



Chapter 13

Cultural Heritage Characterisation

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The EIS has been prepared by, for and on behalf of Wafi Mining Limited and Newcrest PNG 2 Limited (together the “**WGJV Participants**”), being the participants in the Wafi-Golpu Joint Venture (“**WGJV**”) and the registered holders of exploration licences EL 440 and EL1105, for the sole purpose of an application (the “**Permit Application**”) by them for environmental approval under the Environment Act 2000 (the “**Act**”) for the proposed construction, operation and (ultimately) closure of an underground copper-gold mine and associated ore processing, concentrate transport and handling, power generation, water and tailings management, and related support facilities and services (the “**Project**”) in Morobe Province, Independent State of Papua New Guinea. The EIS was prepared with input from consultants engaged by the WGJV Participants and/or their related bodies corporate (“**Consultants**”).

The Permit Application is to be lodged with the Conservation and Environment Protection Authority (“**CEPA**”), Independent State of Papua New Guinea.

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The information in the EIS that relates to Golpu Ore Reserves is based on information compiled by the Competent Person, Mr Pasqualino Manca, who is a member of The Australasian Institute of Mining and Metallurgy. Mr Pasqualino Manca, is a full-time employee of Newcrest Mining Limited or its relevant subsidiaries, holds options and/or shares in Newcrest Mining Limited and is entitled to participate in Newcrest's executive equity long term incentive plan, details of which are included in Newcrest's 2017 Remuneration Report. Ore Reserve growth is one of the performance measures under recent long term incentive plans. Mr Pasqualino Manca has sufficient experience which is relevant to the styles of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the JORC Code 2012. Mr Pasqualino Manca consents to the inclusion of material of the matters based on his information in the form and context in which it appears.

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The information in the EIS that relates to Golpu Ore Reserves is based on information compiled by the Competent Person, Mr Pasqualino Manca, who is a member of The Australasian Institute of Mining and Metallurgy. Mr Pasqualino Manca, is a full-time employee of Newcrest Mining Limited or its relevant subsidiaries, holds options and/or shares in Newcrest Mining Limited and is entitled to participate in Newcrest's executive equity long term incentive plan, details of which are included in Newcrest's 2017 Remuneration Report. Ore Reserve growth is one of the performance measures under recent long term incentive plans. Mr Pasqualino Manca has sufficient experience which is relevant to the styles of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the JORC Code 2012. Mr Pasqualino Manca consents to the inclusion of material of the matters based on his information in the form and context in which it appears.

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13. CULTURAL HERITAGE CHARACTERISATION

This chapter of the environmental impact statement (EIS) describes the methods used and the findings of the baseline cultural heritage assessment presented in Appendix U, Cultural Heritage Baseline and Impact Assessment. The purpose of the assessment was to identify, describe and map cultural heritage sites that may exist in relation to areas in which Wafi-Golpu Project (Project) activities are proposed.

The baseline cultural heritage assessment focused on three study areas, which are discussed in this chapter and Chapter 20, Cultural Heritage Impact Assessment, as: the Mine Study Area, Infrastructure Corridor Study Area and the Coastal Study Area (Figure 13.1). These three study areas approximately align with the three key geographic areas of the Project, however, extend beyond these areas by an additional 50 to 100 metres (m) in order to identify cultural heritage sites recorded in close proximity to areas that would be disturbed. The cultural heritage study areas are detailed further in Section 13.1.1. Importantly, several significant cultural heritage sites are located outside the present cultural heritage study areas because the WGJV has re-sited Project infrastructure to specifically avoid these cultural heritage sites.

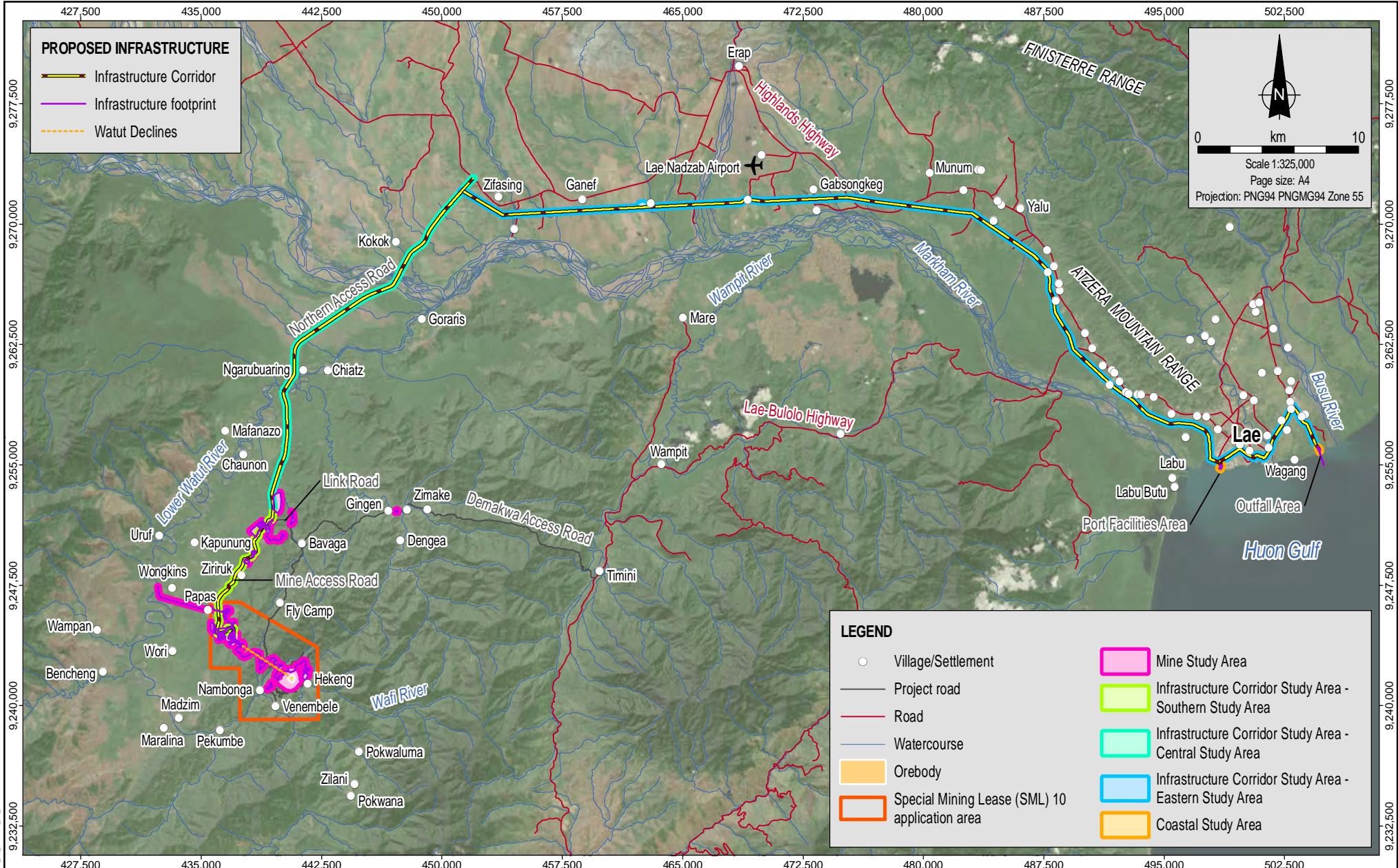
To provide a fuller appreciation of significant cultural heritage sites relative to the location of proposed Project activities and infrastructure, this chapter discusses both significant sites recorded within the cultural heritage study areas, and significant sites recorded in close proximity to these study areas.

13.1. Study Methods

Cultural heritage has both tangible and intangible aspects. Tangible heritage includes physical artefacts and objects significant to a specific culture (UNESCO, 2016). Intangible heritage includes oral traditions passed down through generations that are reflected in practices, expressions, knowledge and skills that communities identify as part of their cultural heritage (UNESCO, 2003). In Papua New Guinea (PNG), intangible and tangible heritage includes:

- Oral tradition sites, which include spiritual and oral history sites of importance to landowners.
- Historic sites associated with the early period of PNG's colonial history, World War II (WWII) history and exploration or mining history.
- Archaeological sites, which often reveal information about past human activity in an area; for example, pottery sherds can provide information on possible migration, settlement and trade patterns of different peoples.

Each type of heritage was considered in the baseline assessment, which was prepared in accordance with Independent State of PNG (State of PNG) legislative requirements and Wafi-Golpu Joint Venture (WGJV) Sustainable Business Management System standards, including Cultural Heritage Standard COM08. The assessment also had regard to the IFC Performance Standards (IFC, 2012), ICMM Sustainable Development Framework (ICMM, 2015) and the Burra Charter (Australia ICOMOS Burra Charter, 2013), as discussed in Chapter 3, Legal, Policy and Administrative Framework.



PROPOSED INFRASTRUCTURE

- Infrastructure Corridor
- Infrastructure footprint
- Watut Declines

0 km 10

Scale 1:325,000
Page size: A4
Projection: PNG94 PNGMG94 Zone 55

LEGEND

- Village/Settlement
- Project road
- Road
- Watercourse
- Orebody
- Special Mining Lease (SML) 10 application area
- Mine Study Area
- Infrastructure Corridor Study Area - Southern Study Area
- Infrastructure Corridor Study Area - Central Study Area
- Infrastructure Corridor Study Area - Eastern Study Area
- Coastal Study Area

MXD Reference: 0520DD_10_GIS024_v01_10

Source:
Study areas from ALA.
SML and orebody from WGJV.
Infrastructure and project roads from WGJV and Coffey.
Roads and watercourses from NSO.
Imagery from ArcGIS Online (capture date unknown).



Date:
13.06.2018
Project:
754-ENAUABTF100520DD
File Name:
0520DD_10_F13.01_GIS



Cultural heritage study areas

Figure No:
13.1

In summary, the baseline cultural heritage assessment involved:

- Defining the study areas relevant to the baseline cultural heritage assessment, including the Mine Study Area, Infrastructure Corridor Study Area and Coastal Study Area.
- Reviewing the field survey results of 12 cultural heritage studies undertaken for the Project between 1996 and 2018 and other documentation relevant to the Mine Study Area, Infrastructure Corridor Study Area and Coastal Study Area.
- Identifying recorded cultural heritage sites located within the Mine Study Area, Infrastructure Corridor Study Area and Coastal Study Area.

As discussed in Chapter 7, Assessment of Alternatives, the Project has been subject to a range of studies which have resulted in progressive refinements to the Project description presented in Chapter 6, Project Description. Consequently, the 12 studies completed by the WGJV and previous exploration licence holders between 1996 and 2018 investigated a range of potential Project infrastructure locations. This has informed an understanding of significant cultural heritage sites that lie directly within the cultural heritage study areas defined in this chapter (which specifically relate to location of Project infrastructure described in Chapter 6, Project Description, with a 50 to 100m buffer), as well as cultural heritage sites recorded outside, but proximal to these areas. The significance of recorded cultural heritage sites has been assessed in a manner consistent with the Burra Charter (Australia ICOMOS Burra Charter, 2013).

Further details of the baseline assessment, including how the significance of sites has been determined, is provided in the sections below.

13.1.1. Study Areas

The study areas used in the baseline cultural heritage assessment are shown in Figure 13.1.

The Mine Study Area included the Project disturbance footprint of the infrastructure and facilities shown in Table 13.1 with a 50 to 100m buffer in addition to the footprint.

The Infrastructure Corridor Study Area was investigated in three sections (as shown in Figure 13.1 and Table 13.1): the Southern Study Area, Central Study Area and Eastern Study Area. Each of these study areas included a 50m wide construction right of way (25m either side of the Infrastructure Corridor centreline) buffered either side by a further 50m for a total Infrastructure Corridor Study Area width of 150m.

The split of the Infrastructure Corridor Study Area into Southern, Central and Eastern components reflects the progressive nature of field studies, with the Southern, Central and Eastern study areas being studied in 2012-2014, 2015-2016 and 2018 respectively.

The Coastal Study Area included the footprints of the Port Facilities Area and the Outfall Area with an additional 50m buffer.

Table 13.1: Cultural heritage study areas

Study Areas and Associated Infrastructure and Facilities		
Mine Study Area		
Mine subsidence zone	Waste management facility	Borrow pits and gravel extraction sources: <ul style="list-style-type: none"> • Miapilli Clay Borrow Pit • Migiki Borrow Pit • Humphries Borrow Pit • Northern Access Road Borrow Pits • Bavaga River gravel extraction • Waime River gravel extraction • Lower Papas Aggregate Source and crushing / screening area
Waut Declines Portal Terrace and Watut Waste Rock Dump	Wastewater discharge pipeline and raw water make-up pipeline	
Process plant terrace (including the Watut Process Plant, raw water dam and sedimentation dam)	Finchif Construction Accommodation Facility	
Nambonga Decline Portal Terrace	Fere Accommodation Facility	
Miapilli Waste Rock Dump	Explosives magazines	
Nambonga Haul Road	Power generation facilities	
Ventilation shaft	Quarries and access road	
Infrastructure Corridor Study Area		
Southern Study Area: between the proposed Watut Process Plant and Link Road (containing the Infrastructure Corridor, including the Mine Access Road)		
Central Study Area: between Link Road and the Highlands Highway, near the village of Zifasing (containing the Infrastructure Corridor, including the Northern Access Road)		
Eastern Study Area: between the village of Zifasing and up to but not including, the Port Facilities Area and the Outfall Area		
Coastal Study Area		
Port Facilities Area		
Outfall Area		

13.1.2. Cultural Heritage Studies and Other Document Reviews

The baseline cultural heritage assessment (Appendix U, Cultural Heritage Baseline and Impact Assessment) drew upon the findings of 12 cultural heritage studies completed by the WGJV and previous exploration licence holders between 1996 and 2018. These studies were undertaken in support of exploration activities and feasibility studies to inform the design of the mine and supporting facilities. The review of these studies and other relevant documents involved:

- Review of the Wafi-Golpu Cultural Heritage Site Catalogue which contains the results of all cultural heritage studies undertaken during the period from 1996 to 2018 (refer to Appendix U, Cultural Heritage Baseline and Impact Assessment).
- Review of the PNG National Museum and Art Gallery (NMAG) National Site File. This review was undertaken prior to the start of cultural heritage fieldwork for the Project in 2012 to identify if any registered cultural heritage sites were located in the vicinity of the Project. Unfortunately, subsequent applications and requests in 2015 and 2017 to view the National Site File were yet to be approved by NMAG at the time of writing.
- Examination of aerial photography for the cultural heritage study areas and a video filmed by the WGJV at low altitude during a flyover of the proposed Infrastructure Corridor to inform an understanding of terrain and existing levels of ground disturbance in the three study areas.

- Review of WWII military history of the Project Area by G-Tek Australia Pty Ltd and Gap Explosive Ordnance Detection Pty Ltd (GapEOD). This included consideration of historical aerial photographs, local councils and historical societies' records, files held by the National Archives of Australia, the Australian War Memorial and the Defence National Unexploded Ordnance Office, consultation with villages proximal to Project infrastructure and searches using the world wide web. The findings of the G-Tek (2015) report and GapEOD investigations were used to inform WWII aspects of the baseline assessment (Appendix U, Cultural Heritage Baseline and Impact Assessment).

The 12 studies undertaken between 1996 and 2018 include: Alo (2016); CRA (1996); Hitchcock (2012); Green, Muke and Skelly (2017a; 2017b); Green and Sepe (2018); Green, Sepe and Skelly (2017a; 2017b); Muke et al. (2007); Muke and Green (2018); Muke and Skelly (2017); and Skelly et al. (2017).

The preparation of these studies included: desktop review of archival sources and other documentation (similar to that described above); engagement with the NMAG; extensive consultation and field survey programs involving representatives from villages proximal to the areas being studied; and the recording of sites in the Wafi-Golpu Cultural Heritage Site Catalogue according to site type.

An overview of the approach to conducting consultation and field investigations, and the recording of sites during the 1996 to 2018 studies, is provided below. Further details of these studies, including scope, dates and the number of sites identified during each study, are presented in Appendix U, Cultural Heritage Baseline and Impact Assessment.

13.1.2.1. Consultation Activities and Field Investigations – 1996 to 2018

Consulting stakeholders with specific interests in the areas being studied, including people of the Hengambu, Yanta, Babuaf, Wampar and Ahi cultural groups, served as the critical first step in conducting field investigations. The consultation assisted in identifying the nature and location of cultural heritage sites within, and in close proximity to, areas being studied.

Consultation involved:

- Pre-awareness discussions conducted by WGJV Community Affairs personnel with nominated communities to explain the purpose of the field surveys, obtain agreement to enter customary land to conduct surveys, and identify individuals or a group who would be willing to assist in focused interviews and act as guides during subsequent field surveys.
- Providing at the commencement of each survey a general introduction to the purpose of the cultural heritage survey and its methods, followed by an invitation to participate either as individuals or as a group in focused interviews, conducted by qualified archaeologists. Alternatively, individuals already nominated by community leaders as suitable representatives were invited to participate in an interview. Men and women were always invited to attend and participate in the introductory briefing sessions and to participate in key informant interviews and subsequent field surveys.
- Recording all cultural heritage sites reported by community members during interviews. This occurred irrespective of whether the sites were reported within or outside the study area being investigated at the time, therefore enabling a broader understanding of cultural heritage within the vicinity of the Project. Where sites were reported within areas being studied, sites were subsequently investigated through targeted field surveys, as described below.

- In the case of WWII sites, conducting interviews with individuals and groups to identify potential locations of downed aircraft and relics. In the case of the Mine Area, a recognition guide, which included photographs and drawings of WWII munitions that had the potential to exist on site, was used to assist with interviews. Mine Study Area interviews were conducted by G-tek (2015). In the case of the Infrastructure Corridor Study Area, WWII sites were recorded as part of consultation activities and an archaeological survey carried out by Muke and Skelly (2017) and Skelly et al. (2017). GapEOD (2017) also reported on the location of potential unexploded ordnance (UXO) identified in the course of clearance and excavation of geotechnical test pit and drilling sites along the route.
- Engagement with the NMAG with regard to cultural heritage mapping and archaeological survey permits for the studies and to identify and address any issues or concerns.
- Consulting representatives of the PNG Defence Force and the Provincial Disaster Office about potential UXO sites (and therefore potential WWII sites). This consultation related to the Mine Area, Northern Access Road (East B) alignment (refer to Chapter 7, Assessment of Alternatives, Figure 7.3 – this option was not progressed due to significant constraints) and an earlier concentrate filtration plant site at the Lae Tidal Basin (also not progressed following the selection of Berth 6 site as the preferred site) (G-tek, 2015).

Following consultation, targeted field surveys were conducted based on the proposed location of Project infrastructure and the outcomes of community interviews. With respect to the Mine Area, a predictive mapping model (described below) was also utilised.

Surveys involved vehicle reconnaissance followed by targeted pedestrian surveys. Wherever possible, field surveys included a formal archaeological survey of traditional gardens, which were selected based on their locations within different landforms to ensure that as many different landforms as possible were sampled, as well as the relatively high degree of ground surface visibility that gardens display.

Previously recorded sites listed on the Wafi-Golpu Cultural Heritage Site Catalogue with potential to be impacted by Project activities were also inspected to determine their current condition and state of preservation.

13.1.2.2. Predictive Mapping to Inform Field Survey Strategies (Mine Area)

Due to the dense rainforest and the mountainous terrain that dominates much of the Mine Area and therefore limits more expansive pedestrian surveys, a predictive mapping model was developed to predict the possible distribution and location of cultural heritage sites within this area, based on the distribution and location of sites already recorded.

The model (Green and Muke, 2013) was used to inform design of the field survey strategies and cultural heritage investigations for the Mine Area. Development of this model involved the use of site data from the Muke et al. (2007) cultural heritage investigation, together with various environment-related spatial datasets, e.g., geological and landform data, vegetation/ecological data and topographical data. The attributes included in the model were selected on the basis that the environmental parameters they represented would have had a modifying influence on the human occupation and use of the Mine Area (e.g., the presence of very steep slopes would make human occupation and use highly unlikely), and this influence would be detectable in the variations in distribution and density of cultural heritage sites within this area.

The mapping model was used to identify patterns that might characterise the locations of archaeological, burial/cemetery, former village, camp and story sites across the Mine Area, which were then further refined on site through community consultation.

13.1.2.3. Wafi-Golpu Cultural Heritage Site Catalogue and Site Types

All sites identified during these studies were assigned a unique (WG) number, according to site type and recorded in the Wafi-Golpu Cultural Heritage Site Catalogue. The GPS coordinates were recorded for each of the sites and their locations mapped in the Project GIS. Detailed site information including the site location is provided by the Project to NMAG, however the EIS does not disclose this information for cultural reasons and thus the unique codes cannot be indicated on figures presented in this EIS.

Site types were defined in consultation with villagers and Project personnel, including village liaison officers. The site types are described in Table 13.2.

Table 13.2: Cultural heritage site types

Site Types	Description
Oral Tradition Sites	
Burial	An inhumation or ossuary containing the remains of a single named individual.
Camp	The identified location of a known hunting camp or transit camp site.
Cemetery	Inhumations or ossuaries containing the remains of two or more named individuals.
Former village	The identified location of a named former or ancestral village.
Mission	The identified location of a structure or place associated with Christian missionary activities during the historic period.
Rockshelter	A cave or rockshelter identified in local oral history as being of cultural significance.
Story	Any place associated with a known story derived from local oral tradition.
Subsistence/trade	A place acknowledged as significant for subsistence or trade activities, e.g., sourcing clay for the production of pots.
Historical Sites	
WWII	Any place or object associated with Japanese or Allied military actions which preserves at least some physical remnant of that action.
Exploration/mining	A place or object that preserves physical evidence in the form of equipment, structures or excavations relating to the history of exploration and mining in PNG.
Historical	Any other place or object associated with the early period of PNG's colonial history.
Archaeological Sites	
Archaeological	Any place (or group of physical sites) containing preserved evidence of human activity that has been, or may be, investigated using the discipline of archaeology. The specific nature of each site is provided in individual site descriptions, e.g., ceramic sherds, stone beater, axe-adze.

13.1.3. Cultural Heritage Significance Assessment

As described in Chapter 3, Legal, Policy and Administrative Framework, the Burra Charter and its associated Practice Notes provide a best practice standard for managing cultural heritage places in Australia (Australia ICOMOS Burra Charter, 2013). The significance of cultural heritage sites was assessed in a manner consistent with the Burra Charter, whereby significance is derived from a site's aesthetic, historic, scientific, social or spiritual values

and involves an assessment of each of these criteria. In the case of historic, social and spiritual values, the cultural significance rating was based on information community representatives shared with the professional archaeologists in relation to sites.

Table 13.3 outlines how a particular value may be assessed, as well as the basis of its rating (high, medium or low). Where sites were found to demonstrate a range of criteria (e.g., scientific and social), the overall significance rating for each cultural heritage site was determined based on the criteria with the highest rating.

Table 13.3: Cultural heritage criteria and ratings (based on Australia ICOMOS Burra Charter (2013))

Cultural Heritage Values	Examples	Rating
Aesthetic	The place may be distinctive within its setting and/or inspire an artistic or cultural response. It may be represented in art, photography, literature, folk art, folk lore, mythology or other imagery or cultural arts.	Aesthetic value rated as follows: <ul style="list-style-type: none"> • Low, where the site and/or its setting, including vista, has little or no visual appeal • Medium, where the site and/or its setting, including vista, has moderate visual appeal • High, where the site and/or its setting, including vista, has high visual appeal
Historic	The place may be associated with an important event or theme in history, or a particular person or cultural group important to the history of the local area, state or nation.	Historical value rated as follows: <ul style="list-style-type: none"> • Low for sites which are not associated with any known historical event, person or theme • Medium for sites which are associated with a moderately significant historical event, person or theme at either the local and/or provincial and/or national level • High for sites which are associated with a highly significant historical event, person or theme at either the local and/or provincial and/or national level
Scientific	Through the use of scientific techniques such as archaeology, the place has the potential to reveal new information or understandings about people, places, processes or practices.	Ratings for scientific value take into account: <ul style="list-style-type: none"> • Site contents (e.g., size and patterning of site where 0 = no materials remaining, 1 = small number of artefacts with limited diversity (0-10 artefacts), 2 = larger number but limited range of artefacts, 3 = large and diverse range of artefacts) • Site condition (0 = destroyed, 1 = deteriorated, 2 = fair to good, 3 = excellent) • Site representativeness (1 = common, 2 = occasional, 3 = rare) The rating for overall significance is calculated based on the cumulative score for site contents, site condition and site representativeness where: <ul style="list-style-type: none"> • Low (cumulative score 1-3) • Medium (cumulative score 4-6) • High (cumulative score 7 or greater)
Social	The place may be an important local marker or symbol or contribute to the identity of a particular cultural group.	Social value rated as follows: <ul style="list-style-type: none"> • Low for sites which do not appear to have any clear social connection at either the local and/or provincial and/or national level • Medium for sites which have a moderately significant social connection for a cultural group at either the local and/or provincial and/or national level • High for sites which have a highly significant social connection for a cultural group at either the local and/or provincial and/or national level

Cultural Heritage Values	Examples	Rating
Spiritual	The place may contribute to the spiritual identity or belief system of a cultural group and/or may be important to maintaining the spiritual health and wellbeing of a culture or group.	Spiritual value rated as follows: <ul style="list-style-type: none"> • Low for sites which do not appear to have any clear spiritual connection with a cultural group at either the local and/or provincial and/or national level • Medium for sites which have a moderately significant spiritual connection for a cultural group at either the local and/or provincial and/or national level • High for sites which have a highly significant spiritual connection for a cultural group at either the local and/or provincial and/or national level

Source: Appendix U, Cultural Heritage Baseline and Impact Assessment.

13.2. Settlement History

The Hengambu, Yanta and Babuaf are the main cultural groups that reside in proximity to the Mine Area.

Along the Infrastructure Corridor route, the Babuaf cultural group claim the land between the Watut Process Plant and the Lower Watut River. The Wampar cultural group claim the land from the north side of the Lower Watut River, east to the village of Munum. The Ahi people claim the land between Yalu on the outskirts of Lae, and the village of Wagang to the northeast of Lae, noting that a portion of customary land that shares boundaries with the Port of Lae and 3 Mile to 4 Mile State land is under dispute between the Ahi and Labu people.

The Port Facilities Area and the Outfall Area are also located within land traditionally claimed by the Ahi people.

This section summarises the settlement history of these cultural groups.

13.2.1. Hengambu and Yanta

According to the Hengambu and Yanta oral histories, both groups originated from settlements in the Mumeng Valley. They moved into the headwaters of the Wafi, Supgo and Waime river catchments, southeast of Mt Golpu, potentially more than 200 years ago (Ballard and Kanasa, 1993). The groups then dispersed, establishing and then abandoning village settlements at regular intervals, over the past century.

Prior to European contact, which occurred around the 1920s, these settlements consisted of heavily fortified villages situated on defensive ridges. The inhabitants of these settlements were engaged in almost constant warfare. When not in conflict, inhabitants dispersed to hunting camps at lower altitudes where they spent periods of up to several months hunting, trapping and harvesting local fruit and nut resources. They returned to the fortified villages when fighting resumed (Ballard and Kanasa, 1993). The present Hengambu and Yanta settlement pattern is thought to be the product of interaction with colonial authorities, missionaries and, more recently, mining projects (Ballard, 1992). The Yanta and Hengambu speak slightly different dialects of a common Mumeng language (Adams and Lauck, 1985; Ballard and Kanasa, 1993).

13.2.2. Babuaf

By contrast to the Hengambu and Yanta, relatively little historical research has been conducted specific to the Babuaf (Muke et al., 2007). The Babuaf report that their ancestors originally lived just below Wafi Exploration Camp on Mt Golpu, and later moved to a number

of locations on the eastern floodplain of the Watut River, including Fere, Muguso and Mari, and the western foothills of the Watut Range. Eventually, they crossed the river to live at Efafan Creek further upstream on the Watut River (Tovue, 1989).

Muke et al. (2007) noted that Lutheran missionaries in the 1920s and 1930s encouraged the Babuaf to congregate into fewer, larger, settlements. Thus, prior to European contact, the Babuaf were probably distributed across a much wider area than the five villages in which they reside today.

The Babuaf speak an Austronesian language that has been labelled by Holzkecht (1989) as Middle Watut (and sometimes also referred to as Central Watut). Villages speaking this language were identified by Holzkecht (1989) as including Babuaf/Madzim (eastern Watut River floodplain) and Maralina and Bencheng (Tsile Tsile) (western Watut River floodplain).

13.2.3. Wampar

The Wampar inhabit the alluvial plains of the lower Markham Valley, mostly along the southern floodplain of the Markham River. They live in at least ten villages to the north and south of the Highlands Highway, which include Zifasing, Chiatz, Mare, Wampit, Gabensis, Tararan, Gabsonkec, Nasuapum, Mararumi and Munum. The population has most recently been estimated at around 12,000 to 15,000 people (Beer and Bender, 2015). According to their origin stories, the Wampar previously occupied the hilly Watut country to the south, including the area around Mt Golpu (Fischer, 1976: 13; Sack, 1976: 97; see also Holzkecht, 1974).

Wampar is identified by Holzkecht (1989) as a member of the Lower Markham language sub-group, part of the Markham Group of the Huon-Gulf Family. According to the people of Chiatz and Mare villages, they, along with the people of Wampit, speak a different dialect to the Wampar people living north of the Markham River. Further, they identify as a distinct sub-group of the Wampar, the Wampar Saab, in contrast to the remaining members of their language group which they refer to as Wampar Fofon (Hitchcock 2012: 20).

Among the Wampar there is an oral tradition called *dzob a mamafe*, comprising many stories which account for the coming into being of aspects of Wampar culture or the environment (Hitchcock, 2012). Some of these stories refer to cultural heritage story sites (e.g., story beings that turned into stones). Many stories also refer to place names and a general movement northwards down the Watut River to the Markham Valley, providing some evidence for Wampar migration history. From genealogical evidence, this movement into the Markham Valley appears to have taken place no more than 200 years ago, and was still in progress at the time of first European contact in the late 1890s and early 1900s (Holzkecht, 1989).

13.2.4. Ahi

Several village communities in and around Lae, including Butibum, Hengali, Kamkumung, Yanga, Yalu and Wagang, identify themselves socially, culturally and politically as Ahi.

Originally, the languages spoken by the communities at Butibam, Hengali, Kamkumung, Yanga and Wagang was either Bukawa (also known as Kawac) or Yomkawa, which are probably components of a single dialect chain identified by Holzkecht as Bukawa (Holzkecht, pers. comm. 7 December 2017). Bukawa is a North Huon Gulf language distinct from the languages spoken in the Markham River Valley. Today, Wagang villagers speak Yabem (which shares a close relationship with Bukawa) due to missionary influence in the early 1900s, when Yabem was the language of the Church (Muke and Skelly, 2017).

Village communities in and around Yalu speak Aribwaungg, one of five languages in the Busu subgroup of the Lower Markham language group belonging to the Markham family of

the Huon Gulf language group. According to oral tradition, the origins of Yalu can be traced to a tribe called Ngalunuf who lived in the mountains close to the headwaters of the Yalu River.

The migration of the Ngalunuf tribe to Yalu is thought to have been one of a number of migrations that occurred from inland areas (Sack, 1976: 88). Oral tradition recorded by missionaries suggests that the Wampar people regularly raided the Watut River Valley leading people to relocate to the Yalu area. Attacks at Kabatsits, a village near Yalu, also resulted in groups including the Aribwaungg fleeing to the coast near Lae. Wagang oral tradition recalls the Aribwaungg making incursions on to Wagang land to escape raids by the Wampar. The Aribwaungg were not always welcomed in the Lae area (although Holzknicht (1989: 39) notes that they were welcomed by Bukawa-speaking relatives in Kamkumung and other coastal villagers), and moved back and forth between the coast and their traditional homelands in the Atzera Mountain Range until the raiding ceased and they were able to return to their homelands permanently (Sack, 1976: 37).

13.3. World War II History

This section summarises the WWII history relevant to the three study areas, which has led to the presence of relics including airfields, aircraft wrecks, and abandoned military vehicles and hardware within the study areas and across Morobe Province.

During March 1942, as part of an overall strategy to establish bases in the South Pacific, the Japanese captured Lae and established bases in Lae and the small port town of Salamaua, located 35 kilometres (km) to the south of Lae (Bullard, 2007). Prior to this, in July 1937, Lae had been made the capital of Australian-mandated New Guinea.

In June 1943, the United States Army 871st Airborne Engineers established a secret forward airfield at Tsile Tsile (Bencheng), approximately 12km west of the Mine Area, to advance operations to re-claim Lae. A support airstrip was also established at Maralina. Japanese forces, upon discovering the airfield, launched pre-emptive attacks on Tsile Tsile on 15-16 August 1943, inflicting casualties but little damage to the airfield (Gamble, 2013). Subsequent Allied bombing attacks launched from Tsile Tsile on Japanese airfields at Wewak on 17-18 August 1943 caused heavy damage to many Japanese aircraft and facilities and resulted in Japanese forces finally losing their air superiority over New Guinea (Gamble, 2013).

In September 1943, Allied forces launched 'Operation Postern' to liberate Lae and Salamaua. The operation involved two converging advances on Lae in an attempt to circle and capture the town. The first advance involved an amphibious assault with US Navy destroyer artillery support to the east of the Lae. The assault was unopposed on land, but the Allies were attacked from the sky by Japanese bombers. Approximately 100 Allied forces naval and army personnel lost their lives (Johnston, 2002).

The second advance involved an airborne landing near Nadzab, 50km to the west of Lae. On the morning of 5 September 1943, 302 aircraft from eight different Allied airfields in PNG rendezvoused over Tsile Tsile before proceeding down the Watut Valley, turning to the right over the Markham Valley, and approaching Nadzab, where they made an unopposed parachute drop and successfully secured the Nadzab Airfield, cutting off any possible Japanese retreat into the Markham Valley (Kenney, 1949).

The assault was a success and Allied Forces re-captured Lae on 15 September 1943. The Salamaua-Lae campaign preceded the strategically important Huon Peninsula campaign, which enabled the Allies to establish air and naval bases for future operations (Johnston, 2002).

13.4. Recorded Cultural Heritage

Twelve cultural heritage surveys have been undertaken for the Wafi-Golpu Project since 1996. As a result of consultation with the Hengambu, Yanta, Babuaf, Wampar and Ahi cultural groups and archaeological field surveys, 351 cultural heritage sites were recorded. This includes 289 oral tradition sites, 59 archaeological sites and three historical sites.

Figure 13.2 shows the distribution of the recorded sites relative to the cultural heritage study areas and Project disturbance footprint.

Recorded sites with a high cultural significance rating, which are located within or in close proximity to the cultural heritage study areas, are discussed below. As noted in the introduction to this chapter, several cultural heritage sites with high significance ratings are located outside the present cultural heritage study areas because the WGJV has re-sited Project infrastructure to specifically avoid these cultural heritage sites. These sites are nevertheless discussed below to provide a full appreciation of significant cultural heritage sites located in the vicinity of the Project.

13.4.1. Mine Study Area and Surrounds

The Mine Study Area is located within land claimed by the Babuaf, Hengambu and Yanta cultural groups.

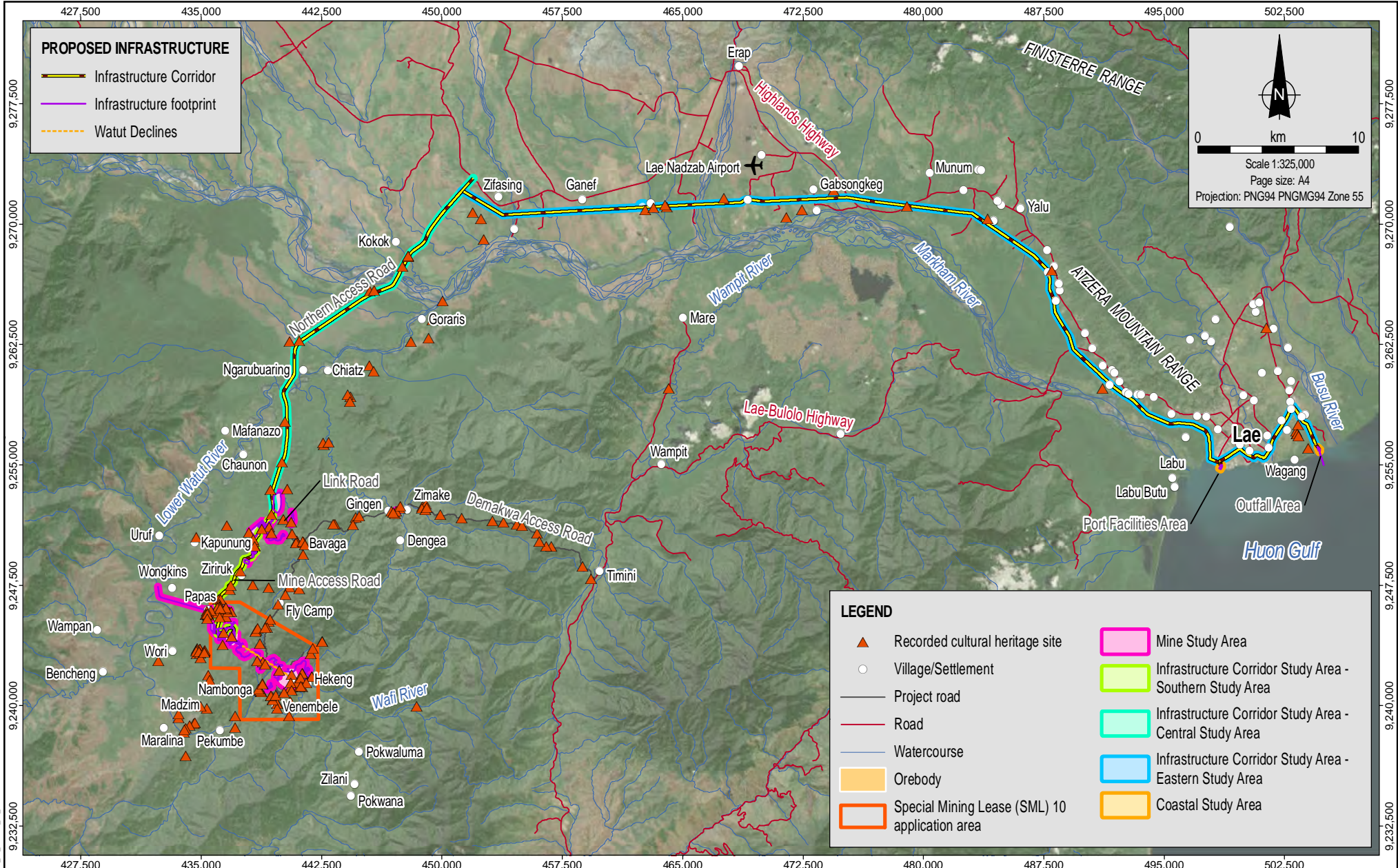
13.4.1.1. Mt Babul Settlement Site (WG010)

Mt Babul forms part of a prominent landscape to the northwest of the village of Bavaga and marks the northeast end to the Watut Range. The Mt Babul Settlement Site (WG010) is a former village that was assessed as having a high social value due to its extensive connection to Babuaf oral tradition.

The Mt Babul Settlement Site was potentially an extension to the Wames Archaeological Site (WG008), which is located on an adjoining ridgeline and is also assessed as having high social value.

13.4.1.2. Wames Archaeological Site (WG008)

The Wames Archaeological Site (WG008) is part of the Babul-Wames settlement group of sites and, as noted above, is assessed as having high social value as it comprises a ridge settlement that is characterised by the distribution of archaeological assemblages (stone artefacts) along the entire ridge system.



MXD Reference: 0520DD_10_GIS025_v01.11

Source:
 Recorded cultural heritage and study areas from ALA.
 SML and orebody from WGJV.
 Infrastructure and project roads from WGJV and Coffey.
 Roads and watercourses from NSO.
 Imagery from ArcGIS Online (capture date unknown).

coffey
 A TETRA TECH COMPANY

Date: 13.06.2018
 Project: 754-ENAUABTF100520DD
 File Name: 0520DD_10_F13.02_GIS

WAFI-GOLPU
 JOINT VENTURE

Wafi-Golpu Project

Recorded cultural heritage sites
 relative to cultural heritage study areas

Figure No:
13.2

13.4.1.3. Gwavengo/Ngendakghoma II Rockshelter Site (WG040)

The Gwavengo/Ngendakghoma II Rockshelter Site (WG040) was used by Hengambu and Yanta hunters as an overnight camp. The site was assessed as being of high cultural heritage significance due to:

- High Hengambu and Yanta communities' social connection.
- High aesthetic value due to its location on the southeastern flank of Mt Golpu.
- High historical value owing to a Hengambu oral tradition which connects it with a number of named ancestors who took part in an historically significant expedition. The site is also connected to other sites located nearby, including WG045 Beavemo Burial Site and WG229 Ngandoyeng Story Site.
- High scientific value due to the presence of intact sediments at the base of the rockshelter.

13.4.1.4. Beavemo Burial Site (WG045)

The Beavemo Burial Site is located near the top of Mt Golpu. Beavemo is a named ancestor who is closely associated with a significant Hengambu oral tradition that links this site with other cultural heritage sites located on the south-eastern flank of Mt Golpu.

The site was assessed as being of high cultural heritage significance due to its high scientific value and the strong social connection the Hengambu have to the site. The site's scientific value was rated as high due to the significant nature of its contents, its relatively intact nature, and the rarity of burial sites on Mt Golpu (the latter probably a result of very steep to precipitous midslope ground surfaces in combination with thin topsoils).

13.4.1.5. Kelerel Grave Site (WG066)

Kelerel Grave Site is named after the area in which it is located, and has standing stones which mark the boundary of the grave site. The grave site is still tended by the residents of Hekeng village, despite the fact that the identity of the person buried there is now unknown.

As with the Beavemo Burial Site, the Kelerel Grave Site was assessed as having high scientific value due to the significant nature of its contents, the rarity of burial sites on Mt Golpu and the relatively intact nature of the site.

13.4.1.6. Mari Settlement Site (WG027 and WG313)

The Mari Settlement Site (WG027 and WG313) reflects the conflict history of the Babuaf people. According to the Babuaf representatives participating in the survey, Mari Settlement Site was originally home to members of the Wafes clan who abandoned the site seven generations ago (approximately 140 to 175 years ago) after a village-wide conflict led to a group of people splitting from the Wafes to form a new clan, the Lerom. The Wafes clan relocated 1km to the south (WG015 Muguso South Archaeological Site), while the Lerom fled 3km to the southwest to another location on the Watut River floodplain known as *Mauro*. The Mari Settlement Site is assessed as holding high historical and social values.

Seven archaeological sites (WG027, WG289, WG290, WG291, WG297, WG298 and WG299) were recorded within the extent of the Mari Settlement Site as defined by the Babuaf representatives. A further five archaeological sites (WG292, WG293, WG294, WG295 and WG296) were recorded just outside the southern and eastern extents of the Mari Settlement Site. These archaeological sites have also been assessed as holding high historic values (due to their proximity to the Mari Settlement Site) and social values (based on the importance that the Babuaf place on archaeological sites).

13.4.1.7. Mt Sibal Sacred Site (WG026)

The Babuaf and Hengambu have oral traditions associated with the Mt Sibal Sacred Site (WG026). The Babuaf identify the site as a former village, while the Hengambu identify the area as a place where ancestral spirits reside. Mt Sibal is the Babuaf name for the location of the site, whereas the Hengambu call it Mt Bavaga. The site was assessed as being of high cultural heritage significance due to the Babuaf and the Hengambu holding strong social and spiritual connections to it.

13.4.1.8. WSC1-4 (WG303)

The WSC1-4 Site is an archaeological site consisting of one ceramic rim sherd and one body sherd. This site was assessed as having a high cultural heritage significance due to its social value to the Babuaf. The Babuaf are one of only a few cultural heritage groups within Morobe Province reported to have been pottery producers (Muke et al., 2007). Pottery found at oral tradition and archaeological sites in the Lower Watut River valley connect the present-day Babuaf community to their ancestral past.

13.4.1.9. Ples Tambu Story Sites

The Mine Study Area includes a number of areas identified by the Yanta, Hengambu and Babuaf as *ples tambu*, i.e., places identified as dangerous.

Ples tambu are often roamed by *masalai*, malevolent spirits who generally cause trouble to people who disturb them, or disturb features or objects in the natural landscape in which *masalai* live. Mt Golpu and Vengiki Ridge *ples tambu* are described in Table 13.4 below.

Table 13.4: Ples tambu sites recorded in the Mine Study Area

Site No.	Site Name	Description
WG041 WG042 WG043 WG044	<ul style="list-style-type: none"> Tongova Sacred Spring Biangova Sacred Spring Mea Gova Biangova Sacred Spring Mea Gova Tongova Sacred Spring Site 	The Hengambu identify a considerable portion of the southeastern flank of Mt Golpu as <i>ples tambu</i> associated with male and female <i>masalai</i> who reside at WG041 Tongova Sacred Stone Site and WG042 Biangova Sacred Stone Site. The same area also has oral traditions about people who become ill after gardening or procuring resources in a sacred place referred to as <i>mea gova</i> , particularly WG043 Mea Gova Biangova Sacred Spring Site (located within the subsidence zone) and WG044 Mea Gova Tongova Sacred Spring Site. Due to their spiritual importance to the Hengambu, these sites were assessed as being of high cultural heritage significance.
WG060 WG234 WG235 WG236 WG238	<ul style="list-style-type: none"> Mia Yo Sacred Spring Mia Yo A Mia Yo B Mia Yo C Mia Yo D 	The Yanta identify several watercourses draining the south-eastern flank of Mt Golpu as <i>mia yo</i> (Figure 13.3). These are <i>ples tambu</i> (some inhabited by <i>masalai</i>) and the water flowing through these drainage lines is magically tainted. It is not permissible to drink from a <i>mai yo</i> – people who do fall ill and sometimes die. (These sites are locations of naturally occurring acid and metalliferous drainage and as such, reports of illness following ingestion are credible.) Due to the spiritual importance of these site to the Yanta, the sites were assessed as being of high cultural heritage significance.
WG310	<ul style="list-style-type: none"> Mudju Afas Masalai Site 	The Mudju Afas Masalai Site was recorded in an area of secondary rainforest bordering the base of the <i>kunai</i> grassland slopes, approximately 250m southeast of Papas hamlet. The site pertains to a fallen log situated in a deep pool within a creek called <i>mudju afas</i> by the Babuaf. The log is said to be the home of numerous <i>masalai</i> spirits. Babuaf informants have also advised that the surrounding forest is considered <i>ples tambu</i> because of the <i>masalai</i> present in the creek. Due to the spiritual importance of the site to the Babuaf, the site was assessed as being of high cultural heritage significance.

13.4.1.10. Sangia (WG261)

Sangia (WG261) is a story site located within the Waime River gravel extraction area. It was assessed as being of high historical significance. This site marks the location of traditional fighting grounds where Towangola warriors fought with Markham River clans. Fighting arose as a result of territorial disputes and continued until contact by Christian missionaries, who managed to broker a reconciliation which occurred at this location. The reconciliation event was marked by the planting of *tanget* (i.e., cordylines) and the erection of a marker stone by the Towangola.

13.4.1.11. Anga Masalai Tree (WG276)

The Anga Masalai Tree (WG276) is a story site. It was assessed as being of high cultural heritage significance due to the strong social connection the Babuaf have with the site and the stated intention to use sites such as this to educate their children about traditional values and lifeways.

13.4.2. Infrastructure Corridor Study Area

13.4.2.1. Southern Study Area – Watut Process Plant to Link Road

The Infrastructure Corridor Southern Study Area traverses land claimed by the Babuaf people.

13.4.2.1.1. Babul Archaeological Site (WG002)

This site is one of several former Babuaf villages and archaeological sites located at Wames and Babul, and exhibits cultural evidence of previous settlement including ceramic sherds. It was assessed as being of high cultural heritage significance due to the strong social connection the Babuaf have with the site.

13.4.2.1.2. Fere Cultural Landscape

Babuaf elders attach a high level of significance to the cultural landscape at *Fere* (Figure 13.4). *Fere* features in the migration stories of the Babuaf people and is located on the lower slope of the *kunai* grasslands adjacent to the Watut River floodplain. The landscape comprises a mixture of oral tradition and archaeological heritage, and contains site types which the Babuaf have generally attributed as having high social value. The Fere Sacred Site (WG003), which includes a lake, is of high social value due to a detailed oral tradition which explains the formation of the site. The Babuaf also deem the site to have a high aesthetic value. Thirteen archaeological sites have also been located in this landscape, most within 300m of WG003. These include the Fere C Archaeological Site (WG031), Fere H Archaeological Site (WG214), Fere I Archaeological Site (WG215) and Fere J Archaeological Site (WG216), which are all located within the Infrastructure Corridor Study Area.

13.4.2.1.3. Buasus 1 (WG202)

This archaeological site is located on elevated *kunai* grassland in a location known by the Babuaf as *Buasus*. It consists of stone artefacts and ceramic sherds. The site was assessed as being of high aesthetic, scientific and social value.

13.4.2.1.4. Nomonum 1 (WG207)

Nomonum is a story site that was assessed as having a high historical value due to the Babuaf oral tradition that links the site with the death of an employee of the Morobe Mining Joint Venture during the construction of the Watut Valley Road.

Figure 13.3
View south across gully containing Mia
Yo Sacred Spring Site (WG060)



Photo credit: ALA

Figure 13.4
Fere cultural landscape in foreground,
view southwest towards Watut River



Photo credit: Social Research Institute PNG

Figure 13.5
Proposed Infrastructure Corridor
(Eastern Study Area) located adjacent to
high-voltage transmission line corridor



Photo credit: WG-IV

13.4.2.1.5. Babul Village 1 (WG208)

This former village site was found to contain a range of archaeological materials including decorated and undecorated ceramic sherds and flaked stone artefacts made from a variety of raw materials. The site was assessed as having a high cultural heritage significance due to its scientific value and social significance to the Babuaf.

13.4.2.1.6. Fere Clay Source Site (WG308)

Fere Clay Source Site is a subsistence/trade site. The location is well known to local Babuaf potters as an important raw material source used in the manufacture of clay pots. The site was assessed as having a high cultural heritage significance due social and scientific values related to the use of the site by many generations of Babuaf potters, including the present generation.

13.4.2.2. Central Study Area – Link Road to Zifasing

The Infrastructure Corridor Central Study Area traverses land claimed by the Babuaf and Wampar peoples.

13.4.2.2.1. Magense (WG121)

The Magense Site (WG121) is a burial site that was first identified by Hitchcock (2012) in interviews with Wampar community representatives. The burial site is located within a former village and ceramic sherds have previously been seen in this location (Hitchcock, 2012). The site has been assessed as being of high scientific value due to its contents.

13.4.2.2.2. Ples Tambu Story Sites

Six *ples tambu* sites were recorded in the Infrastructure Corridor Central Study Area.

Of these, four sites have been assessed as being of high cultural heritage significance due to the strong Babuaf social connection to these sites.

These include the Wames Story site (WG319), Nufgarak Story Site (WG320), Ngalulase Story Site (WG321) and Fobias Story Site (WG322), which are all areas of rainforest located to the south of the Lower Watut River either at the base of the foothills descending from the Watut Range to the floodplain (WG319), or on the floodplain itself (WG320, WG321, WG322). Of these:

- The Wames Story Site (WG319) is identified as inhabited by spirits, which are associated with swamps dominated by sago palm (*Metroxylon sagu*).
- The Nufgarak Story Site (WG320) is identified as a spirit version of a human garden.
- The Ngalulase Story Site (WG321) is identified as a crocodile spirit place.
- The Fobias Story Site (WG322) is identified as a snake spirit place.

13.4.2.2.3. Litia Burial Site (WG327)

This burial site was identified within the ancestral Wampar village of Kokok. It is identified by a ring of small stones arranged around a grave, which is further surrounded by plants including *tanget*. It marks the burial site of a Chuaif clan woman named Litia who died in 2009. The site was rated as being of high scientific significance given its contents.

13.4.2.2.4. Fansun Story Site (WG325)

Fansun Story Site is associated with Fansun Hill, which the Chuaif clan of the Wampar people consider to be a symbol of identity and source of the origins of the Chuaif clan and therefore sacred. Permission to conduct a comprehensive survey of Fansun Hill was not granted by Chuaif representatives, however representatives reported a settlement site located on the eastern foothills of Fansun Hill and ethno-botanical species, such as cordilyline plants, which are normally associated with old gardens and settlements, were observed in the surrounding forest. Chuaif representatives requested that Project development avoid Fansun Hill and, as noted in Chapter 7, Assessment of Alternatives, the alignment of the Infrastructure Corridor was subsequently moved east during Project planning in 2017 to avoid this site. The site is rated as being of high social significance based on advice provided by Wampar informants during fieldwork. It is considered likely that the Wampar would also regard the site as being of high spiritual value, despite no specific records having cited this assertion.

13.4.2.3. Eastern Study Area – Zifasing to Coastal Area

A significant portion of the Infrastructure Corridor will be constructed adjacent to the existing PNG Power Limited high-voltage transmission line corridor. Vegetation growth is kept in check along this corridor to prevent interference with the transmission line (

Figure 13.5). The Infrastructure Corridor Eastern Study Area traverses through land claimed by the Wampar and Ahi peoples.

13.4.2.3.1. Umiroron Story Site (WG336)

This traditional fishing and story site (subsistence site) is located in a permanent spring-fed lake surrounded by dense vegetation on a flat *kunai* grass plain. The site was an important fishing site until traditional rights of access were restricted by agriculture in the 1950s. The site was assessed as being of high social significance to the Wampar people.

13.4.2.3.2. Orogwanginpup Settlement Site (WG337)

This former village site was occupied five generations before the current adult generation, which places settlement in the late 1800s or early 1900s. It contained more than 50 pottery sherds, three stone artefacts and a worked bone tool. The site was assessed as being of high scientific significance given the visible presence of dense, stratified archaeological deposits within the former village. It was also assessed as being of high social significance as Wampar representatives indicated that it was an important place that should be preserved from any further impacts.

13.4.2.3.3. World War II Sites

13.4.2.3.4. Kafag Airstrip Archaeological Site (WG341)

Kafag Airstrip Archaeological Site (WG341) was assessed as being of high historical significance. Study informants indicated that the airstrip was built by Australians during WWII to serve the Allied forces (Skelly et al., 2017). The concrete/bitumen strip is largely well-preserved.

13.4.2.3.5. Tanam Airfield Archaeological Site (WG346)

Tanam Airfield Archaeological Site (WG346) was assessed as being of high historical significance. The site consists of two airstrips constructed by Allied forces during WWII. Sections of the original airstrips surfaces, a coarse grained concreted bitumen, remain.

Study informants indicated that there was an allied prisoner of war internment camp in close proximity to the eastern end of the north runway. No physical evidence of this camp remains.

13.4.3. Coastal Study Area

The Coastal Study Area includes land claimed by the Ahi people.

13.4.3.1. Hungkwangpup Story Site (WG342)

Wagang villagers reported that the Hungkwangpup story site (WG342) is a sacred site and a forbidden area, and no living person from Wagang village has entered the site. According to oral tradition, those who enter the site will become trapped and die (Skelly et al., 2017). Representatives of Wagang village accompanied professional archaeologists to record the boundary of the site. The boundary recorded was approximate due to lack of clear access through dense vegetation and sago swamp. However, according to the Wagang representatives present, the recorded boundary approximated an acceptable distance from the site, outside which the WGJV may conduct activities. The site was assessed as being of high cultural heritage significance due to the spiritual values that the Wagang villagers consider the site to hold.

As noted in Chapter 7, Assessment of Alternatives, the location of the Outfall Area was previously located within the boundary of the Hungkwangpup site, but has since been relocated to the east with an additional 150m buffer.

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