

**Figure 1: Location of Project site.**

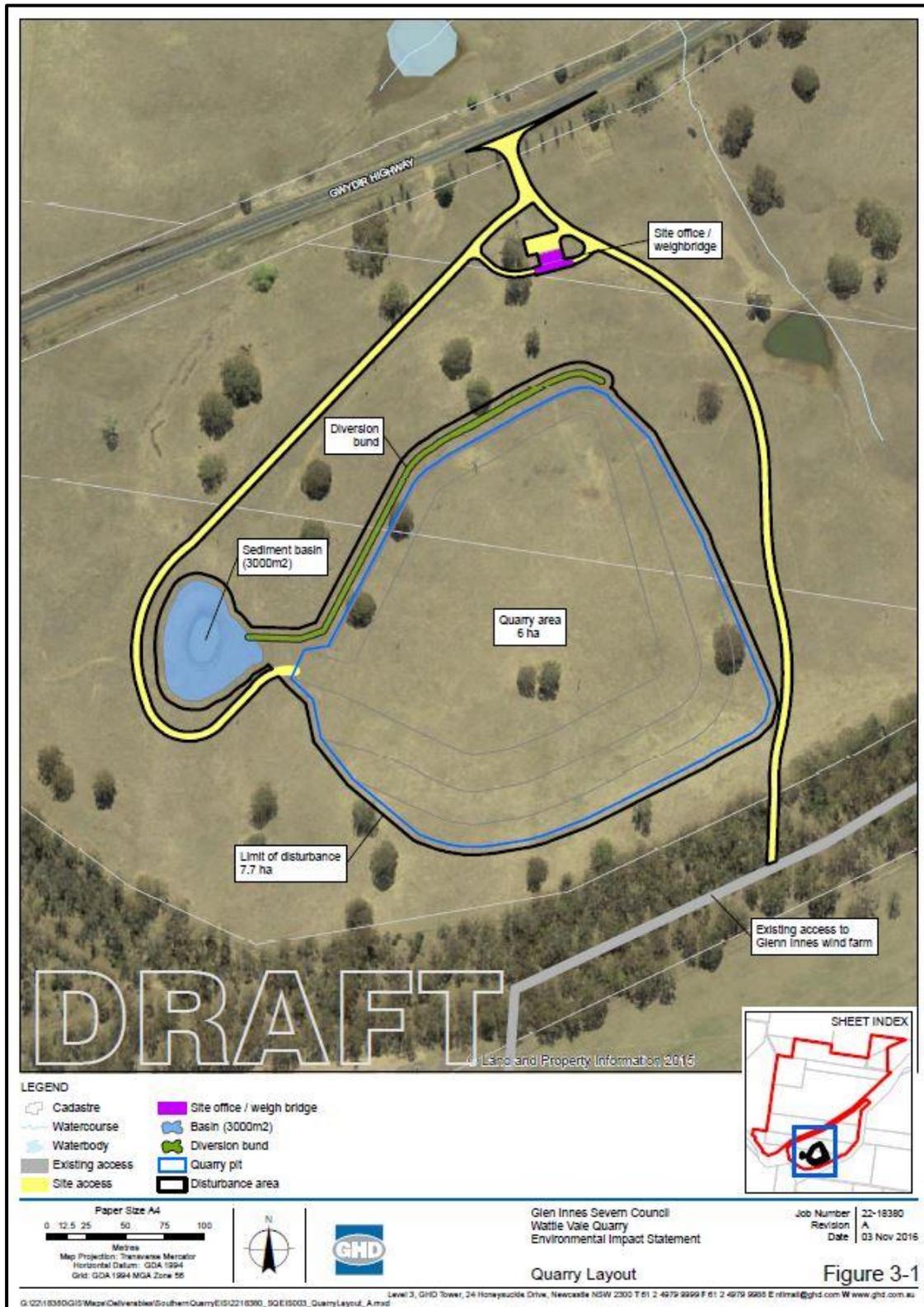
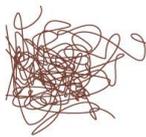


Figure 2: Detail of the proposed quarry area.



## 2. LEGISLATIVE AND PLANNING CONTEXT

The following legislation provides the context for cultural heritage in NSW: the *National Parks and Wildlife Act 1974* (NSW), the *Environmental Planning and Assessment Act 1979* (NSW), the *Heritage Act 1977* (NSW) and local council Environmental Plans and Development Control Plans. The Commonwealth also has a role in the protection of nationally significant cultural heritage through the *Environmental Protection and Biodiversity Conservation Act 1999* (Cth), *The Protection of Movable Cultural Heritage Act 1986* (Cth) and the *Historic Shipwrecks Act 1976* (Cth).

For the purposes of this assessment it is the State and local legislation that are most relevant. The consent authorities will be the Glen Innes Severn Council and, where a referral agency is required, the OEH. Approval from the OEH will also be required should the Project impact on identified Aboriginal Objects. The information below lists the legislative and policy framework within which this assessment is set.

### 2.1 The *National Parks and Wildlife Act 1974* (NSW) and the *National Parks and Wildlife Regulations 2009* (NSW)

The *National Parks and Wildlife Act 1974* (NSW) ('NPW Act') is the primary legislation concerning the identification and protection of Aboriginal cultural heritage. It provides for the management of both Aboriginal Objects and Aboriginal Places. Under the NPW Act, an Aboriginal Object is any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area, regardless of whether the evidence of habitation occurred before or after non-Aboriginal settlement of the land. This means that every Aboriginal Object – regardless of its size or seeming isolation from other Objects – is protected under the Act.

An Aboriginal Place is an area of particular significance to Aboriginal people which has been *declared* an Aboriginal Place by the Minister. The drafting of this legislation reflects the traditional focus on Objects, rather than on areas of significance such as story places and ceremonial grounds. However, a gradual shift in cultural heritage management practices is occurring towards recognising the value of identifying the significance of areas to Indigenous peoples beyond their physical attributes. With the introduction of the *National Parks and Wildlife Amendment Act 2010* (NSW) the former offence provisions under Section 86 of 'disturbing', 'moving', 'removing' or 'taking possession' of Aboriginal Objects or Places have been replaced by the new offence of 'harming or desecrating'. The definition of 'harm' is 'destroying, defacing or damaging an Object'. Importantly in the context of the management recommendations in this assessment, harm to an Object that is 'trivial or negligible' will not constitute an offence.



The new amendments also significantly strengthen the penalty provisions. The issue of intent to harm Aboriginal cultural heritage has been formally addressed by separating it from inadvertent harm. The penalty for individuals who inadvertently harm Aboriginal Objects has been set at up to \$55,000, while for corporations it is \$220,000. Also introduced is the concept of *'circumstances of aggravation'* which allows for harsher penalties (up to \$110,000) for individuals who inadvertently harm Aboriginal heritage in the course of undertaking a commercial activity or have a record for committing similar offences. For those who knowingly harm Aboriginal cultural heritage, the penalty will rise substantially. The maximum penalty will be set at \$275,000 or one year imprisonment for individuals, while for corporations it will rise to \$1,100,000.

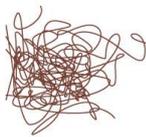
Where a land user has or is likely to undertake activities that will harm Aboriginal Objects, the Director General (OEH) has a range of enforcement powers, including stop work orders, interim protection orders and remediation orders. The amended regulations also allow for a number of penalties in support of these provisions. The NPWA also now includes a range of defense provisions for unintentionally harming Aboriginal Objects:

- a) undertaking activities that are prescribed as *'Low Impact'*;
- b) acting in accordance with the new Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (2010) (*'Due Diligence Code'*);
- c) using a consulting archaeologist who correctly applies the OEH *Code of Practice for Archaeological Conduct in New South Wales* (2010) (*'Archaeological Code of Practice'*) (see Appendix A); and
- d) acting in accordance with an Aboriginal Heritage Impact Permit (AHIP).

### 2.1.1 *'Low Impact Activities'*

The new regulations allow for a range of low impact activities to be undertaken without the need to consult the OEH or a consulting archaeologist. Generally, those who undertake activities of this nature will not be committing an offence, even if they inadvertently harm Aboriginal Objects. These activities include:

- a) Maintenance – For example on existing roads and tracks, or on existing utilities such as underground power cables and sewage lines.
- b) Farming and Land Management – for land previously disturbed, activities such as cropping, grazing, bores, fencing, erosions control etc. \*
- c) Removal of dead or dying vegetation - only if there is minimal ground disturbance.
- d) Environmental rehabilitation – weed removal, bush regeneration.
- e) Development in accordance with a Development Certificate issued under the EPA Act 1979 (provided the land is previously disturbed). \*



- f) Down hole logging, sampling and coring using hand held equipment.
- g) Geochemical surveying, seismic surveying, costeaning or drilling. \*

\* This defense is only available where the land has been disturbed by previous activity. Disturbance is defined as a clear and observable change to the land's surface, including but not limited to land disturbed by the following: soil ploughing; urban development; rural infrastructure (such as dams and fences); roads, trails and walking tracks; pipelines, transmission lines; and storm water drainage and other similar infrastructure.

## 2.2 Due Diligence Code of Practice for the Protection of Aboriginal Objects

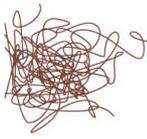
The Due Diligence Code has been applied in Section 8 of this assessment. It operates by posing a series of questions for land users before they commence development. These questions are based around assessing previous ground disturbance. An activity will generally be unlikely to harm Aboriginal Objects where it:

- a) will cause no additional ground disturbance; or
- b) is in a developed area; or
- c) is in a significantly disturbed area.

Where these criteria are not fulfilled, further assessment for Aboriginal cultural heritage will typically be required prior to commencing the activity.

## 2.3 The ACHCRP (2010)

The OEH has recently published the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (2010) (ACHCRP). These requirements replaced the former *Interim Community Consultation Requirements for Applicants* (2004) (ICCR) as of 12 April 2010. The ACHCRP provide an acceptable framework for conducting Aboriginal community consultation in preparation for Aboriginal Heritage Impact Permits. Proponents are also required to follow the ACHCRP where undertaking a project that is likely to impact on cultural heritage and/or where required by the consent authority.



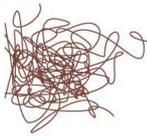
## 2.4 The Glen Innes Severn Local Environmental Plan 2012

The Glen Innes Severn LEP 2012 provides statutory protection for items already listed as being of heritage significance (Schedule 5), items that fall under the ambit of the *Heritage Act 1977* (NSW) and Aboriginal Objects under the *NPW Act 1974* (NSW). It aims to ensure best practice components of the heritage decision making process are followed.

For listed heritage items, or a building, work, relic or tree and heritage conservation areas, the following action can only be carried out with the consent of the Glen Innes Severn Council:

- a) demolishing or moving any of the following or altering the exterior of any of the following (including, in the case of a building, making changes to its detail, fabric, finish or appearance):
  - (i) a heritage item,
  - (ii) an Aboriginal object,
  - (iii) a building, work, relic or tree within a heritage conservation area,
- b) altering a heritage item that is a building by making structural changes to its interior or by making changes to anything inside the item that is specified in Schedule 5 in relation to the item,
- c) disturbing or excavating an archaeological site while 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,
- d) disturbing or excavating an Aboriginal place of heritage significance,
- e) erecting a building on land:
  - (i) on which a heritage item is located or that is within a heritage conservation area, or
  - (ii) on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance,
- f) subdividing land:
  - (i) on which a heritage item is located or that is within a heritage conservation area, or
  - (ii) on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance.

In addition, Council may not grant development consent without considering the effect the proposed development will have on the heritage significance of heritage item or heritage conservation area concerned.



With respect to Aboriginal heritage significance Glen Innes Severn Council as consent authority must, before granting consent in a place of Aboriginal heritage significance:

- a) consider the effect of the proposed development on the heritage significance of the place and any Aboriginal object known or reasonably likely to be located at the place by means of an adequate investigation and assessment (which may involve consideration of a heritage impact statement), and
- b) notify the local Aboriginal communities, in writing or in such other manner as may be appropriate, about the application and take into consideration any response received within 28 days after the notice is sent.

### 3. ABORIGINAL COMMUNITY CONSULTATION TRADITIONAL OWNER KNOWLEDGE & PARTICIPATION

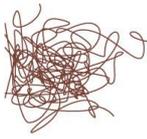
Traditional Owners have been and will continue to be consulted with regard to concerns not only about archaeological sites, but other cultural values such as historic and spiritual significance, and values relating to flora and fauna of the area.

We recognise that there may be traditional knowledge that will have to be treated in a confidential manner and we will be seeking advice from Traditional Owners on the appropriate protocols to be adopted in regard to such knowledge.

Aboriginal community consultation was undertaken via the Glen Innes LALC CEO Trevor Potter and Aboriginal Sites Officer Mr Jayden Potter. Trevor Potter did not identify knowledge of any specific sites in the area of the proposed quarry, but did identify the potential for sites to occur within the Project site based on knowledge of archaeological values in similar landscapes across the Tablelands. Trevor indicated that camp sites were known further along Back Plain Creek (north of the Project site). This potential has been discussed in further detail in Section 7 below.

### 4. LANDSCAPE CONTEXT

The Project site is located on ridge crests and steep hill slopes within the upper watershed of Back Plain Creek, located to the east. The Project site generally has a northerly aspect and varies between approximately 1200 and 1140 AHD. The Quarry area is located primarily on a steep north facing slope and flat ridge crest.



Soil landscape mapping for the Project site is limited, however the soils are observed to be thin and derived from the surrounding basalts. The soil profile is erosional, but relatively stable, being dry and rocky.

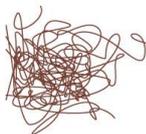
It is noted that the majority of the soil landscapes on the New England Tablelands around Glen Innes have been heavily modified as a result tree clearing. Morand (1999) indicates that most of the region would have been either largely treeless or consisted of only a scattering of trees. The Project site is typical of this description and it is reasonable to assume that trees present mostly post-date European settlement. However as early tree clearing was selective the potential exists for some trees to pre-date European land clearing. Pastures have been mostly replaced by introduced and improved species.

## 5. DATABASE SEARCHES

### 5.1 The OEH Aboriginal Heritage Information Management System (AHIMS)

Care should be taken when using the AHIMS database to reach conclusions about site prevalence or distribution. For example, a lack of sites in a given area should not be seen as evidence that the area was not occupied by Aboriginal people. It may simply be an indication that it has not been surveyed, or that the survey was undertaken in areas of poor surface visibility. Further to this, care needs to be taken when looking at the classification of sites. For example, the decision to classify a site an Open Campsite containing shell rather than a Midden can be a highly subjective exercise, the threshold for which may vary between archaeologists.

A 'basic' search was conducted on 22 July 2016 of the OEH AHIMS for the area surrounding the Project site (with a 1000 metre buffer- Service ID 235468). The search returned no (0) registered Aboriginal heritage sites within a kilometre of the Project site.



## 5.2 Other Heritage Registers: Aboriginal & Historic Cultural Heritage

The following heritage registers were accessed on 14 August 2016:

**The National Heritage List** (Australian Heritage Council): Contains no Aboriginal heritage listings within the Project site.

**Commonwealth Heritage List** (Australian Heritage Council): Contains no Aboriginal heritage listings within the Project site.

**Register of the National Estate** (Australian Heritage Council): Contains no Aboriginal heritage listings within the Project site.

**The State Heritage Register** (NSW Heritage Office): Contains no Aboriginal heritage listings within the Project site.

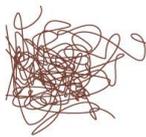
**The State Heritage Inventory:** Contains no Aboriginal heritage listings within the Project site.

**The Register of the National Trust of Australia:** Contains no Aboriginal heritage listings within the Project site.

**Glen Innes Severn Local Environment Plan 2012 (LEP):** Contains no Aboriginal heritage listings within the Project site.

## 6. ARCHAEOLOGICAL SYNTHESIS AND PREDICTIONS

Ngarabal is the language group for the Glen Innes area. It is described by Tindale as spoken in an area between Tenterfield and Glen Innes defined by the Beardy River to the east where the Ngarabal adjoin the Jukumbal. To the west is the Kwiambal language group, to the north the Kambuwal and to the south the Anaiwan (Tindale 1974). Dates for prehistoric occupation of the Northern Tablelands range between 5450 BP (before present: 1950) in rock shelters at Graman on the western slopes and 1600 BP at Bendemeer. McBryde's review of ethno historic sources for the material culture of the Tablelands region summarises '...the stress in the sources is on spears, clubs, waddies, and boomerangs among wooden artefacts, on tomahawks and stone knives among stone tools'. There is evidence for both hand-throwing of spears and the use of the woomera on the western slopes and plateau country. McBryde also refers to kangaroo and possum skin cloaks and rugs, kangaroo bone needles and sinew for thread bags of fur and bark fibres, nets of fibre cord use in hunting and fishing. Large permanent nets made from tough Kurrajong bark were erected in the richest hunting grounds, while weirs were constructed across rivers such as the Gwydir to trap fish (McBryde 1974:13). Populations were considered low for the Tablelands in comparison to the western slopes and coastal lands. The dispersal of Aboriginal groups over the northern Tablelands and the patterns of movement that might be implied from the study of eyewitness European accounts has been the



subject of debate since the nineteen seventies. The earliest view advanced by McBryde (1974) on the basis of ethno-historical accounts, was that seasonal movement from the Tablelands to the coastal regions during the winter was an annual practice, although supportive archaeological evidence has not been found. Goodwin (1991) has conducted the most recent and detailed review of the ethno-historical sources, resource zones and habitats, stone axe distribution, art styles and motifs to support a model arguing that groups of Tableland people moved throughout the year and that limited contact was maintained with upriver coastal groups and not with coastal tribes. On the other hand contact and reciprocity between the Tablelands groups and Western Slopes groups was more common and frequent than contact with coastal groups (Davies 2001:18 – 19).

## 6.1 Archaeological and Cultural Heritage Assessments

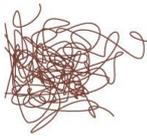
There have been few archaeological assessments in the Glen Innes and surrounding region consequently a limited range of environmental contexts have been sampled and few sites have been recorded.

Rich (1988) conducted a desktop review of the potential for Aboriginal cultural heritage in the Glen Innes municipality. Three areas of significance were identified rock wells a natural mythological feature, Bell Rock a women's site and a traditional camping place that was also of archaeological significance. An area of contemporary historical significance 'The Common' on which a shanty town occurred was also identified. Of these areas only the rock wells (# 12-4-0001) appears on the current DECC AHIMS sites register.

Kelton (1999) conducted a survey of the proposed Glen Innes Sewage Augmentation. Although the quarry area was located adjacent to Furracabad Creek no Aboriginal sites were located. This was considered to be a product of the highly disturbed nature of the quarry area.

Navin and Officer (2005) conducted an archaeological assessment to accompany a Development Application for the construction of a sub-station 100 m west of the present 166/32 kV Bulk Supply Substation on the eastern end of Golf Course Road at Glen Innes. The location is the point of origin for the proposed construction corridor under this report. The 2005 assessment found no Aboriginal sites, objects or areas of archaeological sensitivity (Navin & Officer 2005: 1).

Appleton (1992) conducted an assessment over 14.5 km of a proposed fibre optic cable route 16 km east of Glen Innes. No artefacts were found on the proposed route, four artefacts of quartz material were found alongside Pinkett Road in the vicinity of the Yarrow River beyond the proposed route.



Studies over the eastern slopes and ranges of the northern Tablelands include those of the Glen Innes Forestry Management areas to within approximately 25 km of Glen Innes. A 1997 study identified 20 artefact scatters including 6 single artefacts and 14 scatters containing three to greater than fifty artefacts. One rock shelter with art and a rock shelter with occupation deposit were also found. The report concluded that Aboriginal people favoured the gentler slopes of the Tablelands near permanent creeks. The rugged eastern escarpment probably had great ceremonial significance that focused on stone arrangement sites several of which are located along the eastern escarpment of the Northern Tablelands (Fife 1997: i-iv).

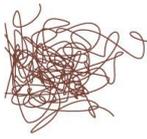
Everett (2000a, 2000b, 2000c) conducted three archaeological assessments at the site of three bridges in the Glen Innes Shire: at Dandahra Creek (68 km east of Glen Innes), Fladbury Creek (25 km north of Glen Innes) and Beardy Waters (6.5 km north of Glen Innes). The scope in terms of area involved in each of the studies was limited and constrained by poor surface visibility conditions, no Indigenous archaeological sites were found nor were there any areas of significant European heritage value.

Robins (2008) completed a survey of the proposed connection between the Trans grid's Glen Innes 132/66kv Zone Sub Station on Golf Course Road and Country Energy's Glen Innes 66/11kv Zone Sub Station on the Gwydir Highway. This study was generally located to the north-west of Glen Innes town ship and included approximately 14km linear transect with a corridor width of approximately 400m. No Aboriginal sites were identified during this survey.

## 6.2 Potential Site Types: Aboriginal Archaeological Sites on the New England Tablelands.

The most comprehensive 'regional' model for the area is provided by Godwin (1990) in a major review of the earlier archaeological research of Isabelle McBryde. Godwin's model specifically investigates patterns of movement between the coastal, sub-coastal, tablelands and western slopes areas.

*'On the Tablelands small groups of people were on the move throughout the year. There are no indications that movement associated with subsistence activities took any particular direction. Abundant evidence exists to indicate that the Tablelands were not abandoned over the winter months. There were also references to travel in a north-south direction on the Tablelands for ceremonial activity. Tableland groups are recorded as travelling onto the western slopes in summer and early autumn months. It should be noted there was little or no social intercourse between sub-coastal and Tablelands people'* (Godwin 1990:122).



The Due Diligence Code (2010) provides a broad predictive model identifying the following areas as having the potential to contain archaeological deposits based on broad landscape type. The following landscape types are identified within the Code;

- a) areas within 200m of water;
- b) located within a sand dune system;
- c) located on a ridge top, ridge line or headland;
- d) located within 200m below or above a cliff face; and
- e) within 20m of or in a cave, rock shelter or cave mouth.

Based on these general predictive models it is possible to make the following specific predictions for the Project site.

#### *6.2.1 Isolated Artefacts*

These consist of single stone artefacts, which may have been randomly discarded or lost. They can occur in almost any environmental context exploited by Aboriginal people. They are commonly stone axes, single cores, hammer stones, pebbles, flakes and grinding stones and/or grooves. Their presence may indicate that more extensive scatters of stone artefacts exist or existed nearby, perhaps obscured by vegetation or dispersed by mechanical means. There is a low to moderate potential for isolated artefacts to be located within the Project site.

#### *6.2.2 Open Campsites/Artefact Scatters*

Open campsites/artefact scatters generally consist of scatters of stone artefacts and possibly bone and hearth features. Their exposure to the elements means that evidence of food resources used on the site (with the exception of shellfish) is usually lacking. They invariably consist of low or high density scatters of primary and secondary flakes in addition to the types of artefacts found as isolated finds. There is a low to moderate potential for artefacts scatters to be located within the Project site.

#### *6.2.3 Quarry Sites*

A stone quarry may occur where a source of opaline silica exists or other siliceous types of stone occur (e.g. chert, chalcedony and silcrete). The area can be identified by a number of different types of stone tools in various stages



of production as well as refuse flakes. Given that visible bedded rock outcrops within the proposed quarry area it is possible that Aboriginal quarry sites will be located within the Project site.

#### 6.2.4 *Scarred Trees*

Scarred trees result from the removal of bark for use as covering, shields, containers or canoes. No doubt, as an outcome of widespread intensive land clearing and natural causes very few have survived. A few trees exist within the Project site and depending on the extent of selective clearing it is reasonable to assume that scarred trees may be located within the Project site.

#### 6.2.5 *Burials*

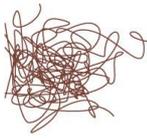
Human burials are typically individual or small group internments which can be found in sandy soil substrates, such as creek lines or within small rock crevices. Most of the known burials have been located by accidental means through mechanical disturbance or natural erosion. Given that the underlying soil is not sandy, there is a low potential to locate burials within the Project site.

#### 6.2.6 *Ceremonial Sites*

Ceremonial grounds are typically places identified by Aboriginal groups as places of importance which were visited by groups to mark or commemorate rites or other occasions. One such example is Bora grounds; earthen mounds crafted in a circular formation which were used for the purposes of ceremonial practices. The study identified no historic sources indicating that ceremonial sites exist within the Project site.

#### 6.2.7 *Mythological Sites*

These sites are natural features, which derive their significance from an association with stories of the creation and mythological heroes. The study identified no historic sources indicating that Mythological sites exist within the Project site.



### 6.3 Predictive Modelling of Aboriginal Cultural Heritage

The desktop review identifies an overall low potential for archaeological materials to be within the Project site prior to European settlement. The Project Site is located on rolling hills with no permanent or ephemeral water in close proximity. Whilst basalt material is present in the Project site the 'quality' of the material in terms of knapping and the production of axe blanks is considered quite low. The nature of disturbance at the site, which involved continued cultivation and grazing across the Project site, would significantly affect surface archaeological materials. Furthermore, due to the extensive ground disturbance, often a result of agriculture, evidence of *in situ* Aboriginal occupation may be considered unlikely to occur within the Project site.

Aboriginal Objects, should they occur in the Project site, would consist of isolated artefacts and stone artefact scatters (open campsites); stone quarries; and scarred trees.

## 7. FIELD SURVEY: ABORIGINAL CULTURAL HERITAGE

### 7.1 Survey Team

The Project site is within the area administered for Aboriginal cultural heritage purposes by the Glen Innes LALC. A pedestrian survey for Aboriginal cultural heritage of the Project site was undertaken by Jayden Potter, Sites Officers of the Glen Innes LALC and Tim Hill of Everick Heritage Consultants on 16 August 2016.

### 7.2 Assessment Methods

The field assessment methods aimed to inspect exposed ground surfaces as conditions would allow; to record any archaeological material found and assess its significance; and assess the potential for concealed Aboriginal archaeological sites. The assessment also aims to establish if there are sites or areas of a non-archaeological nature significant to the Aboriginal community. At this stage of the assessment this is through consultation with Glen Innes LALC.

The archaeological field assessment targeted areas which were considered to have increased archaeological potential and was not restricted to the project footprint. This included areas of outcropping rock (basalt) and mature trees to the north of the proposed quarry. The inclusion of areas with higher archaeological potential within the Study was undertaken to contextualise any finds within the project footprint. Mature trees which were Parallel and meandering pedestrian transects were undertaken across the Project site.

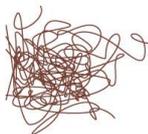


Photographs were taken as a record of general features and conditions and to document the degree of surface visibility. Notes were made of the degree of surface visibility, the area of visibility, ground cover, land uses and any other relevant features. In addition to assessing the cultural heritage potential of the Project site, the survey aimed to confirm the interpretation of the nature and degree of ground disturbance observed in historical aerial photographs and satellite imagery.

For purposes of analysis the Quarry Area is treated as two separate landform units, being ridge crests and slopes (Figure 3 and Figure 4). The Quarry Area was predominately located on a steep slope with only the southern section comprising ridge crest, which in this instance was very flat. The remainder of the Project site comprised moderately step slopes, ridge crests and large outcrops of basalt. A summary of the landscape features and broad disturbance types within each survey unit are listed in Table 1.



**Figure 3: Typical vegetation of the Quarry area (looking east).**



**Figure 4: Typical vegetation of the Quarry area (looking west).**

**Table 1: Summary of Environment and Ground Disturbance for Survey Units.**

<b>Survey Unit</b>	<b>Environmental Description</b>	<b>Ground Disturbance Summary</b>
Slopes	Open pastured grassland with isolated large gums.	Land clearing, Cattle disturbance. Several fences/ paddocks occur across the survey unit.
Ridge Crest	Open pastured grassland with isolated large gums.	Land clearing, Cattle disturbance. Several fences/ paddocks occur across the survey unit.



### 7.3 Constraints to Site Detection

An assessment of the constraints to site detection is made to assist in formulating a view as to the effectiveness of the field inspection to find Aboriginal sites and cultural heritage materials. It also assists in the forming of a view of the likelihood of concealed sites, keeping in mind a site specific knowledge of the disturbance impacts that European land uses and natural processes may have had on the 'survivability' of Aboriginal sites in a Project site.

The constraints to site detection are almost always mostly influenced by post European settlement land uses and seldom by natural erosion processes. The area of surface exposure and the degree of surface visibility within exposed surfaces are usually the product of 'recent' land uses for example land clearing, ploughing, road construction, natural erosion and accelerated (manmade) erosion (McDonald et .al. 1990:92).

In this case the major 'manmade' constraints to Aboriginal site survivability and detection are due to the clearing of original forest and the subsequent impacts of grazing which through, what is called taphonomic processes, can have the effect of accelerating artefact movement downward through soft soils. Detection of Aboriginal archaeological sites in the Project site is severely limited by closed ground cover. Vegetation has been cleared in the past however several large gum trees still stand within the Project site. No evidence of mass movement and erosion of soils was noted throughout the Project site. The Project site has undergone ground 'disturbance' as defined by the Due Diligence Code, being 'ploughing' and 'clearing vegetation' and it is unlikely that any soils in the upper 300mm contain original surfaces.

### 7.4 Survey Coverage

To achieve as thorough and effective an archaeological assessment as possible a systematic ground survey of all mature trees was undertaken in addition to a sample pedestrian survey of ground surfaces. The following summarises the broad conditions for the survey of each unit within the Project site (Figure 5):

Slopes. Closed ground covers with limited areas of surface exposure. Light soils derived from granites typical of the New England Tablelands. Grasses were a mix of natives and introduced species and were actively grazed at the time of survey. Slopes were typically moderately steep.

Ridge Crests. Closed ground covers with limited areas of surface exposure. Light soils derived from granites and basalts typical of the New England Tablelands. Grasses were a mix of natives and introduced species and were actively grazed at the time of survey.



Table 3 and Table 2 present information on the extent to which the survey data provides sufficient evidence for an evaluation of the distribution of archaeological materials across the Project site. The evaluation of survey coverage provides a measure of the potential for the survey unit to reveal archaeological evidence. The calculations in Table 2 and Table 3 do not provide an exact percentages, but reasonable estimates.

**Table 2: Survey Coverage.**

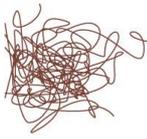
<b>Survey Unit</b>	<b>Landform</b>	<b>Area (m<sup>2</sup>)</b>	<b>Visibility (%)</b>	<b>Exposure (%)</b>	<b>Effective Coverage Area (m<sup>2</sup>)</b>	<b>Effective Coverage (%)</b>	<b>Sites Found</b>
Trans 1	Ridge Crest	7000	25	10	87	2.5	0
Trans 2	Ridge Crest	4600	25	10	115	2.5	0
Trans 3	Ridge Crest	5500	25	10	138	2.5	0
Trans 4	Ridge Crest	4400	25	10	110	2.5	0

**Table 3: Landform summary- sampled areas.**

<b>Landform</b>	<b>Landform Area (m<sup>2</sup>)</b>	<b>Area Effectively surveyed (m<sup>2</sup>)</b>	<b>% of Landform effectively surveyed</b>	<b>Number of sites</b>	<b>Number of artefacts</b>
Slopes	45 600	0	0	0	0
Ridge Crest	56 900	450	0.8	0	0

The following should be considered when reviewing the effectiveness of the survey and the survey results;

- a) the target total survey area for pedestrian transects was biased towards the ridge crests and basalt outcrops where it was expected that Aboriginal sites, should they occur in the Project site, would be situated;
- b) the steeper slopes were not considered to have potential to contain archaeological materials, considering the results from the ridge crests, and were not surveyed;
- c) while the area was predominately grass, the grass cover was short due to grazing from sheep and was not considered a significant constraint on the effectiveness of the survey; and
- d) the overall low likelihood of identifying sites within the Project site primarily due to the absence of water or suitable stone material for knapping.



## 7.5 Survey Results and Discussion

No Aboriginal Objects were identified during the archaeological survey.

No relics of historic (non-Indigenous) significance were identified during the site inspection.

With regard to potential archaeological deposits (as defined by the Due Diligence Code of Practice) no areas were specifically identified as meeting these criteria.

The following considerations are relevant to the findings of this study;

- a) It would be expected that should archaeological materials be present in the topsoil layer of the Project site there would be some surface expression of these sites given the short ground cover;
- b) As the Project site is in the upper watershed better sources of water are likely to occur to the north of the Project site on Back Plains Creek and to the south east on Wellingrove Creek;
- c) the only locally available raw materials observed are local basalts which are of poor quality in terms of knapping and tool production; and
- d) the soils of the plateau are known to be quite thin and disturbed from grazing and tilling in the historic period.

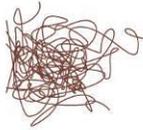
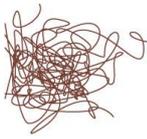


Figure 5: Map of survey transects (approx.).



## 8. CONCLUSIONS AND RECOMMENDATIONS

The assessment of the proposed Wattle Vale Quarry included four pedestrian transects over the quarry area and the surrounding landscape which were determined to have the potential to contain archaeological sites. This survey was affected by grass growth, however grass cover was not considered to significantly constrain the survey. Based on the distance of the Project site from water, the absence of archaeological materials at surface and the extent of historic land clearing the Project site is not considered to be a Potential Archaeological Deposit. **No items of European heritage value were identified during the survey. As such, no further recommendations for historic heritage are required.**

No items of European heritage value were identified during the survey. As such, no further recommendations for historic heritage are required.

The Consultant is of the opinion that the proposed works are unlikely to lead to harm to Aboriginal objects. However as a precautionary measure the following recommendations are provided:

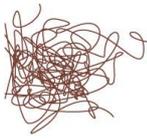
### Recommendation 1: Aboriginal Object Find Procedure.

If it is suspected that Aboriginal material has been uncovered as a result of development activities within the Project site:

- a) work in the surrounding area is to stop immediately;
- b) a temporary fence is to be erected around the site, with a buffer zone of at least 10 metres around the known edge of the site;
- c) an appropriately qualified archaeological consultant is to be engaged to identify the material; and
- d) if the material is found to be of Aboriginal origin, the Aboriginal community is to be consulted in a manner as outlined in the *ACHCRP Guidelines* (2010).

### Recommendation 2: Aboriginal Human Remains

Although it is unlikely that Human Remains will be located at any stage during earthworks within the Project site, should this event arise it is recommended that all works must halt in the immediate area to prevent any further impacts to the remains. The Site should be cordoned off and the remains themselves should be left untouched. The nearest police station (Glen Innes), the Glen Innes LALC and the OEH Regional Office (Coffs Harbour) are all to be notified as soon as possible. If the remains are found to be of Aboriginal origin and the police do not wish to investigate the Site for criminal activities, the Aboriginal community and the OEH should be consulted as to how



the remains should be dealt with. Work may only resume after agreement is reached between all notified parties, provided it is in accordance with all parties' statutory obligations.

It is also recommended that in all dealings with Aboriginal human remains, the Proponent should use respectful language, bearing in mind that they are the remains of Aboriginal people rather than scientific specimens.

### Recommendation 3: Conservation Principles

It is recommended that all effort must be taken to avoid any impacts on Aboriginal Cultural Heritage values at all stages during the development works. If impacts are unavoidable, mitigation measures should be negotiated between the Proponent, OEH and the Aboriginal community.



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# **Appendix E** Flora and Fauna Impact Assessment



**Glen Innes Severn Council**  
Wattle Vale Quarry  
Flora and Fauna Impact Assessment

December 2016

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# 1. Introduction

## 1.1 Overview

An Environmental Impact Statement (EIS) is being prepared by GHD to assess the significance of the potential environmental impacts associated with the establishment of Wattle Vale Quarry. The EIS has been undertaken in accordance with the *Environmental Planning and Assessment Act, 1979* (EP&A Act) and the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation). The proposal is being determined under Part 4 of the EP&A Act.

This Biodiversity Assessment has been prepared as a supporting document to the EIS. It assesses the potential for impacts on ecological values, with particular emphasis on threatened ecological communities, populations and species listed under the NSW *Threatened Species Conservation Act 1995* (TSC Act) and *Fisheries Management Act 1994* (FM Act), and Matters of National Environmental Significance listed under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). Mitigation measures to ameliorate potential impacts of the proposal are included in Section 7 of this report.

The Project involves the establishment of a hard rock quarry with an extraction rate of 300,000 tonnes per year. The total disturbance area of the quarry is approximately 8 hectares which includes an extraction area of approximately 6 hectares.

Project activities will be generally as follows:

- Progressive installation of environmental controls including erosion and sediment control measures.
- Construction of the intersection with the highway and signage.
- Construction of fencing.
- Delineation of the site and stockpiling areas.
- Vegetation clearance, soil stripping and stockpiling.
- Construction of temporary drainage controls.
- Expanded quarry operations.
- Establish site office and weighbridge.
- Close and rehabilitate the quarry.

## 1.2 Construction

The construction phase of the quarry would be relatively short (i.e. about 1 month). The main activity would be the construction of the access road. Other activities would be:

- Progressive installation of environmental controls including erosion and sediment control measures.
- Vegetation clearance within the proposed extraction area, soil stripping and stockpiling.
- Construction of temporary drainage controls.

A dozer, excavator and haul trucks are the main pieces of equipment likely to be required during construction. Other equipment may include:

- Roller
- Grader
- Water cart
- Compactor
- Light vehicles
- Hand tools

### **1.3 Operation**

The quarry operations would be carried out in stages and in response to demand.

Stripping would occur in stages prior to excavation, generally stripping each area immediately prior to quarrying. Overburden would either be stockpiled for future rehabilitation works, or placed in final location as voids are created. The total area of the quarry would be stripped with excavation continuing to establish a quarry face of about 7 metres.

Excavation would commence on the western side of the disturbed area and continue in an easterly direction.

Once the first bench has been exhausted, a second 7 metre wide bench would be established and the process would be repeated until the final depth of approximately 20 metres below the current ground level (i.e, 1,160 m Australian Height Datum (AHD) is reached.

#### **1.3.1 Drilling and blasting**

Overlying weathered material will be removed using bulldozers and excavators. Underlying fresh rock will require blasting.

Blasting will be strictly controlled and conducted by a suitably qualified blasting contractor who will bring explosives onto site as required and fill a series of holes pre-drilled by a separate drilling contractor.

Bulk emulsion explosives such as Ammonium Nitrate Fuel Oil will be used. Following blasting, all blasting equipment and any unused explosives will be removed from site. No explosives would be stored on the Project site. Blasting will be undertaken in 20- 30,000 tonne shots similar to the existing Glen Innes Aggregates site. It is anticipated that up to one blast per month would be required.

#### **1.3.1 Crushing and screening**

Contractors would crush and screen the extracted material using mobile plant positioned close to the extraction area. An excavator would feed the excavated rock into a mobile primary crusher. The primary crusher will pass material to a secondary mobile crusher and then to the screening plant to sort the crushed aggregate into different grades depending on market demand. The screening plant will discharge into a stockpile area using a radial stacking conveyor.

#### **1.3.2 Stockpiling**

Material would be stockpiled in designated areas close to the respective pits. Material would be stored in various grades for sale or distribution. Ridge gravels may be brought to site from time to time to blend road base products. These components may form up to 10% of the finished product.

## **1.4 Extraction rate**

The Project will extract up to 300,000 tonnes of material per annum. The actual extraction rate per annum will be dictated by demand requirements, however extraction will not exceed 300,000 tonnes in any twelve-month period. The total available resource is estimated to be 2.1 million tonnes.

The maximum extraction rate of 300,000 tonnes per annum has been selected to allow sufficient capacity to service demand during the construction of the proposed wind farms in the area. Once the wind farms have been constructed, it is anticipated the extraction rate would reduce to less than 100,000 tonnes per annum.

The maximum daily extraction and haul rate would be about 3,000 tonnes but this extraction rate would be rare.

The volume of material extracted from the quarry would be recorded using either a weighbridge or a loader with scales.

## **1.5 Project life and working hours**

As the demand for product from the site will vary depending on the progress of certain major projects and fluctuating market conditions, it is not possible to put firm durations on each stage of activity. However, the quarry is expected to commence operation in late 2016 and be in operation for at least 30 years.

Operations would generally be limited to the following times:

- Monday to Friday: 7.00 am to 5.00 pm
- Saturday: 8.00 am to 4.00 pm
- No work on Sundays or Public Holidays

Staff may arrive and leave site before and after these times to 'start-up' and 'shut-down' the quarry but excavation, crushing or loading would not occur outside the times specified above. Blasting would only occur on weekdays between the hours of 10 am and 3 pm.

## **1.6 Workforce**

The required workforce for the Project will vary depending on the needs for specific activities (contracted crushing and screening, haulage etc.), however it is anticipated to be up to a maximum of eight staff at any time.

## **1.7 Operational plant and equipment**

Equipment at the quarry will depend on levels of activity which will vary from time to time. A description of the plant and equipment to be used is provided in Table 1-1. The frequency of use is relevant to the periods when the quarry is operating.

As an example, when the quarry is operating, the crusher will be operating 100% of the time but when there is no demand for material, the crusher would not be operating.

**Table 1-1 Proposed quarry plant and equipment**

Type	Approximate Number	Typical Frequency of use during operation	Description
Dozer	1	10%	Clearing and grubbing of vegetation and stripping of topsoil. Rehabilitation
Excavators	2	100%	Excavating material and stockpiling Clearing and grubbing of vegetation and stripping of topsoil
Screen	1	100%	Only for aggregate/gravel production and overburden screening
Front-end Loader	1	100%	Loading material onto the haul trucks and stockpiling material within the pit floor
Jaw, cone and impact crusher	1	100%	Crushing rock
Haul Trucks	Up to 100/day	100%	Delivery of materials to customers and stockpiling in pit if needed and carting unsuitable to rehabilitation areas.
Water Cart	1	10%	To water haul roads and stockpiles
Water Pump	3	10%	To dewater excavation/basin and to fill watercart from standpipe To water stockpiles and put moisture in products
Hand tools	5	5%	General activities maintaining plant
Light vehicles	Up to 12	20%	Transporting staff to, from and around site

## 1.8 Access and traffic

The source, destination and route of light and heavy vehicles accessing the quarry is not possible to predict however it is assumed they would travel via various routes to projects and customers around the area via the Gwydir Highway. Alternate routes may be used to supply aggregate to specific projects, such as the Glen Innes Wind Farm project directly south of the Project site.

The access road from the Gwydir Highway along the public road reserve has been approved as part of the Glen Innes Wind Farm and is not part of this Project. However, the intersections (one in and one out) with the Gwydir Highway will need to be upgraded. It is proposed to upgrade the accesses shared to incorporate CHR(s) and AUL(s) treatments

### 1.8.1 Construction traffic generation

During the construction phase, the traffic generated is expected to be limited to a few heavy vehicle movements at the start and end of the construction. A few light vehicles would also access the site daily during the construction works.

## **1.8.2 Operation traffic generation**

### **Workforce Traffic**

During operation it is likely that there would be a maximum of twelve workers or plant operators on the site at any one time. This would yield a daily workforce traffic generation in the order of 24 vehicle trips per day (vtpd). It is assumed the majority of the workforce would arrive between 6:30 am and 7:30 am and depart generally between 3:00 pm and 6:30 pm.

### **Heavy Vehicle Traffic**

Truck and dog trailer combinations have a capacity of about 32 tonnes. At maximum daily production (i.e. 3,000 tonnes), the quarry is expected to generate about 100 truck and dog loads or 200 truck movements per day. The truck movements would start at 7 am and continue evenly throughout the day, until 5 pm.

During the construction of the Glen Innes Wind Farm, not all truck movements will enter the Gwydir Highway, as the Glen Innes Wind Farm is accessed directly from Wattle Vale to the south on roads to be constructed as part of that project.

This rate of maximum truck movements is expected to be infrequent and for short durations. The average number of truck movements is expected to be a lot less and there will be times when no trucks would be operating.

## **1.9 Site facilities**

### **1.9.1 Site drainage**

Surface flows from the quarry (rainfall or groundwater ingress) would drain to sedimentation ponds (either freely or by pumping depending on the stage of quarrying). Following an appropriate settling time for suspended sediments, water from these dams would discharge to a series of drainage lines that lead to Wellingrove Creek and the Severn River.

Surface runoff from uphill will be prevented from entering the quarry by means of diversion drains along the southern edge.

All sediment and erosion controls will be designed and implemented in accordance with the *NSW Soils and Construction – Managing Urban Stormwater Volume 1 ‘the Blue Book’* (Landcom, 2004).

### **1.9.2 Dust suppression**

During dry conditions, exposed areas will be sprayed with water from a water cart to suppress dust. Water will be sourced from the sediment basin, which will be oversized to allow for water storage while still allowing sufficient capacity to meet the Blue Book requirements.

### **1.9.3 Site offices**

In the initial stages of the Project operation, the site will be managed from the existing operation in Glen Innes and no infrastructure beyond road, fencing and stockpile hardstands will be required. At some point in the future, an office, weighbridge and public carpark will be constructed adjacent to the access road.

### **1.9.4 Fuel storage**

Mobile plant refuelling will take place on site from a self-bunded portable fuel store with a capacity of up to 10,000 litres. All scheduled plant and equipment maintenance will take place off site.

### **1.9.5 Lighting**

Quarrying will be limited to daylight hours, avoiding the need for lighting.

### **1.9.6 Utilities**

A rainwater tank will be connected to the site office to service the toilets and hand basin but water for domestic uses will be imported to site. Water for dust suppression and vehicle washing will be obtained from the sediment basin.

Toilet facilities will be provided with effluent being treated and disposed onsite via a septic tank.

Power is not required to operate the quarry.

### **1.9.7 Waste Management**

Small amounts of domestic refuse generated on site will be removed for recycling or disposal at a suitably licensed landfill. The extraction is not expected to generate any waste material, as all extracted material will be either sold as a product or retained for reuse during rehabilitation.

## **1.10 Decommissioning and rehabilitation**

### **1.10.1 Storage of topsoil and overburden**

Topsoil would be stripped and stored on site during the site construction phase. Overburden not suitable for aggregate will be stockpiled for use in rehabilitation. Stockpiled overburden would be stabilised in accordance with the Blue Book.

### **1.10.2 Rehabilitation**

Following completion of quarrying, areas that are no longer in use will be landscaped and progressively rehabilitated. Rehabilitation will generally involve:

- Removal of all structures, equipment and other materials from the works area.
- Earthworks and landscaping to reform the land to maximum 3:1 batter slopes with a minimum 0.5% grade to allow free drainage to a small existing farm dam to the west which will act as a sediment basin.
- Revegetation will use native species to match existing conditions.
- Erosion and sedimentation control would remain in place until the site is appropriately reinstated and revegetated.

Access roads will be retained for future uses.

## **1.11 Scope and limitations**

This report: has been prepared by GHD for Glen Innes Severn Council and may only be used and relied on by Glen Innes Severn Council for the purpose agreed between GHD and Glen Innes Severn Council as set out in section 1 of this report.

GHD otherwise disclaims responsibility to any person other than Glen Innes Severn Council arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no

responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

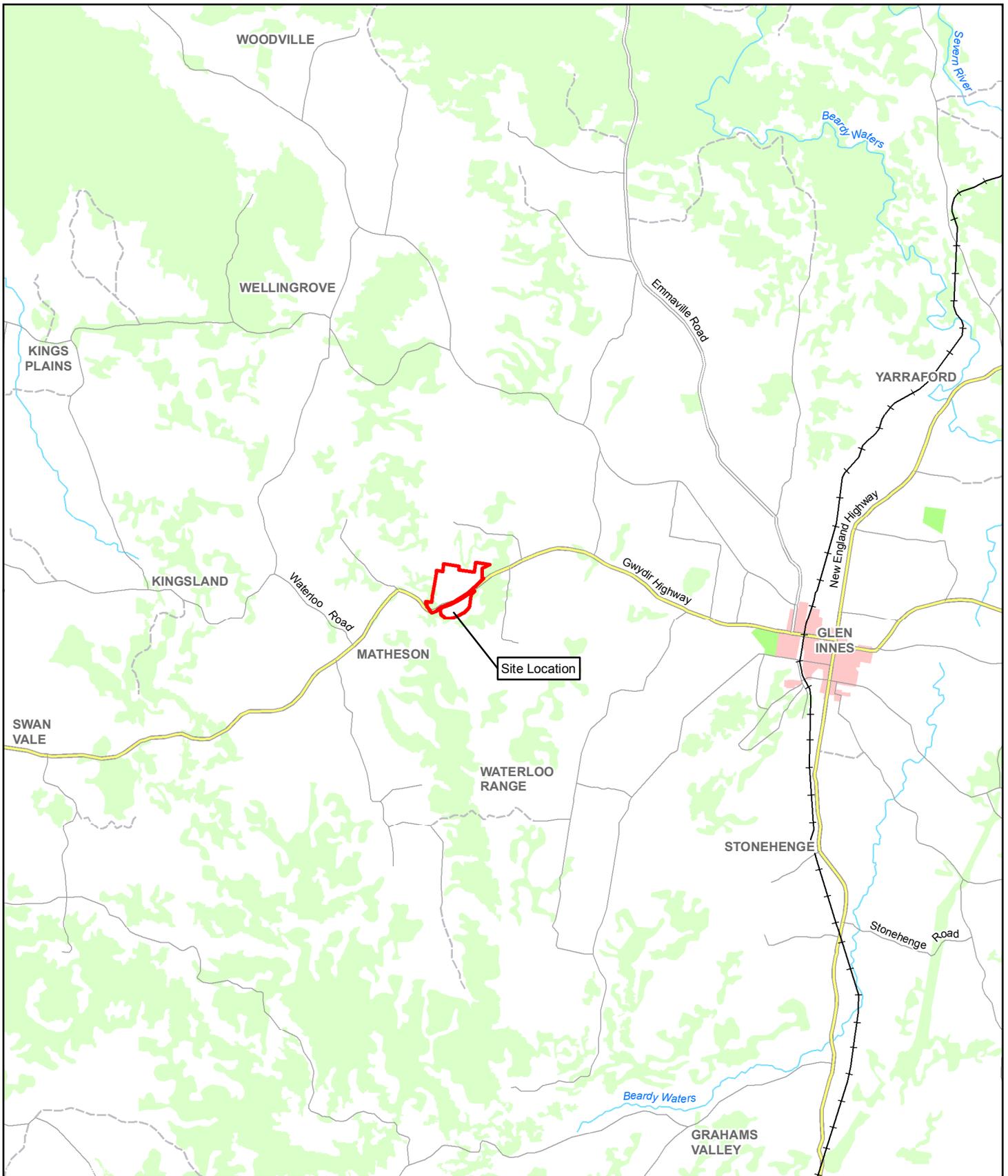
The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section 1 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Glen Innes Severn Council and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

Site conditions (including the presence of hazardous substances and/or site contamination) may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.



Principal Road	Railway	Recreation Area
Secondary Road	Watercourse	Forest Or Shrub
Minor Road	Built Up Area	Project boundary
Track		

Paper Size A4  
 0 0.75 1.5 3 4.5 6  
 Kilometres  
 Map Projection: Mercator Auxiliary Sphere  
 Horizontal Datum: WGS 1984  
 Grid: WGS 1984 Web Mercator Auxiliary Sphere



Glen Innes Severn Council  
 Wattle Vale Quarry  
 Flora and Fauna Impact Assessment

Job Number 22-18380  
 Revision A  
 Date 08 Nov 2016

Site location

Figure 1-1

G:\22\18380\GIS\Maps\Deliverables\SouthernQuarryEIS\FloraFauna\2218380\_SQFFA001\_SiteLocality\_A.mxd  
 Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 T 61 2 4979 9999 F 61 2 4979 9988 E ntm@mail@ghd.com W www.ghd.com.au

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Data source: Geoscience Australia: 250k Topographic Data Series 3, 2006. Created by: fmackay

## 2. Legislative context

### 2.1 NSW legislation

#### 2.1.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) forms the legal and policy platform for proposal assessment and approval in NSW and aims to 'encourage the proper management, development and conservation of natural and artificial resources'. All development in NSW is assessed in accordance with the provisions of the EP&A Act and EP&A Regulation 2000. The proposal will be assessed under Part 4 of the EP&A Act with Glen Innes Severn Council as the determining authority.

Section 111(4) of the Act states that the determining authority must consider the effect of an activity on:

- 'Critical habitat' (as defined under the TSC Act and FM Act).
- Species, populations or ecological communities, or their habitats (as listed under the TSC Act and FM Act) and whether there is likely to be a 'significant effect' on those species, populations or ecological communities.
- Other protected fauna or protected native plants listed under the National Parks and Wildlife Act 1974.

This study assesses the likelihood of threatened biota listed under the TSC Act occurring in the study area and their potential to be impacted by the proposal. Section 5A of the EP&A Act lists seven factors that must be taken into account in the determination of the significance of potential impacts of a proposed activity on threatened species, populations or ecological communities (or their habitats) listed under the TSC Act and the FM Act. The '7-part test' is used to assist in the determination of whether a proposal is 'likely' to impose 'a significant effect' on threatened biota and thus whether a species impact statement (SIS) is required. Section 5A of the EP&A Act was addressed as part of the current assessment and 7-part tests were completed for relevant threatened species and ecological communities that are likely to be affected by the proposal. These assessments are included in Appendix C.

#### 2.1.2 Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act 1995* (TSC Act) provides legal status for biota of conservation significance in NSW. The Act aims to 'conserve biological diversity and promote ecologically sustainable development'. It provides for:

The listing of 'threatened species, populations and ecological communities', with endangered species, populations and communities listed under Schedule 1, 'critically endangered' species and communities listed under Schedule 1A, vulnerable species and communities listed under Schedule 2.

- The listing of 'Key Threatening Processes' (under Schedule 3).
- The preparation and implementation of Recovery Plans and Threat Abatement Plans.
- Requirements or otherwise for the preparation of Species Impact Statement (SIS).

The TSC Act has been addressed in the current assessment through:

- Desktop review to determine the threatened species, populations or ecological communities that have been previously recorded within the locality of the site or have distributions that encompass the study area and hence could occur subject to the habitats present.
- Targeted field surveys for threatened species, populations and ecological communities listed under the Act.
- Identification, assessment and mapping of EECs and threatened species (or their habitat) listed under the Act.
- Assessment of potential impacts on threatened species, populations and ecological communities listed under the Act.

### **2.1.3 Fisheries Management Act 1994**

The objects of the *Fisheries Management Act 1994* (FM Act) are to conserve, develop and share the fishery resources of the State for the benefit of present and future generations. It provides for:

- The listing of threatened species, populations and ecological communities, with endangered species, populations and communities listed under Schedule 4, 'critically endangered' species and communities listed under Schedule 4A, and vulnerable species and communities listed under Schedule 5.
- The listing of 'Key Threatening Processes' (under Schedule 6).
- Diseases affecting fish and marine vegetation (under Schedule 6B).
- Noxious fish and noxious marine vegetation (under Schedule 6C).
- The preparation and implementation of Recovery Plans and Threat Abatement Plans.
- Requirements or otherwise for the preparation of a SIS.

One of the objectives of the FM Act is to 'conserve key fish habitats ' which includes aquatic habitats that are important to the maintenance of fish populations generally and the survival and recovery of threatened aquatic species.

Given that no works will be undertaken within creeks, no dredging or de-snagging would occur, and there would be no blocking (permanent or temporary) of fish passage or impacts on key fish habitat.

The FM Act has been addressed in the current assessment through undertaking:

- A desktop review to determine the threatened species, populations or ecological communities that have been previously recorded within the locality of the proposal and hence could occur subject to the habitats present.
- Assessment of aquatic habitats during terrestrial field surveys.
- Assessment of impacts on aquatic habitats.
- Assessment of the potential for impacts on threatened species, populations and ecological communities listed under the Act.
- Identification of suitable impact mitigation and environmental management measures to avoid or mitigate impacts on the aquatic environment.

### **2.1.4 Native Vegetation Act 2003**

The *Native Vegetation Act 2003* (NV Act) regulates the clearing of native vegetation on all land in NSW except for land listed in Schedule 1 of the Act. Excluded land under Schedule 1 of the Act includes National Parks and other conservation areas, State forests and reserves, and urban areas.

The NV Act does not apply to the clearing of native vegetation that is, or is part of, designated development within the meaning of the EPA Act and for which development consent has been granted.

### **2.1.5 Noxious Weeds Act 1993**

The *Noxious Weeds Act 1993* (NW Act), provides for the declaration of noxious weeds by the Minister for Primary Industries. Noxious weeds may be considered noxious on a National, State, Regional or Local scale. All private landowners, occupiers, public authorities and Councils are required to control noxious weeds on their land under Part 3 Division 1 of the NW Act. This report has identified noxious weeds in the study area and appropriate mitigation measures to minimise the potential introduction or spread of weeds as a result of the proposal.

## **2.2 State planning policies**

### **2.2.1 SEPP 44: Koala Habitat**

State Environmental Planning Policy 44 (SEPP 44) aims to encourage the 'proper conservation and management of areas of natural vegetation that provide habitat for Koalas (*Phascolarctos cinereus*) to ensure a permanent free-living population over their present range and reverse the current trend of Koala population decline'.

Schedule 1 of SEPP No. 44 identifies areas of land that are classified as being 'Core Koala Habitat' or 'Potential Koala Habitat'. They are defined as follows:

- Core Koala Habitat is an area of land with a resident population of koalas, evidenced by attributes such as breeding females (that is, females with young) and recent sightings of and historical records of a population.
- Potential Koala Habitat are areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15 per cent of the total number of trees in the upper or lower strata of the tree component.

Under SEPP 44, if core Koala habitat is to be impacted by a proposal, an approved Koala Plan of Management is required prior to approval of the proposed development.

## **2.3 Commonwealth legislation**

### **2.3.1 Environment Protection and Biodiversity Conservation Act 1999**

The purpose of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is to ensure that actions likely to cause a significant impact on MNES undergo an assessment and approval process. Under the EPBC Act, an action includes a proposal, undertaking, proposal or activity. An action that 'has, will have or is likely to have a significant impact on a matter of national environmental significance' is deemed to be a 'controlled action' and may not be undertaken without prior approval from the Australian Government Minister for the Environment (the 'Minister').

The EPBC Act identifies MNES as:

- World heritage properties.
- National heritage places.
- Wetlands of international importance (Ramsar wetlands).
- Threatened species and ecological communities.
- Migratory species.
- Commonwealth marine areas.
- The Great Barrier Reef Marine Park.
- Nuclear actions (including uranium mining).
- A water resource, in relation to coal seam gas development and large coal mining development.

Potential impacts on any MNES must be subject to assessments of significance pursuant to the EPBC Act Significant Impact Guidelines (DotE, 2013). If a significant impact is considered likely, a referral under the EPBC Act must be submitted to the Minister.

This study assesses the likelihood of MNES occurring in the study area and their potential to be impacted by the proposal. Assessments of significance for relevant MNES are included in Appendix D.

## **2.4 Local environmental planning instruments**

### **2.4.1 The Glen Innes Severn Local Environmental Plan 2012**

The proposal is wholly located within the Glen Innes Severn LGA. The *Glen Innes Severn Local Environmental Plan 2012* (Glen Innes Severn Council LEP 2012) controls development within the LGA.

The proposal is located on land within zone RU1 (Primary Production). The objectives of zone RU1 are:

- *To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.*
- *To encourage diversity in primary industry enterprises and systems appropriate for the area.*
- *To minimise the fragmentation and alienation of resource lands.*
- *To minimise conflict between land uses within this zone and land uses within adjoining zones'.*

Under the provisions of zone RU1, extractive industries are permissible with consent.

## 3. Existing environment

### 3.1 Site description

The study area is approximately 8 hectares in area which includes an extraction area of approximately 7.76 hectares and sits on undulating pasture land on the edge of the Waterloo range, a low lying north-south belt of hills to the west of Glen Innes (see Plate 3-1 below). The surrounding area is relatively sparsely populated. The closest residence lies approximately 1,200 m to the east of the study area.



**Plate 3-1 Southern portion of the study area**

#### 3.1.1 Neighbouring settlements

The nearest population centre to the study area is Glen Innes which is located approximately 13 km to the east. Other residences and settlements in the vicinity of the study area include:

- A small hamlet 1.3 km to the north of the study area on Malboona Road.
- Individual farm properties:
  - 1.7 km west at the entrance to Pitlochry Road
  - 1.5 km east Rose Hill Road
  - 2 km northeast on Malboona Road
  - 2.3 km east of on the Gwydir Highway

The proposed Glen Innes Wind Farm is located to the immediate south of the Project site. The wind farm has a current project approval for the construction and operation of up to 25 wind turbines each with a potential capacity of 3 Megawatts (MW), to produce enough energy to power approximately 47,000 homes (One Wind, 2016). The wind farm is currently moving into the construction phase.

### **3.1.2 Site history**

The study area predominately consists of cleared land that is currently being used as pasture. The study area includes a three-bedroom home and sheds, and is under occupation by the former owners for six months as a condition of the contract of sale.

There are no existing extractive industries on the study area, however there is a small roadside quarry on crown/council road reserve adjacent to the site that has not operated for some years.

### **3.1.3 Topography and drainage**

The study area occurs on land with a gentle slope leading to a ridge with an elevation of approximately 1,190 m Australian Height Datum (AHD).

The proposed extraction pit occurs close to the top of a ridge at around 1,180 m AHD.

An unnamed tributary of Backplain Creek runs through the study area (see Figure 3-1). Backplain Creek is a tributary of the Wellingrove Creek flowing into the Severn River. A number of small farm dams are located throughout the study area.

### **3.1.4 Ownership**

The study area is located on Lot 1 of DP 728579, Lots 133 and 134 of DP 753274, and Lots 249, 174, 253, 101, 175, 87 and 113 of DP 753319. Council has recently acquired this land.

### **3.1.5 Other proposed or consented activities**

Council have entered into preliminary discussions with Glen Innes Wind Farm (One Wind) regarding a shared entrance to the quarry and the wind farm off Gwydir Highway, plus a modification to their approval to incorporate three or four wind turbines on the Wattle Vale property. The shared entrance will be assessed as part of the Project. The modification to the wind turbine locations would be assessed by One Wind as a modification to their approval.

## **3.2 Regional context**

The study area occurs in the Glen Innes Severn Council Local Government Area (LGA) in the New England area of NSW, approximately 13 km west of Glen Innes. The LGA covers an area of approximately 5,487 km<sup>2</sup> with a population of around 9,000 people and lies within the Border Rivers-Gwydir region.

The Glen Innes area is primarily known for its agricultural enterprises with Glen Innes providing an important centre for livestock sales. Key industries in the region include wool, sheep, cattle, agriculture, viticulture, sapphires and tourism. Renewable energy is a growing industry in the region with three wind farms and one solar farm recently approved.