Appendix R
Cultural Heritage

Cultural Heritage Desktop and Constraints Analysis
Gladstone Nickel Project,
Central Queensland

Prepared for

RLMS & Gladstone Pacific Nickel

Prepared by

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with the assistance of

Central Queensland Cultural Heritage Management

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1. Introduction and Background

Gladstone Pacific Nickel Pty Ltd (GPN) is proposing to construct and operate the Gladstone Nickel Project to carry, refine and ship nickel from the Marlborough Nickel Mine to and from Gladstone in Central Queensland. The project involves the construction and operation of a series of infrastructure components (Figure 1).

The Gladstone Nickel Project, as currently defined, is composed of the construction and operation of a nickel/cobalt mine and beneficiation plant and associated infrastructure located approximately 20km south of Marlborough, a pipeline corridor between that mine and Gladstone which will contain several underground pipelines (including an ore slurry pipeline, and a seawater pipeline) and associated surface infrastructure, a nickel refinery and associated infrastructure located to the immediate west of Gladstone within the Gladstone State Development Area, residue pipelines between that refinery and a residue storage facility located approximately 8 km to the southwest of Yarwun within the Gladstone State Development Area, and pipelines and other infrastructure connecting the refinery to the port of Gladstone.

GPN is required to prepare an Environmental Impact Statement (EIS) for this project. The Terms of Reference (ToR) for this EIS requires, among others, the consideration of both Indigenous and European cultural heritage matters. GPN has engaged Darumbal Enterprises Pty Ltd to develop and co-ordinate the Indigenous cultural heritage processes for the Gladstone Nickel Project.

Under this commission, one of the tasks to be undertaken was a review of the nature and form of known cultural heritage places and values in the area of the Gladstone Nickel Project. This is primarily aimed at providing a baseline indication of the places and values that may be either known or likely to be located throughout the project area which might be impacted by the proposed development activities and hence could constitute a possible constraint to the development proceeding as planned. Secondly, it is also aimed at ascertaining the presence or otherwise of any known cultural heritage places that are currently protected by virtue of their inclusion on any of the number of state and federal cultural heritage lists and registers. These considerations were to be reported as a desktop synthesis of previously undertaken cultural heritage investigations and assessments undertaken in the project area insofar as such information was available for review and consideration.

This synthesis will be presented here in four broad sections. This first outlines the methodology employed and sources used in gathering known and available information relating to the cultural heritage of the areas within which the Gladstone Nickel Project is located. There are number of constraints and limitations involved in the acquisition and access to this information and its levels of completeness and accuracy. These directly influence the levels to which it can be used, the questions

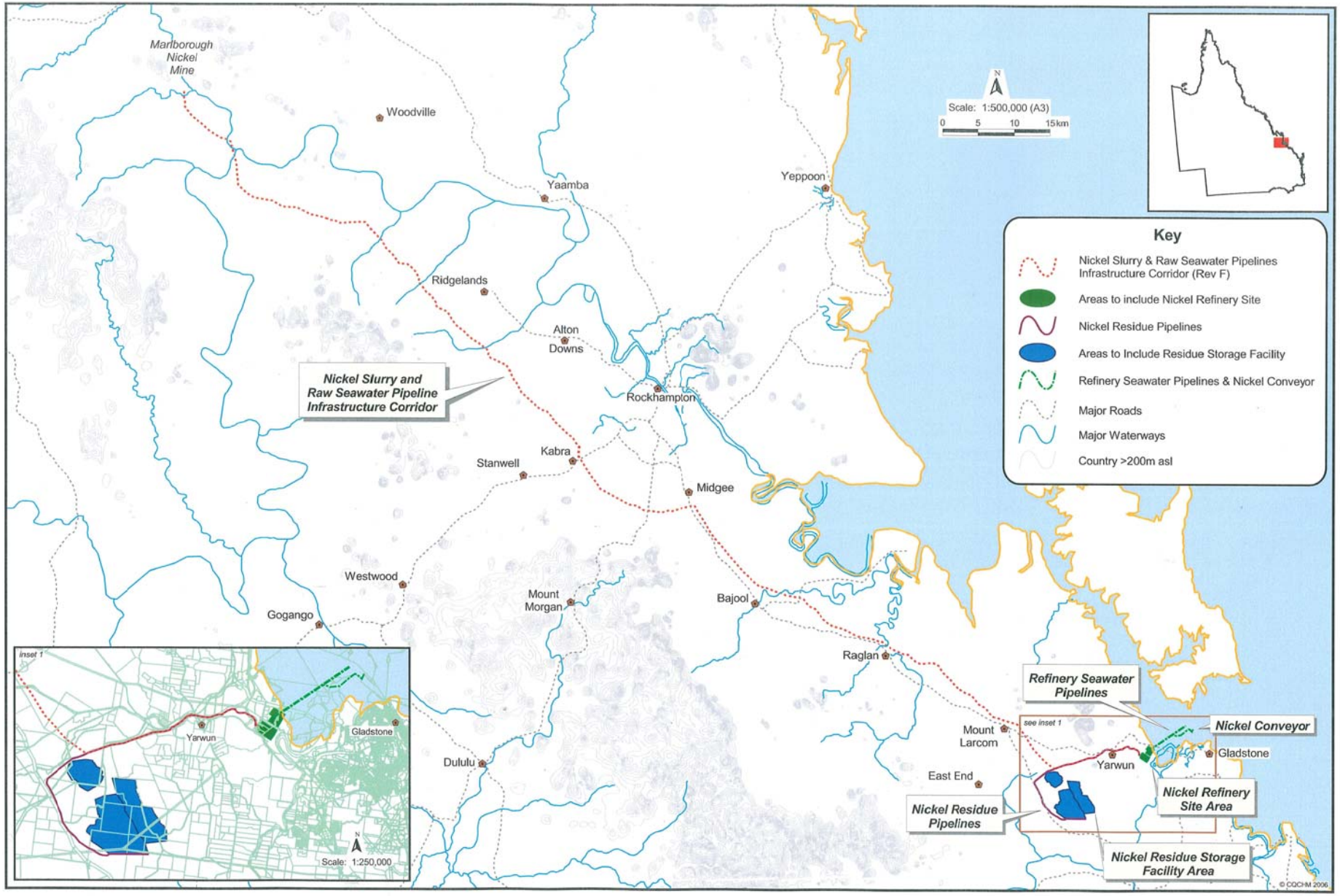

Figure 1: Location and extent of the various infrastructure elements that comprise the Gladstone Nickel Project.

that can be asked of it, and hence the conclusions that can be drawn. Following the consideration of these issues, we turn to a summary and synthesis of the results of these investigations, and finally consider the cultural landscape that might be affected by the project.

The material assessed and issues canvassed have been done so in such a way as to address the requirements of legislation (outlined in detail in a separate report) and best management practice from technical and philosophical perspectives as outlined below. This report has been prepared by Darumbal Enterprises Pty Ltd with the assistance of Central Queensland Cultural Heritage Management Pty Ltd (CQCHM).

2. Data Sources and Methodology

The majority of information on the Aboriginal cultural heritage of the project area derives from cultural heritage investigations undertaken as part of the impact assessment process associated with development projects such as that currently under consideration for the Gladstone Nickel Project. These studies have been undertaken within legislative parameters that have largely required the cultural heritage information deriving from them to be provided, compiled, maintained and controlled by governmental agencies. Under Part 5 of the *Aboriginal Cultural Heritage Act 2003* (ACHA) this situation has been maintained with such information being controlled by the Cultural Heritage Co-ordination Unit of the Department of Nature Resources, Mines and Water (DNRM&W).

The three principle sources of Aboriginal cultural heritage information maintained include the report catalogue which contains all cultural heritage studies undertaken under the various pieces of state cultural heritage legislation that have been in operation since the late 1960s (with the vast majority dating from the mid-1970s with the introduction of environmental impact legislation). Associated but separate from this catalogue is the 'site card index' which contains the greatest amount of detail regarding individual cultural heritage places recorded (whether as part of the EIS process, resulting from research projects or otherwise) throughout Queensland. The Indigenous Cultural Heritage Database has been compiled as a synthesis of both of these sources. In recent years this database has been incorporated as a layer in a Geographic Information System (GIS) to provide greater flexibility in both its use and also control of the outputs provided. This database can be modified to output a variety of levels of information as determined appropriate by departmental staff and policy.

Both under the provisions of the ACHA and other departmental policy, public access can be made to various of these data sources. Owing to the nature of this information and the sensitivities inherent in the complex issues surrounding its existence, form, and cultural protocols, access is subject to various caveats (see below).

The Queensland Heritage Register (QHR) established under the *Queensland Heritage Act 1992* (QHA) consists of those places that are considered to possess heritage values that meet one or more of the criteria specified in the QHA. Although these are primarily European historic heritage places, these places may also have or be associated with Aboriginal heritage values. Searches of the QHR are publicly available through the Cultural Heritage Branch of the Environmental Protection Agency (EPA), although if it is considered appropriate, specific information regarding the place or the values for which it has been listed (or is being considered for listing) does not necessarily need to be made publicly available. In addition to this internal search process, searchable web-based system exists to enable the public to obtain further details regarding the heritage values of individual listed places. These place summaries contain background contextual information regarding the places that can prove useful in obtaining a more complete appreciation of a place's heritage values.

There are a number of commonwealth heritage lists and registers that protect important heritage places throughout Australia. These include the National Heritage List, the Commonwealth Heritage List, the Register of the National Estate and the World Heritage List. These lists are administered by the Commonwealth Department of the Environment and Heritage (DEH) and searches of these can also be requested. Unlike the QHR, places inscribed on these lists and registers can be included for a variety of values. These are most commonly broken in to three broad categories, natural, historic or Aboriginal, with places usually listed for their outstanding values in one of these categories (although recent listings are tending to note multiple values) even though the place/area may also contain significant other values. The presence of these other values can rarely be ascertained from the search result summaries provided as a result of a standard DEH listing search.

Like the QHR, there are also a series of searchable web-based databases that enable the user to locate and cross reference further details regarding the place and the values that are looking to be preserved by their inclusion of these various lists. While the summaries that can be obtained may make reference to a place having significant Aboriginal cultural heritage values, these may not necessarily be expounded in any depth owing to cultural restrictions or sensitivities.

Finally a range of cultural heritage information is, via a number of processes, already in the public domain (notably a great number of cultural heritage assessment reports). This information is housed in numerous places including private and professional collections, libraries and archives, and (more recently) by the Aboriginal Traditional Owner groups who either undertook or oversaw such work on their cultural heritage.

As part of the review of cultural heritage information for this report the following was undertaken:

1. Formal application was made to the Department of Natural Resources, Mines & Water for a search of the Indigenous Cultural Heritage Database. As required, a GIS layer containing all of the infrastructure elements of the Gladstone Nickel Project was provided as part of this. It was requested that the results search buffer include cultural heritage places within 1km of these elements:

2. Request was also made to the department to review the report catalogue for cultural heritage works undertaken in areas surrounding the project, and where appropriate, the individual site cards for places within the database search buffer:

3. Request was made of the Environmental Protection Agency, for a search of places on the Queensland Heritage Register also with a 1km buffer of the project elements. A GIS layer of the project infrastructure elements was also required to be provided in support of this request.

4. Formal request was made of the Commonwealth Department of the Environment and Heritage for information relating to any places contained on any of the cultural heritage lists and registers that they administer that lie within 1km buffer of project development areas. A GIS layer of the project infrastructure elements was again required to be provided in support of this request.

5. Upon receipt of these various search requests from 3 and 4 above, their results were investigated in further detail using the web-based heritage databases for other information relating to the presence or otherwise of Aboriginal cultural heritage values.

6. Finally, a review was undertaken of material held in a range of publicly available archives, collections and publications for Aboriginal cultural heritage information of relevance to the project area.

Where it has been possible to do so, the data that has been collated as part of these investigations has been placed in a Geographic Information System (GIS) that we have custom built for the project. This GIS is based on ArcView / ArcInfo. A substantial amount of the discussions included in this report derives from the analyses of these datasets within the GIS. One of the primary advantages of GIS is that it allows for the multivariate analysis of a number of data sources and to provide the results of these in a variety of formats (principally tabular and graphical in the case of this report). Additionally, it is relatively easy and timely to expand, undertake new analyses and revise observations and interpretations as new data becomes available.

Although the GIS can operate in a number of projections and datums depending upon the nature of the tasks or analyses being performed, unless otherwise stated all of the mapping within this report is presented using decimal degrees in GDA94.

3. Constraints and Limitations

As outlined above, this assessment of cultural heritage information relating to the project area has been done exclusively on the basis of a desktop analysis of available information. A major issue resulting from this then becomes one of the sources that are available for an assessment of this kind (discussed above), and the limitations that should be borne in mind when attempting to use what can be obtained. Put simply, there is no definitive body of data available on the cultural heritage values of the project area. The vast majority of the project area has not been subject to detailed investigations. Indeed, with limited exceptions, to which certain caveats apply, there have been no special studies of the Aboriginal cultural heritage values of the broader region within which the project area resides.

The review undertaken herein has drawn on sources of cultural heritage information that are disparate in nature. Firstly, these sources include searches of various legislatively mandated State and Commonwealth cultural heritage place databases, registers and lists. Secondly, we have reviewed a range of published, unpublished and multimedia information sources, where data pertinent to the issues under review is housed. Thirdly, we have reviewed our own databases and sought assistance from others who have undertaken work of relevance to the project area.

All of this data is limited in various ways. For instance, it might be considered that the Indigenous Cultural Heritage Database maintained under the ACHA would constitute the primary sources of information relating to Aboriginal cultural heritage places in Queensland. Unfortunately, this would be a very poor appreciation of the origin of those sources. At the current time, they derive in the main from the Aboriginal and Torres Strait Islander Heritage Places database developed variously by the various State agencies charged with carriage of Indigenous cultural heritage legislation over the years since 1967. This database had its inception and further development in two pieces of legislation: the *Aboriginal Relics Preservation Act, 1967* and the *Cultural Record (Landscapes Queensland and Queensland Estate Act), 1987*. The pieces of legislation were flawed or limited in numerous ways, but of particular relevance to the current investigations is the definition of what constituted the Aboriginal cultural heritage that was protected under these Acts. In both cases, their primary, if not exclusive, focus was on material culture. For example, the *Cultural Record (Landscapes Queensland and Queensland Estate Act), 1987* framed cultural heritage in the following terms:

> **"Queensland Estate"** means evidence of human occupation of the areas comprising Queensland at any time that is at least 30 years in the past but does not include anything –
> (a) made or constructed as a facsimilie; or

(b) made or constructed at or after the commencement of this Act for the purpose of sale; or
(c) that is not of prehistoric or historic significance.

"Item of the Queensland Estate" includes, in relation to any structure or object in, on or under land, the surrounds of the structure or object from which it cannot be separate without destroying or dimishing its value or significance.

The emphasis on material culture (objects or things) is of vital importance here as it heavily influenced the nature of the places that were covered by the Act, becoming almost exclusively 'archaeological sites' such as stone artefacts, scarred trees, shell middens and the like. This directly affected the methodology, location and recording of Aboriginal cultural heritage places and values undertaken as part of assessment undertaken under the provisions of the legislation (not to mention more generally within Queensland), and thereby included on the resulting database that was created from this information.

It has been suggested that it was not the sole intention of this Act to focus on material culture alone. This argument has its foundation in the following definition:

"Landscapes Queensland" means areas or features within Queensland that –
(a) have been or are being used, altered or affected in some way by humans; and
(b) are of significance to humans for any anthropological, cultural, historic, prehistoric or reason;

and includes any item of the Queensland Estate found therein.

This definition does seem to countenance the entry of places that might not have an exclusively material dimension. The mechanism under the Act for the recognition of such places was by having them gazetted as a Designated Landscape Area (DLA). It is worthy of note that there were only ever 13 of these places gazetted in the almost 20 years that this Act was in operation. In all cases, these DLAs were gazetted exclusively because of their material dimensions, either being or containing rock art sites, stone arrangements or bora grounds. No places that did not have a material expression, but which may well have been culturally important, were gazetted as DLAs.

It is true that the ACHA has replaced the clearly unreasonably limited definition of Aboriginal cultural heritage with something that is broader and more inclusive of the totality of places and values that really constitute Aboriginal cultural heritage. The simple fact is, however, that the ACHA has not been in operation for long enough to even begin to redress the imbalance in the classes of cultural places and values within its databases. Additionally, with the majority of cultural heritage assessments being related to development work, these other cultural heritage places and values have been lost with the undertaking of these activities.

Nor is there necessarily a willingness on the part of Aboriginal people to disclose any information or knowledge regarding their cultural heritage, particularly sensitive cultural information, to the state given the curious measures in place to supposedly protect such information and the virtually unrestricted access of a range of individuals to it (cf. below). The point remains, however, that at this stage the Indigenous Cultural Heritage Database are heavily weighted towards places where there is material cultural material of some form.

Following on from the ability to access the cultural heritage information housed in the Indigenous Cultural Heritage Database under the provisions of the ACHA, there is a second tier of access regulation and data provision that also exists, under various departmental policies. While a search of the database is freely available, the resulting information provided is highly generic, including only limited fields. These include the database identifier for each place (which can be used to cross-reference against the site cards), the type of place under consideration, and its locational information.

As outlined above, access was requested to the report catalogue and site cards for recorded places within the 1km buffer of project infrastructure. Such access is not available without the written authorisation from a Native Title Claimant for the area in question. Engagement and negotiations with the Aboriginal parties for the project area at the time this background work was compiled were in their early stages. An on-going relationship between the team undertaking the review and one of the Native Title Traditional Owner groups (the Darumbal People), however, meant that such authorisation could be obtained within the timeframes available. Thus a complete review of cultural heritage information relating to the Darumbal section of the project area (as previously mentioned, about 75% of the pipeline corridor that will contain the slurry and seawater pipelines) within DNRM&W data sources could be accessed for this synthesis.

Once access to such cultural heritage information has been secured and results obtained, a series of other issues must then be considered. In the first instance, this relates to the origin of, and manner in which, the data so included has been collected. These data derive in large measure from either *ad hoc* recordings of varying quality or from EIS or development related projects that had a geographical focus determined by the location of a piece of development rather than being approached from any cultural parameters. Only a small portion of the available cultural heritage information has been collated as part of any systematic research program of even relatively restricted geographical extent (and this is even more limited in the context of the project area). That is, the imperatives for collecting most of the information that exists has not necessarily been collected in a comprehensive or systematic fashion across much of Queensland, and hence is of little applicability.

Questions of accuracy also then intrude. The introduction and widespread availability of Global Positioning Systems (GPS), now a standard fieldwork tool for cultural heritage assessment, is a relatively recent phenomenon. Prior to this the accuracy of a recording depended on the accuracy of map reading, and then the subsequent long hand generation of co-ordinates. In such cases an error of only 1mm (the size of a pencil dot) on a 1:250,000 scale map equates to an on-the-ground error of 250 metres. Errors reading maps to calculate a place's co ordinates, and inconsistent and incomplete provision of grid references has meant that there are systemic errors throughout these databases, then used to create computer-based datasets. Use of correction factors that convert imperial grid references to metric have only served to compound the problem.

Despite GPS having powerful and highly accurate applications within cultural heritage management (especially since the removal of selective availability), there has been a basic lack of understanding of issues surrounding the datum used in collecting mappable information and projections, and the importance of providing this information as a component of cultural place locational data. With differences between the various commonly used projections being in the order of several hundred metres, this further diminishes certainty as to the accuracy of the cultural heritage databases. To our knowledge, there has not been any concentrated program of review to establish the internal consistency and levels of confidence that exist for information housed within these databases, or to subsequently ground truth even a sample of cultural heritage places to validate or correct this locational information.

This is not a situation restricted to the Indigenous Cultural Heritage Database alone, but rather is one that applies generally (although in varying degrees) across all of the current governmental cultural heritage databases. By way of example, a recent investigation of a place listed on the QHR for a project located in close proximity to elements of the Gladstone Nickel Project found that the place that was the subject of the heritage listing was not located on the lot on plan (the QHR lists places by this rather than grid references) provided in its listing. While the reasons for this error have not been fully resolved, it is thought that the listed lot on plan details may have, at the time of listing, been correct, and that subsequent subdivision of the lot has taken place with the portion containing the place to be protected lying on a newly titled lot. The implications of this situation for impact assessment and management of this place are self-evident.

It is in some way to counter this particular raft of issues that all requested database searches for this review have been based on an expanded, buffered area surrounding the various project infrastructure elements. With the stated level of certainty in the location and extent of these elements (that is, the small nature of any alterations, modifications or realignment that is expected), this buffer was set a

1km surrounding these. In the case of the linear developments such as pipelines and conveyors this buffer is 1km either side of their centreline as available at the time the searches were undertaken.

The various Commonwealth heritage lists and registers and the QHR also contain various other limitations. The most notable is the fact that all of these generally only house cultural heritage places that have been nominated to, and then actually been inscribed in, those lists and registers (although recent modification have tended to note the destruction or removal of previously listed places). Thus, if no nomination has been made or such nomination has not been successful, then no information will be recorded. Nomination to these lists comes often, but not necessarily, with a variety of criteria for listing. These nominations are assessed by committees, and their reasoning in relation to the criteria is not always transparent. At various times on the majority of these lists and registers there have also been 'trends' or themes pursued, which have seen large numbers of certain classes of cultural heritage entered on them. With a general lack of strategic direction and planning in the identification and conservation across the gamut of cultural heritage places and values, these lists are generally overrepresented in a few cultural heritage place-types. In light of these considerations, absence of evidence can not necessarily be interpreted to mean evidence of absence.

Finally, the analyses and interpretations provided regarding Aboriginal cultural heritage places, objects and values throughout the project area search buffer relates to the most current project infrastructure datasets that were available to Darumbal Enterprises Pty Ltd at the time of submitting the cultural heritage data search requests. The dataset used was that titled as 'REV D'. Following this, a further revision, 'REV E', has been made available. The changes made between these revisions have not been substantial (rarely being in excess of 100m) and relate entirely to the alignment of the pipeline corridor running between Marlborough and the Nickel Refinery Site. All of these alignment changes fall well within the 1km search buffer area and as such, it is not viewed that these significantly alter the general picture of the cultural landscape or conclusions regarding the impacts of the project upon it.

Subsequent to the finalisation of the draft of this desktop report, a further revision, 'REV F' to the Nickel Project infrastructure datasets was made available. A number of changes occurred to the placement and extent of the project infrastructure between revisions E and F. All of these relate to the Gladstone end of the project. Further minor modifications in the Slurry Pipeline Corridor alignment have been made across the area between Yarwun and the Nickel Refinery Site. These are a maximum of 400m, at the Nickel Refinery, but are more generally only 30-50m. The majority of these changes actually move the corridor back towards the 'REV D' alignment that was the subject of the original database searches. There have also been changes in the area to contain the Residue Storage Facility and Nickel Refinery Site. In general, these are in the same locations as previous but have decreased in

size from considerably larger areas previously described in 'REV D' and 'REV E', and as used in the original database search requests. The one kilometre buffer of these original areas caters for these modifications. The major difference between the 'REV D/E' and 'REV F' datasets lies in the alignment of the easternmost section of the Residue Pipelines. These make a substantial deviation almost 5km to the west of the original 'REV D' dataset. Despite this, the modified alignment either travels within or skirts closely the larger Residue Storage Facility area used as the basis of the original cultural heritage database searches. Add to this the 1km buffer of this initial area and the pipeline modifications present in the 'REV F' data would seem to be adequately covered.

It should be noted that while the general search results provided in Section 4.1 below contain the results of searches undertaken on the basis of the 'REV D' datasets available at the time these requests were made, all mapping showing the relationship between individual recorded places from the search results and the project infrastructure elements (Figures 2 and 3), has been provided on the basis of the 'REV E' data. In this way the noted distances of particular places described throughout Section 4.2, is the distance from the 'REV E' pipeline corridor centreline. As previously noted, however, the changes between 'REV E' and 'REV F' are not such as to change the overall picture of the cultural landscape of the project area outlined further below. Figure 1 shows the most recent 'REV F' project element datasets for comparative purposes.

In the light of all of the above discussion, it should be realised that this study can not be, nor does it purport to be, a definitive statement of the Aboriginal cultural heritage values associated with the Project. Rather it represents the collation of a body of data that is subject to considerable limitations and flaws. From this some observations and predictions have been posited. They should not be considered as anything else.

4. Previous Cultural Heritage Research in the Project Area

4.1 Cultural Heritage Database, List and Register Search Results

As outlined in Section 2 above, formal requests were sent off to a variety of State and Commonwealth agencies regarding searches of the various cultural heritage databases, lists and registers that they administer. The results of these are outlined in the following sections.

4.1.1 Queensland Indigenous Cultural Heritage Database

As already outlined, the principle source of information regarding known Aboriginal cultural heritage places and values in the area of the Gladstone Nickel Project is found on the Queensland Indigenous Cultural Heritage Database administered by the Department of Natural Resources, Mines and Water. A search of this database was undertaken for a 1km buffer surrounding project infrastructure. Within this area a total of 16 places have been recorded, 9 within the northern portion within Darumbal

Country and the remaining 7 within the southern Port Curtis Coral Coast (PCCC) Native Title Claim area (Figure 2).

These are distributed throughout the project area is four distinct clusters. From north to south throughout the project area, the first of these is in the area of the Slurry Pipeline Corridor's crossing of the Fitzroy River. In this area four places (HF:A34, HF:A40, HF:A41, & HF:B94) were all located during Morwood's 1984 study for the Stanwell Weir EIS. The second cluster is located to the north and west of Kabra. These three places were variously identified during pipeline and powerline impact assessment studies as part of an unknown Powerline project (Pratt 1979; JF:A14 & JF:A15 – original recording), the Stanwell Water Pipeline (Morwood 1984b; JF:A15 – re-recording), the AMC Slurry Pipeline (CQCHM 1999; JF:D01) and. The third cluster consisting of a further two places (JF:A73 & JF:A74) are located in the Midgee Creek area to the southwest of Midgee township. Both of these places were located during Alfredson's 1990 investigations for the Rockhampton Branch of the State Gas Pipeline in 1990. Two of these places (HF:B94 and JF:A14) are located less than 100m from the centreline of the Nickel Slurry and Seawater Pipeline Corridor. Further detailed information regarding these places can be found in the summaries of these projects provided in Section 4.2.

The forth and final cluster of recorded cultural heritage places is located along the final 15 or so kilometres of the pipeline route in the area between the Residue Storage Facility and the Nickel Refinery Site. Seven cultural heritage places (JF:D54, JF:D52, JF:D53, JF:B10, JF:C71, JF:C68 & JF:C15) were located in this area. All of these places are located within the PCCC Native Title Claim area and as such only limited detailed information was able to be discerned regarding them (see previous discussion in Section 3). These places are generally some considerable distance from the pipeline route (see Table 1). Exceptions to this include: place JF:C15 which is located about 140m to the northwest of the Residue pipelines centreline and is also around 420m to the northwest of the Nickel Refinery Site; and JF:D53 which is around 210m to the northeast of the Nickel Slurry and Seawater Pipeline Corridor.

Additionally, while place JF:D52 is located in excess of 1km from the Nickel Slurry and Seawater Pipeline Corridor, it lies 400m to the northwest of the broader area within which the Nickel Storage Area will be constructed. Despite this, the place is some 2,400m to the north of the nearest of the three possible locations for this storage facility within this area.

Although only 16 cultural heritage places have been recorded and registered to date, there is some notable diversity in their place-types. While the majority contain stone artefacts either as individual

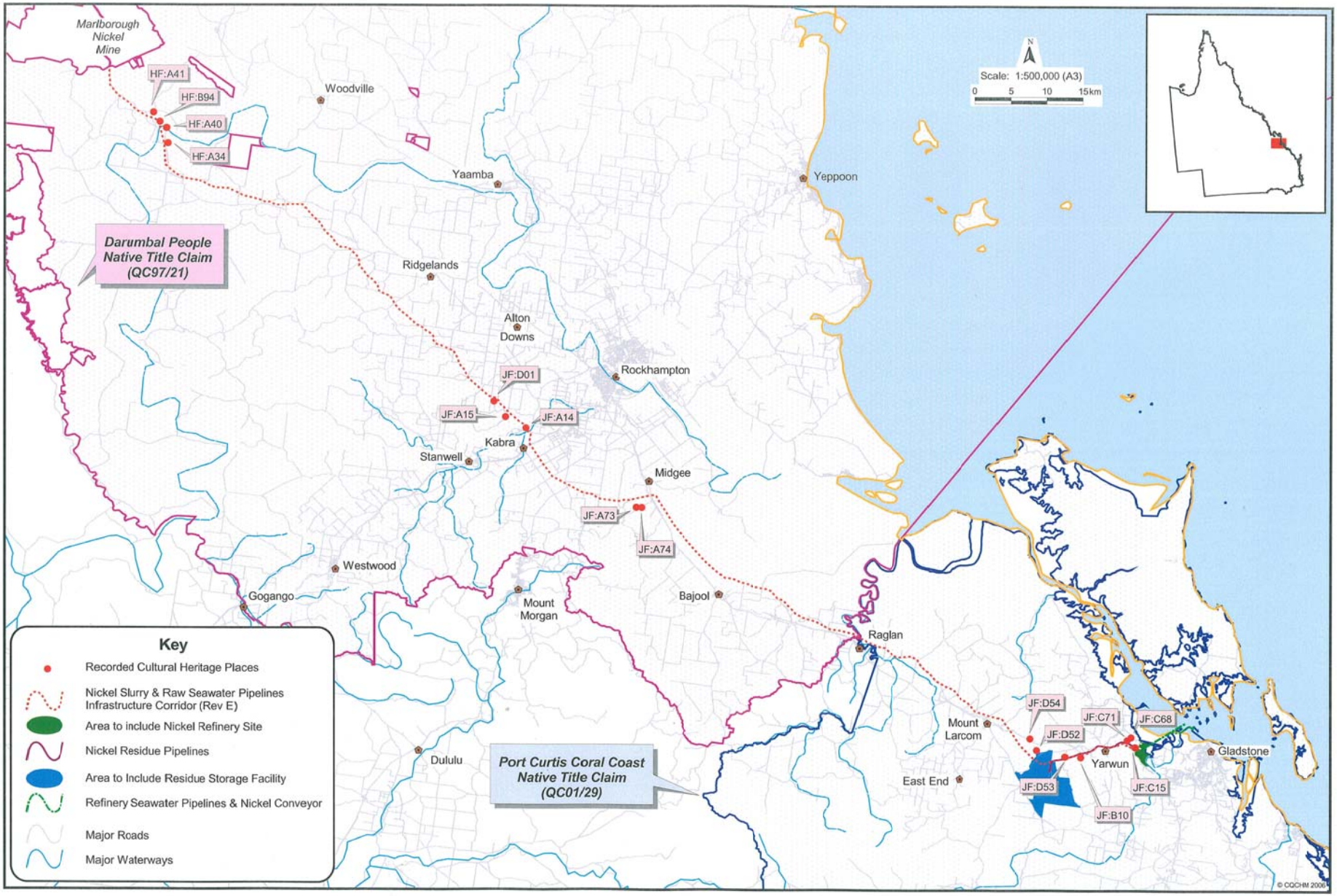

Figure 2: Location of DNRM&W recorded cultural heritage places within the 1km buffer of project elements in relation to the Darumbal and Port Curtis Coral Coast Native Title Claim areas.

occurrences or as scatters, two scarred trees and one each of an ochre source (not thought to have been used), a quarry where source stone has been collected for the manufacture of stone artefacts, a post-contact area containing flaked bottle glass have all been recorded, and a possible hearth have all been located (Table 1). Again, where further information regarding these places has been available, it has been discussed in more detail in the individual project summaries provided in Section 4.2 below.

Place ID	Place Type	NT Claim Area	Proximity from Infrastructure	Recorder	Year	Project	Raw Material Viewed
HF:A34	Stone Artefact Scatter	Darumbal	460m east	M. Morwood	1984	Stanwell Weir EIS	Yes
HF:A40	Ochre Source	Darumbal	750m east	M. Morwood	1984	Stanwell Weir EIS	Yes
HF:A41	Scarred Tree	Darumbal	800m northeast	M. Morwood	1984	Stanwell Weir EIS	Yes
HF:B94	Isolated Stone Artefact/s	Darumbal	100m northeast	M. Morwood	1984	Stanwell Weir EIS	Yes
JF:A14	Quarry	Darumbal	25m southwest	J. Pratt	1979	Proposed Powerline	Yes
JF:A15	Stone Artefact Scatter / Possible Hearth	Darumbal	760m southwest	J. Pratt M. Morwood	1979 1984	Proposed Powerline Stanwell Water Pipeline	Yes
JF:A73	Stone Artefact Scatter	Darumbal	1,210m south	G. Alfredson	1990	State Gas Pipeline Initial	Yes
JF:A74	Isolated Stone Artefact/s	Darumbal	1,420m south	G. Alfredson	1991	State Gas Pipeline Initial	Yes
JF:B10	Stone Artefact/s	PCCC	530m south	G. Alfredson	1992	Aldoga	No
JF:C15	Stone Artefact/s	PCCC	140m northeast 420m northwest	J. Hall	1980	Alcan Smelter	No
JF:C68	Scarred Tree	PCCC	1,080m north	M. Strong	1999	-	No
JF:C71	Stone Artefact/s	PCCC	670m north	M. Strong	1999	-	No
JF:D01	Flaked Green Glass	Darumbal	520m southwest	CQCHM	1998	AMC Slurry Pipeline	Yes
JF:D52	Stone Artefact/s	PCCC	1,100m northeast 400m northwest	D. Johnson	2002	Calvale to Aldoga Powerline	No
JF:D53	Stone Artefact/s	PCCC	210m north	D. Johnson	2002	Calvale to Aldoga Powerline	No
JF:D54	Stone Artefact/s	PCCC	1,530m northeast	D. Johnson	2002	Calvale to Aldoga Powerline	No

Table 1: Details of recorded cultural heritage places located within the 1km buffer of project infrastructure from the Queensland Indigenous Cultural Heritage Database. Note: multiple values in the 'Proximity from Infrastructure' column are explained further in the text above.

4.1.2 Queensland Heritage Register

Only one place within a 1km buffer of the project infrastructure elements was provided by the Environmental Protection Agency as being either on or nominated for listing on the QHR. This place is Raglan Homestead (QHR ID 600389). The homestead precinct is located on Raglan Station Road about 40km northwest of Gladstone and is a 'permanent' listing on the QHR. It is located on Lot 804 DT407, which is broken in to two parcels that straddle Raglan Station Road. The area actually inscribed on the QHR for its heritage values covers approximately 59ha of the northeastern portion of the southern parcel (Figure 3).

While the Nickel Slurry and Seawater Pipeline Corridor centreline actually runs through the north of the Raglan Station Road easement and does not impact either the area inscribed or either of the two parcels that contain the listed place, it lies variously within 15-20m of the boundary of the northern parcel. Given, that the Nickel Slurry and Seawater pipelines will sit within a broader easement it is unclear if this will encroach in to this northern parcel and raise the possibility of further QHA considerations. Application will likely have to be made to the Queensland Heritage Council to clarify this issue.

A review of the place summary provided on the Environmental Protection Agency's web site, could find no reference to any Aboriginal associations or values considered as part of its listing.

4.1.3 Commonwealth Heritage Lists and Registers

The search of the national cultural heritage lists and registers administered by the Commonwealth Department of the Environment and Heritage found two places that were located within the 1km buffer of the project infrastructure elements (Figure 3). At the northern end of the Nickel Slurry and Seawater Pipeline Corridor this includes the Capricornia Serpentinite Landscape, a large area that is only an 'Indicative Listing' on the RNE (RNE ID 102290). This means that at the current time only the basic information regarding this place has been provided to or obtained by the Australian Heritage Council and has been entered into their database. The place is at some stage in the assessment process and a decision on whether the place should be entered in the Register has not been made. This place is proposed to be listed for its Natural values.

At the southern end of the project lies the Great Barrier Reef. This is a highly significant area being a registered place on the RNE (RNE ID 103284), a declared property on the World Heritage List (WHL ID 105060), and an indicative listing on both the National Heritage and Commonwealth Heritage lists (NHL ID 105709 & CHL ID 105573). Although all of these listings note that the area is or is proposed to be registered for its natural values, its Indigenous values have also been recognised. Its RNE listing significance statement includes the folowing:

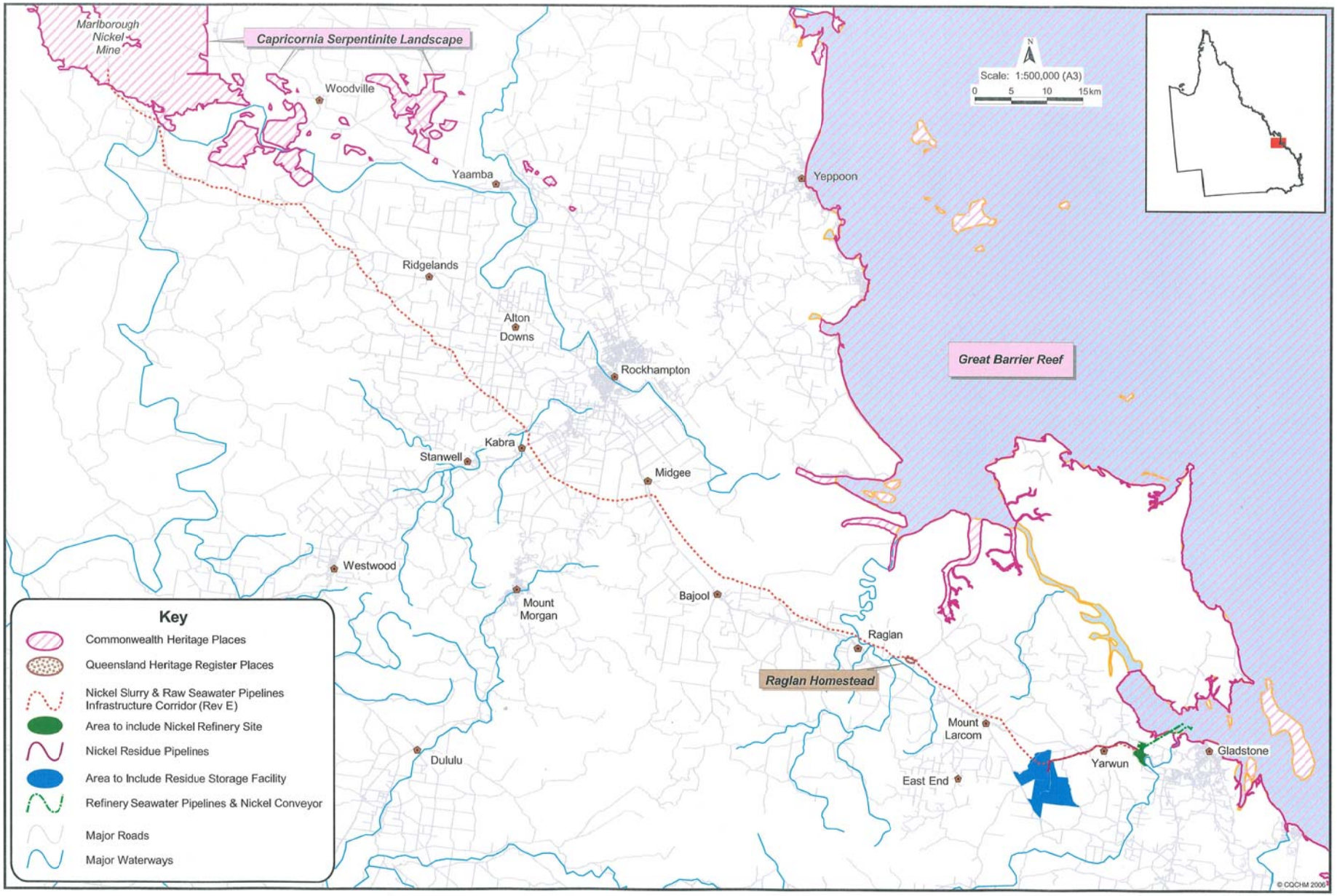

Figure 3: Places returned from the Commonwealth Heritage lists and Queensland Heritage List searches that lie within the 1km buffer of project infrastructure.

> The Commission has determined that the place has Indigenous values of National Estate significance. The Commission is currently consulting with relevant Indigenous communities about the amount of information to be placed on the public record.

Additionally, its World Heritage inscription states that:

> The World Heritage property is also of cultural importance, containing many middens and other archaeological sites of Aboriginal or Torres Strait Islander origin.

Various infrastructure elements of the project enter into both of these areas as provided by DEH (Figure 3). The northernmost 2km or so of the Nickel Slurry and Seawater Pipeline Corridor crosses into the Capricornia Serpentinite Area as proposed for listing on the RNE, while the easternmost 2.2km of the Refinery Seawater Pipelines and 3.5km of the Nickel Conveyor enters the Great Barrier Reef area as in currently registered and declared under the RNE and WHL and as proposed for listing under the NHL and CHL.

The listing of the Great Barrier Reef on the World Heritage List makes the place a Matter of National Significance under the *Environmental Protection and Biodiversity Conservation Act, 1999 (as amended 2003)* (EPBC). The EPBC states that a person must not take an action that has, will have or is likely to have a significant impact on a matter of National Environmental Significance, except where certain processes have been followed and/or certain approvals obtained. The proponents of actions to which the EPBC may apply are required to seek a determination from the Commonwealth Minister for the Environment and Heritage regarding whether or not their proposed action is a controlled action. Proponents must then, if the Act applies, seek approval for the controlled action directly from the Minister. This will need to be pursued further in the context of the development proposal.

4.2 Published and Unpublished Documentation

There has been a substantial amount of research undertaken in the vicinity of the project area. The great majority of this has been undertaken in coastal areas as part of IAS/EIS development projects, but there has also been some research aimed at describing Aboriginal occupation and use of the coastal zone and off-shore islands along the Capricorn Coast. This research need not concern us here. Rather, attention is focused on work in the hinterland, and particularly that undertaken in the immediate vicinity of the project area in recent years. A synthesis of this work is provided below.

Pratt 1979

Jeff Pratt was a Department of Aboriginal and Islander Affairs ranger based in Rockhampton for a short time during the later parts of the 1970s. In early 1979 he recorded a quarry in close proximity to a proposed powerline (State ID JF:A14). While it is somewhat unclear, the quarry seemed to cover an

area of about 1,600m^2 and consisted of an outcrop of what he describes as black slate. Slate is generally poor quality for flaking and numerous outcrops of basaltic and andesitic material are common throughout the general area. Numerous flaked pieces of the outcropping stone were recorded across this area. Overlooking the Gracemere Lagoons about 3km to the east, Pratt links this as part of the same Aboriginal activity area.

This place lies just on the outside edge of a gazetted powerline easement and as such it is unknown if the place still exists. If this is the case, it would seem highly likely that the proposed Gladstone Nickel pipelines will impact it as its centreline is located less than 25m from grid reference provided for the centre of this place.

Billings 1982-84

Between 1982 and 1984, a warden, Geoff Billings, appointed under the *Aboriginal Relics Preservation Act, 1967* and was active in the Rockhampton area. He undertook several surveys near Neerkol and Stanwell and recorded a number of sites. Again, these were dominated by stone artefact scatters, the data about which is sparse with no information available regarding their size, composition and, in most instances, their environmental setting. He also recorded one scarred tree, which he noted was in the immediate vicinity of what he termed a 'campsite', presumably one of the artefact scatters he recorded.

He also recorded a small rockshelter which contained occupation deposit and art. This was said to lie to the south of the Fitzroy River, about 30km west of Rockhampton. This would seem to put this site somewhere in the vicinity of the broken country around Lion Mountain. No other details are available about this site.

Morwood 1984

Morwood (1984a) was engaged to undertake a survey of the area to be affected by a weir on the Fitzroy River required to supply water to the then-proposed Stanwell power station. The survey included examination of 18km along both sides of the river, starting at the confluence of Princhester Creek and the Fitzroy River and finishing in the vicinity of 'Craiglee'. The survey was undertaken both on foot and using motorbikes, with a field team of 5 people. A total of 20 person days were spent in the field. For the purpose of analysis, Morwood divided the study area into a series of environmental or land system units.

Morwood and his team documented 22 separate areas containing Aboriginal cultural material. These were predominantly stone artefact scatters, which ranged in size from isolated finds to extensive scatters covering 300,000m^2. He also recorded a source of yellow and red ochre, as well as scarred trees and several sites where both stone artefacts and shell midden material was present. Included

among the stone artefactual material was equipment for grinding, in the form of a top stone. It is unclear whether this was used for the grinding of grass and tree seed preparatory to cooking as small cakes, preparation of ochre, or possibly as a whetstone for axe and tool sharpening. Raw materials identified for stone artefact manufacture included chert, silcrete and basalt. Both cores and flakes were recorded by Morwood, although he makes no mention of any of these containing retouch indicative of use and maintenance. Morwood notes that one of the sites he identified was also reputed to be an historic Aboriginal camp, but the source of this information is not cited.

Four of theses places are located between 100m and 800m to the east and northeast of the pipeline route in the area of the confluence of Marlborough Creek and the Fitzroy River. Included among these is the source of yellow and red ochre (located on the banks of the Fiztroy River; HF:A40), a single isolated chert core (HF:B94), a scarred tree (containing a single scar measuring 2.3m long and 1.1m wide; HF:A41), and an extensive stone artefact scatter located on the southern side of the river (HF:A34). This scatter measures in excess of 200m in length and 50m wide (over 1 hectare in size) and is located along the edges of an ox-bow lagoon. The recorded grid reference for this cultural heritage place (which does not take its extent into account) is located some 460m east of the pipeline route, while the single stone artefact recorded at HF:B94, is the closest of this group to the pipeline route.

In a related study, Morwood (1984b) also surveyed the proposed pipeline route required to carry the water from the proposed weir to the power station. This extended for a distance of 24km across the Fitzroy River floodplain to the south of the river, crossing Neerkol Creek twice and Malchi Creek once. Four person days were spent examining this route, using both motorbike and foot inspections. Morwood recorded three stone artefact scatters, all of which were located on the southern section of the route and are the closest to the current study area.

The first of these was a sparse scatter of stone artefacts on the eastern side of Malchi Creek near the intersection of the power transmission line and the water pipeline. This consisted of a sparse scatter of artefacts over and area of 900m^2 (30m x 30m) and was located directly on the water pipeline route. Artefact recorded consisted of 'retouched stone flakes and pebble manuports up to 15cm in diameter, at a maximum density of 1/sq metre' (Morwood 1984b:13). Two mudstone flakes were also noted on the ridge on the western side of the Malchi-Little Malchi Creek junction.

A second scatter was also located in the same area. This was located approximately 360m west of the pipeline route in an eroded area on the eastern side of Malchi Creek. The material consisted of 'chipping waste' and was present at densities up to 12/m^2 and covered an area of 120m^2 (15m x 8m). There was an exposed section at this site 1.3m deep, but no evidence of stratified material was noted.

Morwood (1984b:18) states that 'it is clear that the artefacts are only [on the] surface'. This place (JF:A15) is located approximately 760m to the southwest of the current proposed Gladstone Nickel pipeline route. It would appear that this place was originally recorded by Pratt in 1979 (possibly as part of his unreported powerline study) and re-recorded during this study by Morwood. While the DNRM&W database notes this site as containing a hearth, Pratt's original recording note this as a possibility only whose suggestion was occasioned by the presence of some 'blackened stones'. Given that Morwood make no reference of this feature in his detailed recording of the place, it is safe to assume that either it was not a hearth, or had disappeared in the intervening time between recordings.

Morwood also made a visit to two of the well documented Gracemere Station sites (an extensive campsite adjacent to Gracemere Lagoon and a basalt quarry) approximately 3km to the east of the pipeline route.

The third area containing cultural material was located on the pipeline route on the southern side of the Capricorn Highway. Again this was located on an alluvial terrace adjacent to a creek. This area consisted of a mudstone flake and a quartz bipolar core. Morwood (1984b:12) notes that despite extensive investigation along the creek and throughout the more general area, nothing else was located. It was thought that periodic overflowing of the creek could account for the minimal amount of artefactual material present. It is noted, however, that the general area contains an abundance of resources including permanent water, fish, wild fowl and aquatic plants.

Two of these areas were directly on the pipeline route and, as no further work was recommended, were destroyed during the construction of the water pipeline easement. No further work was likewise recommended for the third area.

Alfredson (1989)

In the Gladstone area, Alfredson undertook a survey of land owned by Queensland Cement Limited. A range of cultural heritage places were recorded including an artefact scatter and a shell midden. The scatter, consisting of five stone artefacts located near a natural drainage channel, comprised four flakes and a core of siltstone and meta-sedimentary material. A low density of oyster shells, possibly disturbed midden material, was also located in a pile of sandy soil near an erosion bank. Further north, within land owned by Gladstone Port Authority, two flakes and three cores were located 100 metres from the previous site near a second drainage channel where a natural rocky seam provided a crossing. A small fragment of weathered oyster was recorded in marine couch nearby. About 300 metres south of the first site located by Alfredson, a possible scarred tree was located.

Alfredson 1990

Over 5 days in April and May 1990 Alfredson undertook an archaeological survey of the proposed Rockhampton Branch Line of the State Gas Pipeline. This was not a complete investigation of the route with road crossings and adjacent creeklines of the pipeline route being the primary focus of investigations. Alfredson estimates that approximately 10% of the route was physically inspected. Seventeen cultural heritage places were located during these investigations with all being within 500m of the proposed pipeline route. These included seven stone artefact scatters, eight occurrences of isolated stone artefact/s and two scarred trees. Two of these places, located in the Midgee Ck area, are located between 1.2 and 1.4km to the south of the Gladstone Nickel pipeline route.

The nearest of these consists of several adjacent ground surface exposures containing scatters of unmodified stone artefacts manufactured from siltstone (JF:A73). These scalds covered an area of about 100m^2 between Midgee Ck and an adjacent road. About 600m to the east of this scatter a single artefact of the same material was also recorded (JF:A74). Neither of these places were to be affected by the alignment of the gas pipeline.

In addition to these Alfredson recorded a great array of useful and medicinal plants in amongst the fringing vegetation of the creeklines investigated. These included: Burdekin plum, cabbage tree palm, sandpaper fig, emu-berries, cocky apple, orchids, Crinum lillies, nardoo, and native currant, cherry, mulberry, lime and almond.

Barker 1990

Barker (1990) undertook a survey of a section of the Fitzroy River on which it was proposed to construct another weir, also to supply water to the Stanwell power station. This was contiguous to the section inspected by Morwood (1984b) and covered approximately 15km of the river centring on Princhester Creek. Barker's survey took four days, with a total of four person days spent in the field. He identified two major landform units: river flats and low hillslopes. Areas containing Aboriginal cultural material were predominantly located on the river flats.

He recorded a total of ten Aboriginal sites throughout this investigation. These included three isolated finds (all flakes), six stone artefact scatters, and one scarred tree. The scarred tree was on a box tree, with the scar measuring 150cm x 70cm. Stone artefactual material was mainly flakes and cores, but two hammerstones and one 'tula' slug (thought to be hafted in a wooden handle and used for wood working) were also recorded. Raw material used for stone artefact manufacture was predominantly chert, but quartzite, jasper and silcrete were also recorded. The largest site was approximately 500m in length, with a density of 20 artefacts/m^2 being recorded. The majority of sites were much smaller

than this, although one other 'extensive' site was recorded. Barker also noted that some of the sites he recorded were extensively disturbed by vehicle tracks and cattle-induced erosion.

Armagh Burials

In September, 1992 local Police were alerted to the discovery of human skeletal material on the south bank of the Fitzroy River on Armagh Station, approximately 20km to the north of Westwood, 50kms to the west of Rockhampton. On examination it was determined that the remains were those of Aboriginal people buried in traditional manner, in a complex bundle form, which had been partially exposed. At least three burials were present at this place. More might have been present but as the intention was to avoid any unwarranted disturbance of the site, definitive evidence of this could not be obtained and there was no investigation for evidence of possible pathologies or cause of death. All damage seen was definitely post mortem. The burial was in a sandy, alluvial area less than 100m from the Fitzroy River. The area was a floodway which had presumably been scoured during the massive 1990 flood of the Fitzroy. This, along with cattle disturbance of the area, had resulted in exposure of the burials. The burials were re-covered with sand and a fence erected to keep cattle from disturbing the area while it stabilised through natural revegetation. The Armagh burials are located approximately 6km upstream from the Gladstone Nickel pipeline's crossing of the Fitzroy River.

Burke (1993)

Burke was engaged by the Queensland Department of Environment and Heritage to undertake a baseline study of the Curtis Coast in 1993. She located 93 Aboriginal sites along the coast. Extensive middens and artefact scatters were recorded on off-shore islands, including Curtis, Facing, South Trees and Hummock Hill Islands together with a quarry at Monte Christo Creek on Curtis Island. To the north of Gladstone, nearer to the study area, further middens are located on the mainland in The Narrows between Curtis Island and the coast.

Wallin, 1996a

The proposal to develop a residential estate on the Helensvale property located near Alton Downs, to west of Rockhampton, saw Wallin and Associates (1996a) engaged to undertake a survey of the property prior to development. The property was 690 hectares (6.9km^2) in size. A field team of three undertook the survey but no details of the time taken for the survey are available.

Wallin recorded three artefact scatters, one isolated find and four scarred trees. The largest stone artefact scatter was 100m in length with a density of artefacts ranging between 1 and 6/m^2. The site was situated on a small knoll about 50m from Lion Creek. Both cores and flakes were found; some of the flakes were retouched. It was apparently possible to conjoin some of the flakes, indicating some manufacturing activities were taking place on the site. The dominant material was silcrete but

quartzite, chert and petrified wood were also identified. The other two sites consisted of 12 artefacts spread over 240m^2 and another spread over 600m^2 with material at a density of between 1-3m^2. In neither case was there any evidence of retouch. Both were situated near small creeks.

The isolated find consisted of an edge-ground axe which had been manufactured on basalt.

Details are available for only one of the trees. This was blue gum with a scar measuring 100cms by 30cms present. The other three trees were situated in close vicinity to each other. Scar sizes apparently were consistent with use as coolamons.

Wallin mentions that there was a background scatter of artefacts situated between a drainage line and a small hill. No other details of what this describes are available.

Wallin, 1996b

The Fitzroy Shire engaged Wallin and Associated to prepare a report overviewing Aboriginal cultural heritage in four potential industrial locations within the shire. The report contains little in the way of information which has not been reviewed above, and the predictive statements are similarly general and unspecific. No further consideration of this study is presented here.

Marlborough Nickel Project

Of note in light of the current project, in late 1997 and early 1998, representatives of the Darumbal Noolar Murree Aboriginal Corporation for Land and Culture (DNMACLC), Barada-Barna-Kapalbara-Yetimarala Corporation and Barada-Kapalbara-Jetimarala groups in association with CQCHM, undertook a cultural heritage assessment of areas to be affected by the proposed Marlborough Nickel Mine Project. This study included archaeological, anthropological as well as historic heritage investigations. The results of this survey are of particular relevance to the northern portion of the currently proposed project area.

A field team of up to 12 Aboriginal researchers and 2 archaeologists spent 216 person days undertaking surveys of the 4 study areas which covered some 28km^2. A total of 89 areas containing cultural material were located: 48 stone artefact scatters, 39 isolated finds, one scarred tree and a rockshelter considered to potentially contain occupation deposits. Although only a relatively restricted range of cultural material was found this was entirely as predicted on the basis of previous survey work undertaken throughout the more general area. In general, cultural material was located in far greater densities in areas containing creeklines and their alluvial flats than in the hilly areas. It was, however, noted that these areas had been subjected to substantial impacts through exploration

activities and that simple correlations between topography and densities of cultural material are not necessarily clear cut.

Little indication of the chronology associated with the recorded cultural material could be obtained on the basis of the field surveys alone. A number of areas containing surface scatters of stone artefacts were also noted to have the potential to contain in situ deposits of sub-surface cultural material. Some mussel shell associated with one of these areas was noted as providing opportunities for future dating. Depending on the strength of the association between the shell and cultural material (particularly the in situ material), this was thought to allow for some absolute quantification of this issue in the future. It was thought that the cultural material, at least in one area, was less than 4,500 years old. This assessment was made on the basis of the presence of an axe blank. In general, however, the amorphous nature of the stone artefact assemblages, and the absence of blade technology suggested a more recent age for use of the area.

AMC Slurry Pipeline, Processing Plant and Gas Pipeline

In December, 1998 DNMACLC in association with CQCHM undertook a survey of the proposed slurry pipeline from the Kunwarara magnesite mine to a proposed processing plant near Stanwell, the site of the processing plant itself, and a proposed gas pipeline from Gracemere to the processing plant.

In the course of this study, a comprehensive examination was made of each element of the proposed project: both pipeline routes were examined in their entirety (80kms on the slurry pipeline and 17.3kms for the gas pipeline), while the processing plant (2kms^2) was examined using a series of systematic transects. In the course of examining these areas, which combined totalled 5.14km^2, the survey team recorded 21 separate occurrences of Aboriginal cultural material. These included 13 isolated finds, 6 stone artefact scatters and 2 scarred trees. When allowance was made for effective coverage it was determined that site density in the areas inspected would have averaged between 20 and 25 per square kilometre.

One of the isolated finds located along the slurry pipeline route (IF13) consisted of flaked green bottle glass. This was located on the edge of a powerline easement along which the proposed pipeline was to run. This area (JF:D01) is located some 500m to the southwest of the current Gladstone Nickel pipeline.

A total of ten areas containing Aboriginal cultural material were located throughout the plant site area. Three of these were stone artefact scatters, with the remaining seven areas containing isolated stone artefacts. It is interesting to note that there were no areas that contained a continuous background

scatter of low density cultural material: that is, all material can be seen as discrete, separate incidents as against points of higher density set against a backdrop of a general, low-level scatter of material.

The bulk of recorded cultural material was located in the area on the northeastern side of Coombs Road. In addition, all cultural material noted was in association with the two creeklines that traverse the study area. The Coombs' paddocks, while obviously subject to quite intense use, have generally been modified to far less a degree than the area within the current Stanwell Power Station, and a large uncleared portion still remains in the north of this area. Only two isolated finds were recorded throughout this area despite reasonable ground surface visibility and good transect coverage.

An unnamed drainage channel traverses this area in an east-west direction before crossing Coombs Road into the Coombs paddock and eventually meeting Neerkol Creek on the outskirts of Stanwell. This has no real creek bank development and tends to flood out to form a series of lagoonal areas along its length. Throughout this total area six isolated finds and an extensive but sparse artefact scatter were located. The stone artefact scatter was located around the margins of the northern-most of these lagoonal areas and adjacent to the base of the extensive ridgeline marking the rear of the study area. In all, artefacts were noted over an area of some 200m by 300m (east-west and north-south). While artefact densities were generally averaged 1 or 2/m^2, a maximum density of 7/m^2 was observed on the slightly elevated area on the western side of the creek. The lagoonal area has been dammed and heavily impacted by grazing, clearing and ploughing, and track and dam construction.

The southern end of the study area also had a major creek that winds its way in and out of this area around the base of the ridgeline and exposed areas of outcropping stone. Unlike the creek at the northern end, this was deeply incised and carries substantial volumes of water from the high country associated with the Razorback Range, again to Neerkol Creek. Two small but dense stone artefact scatters and one isolated find were located associated with this creek, which is largely restricted to the Coombs portion of the study area.

The main artefact scatter (AS1) was located on the gently sloping area between the southern end of the ridgeline and the creek itself. It covers an area of some 60m x 50m. The narrow band of flat country between the base of the ridge and the creekline in this area has seen the area bisected by a vehicle track that has disturbed a great majority of the area. This has quite an even distribution of cultural material that would average about 6 artefacts per square metre. No major concentrations were observed. Erosion had also affected this area with minor gullying and blowouts a regular feature.

The other scatter was located just over 1km to the south west where the creekline crossed Coombs Road. Again, this area was located on the area between the base of an exposed area of ridgeline and

the creek itself. While the average density of artefacts through this area was around 1 artefact per $2m^2$, several areas with densities as high as $6/m^2$ were recorded. It should be noted that these were not considered to be representative of activity areas within a background scatter, relating more to post-depositional factors. This area would have been much more extensive but has been severely impacted upon by the construction of Coombs Road, fencing activities, and diversions and modifications to the creek and the construction of other water management infrastructure in the area. All that remains of this area is a narrow strip of land some 15m wide (east-west) and approximately 80m long (north-south).

Stanwell Energy Park

This is a larger area of land that surrounded the AMC processing plant outlined above. Survey of the study area was undertaken over 10 days from late November to early December 2000, involving the inspection of approximately 9.5 sq kms. In all, a total of 60 person days were spent in the field.

During the course of the fieldwork, a total of 72 cultural places were identified and recorded. These included 7 resource places (food, medicine and ceremonial plants), 6 scarred trees (including 2 found during a previous survey), 1 source area for raw material, 8 artefact scatters (including 2 found during a previous survey), 49 isolated finds (individual stone artefacts) and 1 rock shelter that has definite excavation potential but no direct evidence of human occupation in the surface deposits.

The stone artefactual material found in the study area was consistent with raw materials existing in the immediate vicinity of the study area and no doubt related to it. Material used is local in origin and freely available both in pebble form from the creekline and as consolidated conglomerates eroding from the bases of the ridgelines. Quartz and undoubtedly the cherts noted in the assemblages were obtained from these sources. Sandstone and mudstone outcrop in the central southern portion of the study area although none were noted to have been utilised as quarries. This is reflected within the assemblages themselves that, although mudstone was observed, show a reliance on other, more durable materials, such as silcrete that is likewise found throughout the study area as natural blocks and pebbles eroding from the ridgelines. Although other materials are freely available and make up some part of the recorded assemblages, silcrete is the dominant raw material chosen for artefact manufacture. In order of abundance, raw materials preferred for use throughout the study area consisted of silcrete, chert, mudstone and quartz.

No diagnostic artefacts, commonly termed 'tools' were located throughout the study area. The dominant artefacts were unmodified flakes, with a small number of cores noted. A couple of small retouched flakes, probably used as scrapers were identified in the course of the survey.

The larger sites were found in close proximity to Neerkol Creek, and its tributaries, while the isolated finds were more generally scattered on the floodplain and low foothills and slopes. It was thought that this reflected, to some extent, real patterns of occupation in the study area: creeks would have been preferred camping locations, offering water and a range of other resources, while the flood plain and the lower slopes were probably seen as areas from which various resources could be obtained in the course of short forays away from the creeks. These resources would have included numerous plants foods and other useful plants, as well as raw material for the manufacture of artefacts.

There may well have been more artefactual material on the flood plains that has been disaggregated by clearing and then lost through ploughing. Experimental work on plough zones elsewhere has shown that field inspections commonly find only 3-5% of what actually existed in an area prior to disturbance in this way. Even so, application of a correction factor on finds on the flood plain to account for the effect of these processes indicates there is still a clear preference for locations close to creek lines.

Two sites recorded during earlier surveys were examined and recorded during this study. Site AS 1 was first recorded during the survey of the proposed AMC plant site. The site is situated at the southern end of the hill that lies between the plant site and this study area. It consisted of a large scatter of artefacts lying on the western bank of a creek line. Inspection revealed no significant changes had taken place in the two years between the initial recording and subsequent inspection. This probably reflects the relatively short time that had elapsed between recordings, and the overall geomorphological stability of the area. The other site, situated at the eastern end of the southern survey section on Neerkol Creek, was first recorded by Morwood in 1984 as part of the Stanwell water pipeline survey. He recorded only three flakes scattered on the bank of the creek. Subsequent inspection revealed a scatter of artefacts extending for at least 100 metres along the bank of the creek. Artefacts densities averaged $1/m^2$, rising to $3/m^2$ in limited areas. These differences can be attributed to disturbance of the area by cattle, and the subsequent loss of surface soil, no doubt exacerbated by scouring during flood episodes. It also highlights the fact that what is apparent on the surface in some areas, particularly those where the deposits are stable or disturbance has been limited, is not necessarily an indication of what actually exists. Care is therefore required in the formulation of suitable recommendations, particularly where buffer zones and the like are required.

These surveys also resulted in the location of six scarred trees. They were found both in the northern and southern sections, notably in areas that had not been subject to extensive clearing. One of the trees was of considerable interest. It had the classic form of a tree scarred by Aboriginal people. Interestingly, however, it has then been scarred a second time, with a small section having been cut through the first scar into the hollow of the tree. Apparently, the tree died sometime after the first scarring event, the heart of the tree rotted out and it was inhabited either by bees or a possum. The

second scar has resulted from cutting to procure the sugar bar (honey of the native bee) or the possum. This second scar definitely has been cut with a steel axe, indicating it was most likely done post-contact, pointing to cultural continuity. The scarred trees reflect a range of uses for the bark: construction of bark huts for shelter during wet weather; manufacture of coolamons for carry items of food or for the manufacture of shields; scarring resulting from food collection activities.

The rockshelter identified was situated on the eastern flanks of the hill at the western end of the survey area. This shelter measured 7m in length, 2.5m in depth, and the roof was 2m high, allowing a person to stand upright. The floor of the shelter was flat and composed of sand and it was apparent that there had been a substantial build-up of deposit in the shelter. Although no cultural material was identified in the shelter or exposed in the dripline, the shelter offers excellent occupation potential. It falls neatly within the spectrum of shelters that elsewhere have been termed 'Potential Habitation Sites'.

Portions of the study area had been cleared of most of their natural vegetation cover. In the course of the survey, however, a series of culturally important plants (edible, medicinal, or useful for other purposes) were identified. These included plants in all three categories, and included one plant that was important in ceremonial activities. The identification of these plants also emphasises the point of continuity between the archaeological manifestations of earlier Darumbal occupation of the study area and their contemporary knowledge, and use, of country and the resources it contains.

Stanwell to Apis Creek Power Transmission Line

In 2001, Powerlink proposed to construct a powerline transmission route planned to run from Stanwell to Broadsound. The section between Stanwell and Apis Creek lies within Darumbal country and was duly surveyed by them. The results were unremarkable in the sense that no novel discoveries were made. A series of cultural areas consisting of isolated finds and small artefact scatters were identified as were numerous stands of cultural valued plants. A rockshelter containing occupation deposit was also identified in the Native Cat Range section of the route. Very limited amounts of cultural material (a few isolated finds) were identified on the levee of the Fitzroy River. Darumbal also identified a series of places where no cultural material was identified on the surface but where it was considered there was potential for sub-surface material. A subsequent program of test-pitting resulted in a confirmation rate where in more than 60% of cases it was found that the potential for sub-surface material was confirmed by actual finds. In no cases were there large amounts of material. Material was identified at depths of up to 1m. Unsurprisingly, prime locations were alluvial sediments beside watercourses, irrespective of whether they were permanent or ephemeral in nature. The results were sufficient to substantiate requests for monitoring of those locations during the construction phase of the project.

Rockhampton Foreshore Upgrade

In 2005, the Department of Public Works (Qld) planned to improve conditions along sections of the riverfront in the immediate vicinity of Rockhampton. The Darumbal were engaged to survey the area and prepare a statement on the cultural values of the area. Four places were identified in the course of investigations. They included:

The Fitzroy River, or *Toonooba* as it known to the Darumbal, is a major cultural artery throughout this region. The Fitzroy River basin extends over approximately one third of present-day Queensland and the river and its tributaries have always held great social and cultural value for all Aboriginal groups with traditional connection with the river system. The river system is known to be part of a creation story in which the river was formed by the Rainbow Serpent - 'Moondangutta', which still exists within its waters. The Rainbow Serpent created the landscape in which the Darumbal reside, and there are numerous traditional stories in which it figures as a central character. The river has very high environmental values and is a source of sustenance for much of the surrounding country, including the flora and fauna, and is central to the many rich and diverse ecosystems that abound, and many other aspects of the regional environment. The river thus holds significant cultural and linked environmental values for the Darumbal people as well as the broader Indigenous and non-Indigenous communities.

An important fishing place was also recorded. In circumstances where Darumbal people occupied a low position in the socio-economic regional order, the importance of procuring traditional resources, particularly food, was of great importance in maintaining a self-sufficient lifestyle. Accordingly, continued use of places that are known good fishing locations is unsurprising. The fish caught at this location by Darumbal people, a favoured fishing location that is admittedly now used by non-Aboriginal people as well, are distributed among family and friends and used to feed gatherings associated with major events such as weddings, wakes, baptisms and other events. In this way, while the fishing might be seen as a recreational pursuit no different to that of non-Aboriginal people, the produce thereof makes a substantial contribution to reinforcing group cohesion. There are numerous anecdotes about fishing and social interactions that took place at this location. Again, these serve as a social cement of shared events among Darumbal people, and this again reinforces general group and family solidarity for the Darumbal.

A small sandy beach is a recreational area where small groups of Darumbal people went to spend time together fishing, swimming and 'yarning'. This is a quiet section of the river tucked in bushland, away from town and from observation of others. Again, numerous stories of events that took place at this location are frequently recounted among the Darumbal, and recalled with humour and fondness.

In the course of the survey, one plant that was used for medicial purposes was identified. The identification of this plant also emphasises the point of continuity between the archaeological manifestations of earlier Darumbal occupation of the study area and their contemporary knowledge, and use, of country and the resources it contains. This plant is commonly called *gumbi gumbi* and is otherwise known as cattlebush (*Pittosporum pehylliraeoides*). It has been described as a multi-purpose bush medicine in the central Queensland region, and many Aboriginal groups value its broad medicinal qualities. The medicinal values of the plant are heavily stressed in the following example: *Gumbi Gumbi* was the name selected for an Aboriginal alcohol and drug rehabilitation centre now operating in Rockhampton. The plant is now rarely found because it is eaten avidly by cattle and because the country where it was commonly found has been subject to large scale clearing and development. Isolated individual specimens are highly valued, and their location quickly transmitted in the community so that its leaves can be harvested and used in an infusion created by crushing the leaves in hot water.

Enertrade Moranbah to Gladstone Seam Gas Pipeline – Darumbal Section

The surveys for the Darumbal section of the proposed gas pipeline from Moranbah to Gladstone were conducted in September and November 2005. Along the 112km of the pipeline in Darumbal country a total of 132 places were recorded during the survey. Of these, 129 were significant areas or contained significant objects that were recorded as 'Aboriginal' cultural heritage. Of these: 111 (86%) consisted of isolated stone artefact/s; 16 (12%) were stone artefact scatters; and one was recorded as a resource plant. Finally, and importantly, the proposed project involved the crossing of the Fitzroy River which, as previously noted, is of high cultural significance to the Darumbal People through its association with the major creator being, the Rainbow Serpent, who made the river and the surrounding landscape, and still resides in the river itself.

Although in a broad sense Aboriginal cultural heritage places were located throughout the entirety of the survey areas, two observations regarding its general distribution can be forwarded. Firstly, while a majority of the places recorded are associated with creeklines, there are significant sections of the route that are well watered that contain no identifiable cultural places. Secondly, and further to the first, these places tended to be found as clusters along the pipeline route. Although there are some differential impacts from a range of development activities along the route, this does not coincide so significantly as to be attributable as the major reason for this observed distribution. Rather, this would seem in large measure to reflect a culturally-derived footprint of use and occupation of the study area.

As this survey is of a similar nature and covered very similar country to the Gladstone Nickel Project (particularly the 60km section between Stanwell and the Raglan Creek area where the slurry and raw sweater pipelines generally parallel this route some 4-5km to the east), a detailed synthesis of the

cultural places and material found during these surveys will be provided. These are outlined moving east and south along the pipeline alignment.

Melaleuca Ck - Fitzroy River

A total of 9 cultural places were identified along this section of the pipeline route. With one exception which was located on the crest of a hill, all of these places are found in direct association with unnamed creeklines. Three places were found on tributaries of Melaleuca Ck, while the remaining were located on tributaries of the Fitzroy River. All contained only 1 or 2 artefacts. Both raw materials and artefact types are quite restricted being dominated by unmodified silcrete flakes. A notable exception to this was a preformed but unground basalt axe blank found on the high alluvial terrace of Melaleuca Ck.

The absence of cultural material on the western terraces of the Fitzroy River is unsurprising. Several studies have been undertaken on sections of the Fitzroy River levee. In all cases only small amounts of cultural material have been identified. This probably reflects the intense stripping that takes place during flood events. In this particular case, surface visibility was also limited.

Fitzroy River – Black Mountain / Native Cat Creek

Almost one quarter of total number of cultural heritage places recorded during the survey were found within this area. A total of 37 cultural heritage places were recorded: 29 areas containing isolated stone artefact/s; 7 stone artefact scatters (notable in that this is just under half of the total of number of scatters recorded along the entire pipeline and realignment surveys); and a single area containing a particularly significant resource plant. Despite this, and quite unlike the results of the previous section, this material was found in three quite distinct clusters along the route.

The first of these is found on the eastern terraces of the Fitzroy River where an unnamed tributary flows into it from the north east. This area contains four of the seven stone artefact scatters that were located along this section. All of these scatters were recorded in a single area located several hundred metres to the east of the river and immediately to the north of the unnamed tributary. Although recorded as separate scatters they more reflect exposure conditions experienced at the time of the survey work and as such it is considered that the area would likely be a single large, differentially exposed cultural precinct covering some 250m by 250m (just over 6ha in size).

The second cluster covers an extended area (just over 5km in length) and surrounds the headwater tributary system and main channel of Breakfast Creek. Cultural material is generally sparse but regular in the east and consists entirely of areas containing isolated stone artefact/s. Unlike further to

the east closer to the river, this area shows differences in stone artefact assemblage composition and raw materials.

Between these places and Native Cat Creek (a distance of 8.5km) only two other cultural heritage places were recorded. These were found in close proximity to one another and adjacent to Fred Creek on its high terraces. Like the previous cluster, this area also lay at the western foothills of an unnamed set of hills and was located roughly mid way between Black and Sugarloaf mountains.

Black Mountain / Native Cat Creek – Quarry Creek Realignment Area

A total of 23 cultural heritage places were recorded along this section: 18 areas containing isolated stone artefact/s; and 5 stone artefact scatters. Of these, only 5 cultural heritage places were found across the extensive area between Native Cat Creek and the area of Quarry Creek and all of these were found within the easternmost four kilometres. Other than a single flake located beside Native Cat Creek, the remaining four places were in two locations. A single mudstone flake and a stone artefact scatter covering almost 1,000m^2 were located in close proximity to one another at the confluence of a series of headwater streams that flow into Neerkol Creek just over 1km to the south.

The second location within this area is located adjacent to a set of yards on top of a high knoll that overlooks the Native cat Range to the north and the low-lying floodplains between a series of creeks to the east and south. At the easternmost of these two locations two retouched basalt flakes were recorded.

The majority of cultural heritage places recorded along the remainder of this section of the route were found along the western portion of the narrow valley floor surrounding Quarry Creek and the confluence of Quarry and Centre creeks. These places contained single stone artefacts at each location but varied widely in raw materials (silcrete, argillite, chert and quartz) and also artefact types (2 unmodified flakes, a single platform core and a multi-platform core). All of these were located between the base of a long hill and the creek. A large cluster of cultural heritage places was located around the confluence of the two creeks. Although these are spread out across almost 1,400m of the pipeline route, the vast majority of these (including four stone artefacts scatters and 5 areas containing isolated stone artefact/s) were recorded across a 500m section surrounding the confluence.

Quarry Creek Realignment Area – Bajool Explosive Bunkers

Despite the length of pipeline surveys that were undertaken throughout this area and the number and nature of creeks that traverse it, relatively few cultural heritage places were recorded. With the exception of one stone artefact scatter, all of the recorded cultural heritage places throughout this section of the pipeline route contained isolated stone artefact/s at numbers ranging from one to four.

With one exception, there are no real clusters of material throughout this section and it is fair to say that cultural material was found only in a small number of restricted areas.

Bajool Explosive Bunkers – Horrigan Creek

This section of the route covered the southernmost portion of the route contained within the Darumbal Native Title Claim area. Within this 20km section of the pipeline route, 36 cultural heritage places were recorded. These consisted of 31 areas containing isolated stone artefact/s and 3 stone artefact scatters.

The distribution of this material is best described as a series of clusters of cultural heritage places in the northern third (which contains 24 of the recorded places along this section), within the larger southern portion containing cultural heritage places distributed throughout and in more isolated contexts.

Within the northern portion of this section, the recorded cultural heritage places were recorded in three distinct clusters around an unnamed tributary of Six Mile Creek; 500m further along the route around the main channel of Six Mile Creek, and finally around Eight Mile Creek. It is notable that these creeks are the only waterways holding water in several large waterholes throughout this portion of the route.

Horrigan Creek – PCCC Native Title Boundary

This final section of the pipeline route is around 5.5km is length and dominated by moderate to heavily rolling hills and deeply incised valleys. Some of the larger mountains that flank the south of the route in this area include Mounts Erebus, Holly and Despair and are around 280m above sea level. These provide a series of waterways that traverse the pipeline route and include Branch, Five Mile and Spring creeks. Clearing of the native vegetation has caused considerable damage to these areas that has then been exacerbated by erosion across the steep slopes. Despite this, a single cultural heritage place was located at the northwestern end of this section on a gently sloping valley floor and adjacent to an unnamed tributary of Horrigan Creek (some 800m southeast of the main channel crossing). Two stone artefacts were located over a 300m^2 area: an edge-ground axe made of Andesite and a single platform core manufactured from green chert.

While quite a lot of the green chert was observed as scatter on the cleared slopes at the Horrigan Creek end of this section, almost all other stone observed elsewhere was unsuitable for stone artefact manufacture. The only notable exception to this was the volcanic material that could have been fashioned into artefacts such as the axe located in this area.

The gas pipeline route continued south and east from this area in to Gladstone. This area is with boundaries of the PCCC Native Title Claim. The proximity of this route to that proposed as part of the Gladstone Nickel Project deviates considerably from the Ambrose area, with the gas pipeline heading further to the north before passing through the Nickel Refinery Site less than 200m north of the proposed Residue Pipelines. The results of the Indigenous Cultural Heritage Database search show that no places from this work were recorded within the 1km buffer of the Gladstone Nickel Project's infrastructure elements.

Gladstone State Development (Aldoga) Study

Prior to the development of the GSDA at Aldoga, comprehensive investigations of the area's cultural heritage values were undertaken. These studies are subject to confidentiality clauses in various agreements. It can be noted that various cultural places were identified in the study area. A comprehensive program of mitigation involving the collection of these sites was undertaken. It can also be noted that the development of the site proceeded as planned subject to implementation of agreed management measures.

Gooreng Gooreng Project

The most comprehensive project undertaken that has a possible bearing on the proposed project in the country covered by the PCCC Native Title claim is the Gooreng Gooreng Project, a multidisciplinary project developed and run by the Aboriginal and Torres Strait Islander Studies Unit, University of Queensland, in the mid and late 1990s. The project had an archaeological dimension that focused on coastal sites well to the south of the project area, and on rock shelters in the vicinity of Cania Gorge, well to the southwest, where Pleistocene occupation was discovered. It also had an important social and cultural anthropological dimension. This involved the documentation of many places of traditional and contemporary significance. It did not claim to be a definitive study but is the most comprehensive compilation of such places yet attempted. A review of the places included in that study indicates that none of the 54 places they identified and discussed is situated in close proximity to any of the project infrastructure areas.

5. Conclusions

The above discussions of the results of the heritage lists and database searches and the review of previous cultural heritage research undertaken in the vicinity of the Gladstone Nickel Project lead to the following:

1. In relation to the GNP project, there are 18 cultural heritage places within the 1km buffer of the proposed project infrastructure elements. These consist of 17 places that have Aboriginal

cultural heritage values (including the World Heritage Listed, Great Barrier Reef area) and a further place listed on the Queensland Heritage Register.

2. Of these places, 6 lie within about 200m of project infrastructure areas and include 4 places on the Queensland Indigenous Cultural Heritage Database, one inscribed on the World Heritage List and one registered on the Queensland Heritage Register.

3. Of these, it would appear that the Nickel Slurry and Seawater Pipeline Corridor may directly impact upon two of these places (the recorded quarry, JF:A14; and the Queensland Heritage List place, Raglan Homestead), while the Refinery Seawater Pipelines and Nickel Conveyor enters the Great Barrier Reef area as inscribed on the World Heritage List and the Register of the National Estate.

4. Additionally there are a range of other important places and values that are attached to both specific areas and the broader country through which the project traverses. While the majority of these (such as the Fitzroy River) are known for the project area, there is nonetheless, a moderate likelihood of other such places becoming known.

5. There is a high likelihood of various categories of cultural heritage places, but particularly stone artefact scatters and other isolated finds (predominantly stone artefacts but also extending to quarries, scarred trees and shell midden material), being identified throughout the various project areas;

6. In certain locations, notably highly dissected country where small cliff lines are encountered, rock shelters containing occupation deposit may be found;

7. Irrespective of the presence of cultural material on the surface, there is some likelihood of cultural material being found in sub-surface contexts, and this can be predicted with a reasonable degree of accuracy;

8. Human skeletal remains have been found in alluvial sediments along the Fitzroy River in some proximity to elements of the proposed project. These remains would not have been visible on the surface except for mechanisms that removed sediments that otherwise covered them;

9. Despite the presence of numerous cultural heritage places in a development or area or in close proximity to it, management measures have been developed that have seen all proposed developments undertaken in proximity to the project area proceed to conclusion.

10. There is nothing stemming from this review that would indicate the likelihood of any significant new issue or substantial deviation from the results of these previous investigations that would impact detrimentally upon the Gladstone Nickel Project as proposed.

11. Any such issues or deviations, both currently known and potential (including as a result of new information coming to light regarding the nature and extent of project infrastructure elements or the cultural heritage values of the development areas), will be managed in accordance with the required Cultural Heritage Management Plan (CHMP) developed and implemented with the endorsed Aboriginal parties.

12. The issues of potential project impacts, and therefore required actions, to the places registered on the Queensland Heritage Register (Raglan Homestead), and the World Heritage List and Register of the National Estate (Great Barrier Reef) will need to be addressed via the required processes established under their respective legislations.

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