

**Newcastle Office**

Ground Floor, 241 Denison Street, Broadmeadow, NSW Australia 2292
PO Box 428, Hamilton, NSW Australia 2303

Our Ref: PR 132827-2B

Date: 22 July 2016

Attn: James Wearne
Group Manager Approvals
Centennial Coal Pty Ltd
100 Miller Road,
Fassifern NSW 2283

Via: Email

Dear James,

**RE: HERITAGE DUE DILIGENCE VISUAL INSPECTION FOR FIVE SHALLOW
GROUNDWATER BORES & SOIL MOISTURE PROBES**

RPS has been engaged by Springvale Coal Mine Pty Ltd (the Proponent) to undertake an Aboriginal heritage due diligence visual inspection for five proposed shallow groundwater bores and soil moisture probes, herein referred to as the Project Area (**Attachment 1 - Figure 1**). The Project Area is located on the Newnes Plateau in the Lithgow Local Government Area. The proposed locations are:

Site A - Downstream Gang Gang East shallow groundwater monitoring bore and soil moisture monitoring: GDA Zone 56 Easting 240447.40; Northing 6303083.20.

Site B - Upstream Gang Gang East shallow groundwater monitoring bore and soil moisture monitoring): GDA Zone 56 Easting 239938.3; Northing 6301851.6.

Site C - Downstream Gang Gang South West shallow groundwater monitoring bore and soil moisture monitoring: GDA Zone 56 Easting 240397.53; Northing 6303188.33.

Site D - Upstream Gang Gang South West soil moisture monitoring: GDA Zone 56 Easting 239815.11; Northing 6302879.51.

Site E - Upstream Gang Gang South West shallow groundwater monitoring bore): GDA Zone 56 Easting 239907.40; Northing 6302924.80.

This report has been undertaken in accordance with the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (DECCW 2010) ("Due Diligence Code") and the NSW Minerals Industry Due Diligence Code of Practice for the Protection of Aboriginal Objects (Minerals Council 2010) ("Minerals Due Diligence Code"). This site inspection was undertaken in accordance with Centennial's *Western Holdings Aboriginal Cultural Heritage Management Plan 2014* (ACHMP) (Centennial Coal 2014).

The due diligence visual inspection was undertaken to identify whether Aboriginal objects are present or are likely to be present in the proposed Project Area, to determine whether the

proposed activity is likely to harm any Aboriginal objects present and to determine if an Aboriginal Heritage Impact Permit (AHIP) is required (DECCW 2010:2) and (Minerals Council 2010:5).

This due diligence report details the field investigation conducted by RPS Senior Cultural Heritage Consultant Gillian Goode on 18 July 2016.

Project Area

The Project Area is located in the Newnes State Forest on the Newnes Plateau. The shallow groundwater monitoring bores and soil moisture monitoring probes (Site A to Site E) are located at Gang Gang Swamp (**Attachment 1 - Figure 1**).

Proposed Activity

The bores are to be constructed using a hand auger and located away from any identified threatened species. Vehicle access during proposed works will be limited to established tracks and access by foot in the swamp vegetation restricted to the shortest and safest path to limit trample damage during installation and subsequent access for monitoring. It is expected that any vegetation removal will be undertaken using hand tools.

Environmental Background

The nature of stone exploitation by Aboriginal people depended on the characteristics of the source; for example whether it outcropped on the surface (a primary source) or occurred as gravels (secondary source) (Doelman et al. 2008).

Geology and Soils

The Blue Mountains area is characterised by deep incised gorges with sandstone bed-rock, steep sided cliffs and pagodas, narrow incised valleys with spring fed creek lines and inter-bedded sandstone conglomerate rocks. The geology for the Project Area is primarily formed from the Clifton Subgroup which is part of the Narrabeen Group laid down in the Triassic period and is characterised by an undifferentiated mix of sandstone, shale and tuff. Quaternary alluvium of gravel, sand, silt and clay can be found mainly along watercourses (Bryan, McElroy and Rose 1966). Aboriginal people often made stone tools using siliceous, metamorphic or igneous rocks and therefore understanding the local geology can provide important information regarding resources within the Project Area.

A variety of soil types dominate the landscape in the Project Area (King 1993). The Deanes Creek Swamp Landscape is characterised by narrow gently inclined elongated swamps of closed heath and sedgeland with waterlogged humic gleys and sandstone bedrock; soils are generally shallow comprising sandy loam and clay loams and the hard setting bleached sandy loam. Angular blocky clay is the dominant subsoil, which is characterised by a reddish-brown to bright yellowish-brown colour. Texturally, the subsoil is clayey and forms massive angular blocks when wet. Soil fertility can be low whilst the hard-setting topsoil restricts deep root penetration and in terms of shrink-swell capacity, the shrinkage can reach depths of up to 35 cm (King, D.1993).

Topography and Hydrology

The Project Area is located on the Newnes Plateau at Gang Gang Swamp East and Gang Gang Swamp West. Access to the swamp is via steep v-shaped, ephemeral low order creek lines that

cut through the rocky terrain or along the banks on either side of the swamps. The swamp is fed by high order creek lines which are lined by jointed, flat-lying sandstone bedrock with small waterfalls in areas of stepped sandstone in some areas.

Flora and Fauna

Past Aboriginal people are likely to have encountered several vegetation communities in the local area in proximity to the Project Area (DECCW 2006 in RPS 2014). Vegetation on the flat lying ridge and upper slopes is predominantly open forest characterised by Eucalyptus species in the following vegetation communities (RPS 2014) and (DECCW 2006).

These vegetation communities provide habitat for a variety of animals and would have also provided potential food and raw material sources for Aboriginal people. Typical animals which may have been hunted by Aboriginal people include kangaroos, wallabies, sugar gliders, possums, echidnas, a variety of lizards and snakes, birds, as well as rats and mice. The bones of such animals have been recovered from excavations of Aboriginal sites suggesting that they were sources of food (Attenbrow 2003:70-76), although the hides, bones and teeth of some of the larger mammals may have been used for Aboriginal clothing, ornamentation, or other implements.

Climate

Approximately 18,000 years ago climatic conditions began to change, affecting the movement and behaviour of past human populations in their environments. During this time, notably at the start of the Holocene (11,477 years ago), the melting of the ice sheets in the Northern Hemisphere and Antarctica caused sea levels to rise, with a corresponding increase in rainfall and temperature. The change in climatic conditions reached its peak about 6,000 years ago (Lambeck, Yokoyama and Purcell 2002; Short 2000:19-21). Up until 1,500 years ago, temperatures decreased slightly before stabilising, about 1,000 years ago, at a point similar to the temperature currently experienced. Consequently, the climate in the locality of the Project Application Area for the past 1,000 years would have been much the same as the present day, providing a year round habitable environment.

According to the Bureau of Meteorology data (Bureau of Meteorology 2012), the Newnes Plateau generally experiences greater rainfall in January with a mean average of 108.5 mm, while the month of July is driest with a mean average of 52.2 mm recorded from 1938 - 1978. Given that the Project Area is located in the hinterland, the temperature in this region generally remains moderate to cool throughout the year. The highest temperature generally occurs in January with a mean average of 24.6°C while during the month of July temperatures can drop below 0°C.

Aboriginal Heritage Background

A search of the Aboriginal Heritage Information Management System (AHIMS) database was undertaken on the 12 April 2016 for the Project Area. The coordinates searched were GDA Zone 56 within the parameters: Eastings 237203 – 241955 and Northing 6301838 – 6304597. The search revealed six previously recorded Aboriginal sites in the broader region around Carne West Swamp and Gang Gang East and West Swamps but only two in proximity to the swamps, both of which are more than 150 metres from the proposed drill locations and therefore will not be impacted by the proposed works (**Attachment 1 – Figure 2**).

AHIMS Number	Site Type	Count	Zone 56 GDA Easting	Zone 56 GDA Northing	Percentage %
45-1-0051	Artefact Scatter	1	240355	6303040	66.68%
45-1-0052	Artefact Scatter	1	241105	6303190	
45-1-0077	Artefact Scatter	1	242005	6303940	
45-1-0078	Artefact Scatter	1	241955	6304290	
45-1-2600	Scar Tree	1	238080	6303503	16.66%
45-1-2739/ 45-1-2740	Isolated Find	1	239576	6303753	16.66%
Total		6			100%

Source: AHIMS Search 12 April 20

Summary of AHIMS

A review of AHIMS results indicate that the majority of sites found in the Project Area are artefact sites (artefact scatters and isolated finds). Artefact sites generally consist of flaked stone artefacts (flakes and cores) manufactured from the following raw materials: silcrete, chert, quartz, quartzite, tuff, basalt and mudstone. Modified trees with evidence of cultural scarring are generally found in areas where mature trees are found suitable for procuring bark for canoes, shields and coolamons or carrying vessels. Rockshelters are usually found associated with the pagodas and cliffs located along the banks of the v-shaped creek lines. The interbedded sandstones are differentially eroded forming large overhangs sometimes with a flat or gently sloping floor suitable for human occupation.

Survey Methodology

The visual inspection included the following components:

- Documentation of visual inspection;
- Documentation of results; and
- Documentation of sites/areas of significance to the Aboriginal community within the Project Area.

The visual inspection aimed to provide adequate coverage of the proposed impact footprint for the five proposed shallow groundwater bores and soil moisture probes. The due diligence visual inspection was undertaken on the 18 July 2016 by Gillian Goode (RPS Senior Cultural Heritage Consultant). A Trimble DGPS unit was used to record the proposed locations.

Areas with high visibility and exposure generally have increased land surface disturbance which can expose high quantities of archaeological material (particularly stone artefacts). Conversely, areas with low visibility and exposure are generally more intact (undisturbed) landscapes.

Visual Inspection Results

The visual inspection of the Project Area was undertaken on foot for the five proposed shallow groundwater monitoring bores and soil moisture monitoring probes; the pedestrian access to the site locations were also inspected (**Attachment 1 - Figure 3**).

Site A Downstream Gang Gang East

This shallow groundwater monitoring bore and soil moisture probe location was situated downstream at Gang Gang East Swamp (Plate 1 and Plate 2). The proposed location is on the eastern side of the Gang Gang East Swamp. Exposed ground surface was characterised by sandy loam topsoils with low lying vegetation predominantly graminoids. Ground surface exposure was 20% and ground surface visibility was 20%. There were no Aboriginal objects at Site A or on the approved access track to Site A. Therefore it is considered there are no archaeological constraints to works proceeding at the proposed hand auger location.

▲ No Aboriginal objects were identified at Site A

Site B - Upstream Gang Gang East

This shallow groundwater monitoring bore and soil moisture probe location was situated upstream at Gang Gang East Swamp (Plate 3 and Plate 4). The proposed location is close to the confluence of two arms of the swamp. Exposed ground surface was characterised by peat soils with low lying vegetation predominantly graminoids. Ground surface exposure was 30% and ground surface visibility was 30% due to a recent bushfire. There were no Aboriginal objects at Site B. Therefore it is considered there are no archaeological constraints to works proceeding at the proposed hand auger location. There was a European stone structure (stone foundation) close to the approved access track to site B (Plates 11 to Plate 14). A central GPS coordinate for this European stone structure was recorded at GDA Zone 56H 239900.6 E – 6301813.3N. This area is a No Go Zone and the approved access track is more than 10 metres to the east of the stone structure in order to avoid harming it.

▲ No Aboriginal objects were identified at Site B

▲ One European Stone Structure was identified at Site B and should be avoided from disturbance impact.

Site C - Downstream Gang Gang South West

This shallow groundwater monitoring bore and soil moisture probe location was situated downstream at Gang Gang East Swamp (Plate 5 and Plate 6). The proposed location is on the western side of the Gang Gang East Swamp. Exposed ground surface was characterised by sandy loam topsoils with quartz pebbles and low lying vegetation including shrubs and graminoids. There were some fallen trees upslope. Ground surface exposure was 25% and ground surface visibility was 20%. There were no Aboriginal objects at Site C or on the approved access track to Site C. Therefore it is considered there are no archaeological constraints to works proceeding at the proposed hand auger location.

▲ No Aboriginal objects were identified at Site C

Site D - Upstream Gang Gang South West

This soil moisture probe location was situated upstream at Gang Gang East Swamp (Plate 7 and Plate 8). The proposed location is at the west of the swamp. Exposed ground surface was characterised by peat soils with low lying vegetation predominantly graminoids. Ground surface exposure was 23% and ground surface visibility was 20%. There were no Aboriginal objects at

Site D. Therefore it is considered there are no archaeological constraints to works proceeding at the proposed hand auger location.

▲ No Aboriginal objects were identified at Site D

Site E - Upstream Gang Gang South West

This shallow groundwater monitoring bore was situated upstream at Gang Gang East Swamp (Plate 9 and Plate 10). The proposed location is at the west of the swamp. Exposed ground surface was characterised by peat soils with low lying vegetation predominantly graminoids. Ground surface exposure was 23% and ground surface visibility was 20%. There were no Aboriginal objects at Site E. Therefore it is considered there are no archaeological constraints to works proceeding at the proposed location Site E.

▲ No Aboriginal objects were identified at Site E

Summary of Results

There were no Aboriginal objects or sites identified within the Project Area. There was one European stone structure (stone footings) close to the access track to Site B. The access track to Site B is to be located more than 10 metres to the east of this site in order to ensure that it is not harmed by the proposed works.

Impact Assessment

Based on the outcome of the visual inspection, no stone artefacts, scar trees, grinding grooves or rock shelters were identified in the Project Area. As such the Project Area is considered to have low potential for unidentified Aboriginal objects or for subsurface archaeological deposit to be present.

It is considered that there are no Aboriginal objects in the Project Area. It is unlikely that any Aboriginal objects will be harmed by the installation of the proposed shallow groundwater monitoring devices and soil moisture probes.

There is **one European stone structure (stone footings)** close to the access track to Site B (Plates 11 to 14). The access track to Site B is to be located more than 10 metres to the east of this site in order to ensure that it is not harmed by the proposed works.

Conclusion and Recommendations

This report has considered the available archaeological information for the Project Area, the land condition and the nature of the proposed activity. The purpose of this investigation was to identify if there was risk of impact to Aboriginal objects for the proposed activity. No Aboriginal objects or places have been identified within the Project Area and therefore an Aboriginal Impact Permit (AHIP) is not required for the proposed development.

The following recommendations are made in relation to the proposed activity:

Recommendation 1

That a **No Go Zone** area be made such that during the vegetation clearing and installation of the access track for Site B is positioned more than 10 metres to the east of the European Structure comprising stone footings and wood beam in order that the structure is not harmed.

Recommendation 2

All relevant Springvale Coal staff and contractors should be made aware of their statutory obligations for heritage under the *National Parks and Wildlife Act* 1974 and the *Heritage Act* 1977, which may be implemented as a heritage induction.

Recommendation 3

If unrecorded Aboriginal object/s are identified in the Project Area during works, then all works in the immediate area must cease and the area cordoned off. The area is to be managed in accordance with the procedures outlined in Centennials Western Holdings ACHMP (RPS 2014).

Recommendation 4

In the unlikely event that skeletal remains are identified, work must cease immediately in the vicinity of the remains and the area cordoned off. The area is to be managed in accordance with the procedures outlined in Centennials Western Holdings ACHMP (RPS 2014).

Recommendation 5

If, during the course of development works, suspected historic cultural heritage material is uncovered, the work should cease in that area immediately. The Heritage Branch, Office of Environment and Heritage (Enviroline 131 555) should be notified and works only recommenced when an approved management strategy has been developed.

Yours sincerely
RPS

A handwritten signature in black ink that reads 'G. S. Goode' with a horizontal line underneath.

Gillian Goode
RPS Senior Cultural Heritage Consultant

REFERENCES

- Attenbrow, V. 2003. *Sydney's Aboriginal Past: Investigating the Archaeological and Historical Records*. UNSW Press.
- Bryan, J.H., C.T. McElroy, and G. Rose. 1966. "Sydney. 1:250,000 Geological Series Explanatory Notes." Geological Survey of New South Wales.
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PLATES



Plate 1: Site A Vegetation cover & soils



Plate 2: View south to Site A



Plate 3: Site B Vegetation cover & soils



Plate 4: View to east from 5.5 Site B



Plate 5: Site C Vegetation cover & soils



Plate 6: View to north east to Site C



Plate 7: Site D Vegetation cover & soils



Plate 8: View to south west to Site D



Plate 9: Site E Vegetation cover & soils



Plate 10: View to West to Site E



Plate 11: ES Stone Foundation view east



Plate 12: ES Wood Frame



Plate 13: ES Stone Foundation view east

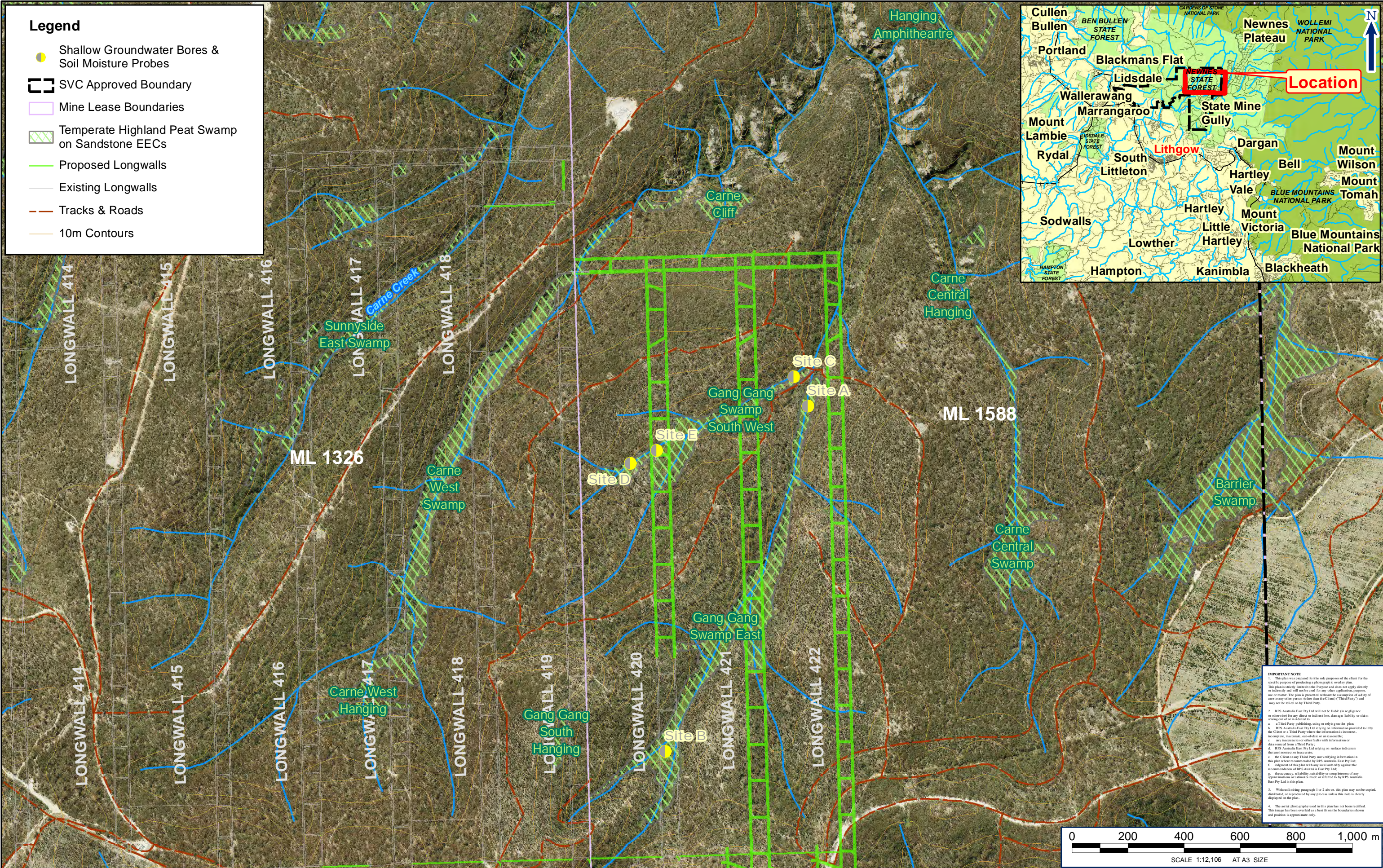


Plate 14: ES Stone Foundation view west

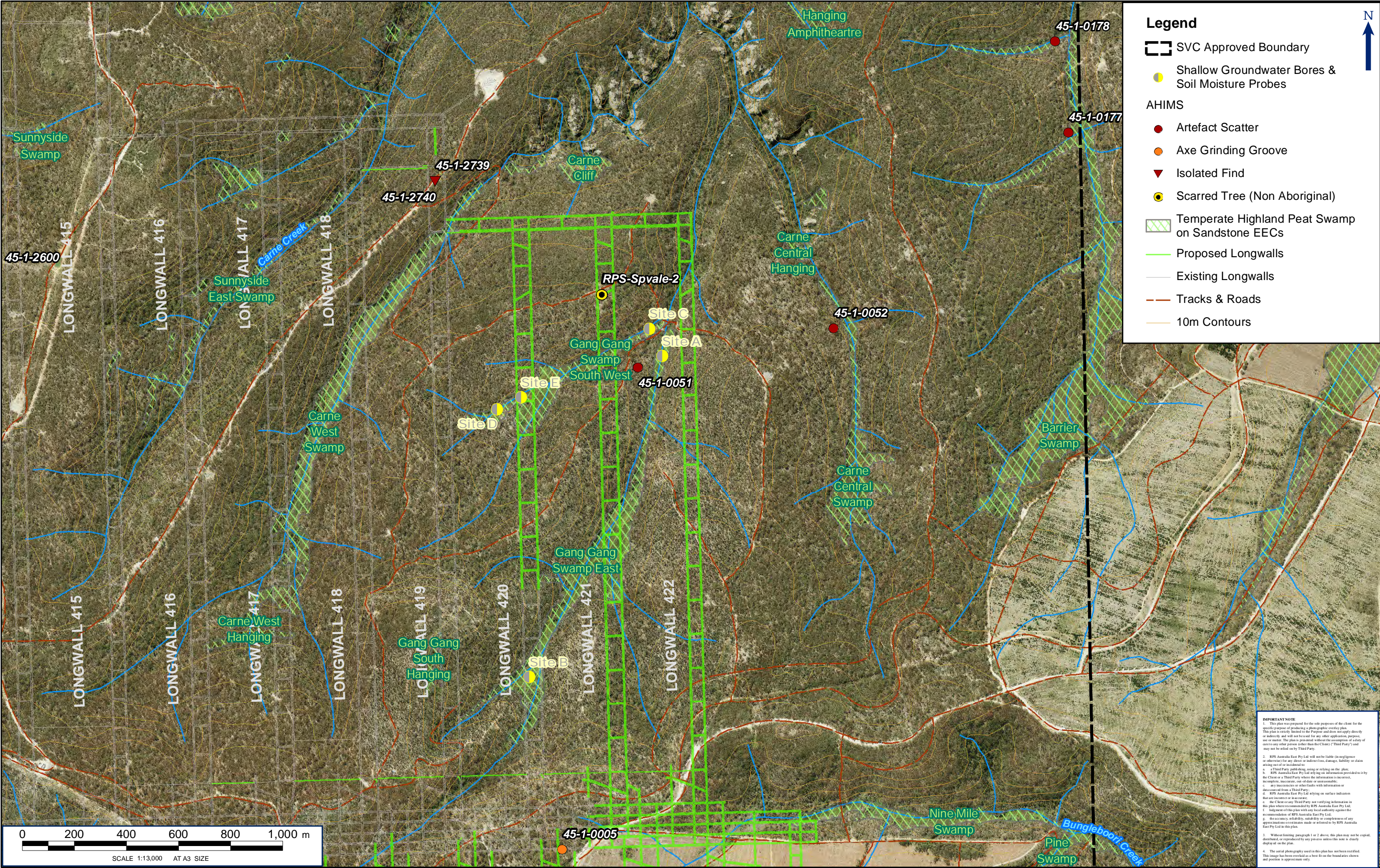


Attachment I

Figures



TITLE : FIGURE 1: LOCATION OF SHALLOW GROUNDWATER BORES & SOIL MOISTURE PROBES	LOCATION : SPRINGVALE	DATUM: GDA 1994	DATE : 20/07/2016	VERSION (PLAN BY): A A3 (Natalie.Wood)
		PROJECTION: GDA 1994 MGA Zone 56	PURPOSE: HERITAGE	PATH: J:\JOBS\Centennial\All Jobs\132827 SV Swamp Eco Due Diligence\10 - Drafting\Arcgis Map Documents\Arch\Report Figures\132827-2b Figure 1 A A3 20160720.mxd



TITLE : **FIGURE 2: SHALLOW GROUNDWATER BORES AND SOIL MOISTURE PROBES WITH AHIMS**

LOCATION : **SPRINGVALE**

DATUM:GDA 1994

DATE : **20/07/2016**

VERSION (PLAN BY): A A3 (Natalie.Wood)

PROJECTION: GDA 1994 MGA Zone 56

PURPOSE: **HERITAGE**

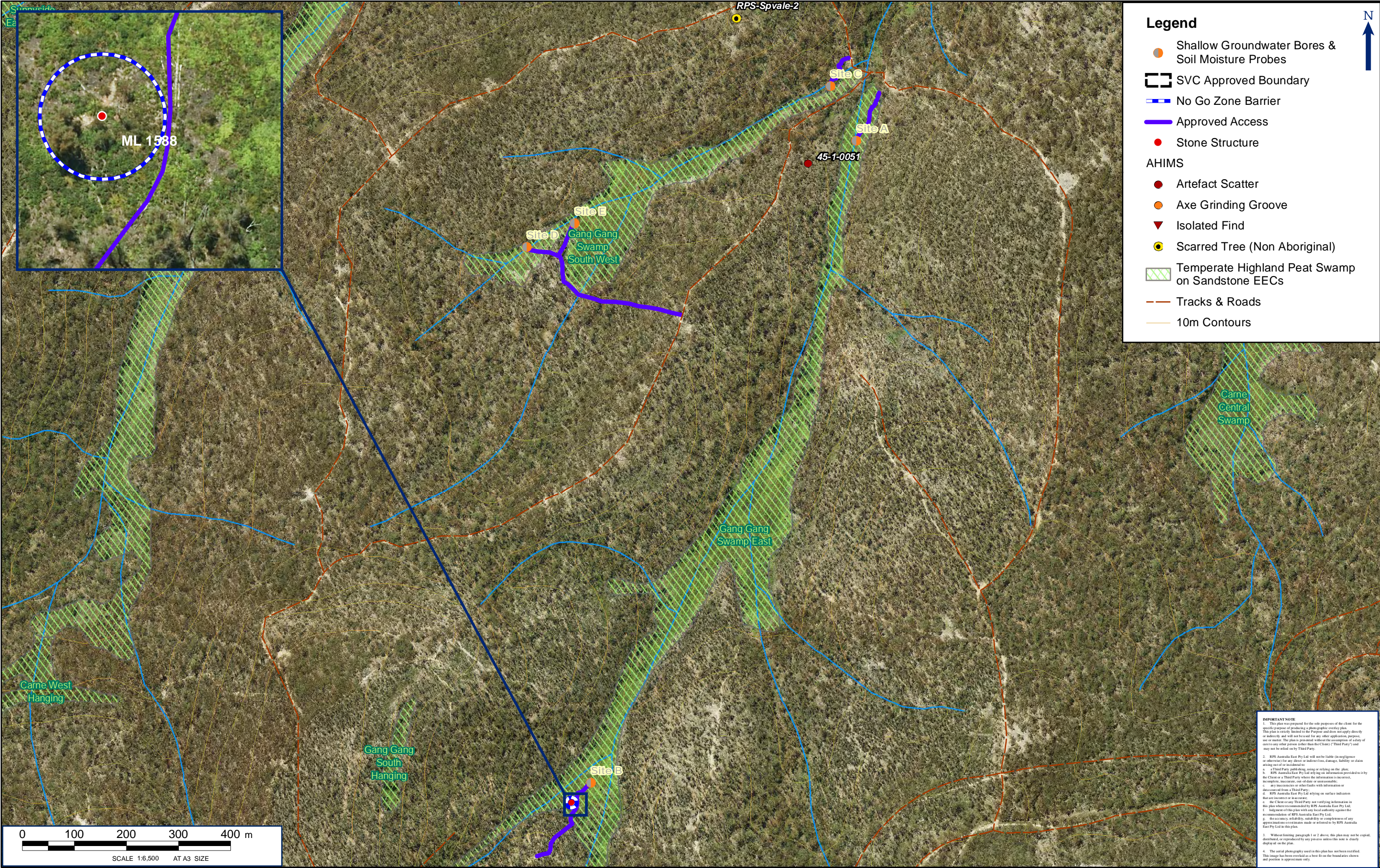
PATH: J:\JOBS\Centennial\All Jobs\132827 SV Swamp Eco Due Diligence\10 - Drafting\Arcgis Map Documents\Arch\Report Figures\132827-2b Figure 2 A A3 20160720.mxd

CLIENT: **CENTENNIAL COAL**
JOB REF: **PR132827-2B**

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
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TITLE : FIGURE 3: APPROVED LOCATIONS AND TRACKS	LOCATION : SPRINGVALE	DATUM:GDA 1994	DATE : 21/07/2016	VERSION (PLAN BY): A A3 (Natalie.Wood)
		PROJECTION: GDA 1994 MGA Zone 56	PURPOSE: HERITAGE	PATH: J:\JOBS\Centennial\All Jobs\132827 SV Swamp Eco Due Diligence\10 - Drafting\Arcgis Map Documents\Arch\Report Figures\132827-2b Figure 3 AA3 20160720.mxd



Attachment 2

AHIMS

RPS Australia East Pty Ltd -Hamilton

Date: 22 April 2016

Accounts Payable Fortitude Valley PO Box 237

BRISBANE Queensland 4001

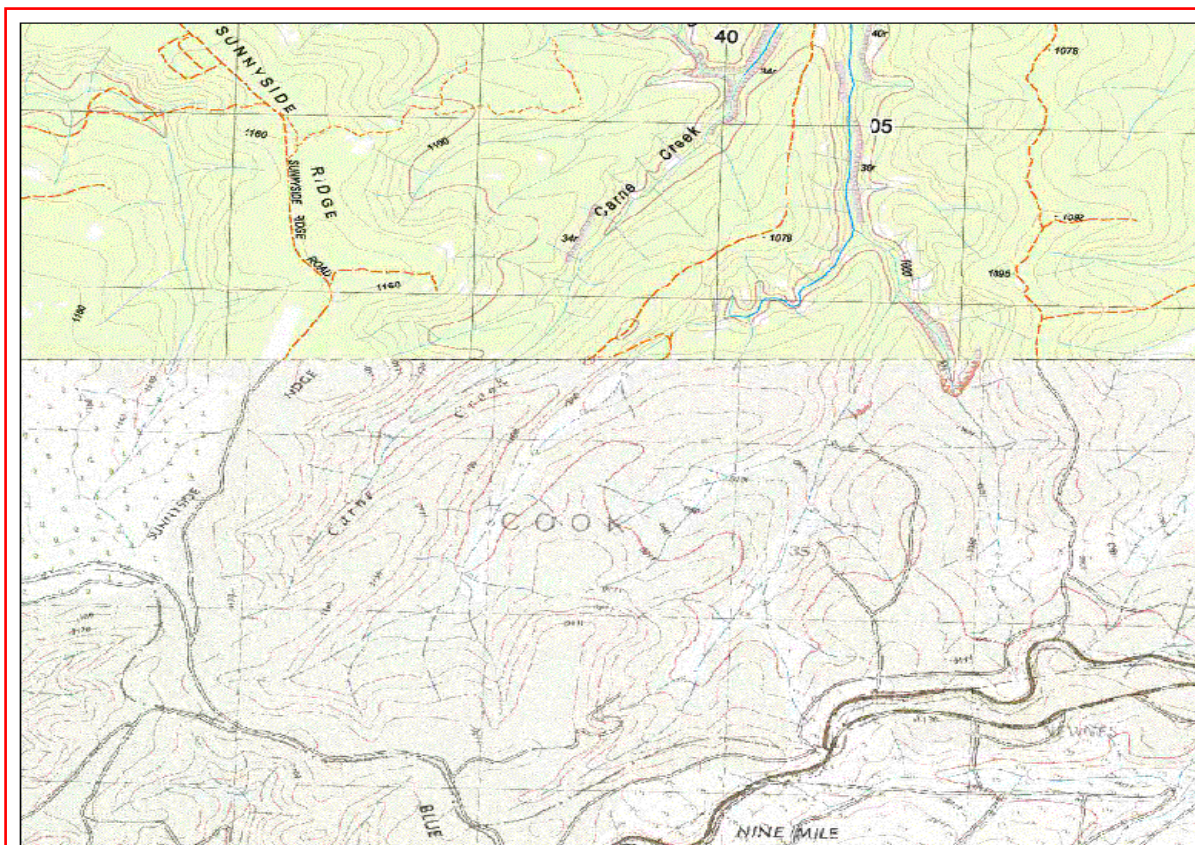
Attention: Gillian Goode

Email: gillian.goode@rpsgroup.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Datum :GDA, Zone : 56, Eastings : 237203 - 241955, Northings : 6301838 - 6304597 with a Buffer of 0 meters, conducted by Gillian Goode on 22 April 2016.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

6	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the [NSW Government Gazette \(http://www.nsw.gov.au/gazette\)](http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date .Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.