niche
Environment and Heritage

Dendrobium Mine Power Supply Upgrade

Statement of Heritage Impact

Prepared for South32 Illawarra Coal

June 2018

Document control

Project no.:	3980
Project client:	South32/ Illawarra Coal
Project office:	NSW
Project Director:	Chris McEvoy
Project Manager:	Duncan Jones
Authors:	Sam Richards, Caitlin Marsh and Duncan Jones
Internal review:	Chris McEvoy
Document status:	Final- Rev 0
Local Government Area:	Wollongong

Document revision status

Authors	Revision number	Internal review	Date issued
SR, CM & DJ	D06	Chris McEvoy, Duncan Jones	26-3-2018
SR, CM & DJ	D08	Chris McEvoy, Duncan Jones	28-3-2018
SR, CM & DJ	D09	Chris McEvoy, Duncan Jones	26-3-2018
SR, CM & DJ	D010	Chris McEvoy, Duncan Jones	28-3-2018
SR, CM & DJ	0	Chris McEvoy, Duncan Jones	6-6-2018

Niche Environment and Heritage

Excellence in your environment.

ABN: 19 137 111 721

Head Office

Suite 1B Level 1, 460 Church Street

Parramatta NSW 2150

All mail correspondence to:

PO Box 2443

North Parramatta NSW 1750

Phone: **02 9630 5658**

Email: **info@niche-eh.com**

Locations

Sydney

Central Coast

Illawarra

Armidale

Newcastle

Mudgee

Port Macquarie

Brisbane

Cairns

Cover photograph: Dendrobium Colliery 33kV Substation. (Source: Niche 2018)

Executive summary

Niche Environment and Heritage Pty Ltd (Niche) have been commissioned by South32 Illawarra Coal to prepare a Statement of Heritage Impact (SoHI) report for the proposed upgrade works to the existing power supply at the Dendrobium Colliery. The Dendrobium Colliery site is listed on the Wollongong Local Environmental Plan (LEP) 2009 as "Nebo Colliery" (Item #7104), as an item of local significance. Previous heritage assessments have defined the existing electrical switchyard site, which is proposed to be replaced, as an item of Moderate to Low heritage significance. Niche (2016:4) advised that should the existing switchyard site be demolished, further heritage assessment would be required to ascertain the precise extent of heritage impacts.

The Dendrobium (formerly Nebo) switchyard was constructed circa 1962. The switchyard is supplied from the BlueScope Steel Limited (BSL) 33kV network. Dendrobium are required to change from the BSL supply to the Endeavour Energy 11kV network. As a result, a new kiosk transformer is to be installed adjacent the existing switchyard. To install the kiosk transformer there is a requirement to remove part of the existing switchyard structures (refer to Annex 1 for the design drawings).

Once the new kiosk transformer has been commissioned the existing switchyard supplied from the BSL network will be decommissioned. At this time the balance of the existing switchyard will be redundant and due to its poor state of repair it will be removed.

This SoHI report has reassessed the heritage value of the 1960s transformer switchyard as an element of low value as part of the heritage significance of the Nebo Colliery site. The removal of the switchyard and replacement with an updated 11kV electrical network would therefore result in a negligible impact to the heritage significance of the site.

Table of Contents

List of Figures

List of Tables

List of Plates

1. Introduction

1.1 Project background

Niche Environment and Heritage Pty Ltd (Niche) have been commissioned by South32 Illawarra Coal to prepare a Statement of Heritage Impact (SoHI) report for the proposed upgrade works to the existing power supply at the Dendrobium Colliery. The Dendrobium Colliery site is listed on the Wollongong Local Environmental Plan (LEP) 2009 as "Nebo Colliery" (Item #7104), as an item of local significance. Previous heritage assessments have defined the existing electrical switchyard site, which is proposed to be replaced, as an item of Moderate to Low heritage significance. Niche (2016:4) advised that should the existing switchyard site be demolished, further heritage assessment would be required to ascertain the precise extent of heritage impacts.

1.2 Location

The proposed works area (hereafter referred to as the 'subject site' or 'site') is located approximately 8 km to the west of the Wollongong CBD, and is located within the boundaries of Wollongong City Council. The works area is located adjacent to the entrance gate and a car park for the current Dendrobium Mine.

1.3 Proposed development

The Dendrobium (formerly Nebo) switchyard was constructed circa 1962. The switchyard is supplied from the BlueScope Steel Limited (BSL) 33kV network. Dendrobium are required to change from the BSL supply to the Endeavour Energy 11kV network. As a result, a new kiosk transformer is to be installed adjacent the existing switchyard. To install the kiosk transformer there is a requirement to remove part of the existing switchyard structures (refer to Annex 1 for the design drawings).

Once the new kiosk transformer has been commissioned the existing switchyard supplied from the BSL network will be decommissioned. At this time the balance of the existing switchyard will be redundant and due to its poor state of repair it will be removed.

1.4 Aims

This report aims to identify whether the proposed replacement of the power supply would have an impact on the heritage significance of the Nebo Colliery (Wollongong LEP 2009 Item #7104). It presents the results of historical research, a site inspection, a heritage impact statement and provides recommendations to avoid and/or minimise any impact on the item's heritage significance. The report aims to satisfy the provisions of Council's LEP and follows the guidelines for preparing a SOHI report contained within the *NSW Heritage Manual* (Department of Urban Affairs and Planning and the NSW Heritage Council, 1996).

1.5 Report Outline

The report is divided into the following sections:

- A summary of relevant legislation (Section 2).
- The results of heritage register searches (Section 3).
- A historical context (Section 4).
- A description of the project, area, setting and identified heritage items (Section 5).
- Significance assessment (Section 6).
- A description of the proposed works and the provision of Statements of Heritage Impact for identified heritage items (Section 7).
- Conclusions and recommendations (Section 8)

1.6 Authorship and acknowledgements

This report was written by Sam Richards (Heritage Consultant, Niche), Caitlin Marsh (Heritage Consultant, Niche) and Duncan Jones (Senior Heritage Consultant, Niche). The report was reviewed by Chris McEvoy (Principal, Niche).

Drawn by: PR Project Manager: CMcE Project Number: 3980 Date: 16/03/2018 T:\spatial\projects\a3900\a3980_\Maps\report\3980_Figure_1_Location.mxd

Location map

Dendrobium Power supply SoHI

FIGURE 1

2. Regulatory and Assessment Framework

2.1 Preamble

The following subsections present a summary of relevant state and local legislation and associated planning instruments designed to conserve significant heritage items and their values.

2.2 The NSW Heritage Act 1977

The *NSW Heritage Act 1977* is a statutory instrument designed to conserve environmental heritage in NSW. It is used to regulate development impacts on the State's historical heritage assets. The Act defines a heritage item as '*a place, building, work, relic, moveable object or precinct*'.

To assist with the management of the state's heritage assets, the Act distinguishes between items of Local and State heritage significance.

> *'Local heritage significance', in relation to a place, building, work, relic, moveable object or precinct means significance to an area in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item;*
>
> *'State heritage significance', in relation to a place, building, work, relic, moveable object or precinct means significance to the State in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item;*

Archaeological features and deposits are afforded statutory protection by the relic's provisions of the Act (as amended in 1999). Section 139[1] states that:

A person must not disturb or excavate any land knowing or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed unless the disturbance or excavation is carried out in accordance with an excavation permit.

2.3 The NSW Environmental Planning & Assessment Act 1979

The *NSW Environmental Planning and Assessment Act 1979* establishes the framework for cultural heritage values to be formally assessed in the land use planning and development consent process and requires that environmental impacts are considered prior to land development; this includes impacts on heritage items. The Act also requires that local governments prepare planning instruments [such as Local Environmental Plans] in accordance with the principles of the legislation to provide guidance on the level of environmental assessment required.

Section 89J of the EP&A Act outlines legislation and approvals that do not apply to SSDs. Of relevance to heritage approvals, under s89J the following do not apply to SSDs:

- An approval under Part 4, or an excavation permit under s139 of the *Heritage Act 1977*.
- Division 8 of Part 6 of the *Heritage Act 1977*, which relates to controlling and restricting harm to buildings, works, relics and places not subject to interim heritage orders or State Heritage Register listing.

2.3.1 Wollongong Local Environmental Plan (LEP) 2009

Each Local Government Area (LGA) is required to create and maintain an LEP that identifies and conserves Aboriginal and historical heritage items. These items are protected under the EP&A Act. As outlined in Clause 5.10 (5) of the LEP, Council may require a heritage assessment to be prepared if the development is "*on land*

that is in the vicinity of land on which a heritage item is located". The heritage assessment must "*assess the extent to which the carrying out of the proposed development would affect the heritage significance of the heritage item or heritage conservation area concerned*".

As the proposed works would be classified as a modification to a State Significant Development Project, consent from, or notification to Wollongong City Council would not be required for the works to proceed.

3. Heritage Register Searches

3.1 Preamble

The following subsections present the results of heritage register searches. The searches included a review of national, state and local heritage registers. The location of heritage items identified within, or in close proximity, to the subject site are illustrated in Figure 2 overleaf.

3.2 National Heritage Registers

Under the *Environmental Protection and Biodiversity Conservation Act 1999 Amendments* (No. 88, 2003) two mechanisms have been created for the protection of heritage places of National or Commonwealth significance: The National Heritage List (NHL) and the Commonwealth Heritage List (CHL) (http://www.environment.gov.au/heritage/places/national/index.html). The NHL provides protection to places of cultural significance to the nation of Australia, while the CHL comprises natural, Aboriginal and historic heritage places owned and controlled by the Commonwealth.

- Searches of the NHL and CHL were undertaken on 14 March 2018. There were no items identified on these heritage registers within, or within proximity to, the subject site.

3.3 NSW State Heritage Register

The State Heritage Register (SHR) lists items that have been assessed as being of State heritage significance to New South Wales. Items appearing on the SHR are granted protection under S.60 of the *Heritage Act1977*.

- A search of the SHR was undertaken on 14 March 2018. No items were identified within the subject site

3.4 State Heritage and Conservation (S170) Registers

S170 of the Heritage Act requires that State Government Agencies establish and maintain a Heritage Conservation Register for heritage items located on land under their control or ownership. Items listed on a S170 Register are listed on the State Heritage Inventory (SHI) and bound by the regulations of the *Heritage Act 1977*.

- Searches of the s.170 heritage asset registers (via the SHI) were completed on 14 March 2018. No items were identified within the subject area

3.5 Wollongong Local Environmental Plan (LEP) 2014

Each Local Government Area (LGA) is required to create and maintain an LEP that identifies and conserves Aboriginal and historical heritage items. These items are protected under the EP&A Act 1979.

- A search of the Wollongong LEP (2009) was undertaken on 14 March 2018. One item was identified within the subject site, and another item was identified in proximity to the subject site:
  - Nebo Colliery, item no. 7104, is located within the subject site. The 'Site of Pioneer Kerosene Works' is located adjoining the Nebo Colliery curtilage. Portions of the Nebo Colliery are also contained within the Kembla Heights Heritage Conservation Area

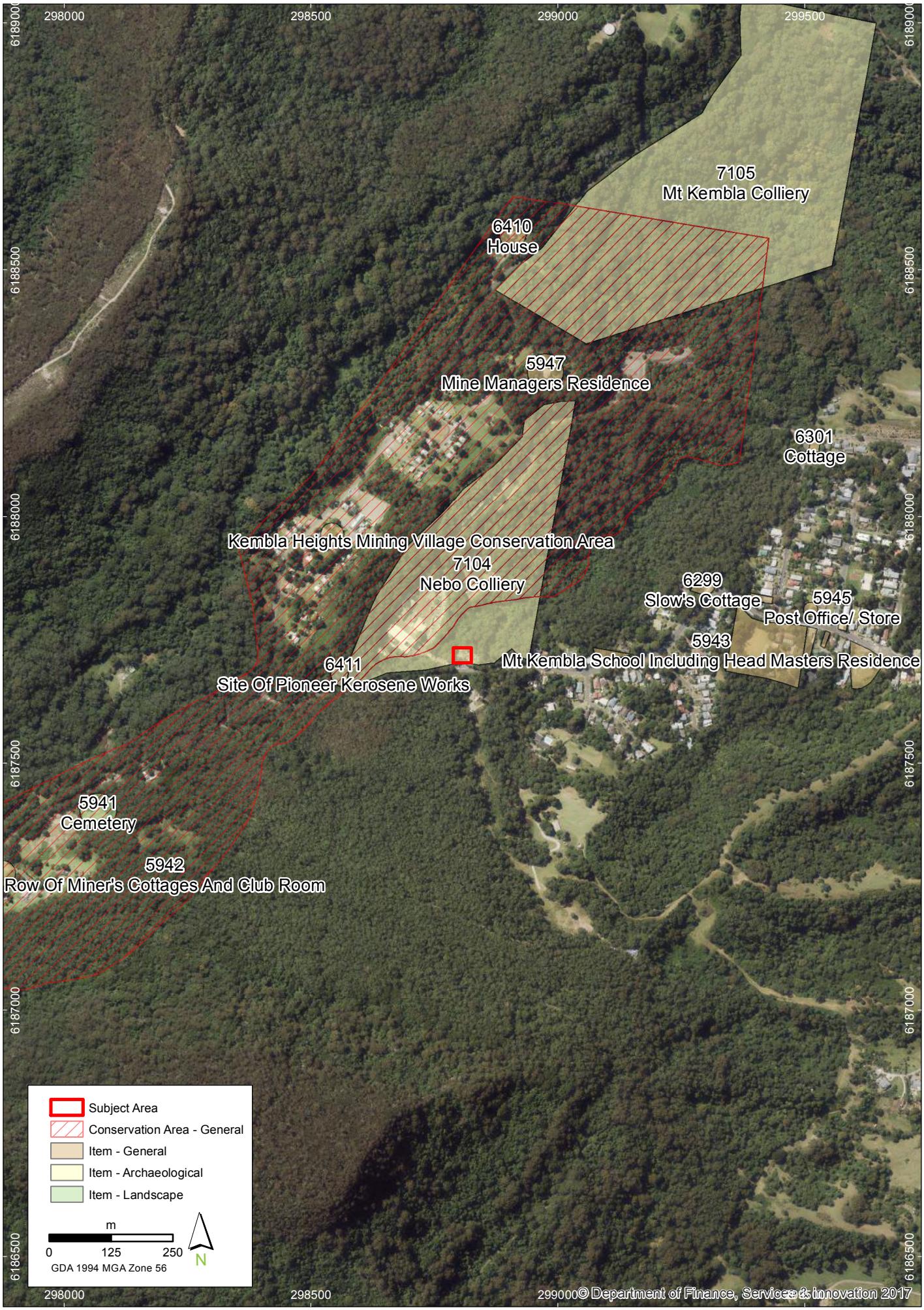
3.6 Summary of Registered Items

A summary of heritage listed items within, or in proximity to, the subject site, is outlined in Table 1. The location of these items with respect to the subject site is illustrated in Figure 2.

Table 1: Summary of heritage listed items in or near the project area

Name of item	Heritage Register	Item Number	Significance	Subject site within curtilage?
Nebo Colliery*	Wollongong LEP 2009	7104	Local	Yes
Site of Pioneer Kerosene Works*	Wollongong LEP 2009	6411	Local	No (located on the boundary of the Nebo Colliery)
Kembla Heights Mining Village—Harry Graham Drive and Soldiers Road Heritage Conservation Area	Wollongong LEP 2009		Local	No (but other parts of the Nebo Colliery site are included within the curtilage)
Mine manager's residence	Wollongong LEP 2009	5947	Local	No (located to the north of the curtilage for the Nebo Colliery)
Former St Clements Roman Catholic Church	Wollongong LEP 2009	5944	Local	No (located east along Cordeaux Road)
Mt Kembla Colliery—including site of mine workings, portal, mine air shaft and pit pony stables*	Wollongong LEP 2009	5946	Local	No (located to the north of the subject site)

* Denotes archaeological items or a heritage item that contains an archaeological component.



niche
Environment and Heritage

Heritage Items

Dendrobium Power supply SoHI

FIGURE 2

Imagery: (c) LPI 2013

4. Historical Context

4.1 Preamble

The following subsections present a broad history on the subject site and surrounds to provide a context for this assessment.

4.2 Coal mining in the Illawarra

The first discovery of coal in the Illawarra was made by a group of shipwrecked sailors who came across it by chance in the vicinity of modern Austinmer. Governor Hunter sent George Bass to investigate the area, accompanied by one of the survivors. They were able to confirm the discovery of coal seams at Coalcliff and Austinmer (OHM Consultants 2005:19).

Development of the coal field in the Illawarra was delayed by the establishment of the Australian Agricultural Company (AAC), which was based in Newcastle and was granted a thirty year monopoly on mining in the Colony by the British Government in 1828. Mining was eventually started in 1849, with the first mine opened at Mr Keira. Other mines opened along the coastline between Helensburgh to Mount Kembla. Between 1847 and 1900 twelve mines were opened along the escarpment. The Mt Kembla mine was opened in 1883, which was the first mine opened on the Bulli seam south of Mt Keira (OHM Consultants 2005:21).

During the first half of the twentieth century more than a dozen mines were opened along the escarpment, with the paces slowing down due the exhaustion of coal reserves, changes in mining practices and the cost of keeping very old mines in service (OHM Consultants 2005:22) . New green field mines have been established since the 1970s to mine the Bulli seam.

4.3 Pioneer Kerosene Works

In 1865 a shale oil (kerosene) mine was established on American Creek drawing from the shale bed known as the American Creek seam. This was the first undertaking of its kind in Australia. A kerosene shale plant was established in 1872 which remained in used only until 1878 when the plant was forced to shut down because they could not compete with the price of kerosene from elsewhere.

There is disagreement regarding the location of the site, due to the fact the area has returned to bushland. The only standing structure (as of 1991) within the gazetted curtilage of the plant is an iron retort which is located by the side of Cordeaux Road at Mt Kembla Heights to the east of the colliery entrance but according to Navin Officer it is not *in situ*. Navin Officer notes that the exact location of the shale oil mine is unknown, but states that the likely location of the mine is in the immediate area of the Nebo Colliery surface facilities (Navin Officer 2000:47). It is likely the mapped curtilage for the LEP archaeological item relates to the location of the moved iron retort, rather than the actual location of the shale mine site. Brian Rogers states that the site of the former Kerosene Works is located on the flat to the east of the present pit top (Rogers 2005:18). This prior assessment, before the Dendrobium Mine came into full operation states that the site will be overfilled with spoil during the excavation of the initial tunnels for the new mine.

4.4 Nebo Colliery

The Nebo Colliery was constructed as a green field mine development on land that had been previously purchased by BHP/AIS for the Mount Kembla Colliery. The mine was established by BHP/AIS to work part of the Wongawilli seam. As noted by Navin Officer, the complex is unique in that is the only ensemble of mine structures in the region that was constructed solely after World War II.

The mine opened in 1947 and was the first fully mechanised mine. The mine employed track mounted mechanical coal loaders and coal cutters constructed by Jeffery Manufacturing (USA), but these were replaced by caterpillar Anderson Boyes cutters (UK) and Joy Manufacturing loaders in 1948. There were also 10-tonne capacity mine cars and battery and diesel powered locomotives.

Once the coal was mined it was refined using a Bradford Breaker (which has since been removed). The coal was then loaded to a conveyor belt and moved to rail loading storage bins which were located adjacent to a private rail line which linked to the original Mt Kembla colliery rail line (which has also been removed).

The ensemble of buildings included a headquarters for administrative and professional staff. The buildings designed for the handling of equipment, maintenance and storage were larger than previous and constructed with steel frames. The construction of a bathhouse on site was part of an architectural suite of buildings designed to be taken as a whole. It was the different ethos for colliery construction that improved miner's working conditions (Irving 2001:85).

Nebo Colliery ceased operations independently in 1993, as the underground workings were linked to Wongawilli mine and the Kemira leases to create the Elouera mine. The surface portals remained working for the Elouera mine ventilation system. The surface structures were retained in relatively intact conditions.

In 2001 the remaining surface facilities at the Nebo Colliery were appropriated into the new Dendrobium Mine and modified where required for this purpose. These include the two brick buildings used as the administration building and the mine workshop, and the bathhouse and the lamp cabin. Shafts 1, 2, and 3 were filled in, and the restoration of the surface facilities took place in 2006 after Dendrobium mine took over the operation.

4.5 Transformer and switchgear compound

The current 33kV substation was not part of the original construction of the Nebo colliery in the 1940s. Brian Rogers identified that it was constructed prior 1974. A map drawn in 1968 of the colliery shows structures in the approximate location of the current substation (Figure 3). They are shown as small square structures with indistinct writing adjacent to them. There is an unknown building to the north, which could not be identified.

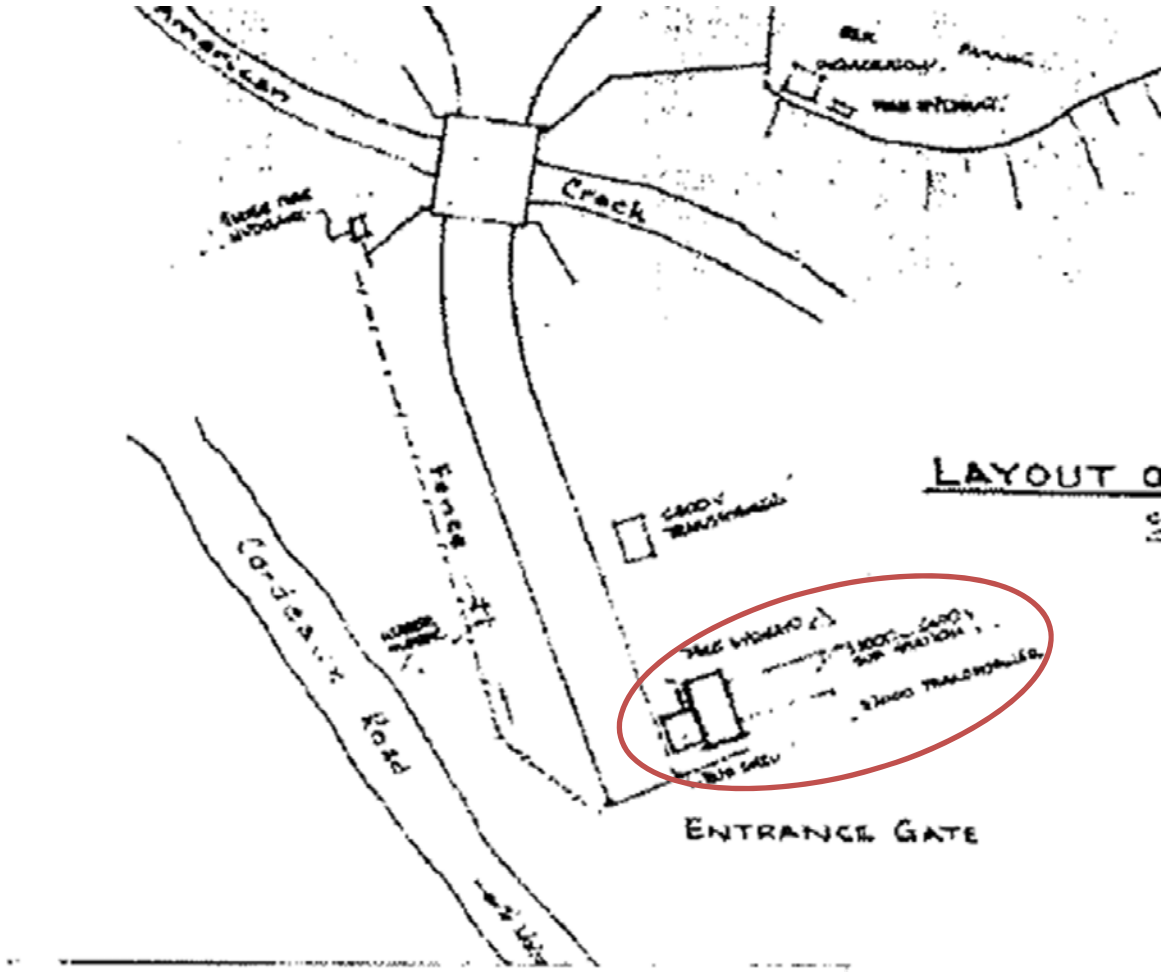


Figure 3: Crop of plan of Nebo Colliery drawn in 1968, the substation is outlined in red (copied from Navin Officer 2000)

5. Description and setting

5.1 Preamble

A comprehensive site inspection of the subject site was conducted by Niche on 23 February 2018 by Sam Richards (Heritage consultant) and Chris McEvoy (Principal - Environmental Approvals).

The focus of the site inspection was to catalogue any physical fabric of the 33 kV substation and to record the wider setting and landscape of the heritage item. Photographs of physical fabric, the landscape context and the surrounding built heritage and natural setting were made.

5.2 Site location and setting

The 33 kV Substation is situated near the vehicle entrance of the current Dendrobium Colliery (and Former Nebo Colliery). The entrance is located 250 m west on Cordeaux road from the T-junction of Cordeaux road and Araluen Avenue, and on Cordeaux Road 420 m east from the intersection of Harry Graham Drive. The substation is located 25 m to the north of the entrance to the site from Cordeaux road. The site is 25 m in length east to west, and up to 25 m in extent north to south. The item is situated within a fenced compound consisting of two steel tower blocks on a cement and gravel base. Thick eucalypt forest is located to the north and northwest of the item, with the south and west sections surrounded by sealed road and a car park to the east. There is a brick bridge located 50 m to the west of the subject site which was noted on the 1948 aerial photo of the site (Rogers 2001:12). Due to the high vegetation cover between the current substation structure and the bridge, it is not visible from the bridge. It is also not possible to see the bridge from the current substation structure (Plate 2 and Plate 3).

The site today is used as an electrical substation which supplies the current Dendrobium mine operation with electricity from a private electrical supplier. One of the larger steel towers of the substation has been replaced and upgraded to allow for the distribution of electricity for operations with the other smaller steel tower block decommissioned and no longer in use.

5.3 33kV Substation

The subject site is located 25 m north of Cordeaux Road from the entrance gate of Dendrobium Mine (Plate 1). The subject site is located within the Nebo Colliery Heritage curtilage (Figure 2). The compound in which in the substation is situated is surrounded by sealed bitumen from an existing car park, with a bitumen road to the south and bushland to the north. The substation compound is situated on flat ground on the top of a ridgeline adjacent to a deeply inclined creek-line to the north. The entrance to the colliery gently slopes to the north on a bitumen road that abruptly branches off to a carpark to the east and the surface operation to the west over the America Creek Bridge (Plate 2 and Plate 3). A hedge line is located at the southern fence line of the substation with a small kerb at the edge of the road. At the northern end of the substation over the fence the landscape steeply drops down to American Creek within thick bushland.

The subject site is surrounded by a steel fence with an opening at its eastern end. The compound is surrounded by a black steel fence with two large steel frames that make up the Substation. These large steel frames are situated on concrete slabs with the rest of the floor space within the compound covered in gravel (Plate 4). The steel tower to the northern end of the compound is approximately 4 m long by 4 m wide and is not currently in use with no clear modern additions or changes (Plate 5). This tower is surrounded by a grey steel fence with barbed wire on the top. The top of the tower has three overhead power cables running to the north from three orange-brown ceramic transmission insulators along a dis-used transmission line. Another three overhead power cables run south from three orange-brown ceramic

transmission insulators to the three orange-brown ceramic transmission insulators on the adjacent steel complex. A further six orange-brown ceramic transmission insulators are situated in the middle on the top tower and are connected to each overhead power cables (Plate 6). This tower is in poor condition with structural rust.

The other steel transmission frame, situated in the southern section of the compound, is surrounded by a grey fence line with razor wire on the top (Plate 7). This rectangular tower measures approximately 3 m wide by 15 m long with a smaller, lower square section to the north east measuring 4 m by 4 m (Plate 8). Four modern additions have been made to this section of the substation. There are three main transformers that connect to the old orange-brown ceramic transmission insulators on the steel frame of the tower (Plate 9) and one 240V auxiliary transformer and distribution board (Plate 10). There are different types of transmission insulators on this section of the substation varying in length and spacing (Plate 11) with some modern additions evident with grey ceramic insulators which have been added to accompany the transformers (Plate 12). This tower is in poor condition.

Plate 1: Entrance to Dendrobium mine from Cordeaux road at the western end of the substation. South east aspect. (Source: Niche 2018).

Plate 2: Eastern end of the substation view down access road to mine surface operations. East aspect. (Source: Niche 2018)

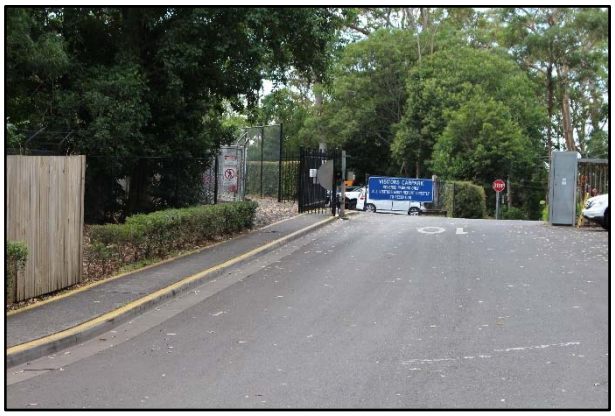


Plate 3: View toward eastern carpark from western access road to surface mining operations, western aspect. (Source: Niche 2018).

Plate 4: View of Substation from eastern entrance, west aspect. (Source: Niche 2018).

Plate 5: 3 m by 4 m steel tower to the north end of the compound, west aspect. (Source: Niche 2018).

Plate 6: Overhead power cables and orange brown ceramic transmission insulators, south east aspect. (Source: Niche 2018).

Plate 7: 4 m by 15 m steel tower to the south of the compound, south aspect. (Source: Niche 2018).

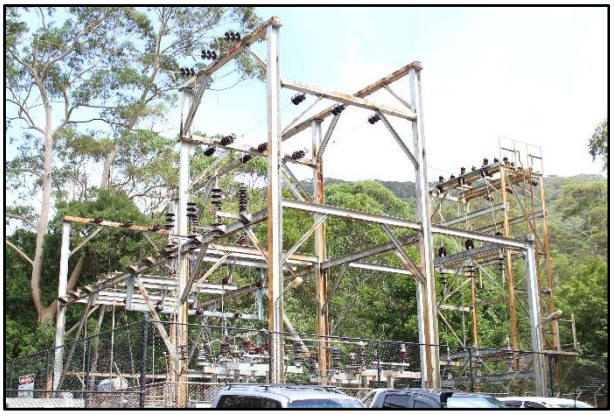


Plate 8: 3 m by 15 m steel tower with a smaller 4 m by 4m north eastern tower, south east aspect. (Source: Niche 2018).

Plate 9: Example of modern transformer addition, south aspect. (Source: Niche 2018).

Plate 10: Modern addition of 240v auxiliary transformer and distribution board, south aspect (Source: Niche 2018).

Plate 11: Example of orange brown ceramic transmission insulators, south east aspect (Source: Niche 2018)

Plate 12: Example of modified grey ceramic insulators, south east aspect (Source: Niche 2018)

6. Assessment of Significance

6.1 Framework

The *NSW Heritage Manual*, prepared by the former NSW Heritage Office and Department of Urban Affairs and Planning, provides the framework for the following assessment and statement of significance. These guidelines incorporate the five aspects of cultural heritage value identified in the *Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance 1999* (Burra Charter) into a framework currently accepted by the NSW Heritage Council.

6.2 Significance Assessment Criteria

The significance assessment provided in Table 2 has been adapted from the Strategic Management Plan for Historic Coal Mining Sites of the Illawarra entry for the Nebo Colliery (OHM Consultants 2005). The heritage significance of the Nebo Colliery site is assessed here. The relative value of the switchyard to the heritage significance of the item is discussed in Section 6.4 below.

Table 2. Significance criteria for Nebo Colliery (the heritage item)

Criterion	Significance
(a) An item is important in the course, or pattern, or NSW's cultural or natural history (or the cultural or natural history of the local area)	Nebo Colliery has association with the development of mining in the Illawarra in the post World War II era. It was opened as a green fields site and constructed to take into account the wellbeing of the mine workers following legislative changes. It was one of the first mechanised mines in the area. Later significance can be garnered from the association with the new Dendrobium mine, which took over the site in 2001. **The heritage item has State heritage significance under this criterion.**
(b) An item has strong or special associations with the life or works of a person, or group of persons, of importance in the cultural or natural history of NSW (or the cultural and natural history of the local area)	Associated with the Broken Hill Proprietary Company Limited /Australian Iron and Steel companies, which were among some of the major industrial companies and employers in the Illawarra area. **The heritage item has local heritage significance under this criterion.**
(c) An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievements in NSW (or the local area)	The mine contains two Post-War International Style buildings (the Administration Building and the Bath House). These buildings are of aesthetic and technical architectural significance for their style of design and functional utility to the post-war operation of the mine. **The heritage item has local heritage significance under this criterion.**
(d) An item has a strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons.	Significant for its association with Mt Kembla village and the surrounding area for its relationship between mines, mining companies and their workers. Coal mining is an industry which is traditionally associated with the labour movement and workplace safety initiatives. **The heritage item has local heritage significance under this criterion.**

Criterion	Significance
(e) An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area)	Phases of reworking of the site over time have left likely archaeological relics throughout the Nebo Colliery precinct, which have some research potential for the understanding of the site and mining practices throughout the late 20th century. **The heritage item has local heritage significance under this criterion.**
(f) An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area); and	Nebo Colliery represents a post-war mining complex, which is not unique or unusual in NSW. While the Administration Building and Bathhouse are of architectural interest, they are not rare examples of their architectural type. **The heritage item does not meet the local heritage significance threshold under this criterion.**
(g) An item is important in demonstrating the principal characteristics of a class of NSW's: ▪ Cultural or natural places; or ▪ Cultural or natural environments; **(or a class of the local area's)** ▪ Cultural or natural places; or ▪ Cultural or natural environments.	The Nebo Colliery site is not considered a representative example of Illawarra or NSW coal mining sites, due to the different phasing of fabric and the change in use of the site over time. **This heritage item does not meet the local heritage significance threshold under this criterion**.

6.3 Statement of Significance

The following Statement of Significance has been adapted from the State Heritage Inventory sheet for the Nebo Colliery (OEH 2017).

> *This site is significant as it was the first mine to be opened as a fully mechanised mine in 1947. It was a green field mine development and its surface facilities were of the most modern design being fully mechanised upon opening. It is also significant for its association with Mt Kembla village and the surrounding area, for its relationship between mines, mining companies and their workers and for the joint ownership of the mine and the associated steel works. It is also significant for its association with the new Dendrobium Mine for which its facilities were chosen to support.*

6.4 Significance Assessment of the existing 33kV substation

The existing electrical switchyard and substation was constructed in the 1960s and was responsible for powering mining operations at the site from that time up until the present day. The northern tower has been decommissioned for a significant period of time, with no visible structural or engineering alterations present. However the tower is in poor condition with most of the steel gantry supports showing significant rust.

The southern substation array is also in a poor condition, but to a lesser degree. It was originally constructed in the 1960s, however it has been upgraded and updated with new transformer equipment and insulators added over time, to continue its operational lifespan.

Neither substation array was constructed as part of the original opening of the Nebo Colliery in the 1940s. Their architectural design is considered a ubiquitous example of 1960s electrical infrastructure. Elements of the Nebo Colliery with high heritage significance are predominantly associated with the 1940s Administration Building and Bathhouse, which were built in an iconic Post-War International architectural style.

As the substation was not part of the original phase of development of the Nebo Colliery, it is either in poor physical condition or has been modified over time, the substation has been determined to be of low heritage value to the overall heritage significance of the Nebo Colliery item.

7. Heritage Impact Assessment

7.1 Introduction

The following subsections assess potential impacts of the proposed works on the heritage significance of the Nebo Colliery (Wollongong LEP Item ID: 7104) and other nearby heritage items.

7.2 Overview of works

Dendrobium Mine Pit Top on Cordeaux Road, Mt. Kembla is currently supplied electricity from a 33kV overhead power line that originates from Bluescope Steel (BSL) at Port Kembla. Illawarra Coal's strategic plan is to migrate from private network supplier (e.g. BSL) and obtain electrical power supply from a local network provider. Dendrobium Mine is proposing to obtain an 11kV supply from the local network provider, Endeavour Energy, and install a new 2MVA 11/6.6kV kiosk style transformer.

The proposed works will take place in two stages:

Stage 1 - Implementation of new Kiosk transformer

The main works associated with Stage 1 are outlined below:

- Removal of existing switchyard structure, footings and electrical connections
- Construction of new footings for Kiosk Transformer
- Replacement of existing perimeter fencing with electrically non-conductive fencing
- Implement new power supply from Endeavour Energy 11kV network which currently runs on the southern side of Cordeaux Road, past the Dendrobium main entrance
- Construct in-ground power supply from Endeavour Energy's nominated point of connection across current visitors' carpark to the kiosk transformer
- Construct a 6.6kV power supply from the kiosk transformer to Dendrobium Main 6.6kV switchboard located in the Nebo workshop
- Commission kiosk transformer
- Disconnect existing switchyard from BSL network

Stage 2 - Removal of redundant infrastructure

Once the new kiosk transformer has been commissioned the existing switchyard supplied from the BSL network will be decommissioned. At this time the balance of the existing switchyard will be redundant and due to its poor state of repair it will be removed.

7.3 Potential heritage impacts

7.3.1 Direct (physical) impacts to the Nebo Colliery site

The tower is no longer in use and in poor condition. Demolition and replacement of the substation is considered a necessary remediation option for the long-term electrical supply requirements of the current Dendrobium Mine.

The substation has been determined to be of low value to the overall heritage significance of the Nebo Colliery item. The removal of the 1960s-era physical fabric of the substation from 1940s-constructed Nebo Colliery would therefore result in a negligible impact to the heritage significance of the item.

In order to connect the new electricity network to the mine site, in ground conduits will be constructed between the new kiosk substation and the workshop building located to the east of the subject site. The

switchboard is located within the workshop building and will be connected with the transformer kiosk by conduits which will be placed between 0.5 and 0.7m below ground. Underboring is proposed between the existing Endeavour Energy 11kV network and the existing Dendrobium power poles near the main entrance to the mine. In-ground conduits will also be excavated within the existing carpark to connect the new kiosk transformer with the Endeavour Energy network. There are no known archaeological items located where the ground disturbance is proposed.

7.3.2 Indirect (visual) impacts to the Nebo Colliery site

The proposed works include the replacement of the tower with a kiosk transformer. The new kiosk will be a metal weatherproof enclosure, with the electrical equipment contained within. The location of the substation is adjacent to the entry way to the Dendrobium mine. The northern tower is located further away from Cordeaux Road and located behind the southern tower superstructure. The works would therefore not be visible from significant parts of the Nebo Colliery (the Administration Building and Bathhouse), and the infrastructure would be replaced with a similar piece of infrastructure. Existing fencing will also be replaced with non-conductive fencing. The current fencing is modern black PVC covered metal chain link fence.

The proposed works would therefore result in a negligible indirect impact to the heritage significance of the item.

7.3.3 Indirect (visual) impacts to nearby heritage items

The substation power supply works are located in the southern portion of the heritage curtilage of the Nebo Colliery site. There are several other heritage items (identified in Section 3.6) which are located within 500 m of the area of proposed works.

Due to the topography and thick surrounding bushland, these nearby heritage items do not have clear sightlines to the substation. The substation would also be replaced with a similar piece of electrical infrastructure.

The proposed works would therefore result in a neutral impact to the heritage significance of the identified nearby heritage items.

7.4 Statement of Heritage Impact for the "Nebo Colliery" (LEP item ID: 7104)

Heritage Office and Department of Urban Affairs & Planning (2002) have outlined three specific issues regarding the impact of a development on a Heritage Item. These issues have been considered and addressed in Table 3.

Table 3. Statement of Heritage Impact

Aspects of the proposal that respect or enhance the heritage significance of the item:	▪ The switchyard to be removed is in poor physical condition and requires long-term remediation or removal for the safe and effective operation of the site.
Aspects of the proposal that could detrimentally impact on heritage significance.	▪ The switchyard is an element of low value to the overall significance of the Nebo Colliery site. The proposed works would result in a negligible impact on the heritage significance of the Nebo Colliery site.
Have sympathetic solutions been considered and discounted?	▪ Six locations were considered in various locations within the pit top site, but they were located within proximity to other heritage items (see Niche 2017 for constraints analysis of the different locations).

	▪ The proposed works are located within the same footprint of the existing structure, with the same use. As the proposed works are required for safe continued mine operation, these works cannot be avoided in the long-term.

8. Conclusion and Recommendations

8.1 Conclusions

- The proposed works are located within the heritage curtilage of the Nebo Colliery (Wollongong LEP 2009 item 7104), of local heritage significance, which was constructed in its present form in the late 1940s. The Nebo Colliery is listed for its historical, social, aesthetic and associative significance.
- The existing northern substation tower was constructed in the 1960s and has been decommissioned for use as a power supply system for the mine. The tower is in poor physical condition and is of low heritage value for the overall significance of the Nebo Colliery site.
- The removal and replacement of the existing substation with a new electrical power supply system on the same site would result in a negligible impact to the heritage significance of the Nebo Colliery site.

8.2 Recommendations

The following recommendations are provided for the proposed works:

- The proposed works would not adversely affect the significance of the Nebo Colliery heritage item.
- The substation should be subject to archival recording prior to the commencement of demolition works. Archival recording should be prepared according the relevant NSW Heritage Office guidelines *How to prepare Archival Records of Heritage Items* (revised 1998) and *Photographic Recording of Heritage Items Using Film or Digital Capture* (revised 2006).
- In the unlikely event that unexpected archaeological artefacts are uncovered during ground disturbing works, work should cease in the subject area and a suitably trained archaeologist should attend site to inspect the find. Should archaeological material be identified as having heritage significance, further approvals may be required before works can proceed.

References

Secondary Sources

Australia ICOMOS (2004). *The Illustrated Burra Charter: Good Practice for Heritage Places*, Deakin University, Burwood, Victoria.

Department of Urban Affairs and Planning (1996) *NSW Heritage Manual.*

Development Approval DA 60-03-2001. *Dendrobium Underground Coal Mine and associated surface facilities and infrastructure*

Heritage Branch of the Department of Planning (2009). *Standard Exemptions for Works Requiring Heritage Council Approval*.

Heritage Office and Department of Urban Affairs & Planning (2002). *Statements of Heritage Impact*. Available online at http://www.environment.nsw.gov.au/heritage/publications/#S-U

Navin Officer Heritage Consultants [NOHC], (2000). *Dendrobium Coal Project: Cultural Heritage Assessment*. Prepared for Olsen Environmental Consulting Pty Ltd on behalf of BHP Coal Illawarra.

Niche (2016). *Dendrobium Mine Surface Electrical Supply - Section 75W Modification (MOD 8) to Dendrobium Mine Development Consent 60-03-2001*. DRAFT-NOT ISSUED.

Niche (2017). *Dendrobium Mine Surface Electrical Supply: Alternate Transformer Sites Heritage Constrains Assessment*. Prepared for South32 Illawarra Coal.

Office of Environment and Heritage, (2017). *State Heritage Inventory entry for "Nebo Colliery*". Available online at http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5062596

OHM Consultants (2006). Strategic Management Plan for Historic Coal Mining Sites of the Illawarra.

Olsen Environmental Consulting (2001). *Environmental Impact Statement for the Dendrobium Underground Coal Mine.*

Rogers, B (2001). *Nebo Colliery: Catalogue Of Items Of European Cultural Heritage, Indicating Level Of Significance And Likely Impact Of Dendrobium Project On Each Item*. Prepared for Olsen Environmental Consulting and BHP Collieries Division.

Annex 1 Design Drawings

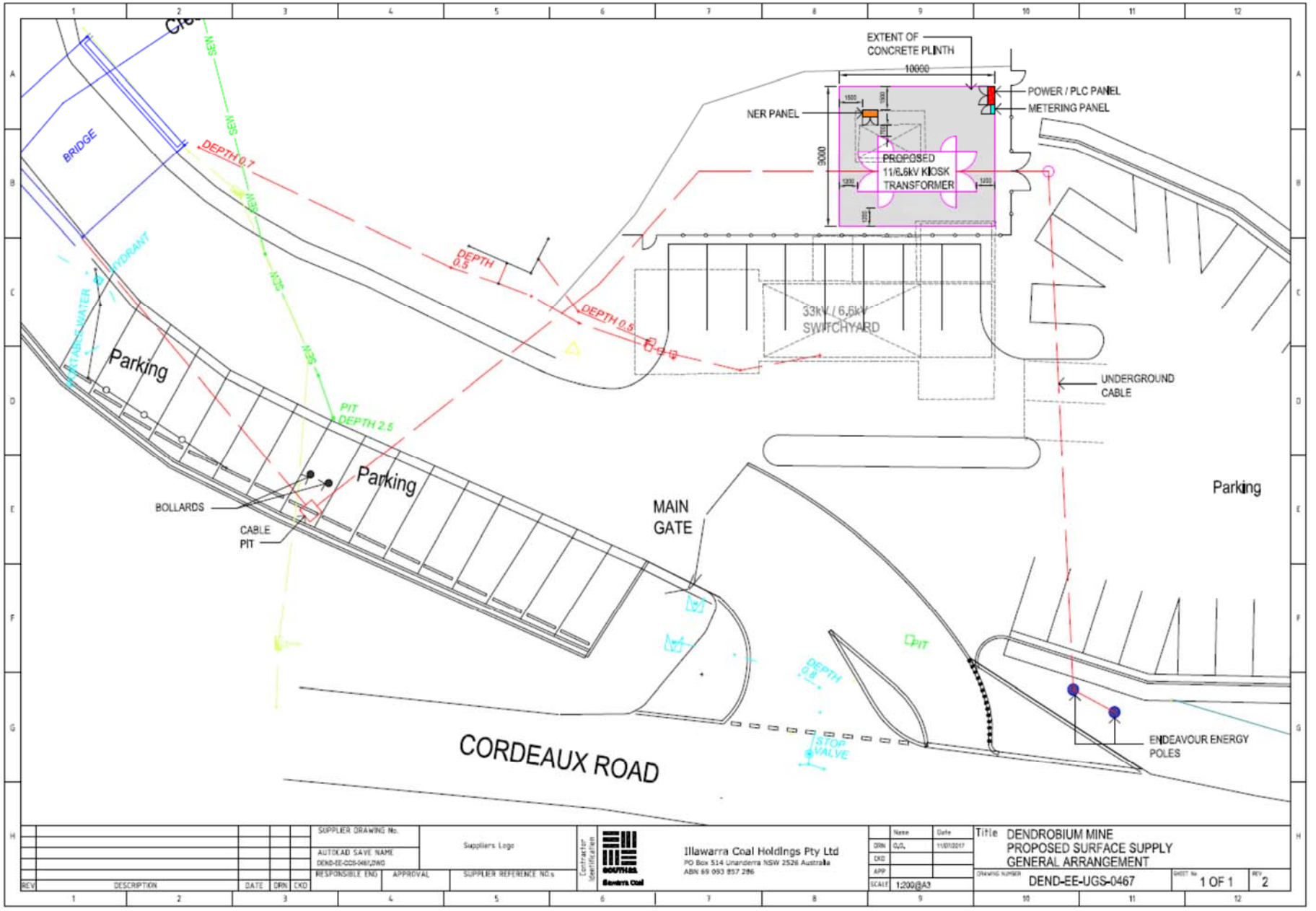


Figure 4: Location of the kiosk transformer and the trench locations to connect the new transformer to the existing switchboard in the Workshop (Source South32)

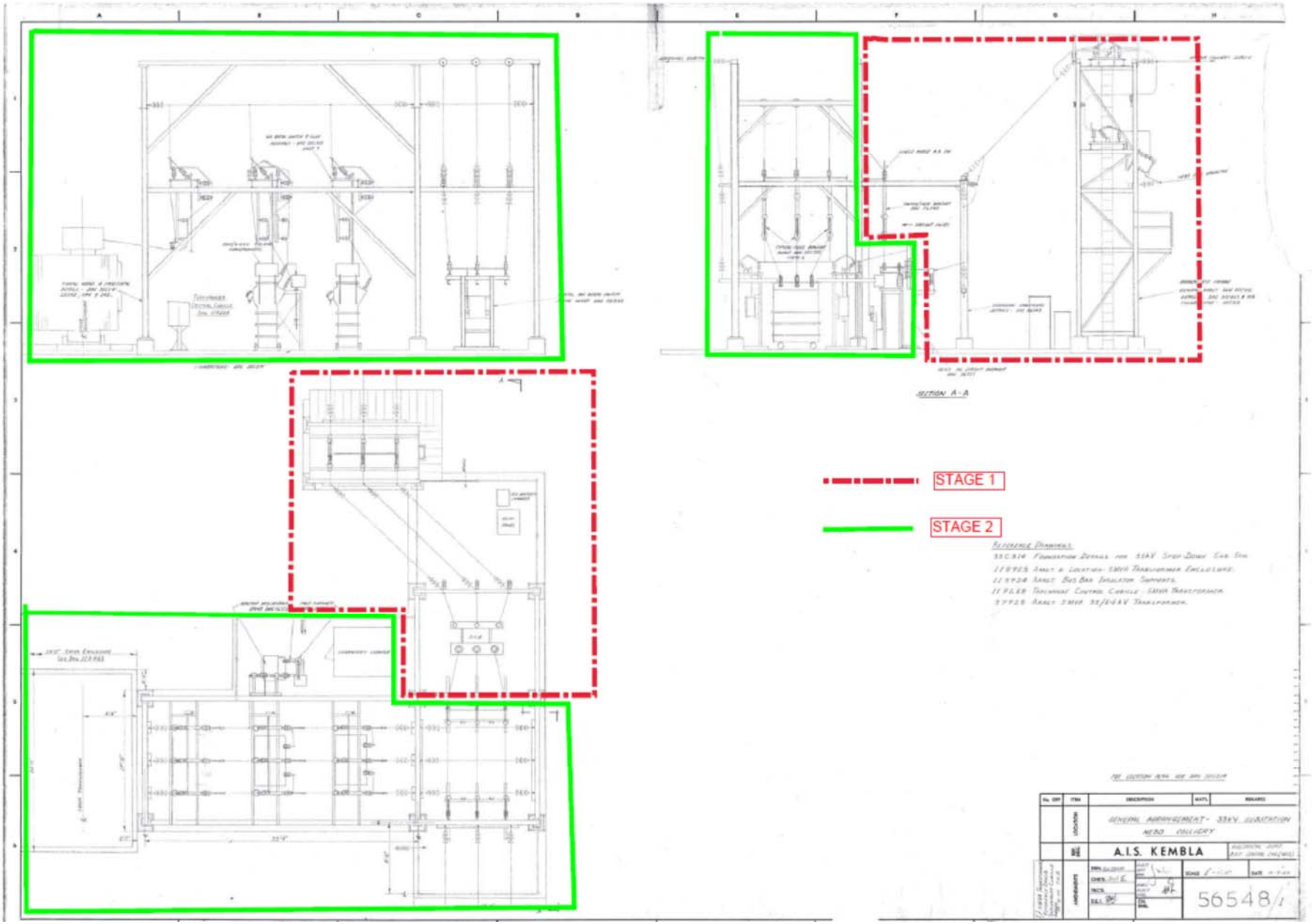


Figure 5: Stage One structure to be demolished in stage out outlined in red, the Stage 2 demolition is outlined in green (Source South32)

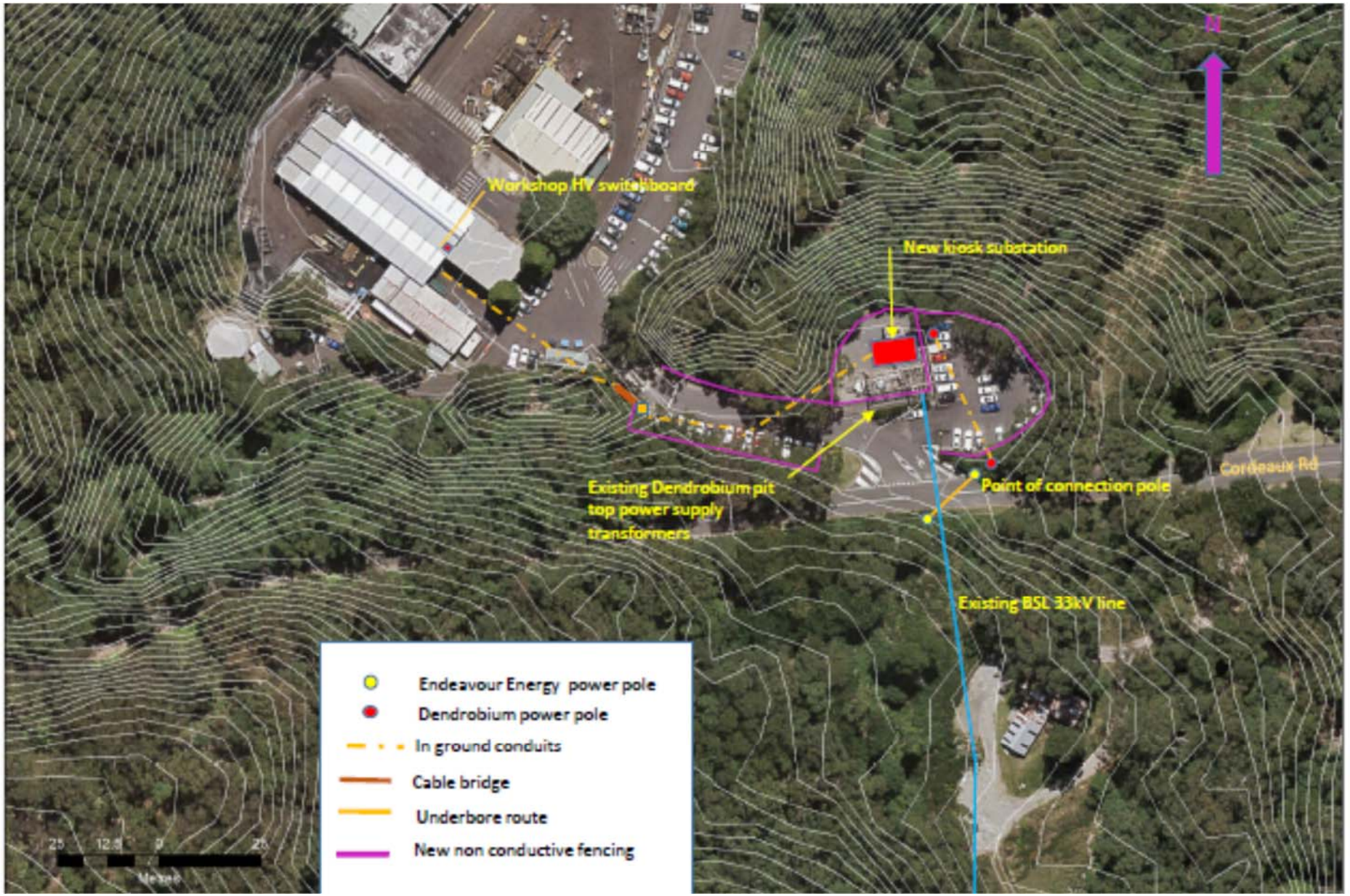


Figure 6: Plan of the proposed works, including the location of the kiosk transformer in relation to the current switchyard. (Source: South32)

Niche Environment and Heritage

A specialist environmental and heritage consultancy.

Head Office

Niche Environment and Heritage
PO Box 2443 North Parramatta NSW 1750
Email: info@niche-eh.com

All mail correspondence should be through our Head Office