farm Complex that includes dilapidation, structural and vibration assessment, adaptive reuse plans and remediation strategies.	The Workers Accommodation Facility has been removed from the Project, however, the Administration and Parking Facility and Access Roads would still have a direct impact on the curtilage of the Complex. There would be no direct impacts to structures associated with the Complex.	• CMP for the management of the item remains appropriate.
Bylong Anglican Church and Cemetery	Visual	• Mitigation strategies outlined within the *Visual Impact Assessment* (JVP Visual Planning and Design 2015) should be adopted to reduce visual impacts to Bylong Anglican Church and Cemetery during the operational life of the mine.	No material changes, although the mining operations are located a further 1.4 km south, meaning potential visual impacts are materially reduced	• Original mitigation measures remain appropriate

Item Name	Original Impact	Original Mitigation Measure	Revised Impact	Revised Mitigation Measure
Harley Hill Farm Complex and Cottage	Visual/ vibration	• Mitigation strategies outlined within the *Visual Impact Assessment* (JVP Visual Planning and Design 2015) should be adopted to reduce visual impacts to Harley Hill Farm Complex and Cottage during the operational life of the mine. • Details for the management of the Harley Hill Cottage are to be included within the HHMP. Management will include the completion of an archival recording and dilapidation reports.	No change	• Original mitigation measures remain appropriate
Bylong Trig Station	Visual	• Mitigation strategies outlined within the *Visual Impact Assessment* (JVP Visual Planning and Design 2015) should be adopted to reduce visual impacts to the Bylong Trig Station during the operational life of the mine.	No change	• Original mitigation measures remain appropriate
Swiss Cottage	Visual/ vibration	• Mitigation strategies outlined within the *Visual Impact Assessment* (JVP Visual Planning and Design 2015) should be adopted to reduce visual impacts to the Swiss Cottage during the operational life of the mine. • Details for the management of the Swiss Cottage are to be included within HHMP. Management will include the completion of dilapidation, structural and vibration assessments.	No change	• Original mitigation measures remain appropriate

Item Name	Original Impact	Original Mitigation Measure	Revised Impact	Revised Mitigation Measure
Bylong Hall	Visual	• Mitigation strategies outlined within the *Visual Impact Assessment* (JVP Visual Planning and Design 2015) should be adopted to reduce visual impacts to Bylong Hall during the operational life of the mine.	No material changes, although the mining operations are located a further 1.4 km south, meaning potential visual impacts are materially reduced	• Original mitigation measures remain appropriate
Tarwyn Park Farm Complex	Direct Visual Vibration	• Impacts to Tarwyn Park House and Stables are to be avoided. • A Conservation Management Plan (CMP) is to be prepared to guide the management of the Tarwyn Park Farm Complex that is to include a structural and vibration assessment, ongoing management procedures and remediation strategies.	Reduced direct impacts Reduced visual impacts Reduced vibration due to increased distance to mining operations	• CMP for the management of the item remains appropriate. As noted above, policies for the management of the horse burials are to be inserted and revised should the Project be approved
Cottage Chimney Remains	Visual	• Mitigation strategies outlined within the *Visual Impact Assessment* (JVP Visual Planning and Design 2015) should be adopted to reduce visual impacts to the Cottage Chimney Remains during the operational life of the mine.	No change	• Original mitigation measures remain appropriate

Item Name	Original Impact	Original Mitigation Measure	Revised Impact	Revised Mitigation Measure
Bylong Landscape Conservation Area	Direct Visual	• Documentation, including photographic record of the portion of the BLCA within the Project Disturbance Boundary is to be undertaken prior to the commencement of works. • It is recommended the Project Rehabilitation Strategy includes reinstatement of elements of the BLCA impacted as part of the Project (i.e., farmland, watercourses) to their existing character.	Reduced direct impacts	• Original mitigation measures remain appropriate for the residual direct impacts. • KEPCO would (subject to consultation with MWRC and agreement over the need for it at the time) construct an unsealed gravel road between the Upper Bylong Road and Lee Creek Road at mine closure. This road would aim to re-establish the connection between the Upper Bylong Road and with the local road network to the south of the Project. The Upper Bylong Road Realignment (East Link Road) which is proposed as part of the Project would provide an appropriate connection to the local road network to the east of the Project.

6.3 Suitability of Mitigation & Management

The SEARs for the historical impact assessment require the effectiveness and reliability of the proposed mitigation measures to be evaluated. The proposed archival recording and archaeological investigation of the directly impacted sites is considered to be an effective and reliable mitigation measure as heritage and archaeological information will be gathered and preserved.

Details for the management of the heritage items within the Project Boundary during construction and operation would be detailed in the HHMP and CMPs. These management documents are commonly used as heritage management tools, their effectiveness and reliability are supported by Heritage Council advocacy. AECOM, on behalf of Hansen Bailey, have drafted the HHMP and a CMP for Tarwyn Park and Iron Tank. These documents would be revised and updated upon the receipt of a positive determination for the Project as stated within this assessment. An Interpretation Strategy would be prepared and implemented following Project approval.

7.0 Summary

KEPCO is seeking State Significant Development approval to construct and operate the Project. The Project is sited on and around the property known as Tarwyn Park (including Iron Tank), which includes the 1920s homestead and stables and is historically connected with the breeding of thoroughbred horses and, more recently, the development of a land management system known as NSF by Peter Andrews OAM. More broadly, the Project sits within a small portion of the BLCA, identified on the non-statutory National Trust of Australia (NSW Branch) Register.

Following feedback from the DPE, which requested all open cut mining and OEAs be removed from Tarwyn Park and that the OEAs should be redesigned to minimise visual impacts, KEPCO have revised the Project Disturbance Boundary of the open cut mine and OEAs. The Revised Project Layout has stepped all open cut mining and OEAs off Tarwyn Park.

The Revised Project Layout steps off Tarwyn Park and therefore the horse burials and NSF farmland and features within this area would remain undisturbed. The system of NSF, initiated by Peter Andrews, would remain intact, allowing for continued study of the technique on the site of its development (subject to identifying a research institution). The indirect vibration impacts on Tarwyn Park Homestead and Stables would also been reduced as mining would now be approximately 1.4 km from the structures.

The former Our Lady of the Sacred Heart Catholic Church and Cemetery would also remain undisturbed, and therefore the exhumation of the cemetery would not need to be progressed for the Project. The former Church building would also remain *in situ*. Additionally, there would be a reduction in direct impacts to Bylong Station Farm Complex as the Workers Accommodation Facility has been removed from the Project. Car parking and first aid facilities would remain on the property, but there would be no direct impacts to the structures associated with the Complex. The reduction in the area of open cut mining would reduce the landscape impacts to the BLCA. Similarly, the retention of the former Our Lady of the Sacred Heart Catholic Church is also a positive impact reduction on the BLCA, as it allows for the retention of an element of the Upper Bylong Village. The Revised Final Landform has significantly reduced impacts to the shape of the Upper Bylong and Lee Creek Valleys.

The Revised Project Layout would require amendments to the proposed mitigation and management measures, which includes:

- Prepare a Conservation Management Strategy for the former Our Lady of the Sacred Heart Catholic Church and Cemetery;
- Undertake a vibration study for the former Our Lady of the Sacred Heart Catholic Church and Cemetery and implement the recommended mitigation and management measures;
- Revise the draft *Tarwyn Park and Iron Tank: Conservation Management Plan* to include management measures for the now retained horse burials and amend the visual mitigation and management measures according to the recommendations within this HHIA;
- KEPCO would (subject to consultation with MWRC and agreement over the need for it at the time) construct an unsealed gravel road between the Upper Bylong Road and Lee Creek Road at mine closure. This road would aim to re-establish the connection between the Upper Bylong Road and with the local road network to the south of the Project. The Upper Bylong Road Realignment (East Link Road), which is proposed as part of the Project, would provide an appropriate connection to the local road network to the east of the Project; and
- Revision of the draft HHMP for the Project to address the above changes and the visual impacts.

The proposed landscaping treatments to be implemented during the life of the Project would provide a more substantial outcome as a result of the Revised Project Layout over that previously provided, due to now being able to provide a more generous visually enclosed space from south to west of Tarwyn Park Homestead. The retention of the former Our Lady of the Sacred Heart Church provides a continuing visual link between the former Upper Bylong Village and Tarwyn Park. This retained visual connection makes a positive contribution to the heritage of the former Church, Tarwyn Park and the BLCA.

This report also provides some recommendations for further integration of the OEAs as relevant to both views from the Tarwyn Park Farm Complex, and for people travelling through the valley in the future by means of increased open woodland cover to the southern parts of the Eastern OEA, to

facilitate increased landform integration for future road users travelling south along Upper Bylong Road into the Upper Lee Creek Valley.

The view west from the Iron Tank Farm House would incorporate a substantially reduced extent of open cut mining operations, with an improved visual amenity outcome upon completion of the Project.

Overall, the Revised Project Layout is considered to provide significantly improved landscape character and visual amenity outcomes over those provided for within the EIS.

8.0 References

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