Appendix E Technical Working Paper: Cultural heritage

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EXECUTIVE SUMMARY

Introduction

The proposed upgrade of the Pacific Highway at Glenugie (the project) forms part of the Pacific Highway Upgrade Program, a joint commitment by the New South Wales (NSW) and Australian Governments to upgrade the standard of the Pacific Highway between Hexham and the Queensland border to a four lane highway.

The project would involve the construction of approximately seven kilometres of the Pacific Highway, along the 71 km alignment defined in the Wells Crossing to Iluka Road Concept Design Report (RTA 2009a). The project would be located between approximately 61 and 68 km north of Coffs Harbour. The northern end of the project is approximately 15 km south of Grafton.

The preferred route for the upgrade of the Pacific Highway at Glenugie has been identified and developed as part of the proposed Wells Crossing to Iluka Road Pacific Highway upgrade, which has been declared to be a project to which Part 3A of the NSW *Environmental Planning and Assessment Act* 1979 (EP&A Act) applies. The project has also been declared to be critical infrastructure under the EP&A Act.

This report provides a cultural heritage assessment for the project based substantially on the analysis conducted for the assessment of the Wells Crossing to Iluka Road Pacific Highway upgrade, and focused on the Director-General's requirements for the separate Glenugie assessment.

Aboriginal consultation

The Aboriginal community consultation conducted for the Glenugie upgrade section forms part of, and builds upon, an existing and on-going consultation program conducted for the larger Wells Crossing to Iluka Pacific Highway upgrade project. This has included seven Aboriginal Focus Groups since 2005 and a program of field survey participation. Since its inception, the consultation program has complied with successive RTA procedures and policies for Aboriginal heritage investigations, and since the identification of a preferred route alignment in 2006, has complied with the DECC *Interim Community Consultation Requirements for Applicants*. Stakeholder registrations were invited via print media advertising in February/March and again in June of 2007. Registrations confirmed the established stakeholders previously identified for the program.

The Glenugie upgrade study area falls within the area of interest of four Aboriginal community organisations comprising: the Grafton-Ngerrie Local Aboriginal Land Council; the Yaegl Native Title Group; the Yarrawarra Aboriginal Corporation (including the Garby Elders); and the Burra:way Wa:jad Traditional Owners group. Comprehensive (and ongoing) consultation has been undertaken with all of these groups and each has variously opted for degrees of representation and participation in fieldwork components of the investigation.

A key outcome of the Aboriginal stakeholder consultation program to 2006 was the identification and eventual selection of a route option which avoided direct impact to places of identified major cultural significance.

Archaeological sensitivity

Based on the results of previous archaeological studies and landform based predictive modelling of archaeological potential, the Glenugie upgrade project area can be considered to have low Aboriginal archaeological potential. This is based primarily on the absence of permanent freshwater sources, a relative absence of valley floor and basal slope contexts, and minimal impact to major ridgeline crests.

Field assessment

Archaeological field assessment of the Glenugie upgrade project area has been progressively conducted as part of the Wells Crossing to Iluka project. This has consisted of sample survey during

the route option assessment in 2005, inspection of route options with specific stakeholder groups, such as the Garby Elders in 2006, inspection of proposed geotechnical investigation sites in mid 2007, and comprehensive archaeological survey of the preferred route alignment in late 2007.

Cultural heritage places within the project area

No Aboriginal sites, places, objects or potential archaeological deposits (PADs) have been identified within the Glenugie upgrade project area.

One European historic site, being, part of the remnant 1915 North Coast Railway branch line/ tramway alignment between the existing Pacific Highway and Franklins Road is situated within the project study corridor and will be impacted by upgrade construction. This site is assessed as an item of local heritage significance.

Conclusions and recommendations

1. As no Aboriginal sites, places, objects or potential archaeological deposits (PADs) were identified along the length of the project study corridor; there are no recommended management actions with regard to known sites or PADs.

2. It is recommended that an archival record of an appropriate portion of the remnant historic branch line/tramway alignment within the project study corridor should be created in accordance with the Heritage Council of NSW guidelines prior to the commencement of any disturbance.

3. It is recommended that the protocols be developed and followed in the event that previously unidentified Aboriginal Objects, historical relics, or suspected human remains, respectively, are revealed within the project area.

4. It is recommended that a cultural heritage component be included in the induction program conducted for all construction and in-field personnel.

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1. INTRODUCTION

1.1 The project and study area

The proposed upgrade of the Pacific Highway at Glenugie (the project) forms part of the Pacific Highway Upgrade Program, a joint commitment by the New South Wales (NSW) and Australian Governments to upgrade the standard of the Pacific Highway between Hexham and the Queensland border to a four lane highway. The regional context of the project is shown in **Figure 1-1**. The project is shown in **Figure 1-2** and **Figure 1-3**.

The project would involve the construction of approximately seven kilometres of the Pacific Highway, along the alignment defined in the Wells Crossing to Iluka Road Concept Design Report (RTA 2009a). The project would be located between approximately 61 and 68 km north of Coffs Harbour. The northern end of the project is approximately 15 km south of Grafton (refer to **Figure 1-1**). The study area for this cultural heritage assessment encompasses the existing highway alignment and the proposed new alignment.

The preferred route for the upgrade of the Pacific Highway at Glenugie has been identified and developed as part of the proposed Wells Crossing to Iluka Road Pacific Highway Upgrade project, which has been declared to be a project to which Part 3A of the NSW *Environmental Planning and Assessment Act* 1979 (EP&A Act) applies. The project has also been declared to be critical infrastructure under the EP&A Act. The Glenugie upgrade project falls within these declarations.

The Roads and Traffic Authority of NSW (the RTA) has conducted extensive community consultation, environmental and engineering investigations to help develop a preferred concept design for the proposed Wells Crossing to Iluka Road Pacific Highway Upgrade project. Heritage investigations have been a critical part of the study and have been undertaken and the results considered in each successive stage of the development of the project. Heritage considerations were one of the key considerations in the selection of the preferred route in the Glenugie area. The concept design and more detailed environmental investigations on the preferred route are presented in the Wells Crossing to Iluka Road Concept Design Report (RTA 2009a) and seven technical working papers, including a technical paper that addresses heritage aspects (RTA 2009b). Each of these reports and working papers were made available to the public.

At its southern extent the project will connect with the existing highway alignment near Franklins Road, approximately 60.5 km north of Coffs Harbour (refer to **Figure 1-2**). The route then heads north on the eastern side of the existing Pacific Highway within the Glenugie State Forest. The route involves a minor crossing of the upper reaches of Glenugie Creek and of a number of other intermittent unnamed waterways. The project then continues north before tying in with the existing three lane section of Pacific Highway just to the south of the existing intersection with Eight Mile Lane, approximately 68 km north of Coffs Harbour (approximately 15 km south of Grafton).

Approval is being sought for a motorway style (class M) upgrade (**Figure 1-2**). This would comprise two lanes in each direction, with the capability of a 110 km/hr posted speed through restricting access to the roadway at grade-separated interchanges only. The median would be wide enough to accommodate future upgrading to three lanes in each direction. The environmental assessment would assess the impacts associated with the motorway-style upgrade. This would ensure that all impacts are assessed, should the project be constructed in stages.

Approval is also sought to construct the project in stages (**Figure 1-3**). The likely initial staging could involve a combination of arterial style highway (class A) and motorway style highway. The class A section would be two lanes in each direction, have a 100 km/hr posted speed limit and have limited access.

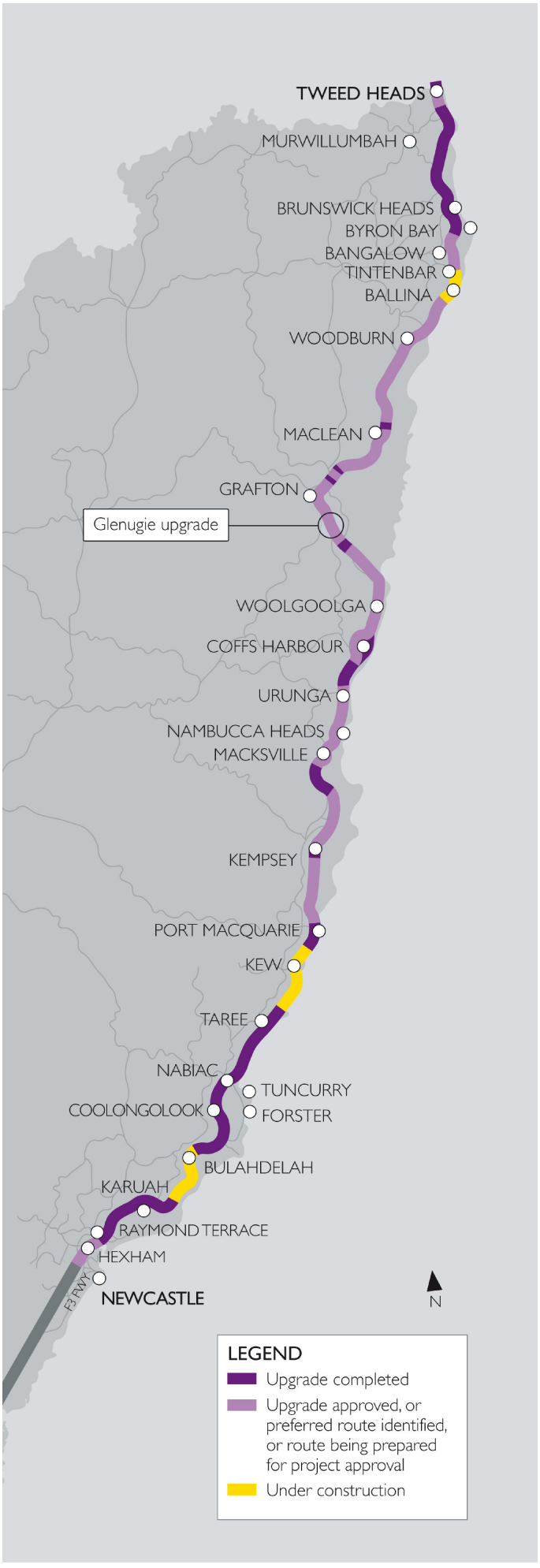
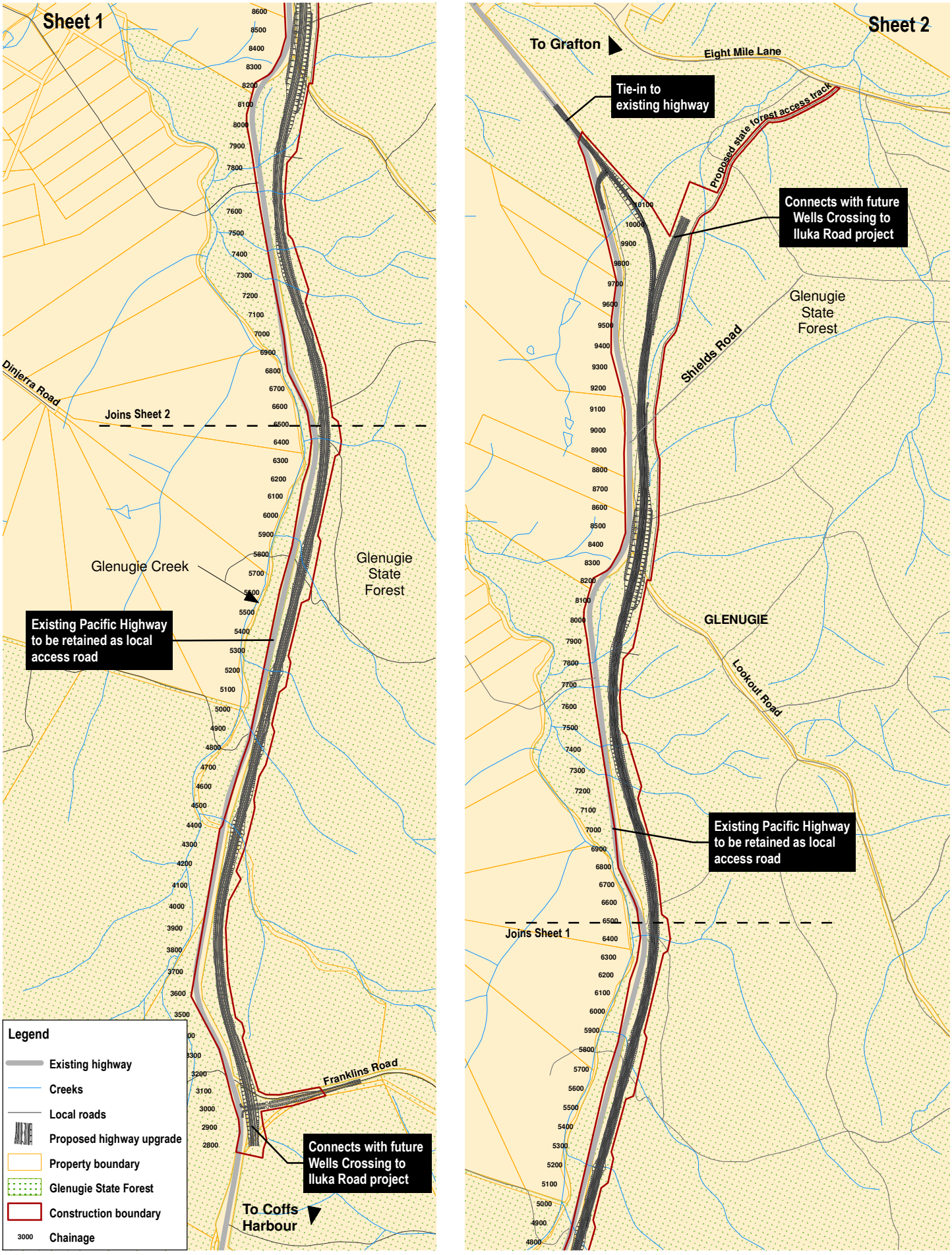


Figure 1-1: Regional context



Data Sources:
LPI, Streetworks

Figure 1-2: The project – Motorway style upgrade proposal

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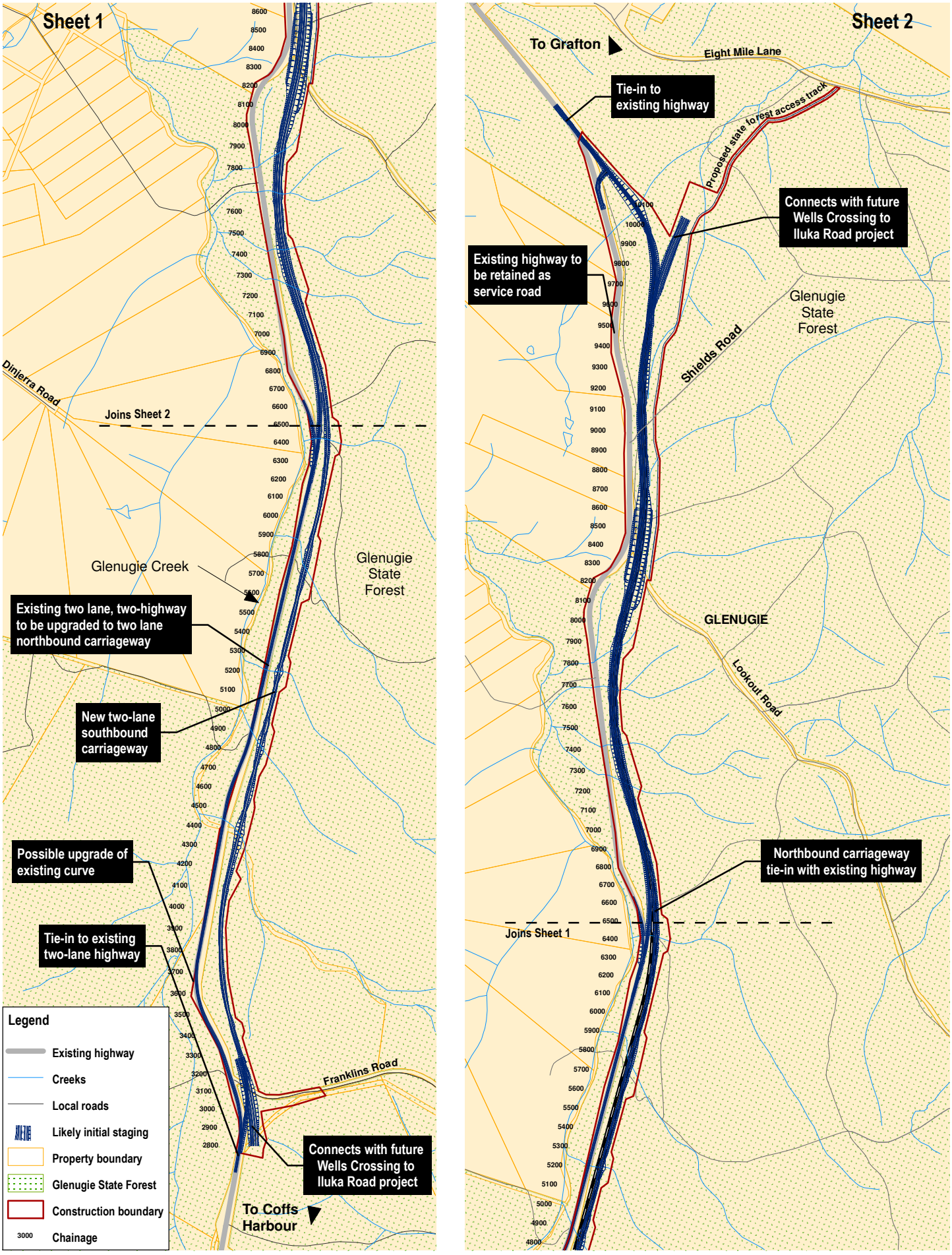

Data Sources:
LPI, Streetworks

Figure 1-3: The project – Likely initial staging

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1.2 Study aims

The objectives of the cultural heritage component of the investigations are to:

- Satisfy the specific cultural heritage requirements identified in the Director-General's Requirements (DGRs) (16/4/09).

  The DGRs provide the following specification under the issue of Aboriginal Cultural Heritage: 'the Environmental Assessment must include an assessment of the potential Aboriginal cultural heritage impacts of the project, including an assessment of objects, places of significance, natural and landscape values of the corridor and surrounding area, taking into account the Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC July 2005).'

  Except for reference to the Australia ICOMOS charter for places of cultural significance (Burra charter) and the NSW Heritage Office 2001 publication on Assessing Heritage Significance, the DGRs provide no specific requirements regarding non-indigenous cultural heritage.

- Provide the results of background research into the study area.
- Provide the results of a comprehensive survey of the proposed route corridor.
- Identify and define Aboriginal archaeological objects, sites and areas of archaeological potential within the corridor.
- Identify and define historical features, sites and areas of archaeological potential within the corridor.
- Consult with the relevant Local Aboriginal Land Councils (LALCs) and other Aboriginal community groups, particularly in order to determine sites of cultural significance; and
- Determine mitigation measures for the management of cultural heritage items within the project study corridor.

Table 1-1 lists the steps in the assessment process specified in the *Draft Guidelines For Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (DEC 2005) and the corresponding sections of this report where these steps are addressed.

Table 1-1 Cultural heritage impact assessment guidelines checklist

Steps in the assessment process	Where addressed in this report
Step 1 Preliminary assessment	Section 1.1 pps 1-4, Section 2 pps 6-10, Section 3 pps 11-14 and 16, Section 7 p.35, Section 9 p. 41, Appendix 1 pps 47-52, Appendix 2 pps 53-55, and Appendix 3 pps 53-58.
Step 2 Information requirements	Section 4 pps 17-19, Section 5 pps 20-29 and Appendix 3 pps 53-58.
Step 3 Integration of information and identification of heritage values	Section 2 pps 6-10, Section 3 pps 11-14 and 16, Section 5 pps 20-30, Section 7 p.35, Section 9 p. 41, Appendix 1 pps 47-52, Appendix 2 pps 53-55 and Appendix 3 pps 53-58.
Step 4 Information regarding the proposed development	Section 3.3 p. 16, Section 5.3 p. 22, Section 5.4 pps 22-24, Section 7.1 p. 35, Section 9.1 p. 41, and Section 10.1 p. 43.

Steps in the assessment process	Where addressed in this report
Step 5 Integration of assessment with proposed development	Section 3.3 p. 16, Section 5.3 p. 22, Section 5.4 pps 22-24, Section 7.1 p. 35, Section 9.1 p. 41 and Section 10.1 p. 43.
Step 6 Management strategy for Aboriginal heritage	Section 3.3 p. 16, Section 5.3 p. 22, Section 5.4 pps 22-24, Section 7.1 p. 35, Section 9.1 p. 41, and Section 10.1 p. 43.

1.3 Report outline

This report:

- Provides an outline of the project.
- Documents the methodology implemented for the study.
- Describes the environmental setting of the study area.
- Provides a background of local and regional archaeology for the study area.
- Provides a background of local and regional history for the study area.
- Documents the results of the field survey of the study area.
- Defines the potential impact of the proposed upgrade on the known and potential cultural heritage resource.
- Provides recommendations for the management and mitigation of cultural heritage sites and values.

2. ABORIGINAL CONSULTATION AND PARTICIPATION

The Aboriginal community consultation conducted for the Glenugie upgrade section forms part of, and builds upon an existing and on-going consultation program conducted for the larger Wells Crossing to Iluka Pacific Highway upgrade project. This program commenced with an inaugural Aboriginal focus Group (AFG) meeting on the 23 May 2005 and followed the upgrade assessment process through a route option analysis to the selection of a preferred alignment in 2006. Three additional AFG meetings were held prior to the selection of the preferred alignment: on the 7 November 2005, 6 February 2006 and the 24 February 2006. These meetings provided a forum for information exchange, and allowed for the accurate identification of stakeholders groups, and places of significance, and promoted discussion of cultural heritage issues and methodologies, field survey participation, and the review of significance assessments and draft reports.

The Wells Crossing to Iluka Pacific Highway upgrade assessment commenced in 2004, prior to the introduction of the then Department of Environment and Conservation *Interim Community Consultation Requirements for Applicants*. As a consequence, the first phase of AFG meetings were based around the invited participation of stakeholders identified initially from a wide base of consultation conducted by the RTA, and subsequently from AFG participant inputs. Following the selection of the preferred alignment in 2006, an invitation to Aboriginal stakeholders to register an interest in the project, as per the DECC *Interim Community Consultation Requirements for Applicants*, was published in February/March of 2007, and repeated in June 2007 in media including:

- Grafton Daily Examiner Feb/March 2007.
- Koori Mail – Feb/March 2007; May/June 2007.
- Yamba Lower Clarence Review- Feb/March 2007.
- National Indigenous Times – March 2007; May/June 2007.
- Deadly Vibe – March 2007; June 2007.
- In Vibe – March 2007; June 2007.
- Clarence Valley Review – June 2007.
- The Daily Examiner – May 2007.

The expressions of interest received, confirmed the stakeholder membership established in the initial phase of AFG meetings. Five local Aboriginal community organisations have been identified as Aboriginal stakeholders, and regularly attended AFG meetings. These are:

- Grafton-Ngerrie Local Aboriginal Land Council (LALC).
- Yaegl Local Aboriginal Land Council.
- Yaegl Native Title Group.
- Yarrawarra Aboriginal Corporation (including the Garby Elders).
- Burra:way Wa:jad Traditional Owners group.

In addition, the Birrigan Gargle LALC was included in the consultation program during the route selection analysis in recognition that the study area for this analysis occurred immediately to the west of their Land Council boundary. This inclusion consisted of attendance at AFG meetings and participation in discussions about Aboriginal heritage sites and areas of significance.

During the route selection phase of the project, systematic archaeological survey of representative landscape sample areas was conducted with Aboriginal stakeholder participation in April of 2005. In March 2006, the RTA conducted a field inspection of the then three options with representatives of

the Garby Elders with particular attention given to Glenugie Peak, the Coldstream River Valley, and Pillar Valley.

A key outcome of the Aboriginal stakeholder consultation program to 2006 was the identification and eventual selection of a route option which avoided direct impact to places of identified major cultural significance, such as Glenugie Peak and Pillar Valley. Where possible predicted archaeological impacts were also minimised by the refinement of route options.

The program of Aboriginal consultation conducted for the assessment of the Wells Crossing to Iluka preferred alignment has been undertaken in accordance with the NSW Department of Environment and Climate Change (DECC) *Interim Community Consultation Requirements for Applicants*, the *Draft Guidelines for Aboriginal Cultural heritage Impact Assessment and Community Consultation* (DEC, 2005) and the then RTA *Draft Procedures for Aboriginal Cultural Heritage Consultation and Investigation*.

A series of field inspections of proposed geotechnical test locations across the preferred alignment were conducted by the archaeologists and Aboriginal stakeholder representatives in June and August 2007. The following stakeholders were represented: the Yaegl and Grafton-Ngerrie LALCs, Yaegl Native Title Claimants Group, Garby Elders Group, and the Burra:way Wa:jad Traditional Owners group.

The fifth AFG meeting for the project was conducted on 6 September 2007. Registered Aboriginal stakeholders, comprising representatives from each of the above organisations attended to discuss among other things, the proposed methodology for the conduct of the Aboriginal cultural heritage assessment of the preferred alignment, which in turn was to inform the concept design. The methodology included details of the survey methodology and Aboriginal participation in that survey.

Following the 2007 AFG, each of the Aboriginal groups was provided with a copy of the proposed methodology and was requested to provide comment on it, and to nominate a site investigation officer from their group to participate in the field survey of the preferred route.

During late October and early November 2007, each of the above organisations responded to the above request. The Grafton-Ngerrie and Yaegl LALCs, and the Yarrawarra Aboriginal Corporation each nominated a site investigation officer from their groups. The Yaegl Native Title Group and the Burra:way Wa:jad Traditional Owners group did not nominate a site officer or participate in the field survey.

Arrangements were then made with the Grafton-Ngerrie and Yaegl LALCs, and the Yarrawarra Aboriginal Corporation for the participation of nominated representatives in the archaeological fieldwork program which was conducted across November and December of 2007. In this regard, the LALC representatives operated within their respective LALC boundaries, and the Yarrawarra Aboriginal Corporation (Garby Elders) operated in the southern section of the preferred route, generally south of Tucabia. **Figures 2-1** and **2-2** provide graphic approximations of the areas of interest of the Grafton-Ngerrie LALC and other Aboriginal stakeholder groups relative to the Glenugie upgrade project area and to the broader preferred upgrade route alignment.

A 2008 draft of a report which documented the cultural heritage assessment of the Wells Crossing to Iluka preferred route alignment was reviewed and discussed at the sixth AFG meeting held on 17 September 2008. After approving of the suitability of the report for public access, the meeting agreed to the public release of the Concept Design Cultural Heritage Working Paper (RTA 2009b). That document did not contain precise location details of sensitive Aboriginal sites or areas within the project precincts.

The information provided in this report on Aboriginal sites and cultural values for the Glenugie upgrade project is based on the approved material presented in the Concept Design Cultural Heritage Working Paper (RTA 2009b).

On 2 June 2009, the seventh AFG meeting was held to:

- Advise that the Glenugie section of the Wells Crossing to Iluka Road upgrade was progressing to construction ahead of the remainder of the upgrade.
- Discuss the findings of previous heritage investigations, as reported in the Wells Crossing to Iluka Road Concept Design Report Heritage Working Paper.
- Advise that the findings of previous investigations were suitable for the environmental assessment of the Glenugie upgrade.
- Discuss the next steps of the project and Aboriginal participation in construction.

Representatives from the following organisations attended:

- Grafton-Ngerrie LALC.
- Yaegl LALCs.
- Yaegl Native Title Claimants Group.
- Garby Elders.

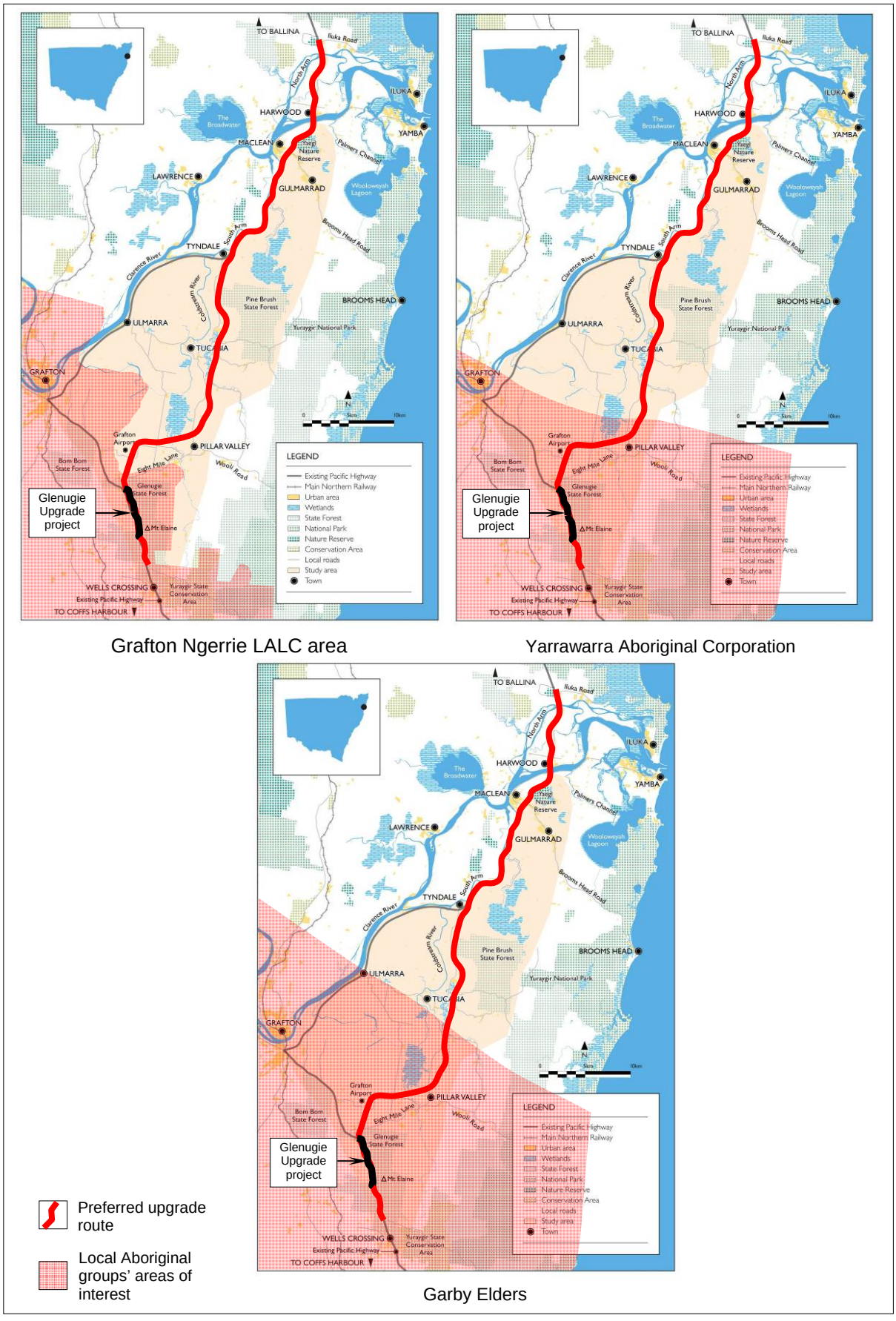

Figure 2-1 Location of Glenugie upgrade project relative to local Aboriginal groups' areas of interest (base map: SKM).

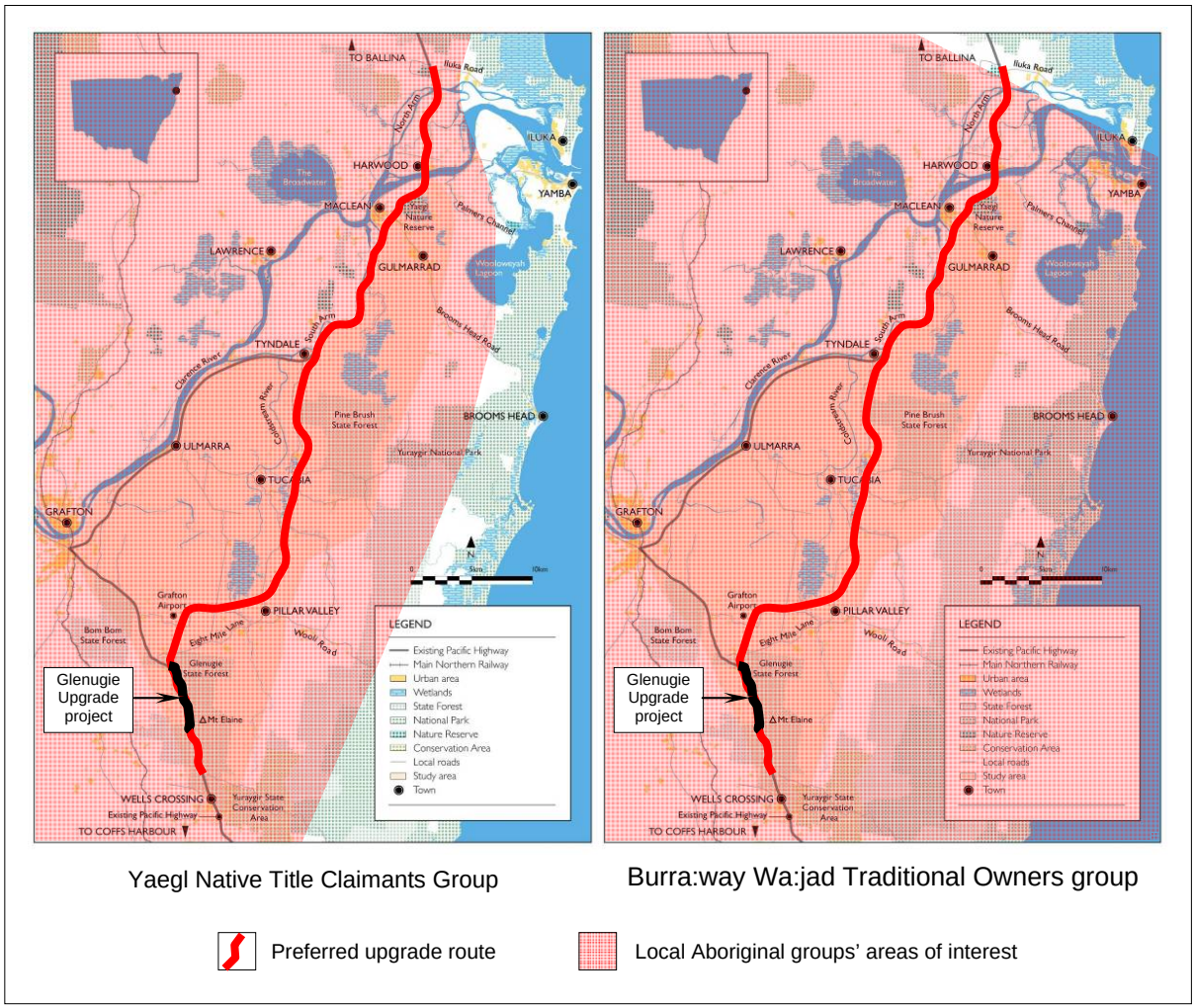

Figure 2-2 Location of Glenugie upgrade project relative to local Aboriginal groups' areas of interest (base map: SKM).

3. STUDY METHODOLOGY

3.1 Literature and database review

A range of documentation was reviewed in assessing archaeological and historical knowledge for the project area and for the wider Wells Crossing to Iluka Road project area and its surrounds. This literature and data review was used to determine if known Aboriginal and historical sites were located within the area under investigation, to facilitate site prediction on the basis of known regional and local site patterns, and to place the area within an archaeological and heritage management context. The review of documentary sources included heritage registers and schedules, local histories, and archaeological reports.

Aboriginal literature and data sources included the Aboriginal Heritage Information Management System (AHIMS) maintained by the NSW DECC (the most recent search was conducted on 14 May 2009) and associated files and catalogue of archaeological reports. Sources of historical information included regional and local histories, heritage studies and parish maps.

Searches were undertaken of the following statutory and non-statutory heritage registers and schedules:

- Statutory registers:
    - AHIMS (NSW DECC) (most recent search dated 14 May 2009).
    - The National Heritage List (Australian Heritage Council).
    - The Commonwealth Heritage List (Australian Heritage Council).
    - The State Heritage Register (Heritage Branch, NSW DoP).
    - State Heritage Inventory (Heritage Branch, NSW DoP).
    - Section 170 Heritage and Conservation Registers compiled by Forests NSW, the RTA and NSW State Rail.
    - Grafton Local Environmental Plan 1998 Heritage Schedule.

- Non-Statutory registers:
    - Maclean Shire Draft Community-Based Heritage Study (March 2006).
    - The Register of the National Estate (Australian Heritage Council).
    - The State Heritage Inventory (Heritage Branch, NSW DoP).
    - Register of the National Trust of Australia (NSW).
    - Royal Australian Institute of Architects Register.
    - Institute of Engineers (NSW) Heritage Register.
    - Professional Historians Association (NSW).

3.2 Fieldwork

3.2.1 Timing

Field inspections of sites of proposed geotechnical investigations across the Wells Crossing to Iluka preferred route were undertaken between 25 and 27 June and the 6 and 14 August 2007. Comprehensive surface archaeological survey was conducted within a two-week period from 26 November to 7 December 2007, inclusive.

3.2.2 Coverage

The area surveyed encompassed a corridor with a width of between 30 and 150 m along the entire Wells Crossing to Iluka preferred route, which is a distance of 71 km, including the approximately seven kilometre long section of the project. All survey was conducted on foot and included the systematic use of straight line and meandering/opportunistic traverses across the full corridor.

3.2.3 Aboriginal heritage

The objective of the survey strategy for Aboriginal heritage was to obtain as comprehensive assessment as possible of the heritage sites within the project study area, and the preferred route corridor as a whole.

The field strategy involved a team comprising an archaeologist, assistant, and representatives nominated by relevant Aboriginal stakeholder groups, walking across the project study area looking for Aboriginal heritage sites. Much of the area was heavily vegetated within the Glenugie State Forest, which meant that ground visibility was generally low and restricted (refer **Figure 3-1**). The survey therefore concentrated on areas of visibility where available, such as vehicle and stock tracks, contour banks, areas of erosion and denuded ground. On the whole, ground surface visibility or exposure incidence within the project study area represented only about five per cent of the total area of the proposed upgrade corridor.

The effectiveness of archaeological field survey is to a large degree related to the obtrusiveness of the sites being looked for and the incidence and quality of ground surface visibility. Visibility variables were estimated for all areas of comprehensive survey within the study area. These estimates provide a measure with which to gauge the effectiveness of the survey and level of sampling conducted.

Ground surface visibility is a measure of the bare ground visible to the archaeologist during the survey. There are two main variables used to assess ground surface visibility, the frequency of exposure encountered by the surveyor and the quality of visibility within those exposures. The predominant factors affecting the quality of ground surface visibility within an exposure are the extent of vegetation and ground litter, the depth and origin of exposure, the extent of recent sedimentary deposition, and the level of visual interference from surface gravels. Two variables of ground surface visibility were estimated during the survey:

- A percentage estimate of the total area of ground inspected which contained useable exposures of bare ground.
- A percentage estimate of the average levels of ground surface visibility within those exposures. This is a net estimate and accounts for all impacting visual and physical variables including the archaeological potential of the sediment or rock exposed.

A total of approximately 90 per cent of the ground area in the study area was inspected during the survey, with about five per cent of that area providing useable archaeological exposures. The average visibility within those exposures was approximately 80 per cent. Taking into account survey coverage, archaeologically useable exposures, and visibility variables, the effective survey coverage (ESC) was 3.6 per cent of the total survey area.

The ESC is a formula based calculation defined by the DECC which attempts to provide an estimate of the proportion of the total study area that provided a net 100 per cent level of ground surface visibility to archaeological surveyors. The ESC calculation is required by the DECC and stated to be of use in assessing and cross comparing the adequacy of archaeological surface surveys. However, the actual utility of the ESC calculation is challenged by many archaeologists. The limitations of the ESC calculation are emphasised by differences in the subjective assessment of exposure and visibility levels, variations in how survey units are defined and measured, and differences in how and which variables are estimated and combined. In reality, ESC results tend only to be meaningful when compared across surveys conducted by the same surveyors and ESC measurers.

During the field survey, the main site type to be expected was artefact scatters, but the survey team also examined mature native trees for signs of scarring, potential midden deposits and other site types dictated by the local environment.

Figure 3-1 Conduct of archaeological survey within the Glenugie State Forest, November 2007.

3.2.4 European heritage

The objective of the survey strategy for historical heritage was to obtain as comprehensive an assessment as possible of the heritage sites within the project area. Owing to the generally more obvious nature of historic sites the strategy employed in the historic heritage assessment was to identify through various register searches the presence of any heritage listed items in the study corridor and to inspect these in the field. Additional potential heritage sites were advised by the local community, identified from topographic maps and identified through driving the existing highway and secondary roads within the study corridor.

Field survey was also conducted for less obvious historic heritage sites, with the same level of field coverage as for Aboriginal heritage. Areas of historical interest were recorded in the field.

3.2.5 Field recording parameters

3.2.5.1 Aboriginal heritage

The archaeological survey aimed at identifying material evidence of Aboriginal occupation as revealed by surface artefacts and areas of archaeological potential unassociated with surface artefacts. Potential recordings fall into three categories: isolated finds, sites and potential archaeological deposits.

Isolated finds

An isolated find is a single stone artefact, not located within a rock shelter, and which occurs without any associated evidence of Aboriginal occupation within a radius of 60 metres.

Sites

A site is defined as any material evidence of past Aboriginal activity that remains within a context or place which can be reliably related to that activity.

Potential archaeological deposits

A potential archaeological deposit, or PAD, is defined as any location where the potential for subsurface archaeological material is considered to be moderate or high, relative to the surrounding study area landscape. The potential for subsurface material to be present is assessed using criteria developed from the results of previous surveys and excavations relevant to the region.

The boundaries of PADs are generally defined by the extent of particular micro-landforms known to have high correlations with archaeological material. A PAD may or may not be associated with surface artefacts. In the absence of artefacts, a location with potential will be recorded as a PAD. Where one or more surface artefacts occur on a sedimentary deposit, a PAD may also be identified where there is insufficient evidence to assess the nature and content of the underlying deposit. This situation is due mostly to poor ground surface visibility.

3.2.5.2 Non-Aboriginal heritage

Non-Aboriginal heritage items can be a place, building, work, relic (mainly archaeological), moveable object or precinct that has cultural heritage significance as assessed under Heritage Council/Branch criteria.

As with Aboriginal archaeological field surveys, the effectiveness of an historical archaeological field survey is to a large degree related to the obtrusiveness of the sites being sought and the incidence and quality of general and ground surface visibility. The methods used to investigate sites are based on trained observation, skilled interpretation and accurate recording of the physical remains, combined with the archaeologist’s own experience of what is likely to be found.

Historical archaeology refers to the 'post-contact' period and includes: domestic, commercial and industrial sites as well as most maritime sites. It is the study of the past using physical evidence in conjunction with historical sources. The two primary types of places or items that may form part of the historical archaeology context in the project area include:

1. Below ground evidence, including building foundations, occupation deposits, features and artefacts; and above ground evidence, including buildings, works, industrial structures and relics that are intact or ruined.

2. Areas of land that display evidence of human activity or occupation.

An historic item is an item that is famous or important in history or, in the case of subsurface archaeological deposits, has the potential to be famous or important in history. In this respect, an historic item or potential historic item can be considered famous or important for a variety of reasons. For example, it may be either or both of the following:

- Famous, that is, renowned or well known, for its iconic nature (for example, the Sydney Opera House) or for its association with a person or event (for example, Bradman's cottage or the site of Captain Cook's landing at Botany Bay).
- Important, that is, of great significance, value or consequence in content or relationship, for its age (for example, a nineteenth-century building or archaeological deposit), content or fabric (for example, chronological paint layers in a building) or its association with a person or event (for example, Bradman's cottage or the site of Captain Cook's landing at Botany Bay).

Within the above description of an historic item a place is an area of land, with or without improvements; a building is a structure of part of a structure; a precinct is an area, a part of an area, or any other part of NSW; a relic is any deposit object or material evidence which relates to the settlement of the area that comprises NSW, not being Aboriginal settlement, and which is 50 or more years old; and a moveable object is portable object that is not a relic.

Historical items inspected as part of the field recording component of this study were firstly assessed for their historic value, that is, whether or not they are famous or important in history (or, in the case of subsurface archaeological deposits, their potential to be famous or important in history) and then, if considered so, they were assessed against the current Heritage Branch legislative and policy interpretations of such items. If that assessment showed an item to have historic value, then the heritage significance of the item was assessed using the Heritage Branch methodology and criteria for cultural heritage significance of such items.

Unlike Aboriginal archaeological field surveys, in many instances historical surveys are aided by the availability of historical documents that assist in locating sites. In this regard, a range of historical research techniques may include the use of early town and rural directories, land title searches, analysis of early maps, photographs and aerial photographs, technological encyclopaedia, immigrant's guides, trade and popular journals, mail order catalogues, bankruptcy records, government records and other specialised sources. In some instances, oral histories may also be available to assist the archaeologist to locate sites.

Some sites are wholly above ground while others are partially or wholly below ground surface. They may be still functioning, derelict or ruinous.

For the most part, the visibility of wholly above ground historic standing structures, such as buildings, fences, etc., poses little problem for the field surveyor. This of course can be variable, particularly where the structure is partially or completely covered by vegetation, or has been covered or enclosed by additional construction. For those structures or items that are partially above ground, visibility and full identification can be difficult. In such cases it may be necessary to undertake an archaeological excavation to ensure that the item is correctly and completely identified and recorded. For items that are wholly below ground, there may be no visible indications of their presence on the surface, or in some cases only a few indications, such as an earth platform or fragmentary artefacts, visible on the surface of the site. In such cases it may also be necessary to undertake an archaeological excavation to ensure the item is correctly and completely identified and recorded. However, the

option not to excavate should be a primary consideration for any site that is subject to development. Where a site is not under threat, archaeological deposits are safer left in the ground.

The information found in historical archaeological sites is often part of a bigger picture which offers opportunities to compare and contrast results between sites. The most common comparisons are made at the local level, however, due to advances in research and the increasing sophistication and standardisation of methods of data collection, the capacity for wider reference (nationally and, occasionally, internationally) exists and places added emphasis on identification and conservation of historical archaeological resources.

3.3 Impact assessment

Two categories of potential impact have been used in this analysis, direct and indirect impact:

- *Direct impact* is defined as physical change occurring to a site or place situated within the corridor of the preferred route (that is within a 150 metre wide corridor defined by RTA), which results in the significant diminution of the cultural heritage values of that site or place. For the purposes of this analysis, direct impact is considered to be a likely development consequence for any site or place situated within the route corridor. Direct impact may include minor and peripheral changes, or large scale removal and destruction.
- *Indirect impact* is defined as a physical change to a site or place, or to its surroundings (where those surrounds contribute significantly to the cultural heritage values of that site or place), where this occurs outside of the corridor of the preferred route, and this physical change is a consequence of the development occurring within the corridor. The potential for indirect impact varies according to the nature of the site or place, and its proximity to the corridor. Assessments of indirect impact must relate to site specific characteristics and it is difficult to generalise about a consistent zone of indirect impact surrounding a development corridor.

3.4 Project personnel

The field investigations for the Glenugie upgrade project were carried out by archaeologists Nicola Hayes and Lindsay Smith with assistance provided by Daniel Powell. The report was prepared by Kelvin Officer and Lindsay Smith. The three Aboriginal groups represented during the field component of the study also provided field assistants, as follows:

- Grafton-Ngerrie LALC – Rod Duroux.
- Yaegl LALC – Ferlin Laurie, Anthony Hickling and Dale Mercy.
- Yarrawarra Aboriginal Corporation – Milton Duroux.

4. ENVIRONMENTAL CONTEXT

4.1 Study area location

The project is approximately seven kilometres long. A nominal corridor width of 150 m has been used for the purpose of this assessment (**Figure 1-2** and **Figure 1-3**). At its southern extent the project will connect with the existing Pacific Highway alignment near Franklins Road and then head north on the eastern side of the existing Pacific Highway within the Glenugie State Forest. The route then continues north before tying in with the existing three lane section of Pacific Highway just south of the existing intersection with Eight Mile Lane.

4.2 Geology and topography

4.2.1 Wells Crossing to Iluka Road study area

In broad terms, the preferred route for the upgrade of Wells Crossing to Iluka Road is situated within the Clarence River Valley, the largest coastal river valley in NSW. The study area can be divided into two main topographic/ environmental zones:

- The valley floor and floodplain of the Clarence River.
- The Coast Range, including associated hills, slopes and ridges.

The Clarence River flows in a generally north easterly direction roughly parallel and to the west of the central part of the preferred route corridor. The corridor crosses the main arm of the Clarence River at the village of Harwood, and at the North Arm of the Clarence River at Woombah. From Maclean, the river flows east to its ocean entrance at Yamba.

Downstream of Grafton, the Clarence River divides into a number of substantial subsidiary streams, termed the South Arm and North Arm. The study corridor runs parallel to part of the South Arm from Tyndale to Maclean and crosses the North Arm just south of Iluka Road.

The Clarence River floodplain, on which the preferred route is situated, comprises Quaternary alluvium, gravel, sand, silt and clay deposits. The floodplain is gently undulating with low residual rises, terraces and levees, depressed flood channels and pockets of swamps (Collins 1998). The study corridor crosses other deposits of Quaternary alluvium associated with the Coldstream River and its tributaries such as Pillar Valley Creek that are situated in the southern and eastern portions of the corridor. The presence of Quaternary alluvium is an important consideration in an archaeological assessment due to the potential for archaeological remains to be conserved within sedimentary deposits in aggrading (accumulating) landform contexts. The recording of such archaeological deposits remains rare however, and most known Aboriginal archaeological sites occur in erosional contexts away from the valley floor.

The Clarence River floodplain is bounded to the east by the Coast Range. This is a prominent north-south aligned range that is formed on Jurassic to Cretaceous era Kangaroo Creek Sandstone and Grafton Formation geological features (Geological Survey of NSW 1970). The main rock types associated with these features are sandstone, conglomerate, siltstone and claystone. The Coast Range tends to have a steep escarpment on its eastern face but gentler to moderate slopes on its western face, where the study corridor is situated. The range reaches an elevation of 300 m AHD on Pillar Ridge, just east of the preferred route corridor.

4.2.2 The Glenugie upgrade area

The project occurs within an extensive area of lowland foothills situated on the western fall of the Coast Range. These foothills form a distinct and undulating topography located between the high

gradient slopes of the Range and the low lying flood plains of the Clarence River Valley. This topography has formed from sandstones, siltstones and claystones of the Grafton Formation and the low to moderate slope gradients and moderate drainage course density, which characterise this landscape are a direct reflection of the weathering of this substrate. A further consequence is that rock shelters and extensive sandstone rock platforms are absent or very rare in this landscape. This is in contrast to the more resistant sandstones and conglomerates found in the Kangaroo Creek Sandstone. This substrate borders the Grafton Formation, and forms the elevated topography of the Coast Range, seven kilometres to the east, and the steep sided valleys west of the Orara River, 10 kilometres to the west.

A local exception to the moderate gradients which typify the project corridor is Glenugie Peak (also known as Mount Elaine). This peak is a basaltic volcanic plug of Tertiary age which has intruded through the earlier sediments of the Grafton formation. Glenugie Peak forms a prominent conical and symmetrical, but flat topped peak of resistant basalt which reaches an elevation of 316 m AHD. The peak is characterised by an upper basaltic portion with high gradients and a lower and more moderately graded conical margin around the basalt intrusion. This lower margin extends relatively uniformly within an approximate radius of one kilometre from the summit. The project comes within approximately one kilometre of the base of the conical margin of the peak. The project will therefore have no direct impact on this formation.

Glenugie Peak is situated on the watershed between the Coldstream River to the east, and Glenugie Creek to the west. Both catchments drain to the northwest and enter a network of now partially drained wetland basins on the floor of the Clarence River valley. The upstream extent of the plain is situated approximately five kilometres to the north of the upgrade project. This is also the edge of the foothills.

The southern end of the project is situated in the upper Glenugie Creek catchment. From here the project traverses the western fall of the Glenugie Creek valley, across a series of low interfluves (low spurlines separated by tributary streamlines). Like the current highway, the project runs parallel to, and within approximately 250 metres of the eastern bank of the creek for a distance of approximately 3.5 kilometres. This section of Glenugie Creek has a limited catchment and the creek is unlikely to provide a permanent source of freshwater. The creek banks merge with the surrounding bedrock slopes and there is no significant development of a flat valley floor. Substantial Quaternary valley floor sediments only become evident in the Glenugie Creek valley around the confluence with the Sawpit Creek, two kilometres downstream, and away from the project area (**Figures 4-1** and **4-2**).

The project crosses a low and broad ridgeline at Lookout Road which forms the watershed between Glenugie Creek and Pheasant Creek, one of its lower tributaries. The project then traverses the upper reaches of the Pheasant Creek catchment until terminating in the area of Eight Mile Lane. Vegetation across the project consists predominantly of dry sclerophyll forest dominated by spotted gum and ironbark species. Small areas of mixed floodplain forest association occur in proximity to Glenugie Creek and its tributaries.

4.2.3 Summary

The project traverses predominantly upper catchment spurs and gullies of the lowland foothills situated between the Coast Range to the east, and the floor of the Clarence valley to the north and north west. Glenugie Peak occurs at least one kilometre to the east of the project. The study area is typified by bedrock based slopes and crests.

Substantial or significant deposits of Quaternary aged valley floor deposits do not occur within the study area. The pre-European resources of the study area would have been characterised by intermittent fresh water sources and predominantly dry sclerophyll forests.

All of these characteristics have implications for the type and incidence of Aboriginal archaeological sites which can be predicted to occur within the Glenugie upgrade project area. In general, the absence of permanent water and aggrading landforms will substantially limit archaeological potential (refer section 5.5).

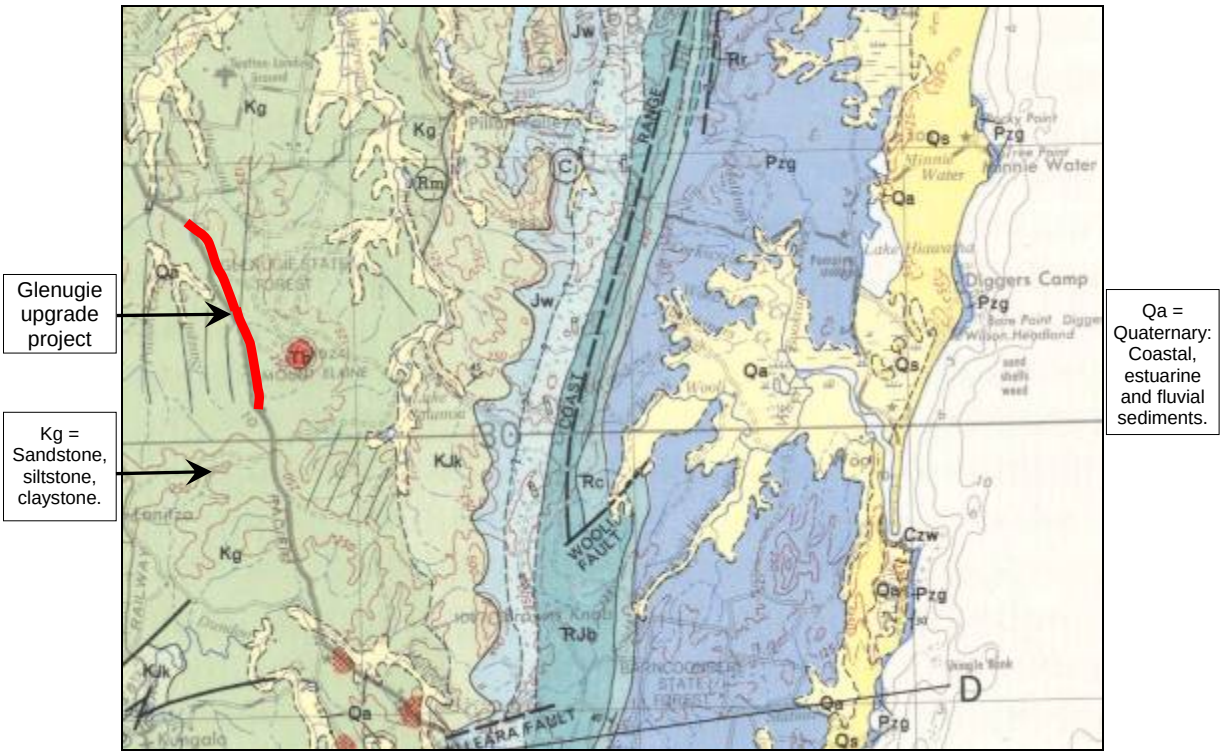

Figure 4-1 Extract from geological map showing Glenugie upgrade project (Maclean 1:250,000 geological series sheet SH 56-7, Geological Survey of NSW, First Edition 1970)

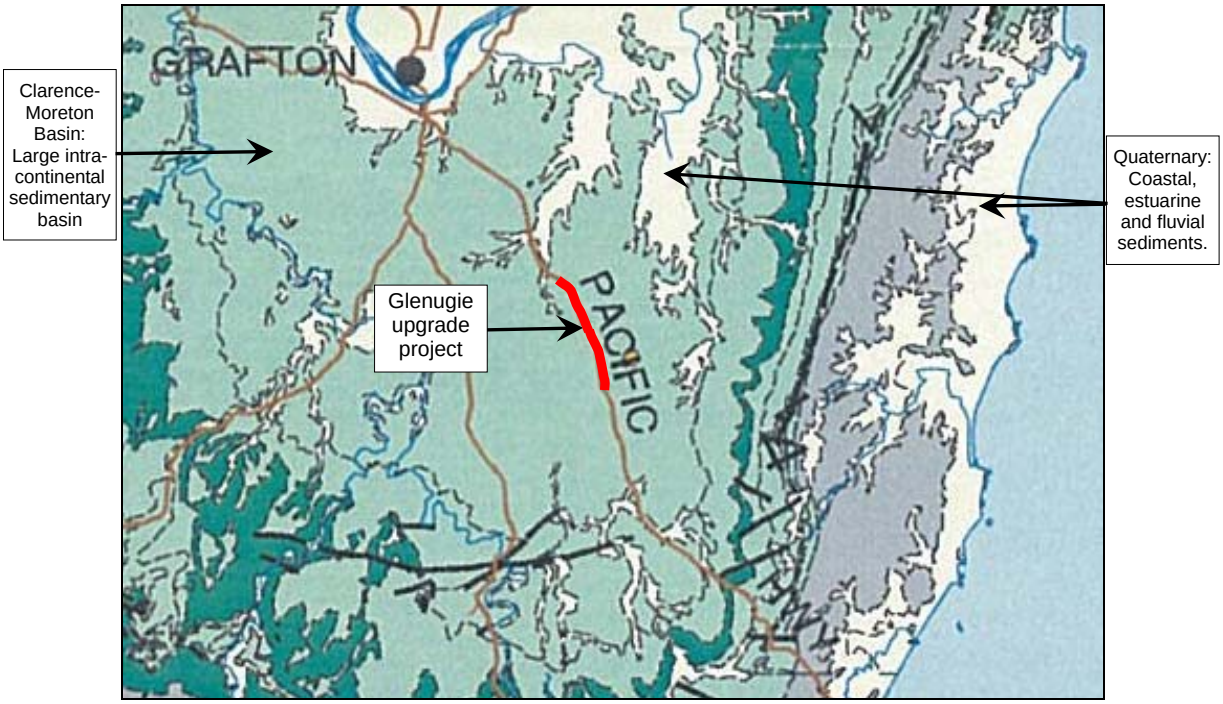

Figure 4-2 Extract from geological map showing Glenugie upgrade project (1:1,000,000 Upper North East NSW, Comprehensive Regional Assessment, Geology, AGSO, June 1998)