Archaeological Management Plan For Mining Areas at Wattle Flat, NSW Specifically

Solitary Reef Big Oakey (Surface Hill Mine) Little Oakey Mine Queenslander (King Mine)



Report to Bathurst Regional Council

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Chris Green is an interested resident of Wattle Flat whose knowledge of the surveyed areas and the regions mining history was invaluable to the project. Chris volunteered two days of his time to accompany the fieldtrip, expertly guiding us to specific locations and giving detailed and knowledgeable descriptions of landforms and the historical items surveyed. He also competently directed us to the best place to leave our vehicles and the easiest walking route through a challenging landscape, all whilst maintaining an unreserved, cheerful and companionable disposition.

Measurements

To help interpret some of the historical terms around measurements, a list of measurements and terms employed in historical mining activities – and their modern day conversions – has been produced below.

Abbreviations

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h.p. = horsepower
p.s.i. = per square inch
r.p.m. = revolutions per minute
23 cubic feet of broken quartz = 1 ton
1 cord of wood = 128 cubic feet and 3.6 cubic metres
Length
1 inch [in.] = 2.54 centimetres [cm.]
1 foot [ft] = 12 inches and 30.48 cm
1 yard [yd] = 3 feet and 91.44 cm
1 mile = 5,280 feet and 1.61 kilometres [km]
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Area

1 acre = 10 square chains and 4046.85 square metres

640 acres = 1 square mile and 2.58 square kilometres

Weight

20 pennyweight [dwt.] = 1 once [oz.]

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1 ounce = 453.6 grams [gm.]
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1 pound [lb.] 16 ounces and 453.59 gm.

1 hundredweight [cwt.] = 1122 lbs. And 50 kilograms [kg.]

1 ton = 2240 pounds [lbs.] and 907.18 kg

Currency

Prior to February 1966, legal tender was expressed in pounds [£], and shillings [s] and pence [d.] 12 pence [d.] = 1 shillings [1s]

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20 shillings = 1 pound [£1.]
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Gold

Gold is traditionally measured in 'troy' ounces, the term 'troy' comes from Troyes, France.

24 grains = 1 pennyweight [dwt] which = 1.55 grams

1 ounce = 20 dwt. Which = 31.10 grams

Executive Summary

Bathurst Regional Council (The Proponent) has commissioned this Archaeological Management Plan (AMP) for four areas within Wattle Flat, NSW. The areas are: Solitary Reef (Lot 7001 DP1117443); Big Oakey (Surface Hill Mine) (Lot 7015 DP1060511); Little Oakey Mine (Lot 7019 DP106034 and Lot 315 DP755790); and Queenslander (King Mine) (Lot 7339 DP1142345). The scope of works for this study is to:

- 1 Determine the key historic boundaries of each mine site.
- 2 Prepare a history of the overall mining in and around Wattle Flat and a brief thematic history of each mine site focusing on its physical history, to assist in the identification and assessment of potential archaeology.
- 3 Undertake non-invasive field assessments of all sites within those boundaries to identify the relative likelihood and significance for archaeological resources.

This Archaeological Management Plan successfully identifies the study area's archaeology, records specific items and their location, assesses their significance, provides management strategies and recommendations, and has recorded this information on the Bathurst Regional Local Environmental Plan 2014. The Proponent can use the findings of this study to assist in the formulation of archaeological provisions, schedules and graphics in its Local Environmental Plan (LEP) and its Development Control Plan (DEP). This will help to protect the identified archaeological resources and to identify opportunities for further interpretation. This report acknowledges the existence of other mining sites in the local Wattle Flat area, but deals mostly with the four areas detailed above.

The sites inspected all relate to alluvial and reef gold mining activities dating from between approximately 1852 and the 1960s and consist predominately of mine shafts, air shafts, mine pits, open cuts. mined landscape, tailing piles/mullock heaps, boiler equipment, stamping machines/batteries/crushers, winch equipment, hut sites, store houses, water races, water dams, tram way lines, and areas of underground potential. These types of features are common in the Australian landscape where gold mining activities have occurred and often hold historical, social, archaeological, scientific and aesthetic significance. Their purpose is always associated with the gold extraction industry, relating either to the remains of the actual gold extraction process or the resulting associated remains – such as tailings heaps, mine shaft or domestic items. The remains consist of stone, concrete, timber, and iron, are usually located near a water source or where natural quartz veins exist within. Very few written records concerning the region's early alluvial mining activities were located. However, a reasonable amount of literature - predominantly 'Department of Mines' mining reports and newspaper articles were located relating to reef mining within the study areas.

Background research and field reconnaissance gives details concerning the remains located, and maps them and details their layout. Their use period spans from before Wattle Flat was established as a small rural frontier town in colonial NSW, through the rapid growth period of Australia's gold rush, and back to a quiet town that is the centre of a predominantly sheep and cattle farming area. No association between the mining remains and prominent people from Australia's colonial period could be found. However, documentary association was made between the remains and some of the gold mining companies, and some of the long standing local surnames around Wattle Flat. The mining remains are in an unused and dilapidated state and missing much of their working components altogether, but still adequately illustrate an Australian industry and parts of its working infrastructure. The remains have been assessed as having a moderate archaeological significance and moderate historical significance as representing mining activities in Wattle Flat and New South Wales generally, a gold extraction landscape, and an integral component in the establishment and ongoing development of the Wattle Flat township. This Archaeological Management Plan has effectively recorded the archaeological features, adequately assessed their physical condition and archaeological potential, conducted an archaeological and historical significance assessment and made recommendations for their protection against future development in accordance with statutory requirements.

Recommendations for the conservation and management of archaeological sites within the study areas have been made and consist of:

- 1. Recommendations relevant for all sites.
- 2. Recommendations for individual archaeological relics associated with the sites.
- 3. Priorities for archaeological items suitable for interpretation and display.

This Archaeological Management Plans does not have independent legal status. It is intended as an advisory tool and early warning mechanism to assist Bathurst Regional Council to manage archaeological remains at Wattle Flat.

Introduction

Brief

This Archaeological Management Plan (AMP) uses non-invasive techniques to identify and access the relative likelihood and significance of archaeological resources at the historical mining sites at Solitary Reef, Big Oakey Mine, Little Oakey Mine, and Queenslander Mine in Wattle Flat, NSW. A note in regard to the spelling of the name Oakey is required. Historical and modern maps tend to use the spelling 'Oaky'. However, in the historical and modern literature both 'Oaky' and 'Oakey' appear. This Archaeological Management Plan prefers 'Oakey', but uses both spellings, depending on where a particular source of information was drawn from.

The results will guide Bathurst Council on how to best manage the archaeological resources associated with each site and assist with the development of planning provisions in their Local Environmental Plan. Bathurst Council will also use the findings from the study to develop opportunities for interpretation, in the form of specific display boards and information plans.

Background

Bathurst Regional Council commissioned this Archaeological Management Plan to investigate four historical gold mining areas in close locality to the village of Wattle Flat, approximately 31 kilometres north north-east form Bathurst, NSW (*Figure 1*). Wattle Flat's current population is approximately 363. However, during the mid-1800s, good quantities of gold was found around Wattle Flat. The region became part of Australia's early gold rush scene, and the population rapidly grew to reach an estimated 40,000. The specific areas investigated were Solitary Reef (Lot 7001 DP1117443; Big Oakey (Surface Hill Mine) (Lot 7015 DP1060511); Little Oakey Mine (Lot 7019 DP106034 and Lot 315 DP755790); and the Queenslander (King Mine) (Lot 7339 DP1142345) (*Figure 2*).



Figure 1 Study area location (red dot) relative to the State of NSW (Google Earth).



Figure 2 Study areas (in red) relative to Wattle Flat (Wattle Flat 8831-4-S; and Sofala 8831-4-N: 25,000 topographic map, third edition 2012).

This AMP has been produced in accordance with the *Guidelines for the Preparation of Archaeological Management Plans* first published in 2009 by the Heritage Branch of the NSW Department of Planning. The aim is to identify and assess the relative significance of archaeological resources within each mining area under investigation and establish how best to manage the archaeological resources now and into the future.

Bathurst Regional Council has commissioned two previous heritage assessments – although broad in scope – within the Bathurst region. The first is Edward Higginbotham 2012, *Bathurst Regional Council Archaeological Plan Volumes 1 Archaeological themes and*

Volume 2 Site Survey, Significance, Conservation and Management; and the second is Edward Higginbotham 2013, The Government Settlement at Bathurst, NSW (1815 – 1840), Archaeological Management Plan.

Two gold mining related sites within the study areas are currently listed on the State Heritage Inventory (SHI), SHI Number 1080664 – Wattle Flat Solitary Mine; and SHI Number 1080658 – Little Oaky Mine remnants. Little Oaky Mine and Solitary Mine are also listed as having local heritage significance under the Bathurst Regional Local Environmental Plan 2014 (Sites I279 and I278 respectively). In addition, Big Oakey Mine, Little Oakey Mine and Queenslander Mine have each been recorded in the 1985 Evans Shire Heritage Study.

The archaeological remains, including the resulting landscape, from historical gold mining activities at Wattle Flat are the primary heritage components in a complex array of alluvial and reef mining operations that is characteristic of the local area and surrounding region. The historical importance of the mining activities relates to better understanding a locally significant component of a wider regional and historically significant 19th and 20th century mining industry and examples of developing mining technology. The items under investigation comprise, in part, boiler and rock crushing machinery, furnace equipment, stone and timber infrastructure, mine shafts, water races, aqueducts, mullock heaps, cradle remains, water wheel, winch equipment, water dams, tram way lines and general extractive alluvial and reef mining landscapes. Their historical significance includes environmental aspects, labour use, technology, development and economics of the Wattle Flat Township, and the potential for early gold mining interpretations that can demonstrate phases of gold mining in Australia. Combined with the region's picturesque aspect and its easily accessible nature, good opportunities exist to develop the remains for further interpretation.

Primary source documents relating to the early gold mining activities at Wattle Flat and other goldfield documents are limited. This is because countless early registers of claims, lease documents and maps from several of the NSW goldfields were destroyed when their archival holding facility in the 'Garden Palace Exhibition Building' in Sydney burnt down in 1882 (*Figure 3*). As such, it becomes important to accurately record the archaeological remains associated with historical mining at Wattle Flat. The area holds a wealth of historical information and with the lack of primary documents represents a challenge in its historical archaeological complexity.



Figure 3 An artist's impression of the 1882 Garden Palace Exhibition Building fire.

The remaining historical maps, illustrations and photographs are an important resource for mapping Wattle Flat's mining landscape and will be used to aid the field survey work – especially in relation to the location and function of alluvial and quartz reef mining equipment.

Social context can also be examined by comparing documentary evidence for the various 'rushes' and the development of the township, in comparison with the mines and mining methods used at Wattle Flat, to see if differences exist in the types of development and materials used.

Avoidance of disturbance to archaeological sites represents the best heritage outcome as it means no impact on any potential heritage features. By undertaking this AMP, Bathurst Regional Council will be better able to understand the nature and significance of Wattle Flat's archaeological mining sites, conserve and manage them as resources, educate the public, promote interpretation within the region, and actively promote good heritage outcomes.

As a government run convict agricultural farm, Bathurst was the first European settlement in Australia (dating to 1815) and without it Wattle Flat may not have existed in its current form. Good quantities of gold were discovered at Ophir in 1851 (66 km to the north west of Bathurst) and all miners going there necessarily travelled through Bathurst – along Ophir Road. The Ophir 'rush' was short lived, but it marked the start of the Australian gold rush and it wasn't long before gold was found around the Bathurst area, including Sofala and Wattle Flat. Despite the impact gold had on the area, the fertile land around Bathurst had already proven itself productive for pastoral use. During and after the gold rush, this led to more permanent settlement in the region. With this background, knowledge of Bathurst's early history acts as an appropriate introduction to Wattle Flat and the Wattle Flat goldfields.

Site's Regional Description

The European history of the Bathurst region has been previously written about. The most notable of these writings is McLachlan 2013 in his book 'A Delightful Spot'. Three other useful and relevant items of literature are Higginbotham (2013) 'The Government Settlement at Bathurst...', Jack et al (2011) Bathurst Regional Council Archaeological Management Plan', and Barker (1992) 'A History of Bathurst...''. To give historical context to this report a brief overview of Bathurst's European history is relevant.

Bathurst is a modern regional city situated in the Central Tablelands of NSW, which span the region between Sydney and the inland plains of NSW, including parts of the Great Dividing Range and the Blue Mountains. There are also several heavily eroded low level mountainous regions to the north east (towards Wattle Flat) and north west of Bathurst that include steep valleys and hillsides. The region is located approximately 200 kilometres west of Sydney, 160 kilometres north-west inland from the coast and 210 kilometres north north-west from Canberra (see *Figure 1*). The main drainage system for the region is the Macquarie River, which is a third order waterway according to the Strahler order for water systems (Speight 1990). The Macquarie River drains approximately north-west for 110 kilometres before entering the Lake Burrendong Lake system and continuing again in a generally north-west direction for approximately 460

kilometres to the Macquarie Marshes before flowing into the Darling River. Other waterways draining the region are the Turon, Fish, and Campbell Rivers to the north, and the Abercrombie and Isabella Rivers to the south. The central basin area of the Bathurst region is mainly weathered granite soils while in the northern areas sandstone, conglomerates, greywacke, siltstones, lime stones and minor volcanic intrusions predominate (Bathurst Statistical Profile 2011).

The earliest documented record of Europeans entering the Bathurst district is Government surveyor George Evans (and five others in his party) in 1813. Evans' task, after the first successful European crossing of the Blue Mountains (earlier that same year by W. Wentworth, W. Lawson, and G. Blaxand), was simply to explore further inland. The European colony in Sydney was expanding and suitable farming and grazing lands were in demand. When Evans reached the Macquarie River (which he named after Governor Macquarie) he found the entire Bathurst region to his liking and reported favourably about its farming potential back to Sydney. Subsequently, the Government contracted William Cox - and supplied convict labour between 1814 and 1815 - to build a road across the Blue Mountains and into the Bathurst region. The original road was 12 feet (3.6 metres) wide, went for 101.5 miles (163.3 kilometres) and took 5 free labourers, 30 convicts and 8 soldier guards from January 1814 to April 1815 to complete (Cox 2011). Governor Macquarie proclaimed Bathurst an official Penal Settlement for agriculture on the 7th of May 1815, making it the earliest inland town in Australia (Jack and Jeans 1996: 90). By the time 1820 came around, the Bathurst region was becoming established as an agricultural frontier. The Government's pastoral pursuits were prospering with the use of convict tendered cattle farming on land the Government had designated as 'Government Domain'. Through the early to mid-1820s free settlers were also bringing sheep and cattle into the area, squatting on prime lands outside the Government Domain, usually beside major waterways such as the Macquarie and Fish Rivers (Jack and Jeans 1996: 90).

By the early 1820s, the regions north, east and west of Bathurst had not yet been surveyed by the Government and were considered beyond the 'Limits of Location'. If stock owners went just outside the government surveyed lands – to the Limits of Location – they could squat there and graze their livestock without incurring a government fee. This opened up the region to free pastoral settlement.

During that period, free Government land grants often went to those in favour with the colonial Governor, those whom the Government owed for particular services or to people already with capital. Anyone with some capital and good social contacts could take advantage of free Government land grants. Within the Limits of Location, newly surveyed parcels of land, 640 acres in size, were given for every £500 of money or stock that a colonial resident possessed, with a limit of 2000 acres – which was later increased to 2560 acres (Ellis 1989: 33).

In 1824, the Colonial Office in London instructed Governor Darling to model the settlement and administration of Australia's new 'out-lands' [Limits of Location] on the existing English method – where the church played a major administrative role. However, with the greater distances and vast quantities of land involved, the system of local government that emerged was one based on police districts with local police administrators. Police district boundaries were used for collecting population and agricultural data and became our modern day county and parish areas. Settlers living

within one of the police districts – the Limits of Location – were provided with Government administration, but more importantly, police protection. However, well watered fertile farming land, a growing and enthusiastic population, and an access road between Sydney and Bathurst made the region an attractive place for settlers seeking land and many people squatted or grazed their livestock beyond this point – hence the first European use of Wattle Flat.

The Colonial Government counteracted the free use of land outside of the Limits of Location, to some degree, by introducing squatting licences (for non surveyed land) in 1837 (after Wattle Flat was already named) and tasking the Police with collecting land use fees – and taxes on livestock.

With the gold rush, Australia's population grew through the 1850s and settlement in the wider Bathurst region increased. With the introduction of the Robertson Land Acts in 1861, there was another increase in the district's settlement. The Acts allowed for free selection of crown land of between 40 to 320 acres, therefore making redundant the Limits of Location. The smaller land parcels encouraged an increase in sheep runs and the region's wool industry rapidly developed (Town and Villages NSW 2008). By the late 1870s, the region was experiencing a gold rush, its farming potential was being realised and it was seen as a viable area for settlement and economic growth.

During this early period of European occupation, the area was mostly cleared of its natural vegetation, firstly to make way for the development of pastural land and later, through mining activities. By the 1830s, Bathurst had proven its capacity to support agricultural endeavours. The 1815 Government Agricultural Station had proved successful – even through drought in the 1830s and later floods. The construction of permanent structures in the town was deemed appropriate and Bathurst quickly developed a very sturdy Government House, a Superintendent's House, a Store House and a Barracks building (Barker 1992: 35). By 1822, the built structure count was still growing with the settlement now boasting a hospital, courthouse, a goal, a brick kiln, and larger convict barracks (Barker 1992: 88) (*Figure 4*).





Bathurst's early penal settlement in 1815, with the Macquarie River in the foreground (looking south west). (State Library of NSW Image Number: a128133).

The region surrounding Bathurst (including Wattle Flat) first had European use (in the 1815 to 1850 period) for crop growing, and cattle and sheep farming. The 1851 Australian gold rush brought substantial commercial activity to the area – through an increased level of general trade and wealth accumulated from mining for gold. By the 1890s, Bathurst, Wattle Flat and much of the surrounding land had been allocated as grants (as Government Land Grants) or sold in small blocks of between 20 to 400 acres to settlers. Many of the landowners would have been miners or small scale farmers who took advantage of affordable lands made available by the Government's passing of the Robertson Land Acts in 1860.

After discussing some of the components in this AMP such as the research methodology employed, its limitations, the statutory requirements, authorship and other brief but, necessary matters, the history of Wattle Flat will be addressed.

Purpose and benefits of the study

Bathurst Regional Council commissioned this project to identify and access the relative likelihood for, and significance of, archaeological resources within the four stated areas at Wattle Flat, NSW in order to:

• Identify areas of archaeological sensitivity so that planning decisions can take these into account;

- Inform prospective developers, site owners and managers about the archaeological sensitivity of their land at the earliest opportunity;
- Ensure that resources (human, physical and financial) are directed to the most sensitive areas and important sites;
- Allow all entities involved adequate preparation time to consider the archaeological sites.

The Management Plan will assist Bathurst Regional Council to identify opportunities to interpret the sites as areas of interest for interpretation. The four gold mining areas of this study have alluvial and reef mining sites within their bounds, but are also associated with similar sites in close proximity. No site impacts are proposed. However, the site type, exact location and approximate boundary details are important factors to be examined further in this Management Plan. If the proposal plans change and impact to any of the mining sites within Wattle Flat becomes imminent, risk mitigation measures should be implemented.

Methodology

This AMP has been produced using guidelines set out in the *Burra Charter* of Australia ICOMOS – which provides a nationally accepted standard for heritage conservation in Australia – and the NSW State Government's Heritage Branch *Guidelines for the preparation of Archaeological Management Plans.* As such, the research methodology employs the following process:

- 1. Historical research based on primary sources such as maps, pictorial material, directories, and Government and Council records. Surface and potential sub-surface remains may be located and an analysis made of their historical context, type, and condition. Through this, a picture of land use history of the site is developed.
- 2. This data is then compared to the study area and to any visible historical remains located there. An assessment on the nature and extent of the archaeological deposits within the study area is made and consideration given to the archaeological potential and sensitivity of a site.
- 3. The heritage significance of the site's archaeological deposits is considered against criteria listed in the *NSW Heritage Act* 1977 (amended) and implemented through the *Burra Charter* and the *State Heritage Inventory Program*. The nature and degree of heritage significance such as historical, social, research potential, rarity, representativeness and technological significance is assessed.
- 4. Based on the assessment of archaeological potential and significance, recommendations are made regarding management strategies for the archaeological deposits.

Limitations

Surface level field-survey work was undertaken at the study areas. The archaeological remains of the sites were defined as surface and sub-surface, and their fabric, size and general character were adequately assessed. No sub-surface investigations were undertaken.

Statutory Requirements

The archaeological remains of mining activities and any disturbance to them are regulated under the NSW Heritage Act 1977 (amended). The Heritage Act was enacted to ensure the environmental heritage of NSW (which includes archaeological resources) would be adequately identified and conserved. The Act established the Heritage Council of NSW, an independent advisory body which makes recommendations to the Minister for Planning on matters affecting the environmental heritage and on the implementation of the Heritage Act.

The Heritage Act is concerned with all aspects of heritage conservation ranging from basic protection against indiscriminate demolition and damage, to restoration and education. The provisions of the Heritage Act, with particular reference to the management of archaeological sites in NSW, are those which relate to "relics".

The term 'relic' is defined in the Heritage Act as any deposit, resource or feature that has heritage significance and:

- which relates to the settlement of the area that comprises NSW, not being Aboriginal settlement; and
- is of State or local heritage significance.

Section 139 of the Heritage Act provides that:

- c). A person must not disturb or excavate any land knowing or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed unless the disturbance or excavation is carried out in accordance with an excavation permit.
- *d*). A person must not disturb or excavate any land on which the person has discovered or exposed a relic except in accordance with an excavation permit.

If a site is the subject of an order under Section 130, an Interim Heritage Order, or is listed on the State Heritage Register, an excavation permit is required under Section 60 of the Heritage Act.

If a site is not the subject of an order under the Heritage Act and is not listed on the State Heritage Register, an excavation permit is not required, in accordance with Section 140.

Section 146 of the Heritage Act requires that the accidental discovery of relics should be reported to the Heritage Council of NSW.

A person who is aware or believes that he or she has discovered or located a relic (in any circumstances, and whether or not the person has been issued with an excavation permit) must:

- e). within a reasonable time after he or she first becomes aware or believes that he or she has discovered or located that relic, notify the Heritage Council of the location of the relic, unless he or she believes on reasonable grounds that the Heritage Council is aware of the location of the relic, and
- *f). within the period required by the Heritage Council, furnish the Heritage Council with such information concerning the relic as the Heritage Council may reasonably require.*

When an item of heritage significance comes under the ownership or control of a public authority, the authority is required to record it in a Heritage and Conservation Register, under section 170 of the Heritage Act. The purpose of the provision is to alert the authority whenever works are proposed, which might affect the item.

The *National Parks and Wildlife Act*, 1974 (amended) is also relevant. This Act ensures the care, control and management of all historic sites and objects (among other things) throughout NSW.

Register of the National Estate

The Township of Wattle Flat and its setting are not listed on the Register of the National Estate (or the Australian Heritage Database) as a place of State heritage significance, as are some New South Wales Townships, such as Braidwood and Hill End. However, the town of Wattle Flat represents an excellent surviving example of the early development of styles of architecture and the Australian gold mining landscape dating from the 1850s. Two buildings of note in the region are the former Rising Sun Inn – although now positioned fourteen kilometres south-east of Wattle Flat – and Ireland's General Store on Wattle Flat's main road. The Inn is listed on the Register of the National Estate (Place ID Number 916) as having historical significance for its association with the Wattle Flat gold rush, its associated industry and its historical phase.

Statutory and Non-statutory Guidelines

The management of heritage sites in NSW should conform to the requirements of the *Burra Charter* of Australia ICOMOS. In addition, the following guidelines provide for a best practice conservation approach:

- Assessing Significance for Historical Archaeological Sites and Relics, NSW Heritage Office, Department of Urban Affairs & Planning, 2009.
- NSW Heritage Manual, NSW Heritage Office, Department of Urban Affairs & Planning, 1996.
- Historical Archaeological Investigations: A Code of Practice, NSW Department of Planning, 2006.
- Historical Archaeological Sites, Investigation and Conservation Guidelines, Department of Planning and NSW Heritage Council, 1993.
- The ICOMOS Charter for the Protection and Management of Archaeological Heritage, ICOMOS International, 1990.

- Heritage Interpretation Policy and Guidelines, Heritage Information Series, NSW Heritage Office, August 2005.
- Photographic Recording of Heritage Items, Heritage Information Series, NSW Heritage Office, 2006.

Authorship

Alister Bowen (Bowen Heritage Management's senior archaeologist) conducted the desktop assessment, historical heritage field survey and report writing for this project. The field assessment was undertaken between the 7th and 10th of February 2017. Alister completed an Honours degree in archaeology in 1999 at the Australian National University and a PhD in archaeology in 2007 at La Trobe University. A background in the Trades has equipped Alister with strong practical experience to complement his academic qualifications. He has undertaken a wide range of historical and pre-historical archaeological projects in Queensland, South Australia, Victoria, ACT and NSW.

Zvonka Stanin (archaeologist) and Ashlee Cutter (Senior Heritage Planner with Bathurst regional Council) assisted with the field component of the project.

Historical Archaeology

Historical archaeology in Australia is the study of historical documents in conjunction with the physical remains of the past. Typically, it spans a period that begins with the British occupation of NSW in 1788. As well as identifying past human activities, the study of Australia's historical material remains can assist in understanding the processes that have helped create our present day surroundings. Historical archaeology in Australia includes an examination of how the late eighteenth and nineteenth-century people lived and coped with a new environment, where they lived, their consumer choices, trade relations, and how people interacted. The material remains that become studied include the following definitions as defined by Casey and Low (2008):

- Archaeological sites:
 - below ground: these contains relics which include building foundations, occupation deposits, rubbish pits, cesspits, wells, other features, and artefacts
 - above ground: buildings, works, industrial structures and relics that are intact or ruined.
- Cultural landscapes
- Maritime sites:
 - shipwrecks
 - structures associated with maritime activities.

Archaeological Potential

Archaeological potential refers to a site's potential to contain archaeological relics which fall under the provisions of the Heritage Act 1977 (amended). This potential is identified through historical research and by assessing whether current building or other ground disturbing activities have removed all evidence of known previous land use.

Archaeological Site

Archaeological sites are places that contain evidence of past human activity. Below ground sites include building foundations, occupation deposits, features and artefacts.

Above ground sites include buildings, works, industrial structures and relics that are intact or ruined.

Archaeological Investigation or Excavation

This is the manual excavation of an archaeological site. This type of excavation usually involves the stratigraphic excavation of open or other areas.

Archaeological Monitoring

Archaeological monitoring is recommended for those areas where the impact of the works would not entail the destruction of significant archaeological fabric. Nevertheless, the disturbance of features – both known and unknown – is possible. In order to provide for the proper assessment and recording of these features, an archaeologist should inspect the work's site at appropriate intervals and should be 'on call' in case the contractor uncovers remains that need to be assessed by the archaeologist.

It is not anticipated that monitoring would impact on the planned works or unduly hold up the contractors' work schedules. If recording of features is required, it would be carried out as quickly as possible so that any time delays are minimised. Monitoring is a regular archaeological practice used on many building and development sites.

Excavation Permit

An excavation permit provides authority to disturb or excavate a relic and is issued by the Heritage Council of New South Wales under Section 60 or Section 140 of the NSW Heritage Act 1977 (amended).

Research Design

This involves developing a set of questions that can be investigated through archaeological evidence and an investigative, guiding methodology. A research design ensures that archaeological investigations focus on genuine research needs. When archaeological resources are destroyed by excavation, their information content can then be preserved and can contribute to current and relevant knowledge.

Research Potential

This refers to the capacity of the sites or features to yield information through archaeological investigation. The significance of archaeological sites is assessed according to their capability to contribute information to substantive research questions.

History of the Study Area

The European use of a landscape is of fundamental importance to the creation, destruction or preservation of the archaeological record. The purpose of this section is to provide historical context for the Wattle Flat mining areas and their associated archaeological record. An overview of the broader region's European history has been given above. Below is an historical (non-Aboriginal) summary of the history of Wattle Flat and its close surrounds.

The Wattle Flat area is well watered due to several sizable creeks such as Big Oaky Creek, Little Oaky Creek, Solitary Creek, Tanwarra Creek, Wiagdon creek, and Bullock Flat Creek, along with several minor waterways that would hold pockets of water for small periods after rain. Aboriginal people were present in the area long before European settlers arrived. The Aboriginal group associated with the region is the Wiradjuri (sometimes spelt Wiradyuri) people, a once nomadic group (Goldney 2015: 3). Governor Macquarie suggested he would set land aside for the local Aboriginal population to live on. However, with good farming land in demand and European settlers seeking to plant crops and develop pastures for their livestock, the Aboriginal population never received the land reserve.

Some written local histories for the region suggest that during the 1821-1850 period, British settlers, including cattle herders, sheep shepherds, farmers and runaway convicts, coexisted amicably with the Wiradjuri living on the plateau. However, more correct histories acknowledge the troubles between Aboriginal people and European settlers. The difficulties are particularly well known due to an Aboriginal warrior called Windradyne (*Figure 5*). Windradyne was unusual in the history of the region because he was the only known resistance leader of the Wiradjuri people against European settlement (Lowe 1994: 6). Emerging as a key protagonist in a period of Aboriginalsettler conflict, Windradyne actively attacked European settler groups and with settler retaliation, there was a great deal of blood lost on both sides.

Hostilities escalated around 1822 when Governor Macquarie, who favoured a slow pace of settlement, was replaced by Governor Brisbane, who favoured rapid settlement and began a period of express land grants to European settlers. The resultant increase in European settlement pushed the Wiradjuri from their traditional camping areas, hunting grounds, water sources and sacred sites. Windradyne rallied and led his people against the European occupation. The continuing conflicts led to the historic 1824 'Bathurst War' between the Wiradjuri people and European settlers. Windradyne used his knowledge of the landscape to raid settlers' homes and then disappear back into the bush. He was so successful that Governor Brisbane proclaimed martial law for the entire Bathurst region (in August 1824), dispatched 75 soldiers to regain order (in whatever manner they could), and offered 500 acres of land for the capture of Windradyne. Soldiers, mounted police, settlers and stockmen joined and a brutal encounter - some say massacre - was turned on the Aboriginal people. Windradyne survived, but after two months of martial law, he made an appeal to Governor Brisbane for peace, which was accepted. Governor Brisbane was later reprimanded for having insufficient grounds to declare consequently recalled England martial law and was to (http://heritagebathust.com/history).



period Figure 5 colonial artist's interpretation of Windradyne А (search=windradyne+facts&rlz=1C1GGGE).

The story of Windradyne makes an interesting starting point for Wattle Flat. An 1824 newspaper report is the first located document to mention the Wattle Flat area. On June 10 1824, The Sydney Gazette stated that some of Windrayne's men attacked and killed two European stock keepers and speared another at 'Warren Gunyah' near Wattle Flat. The report mentions that Warren Gunyah was Mr Lyndall's farm, but no other information has been located regarding the property.

During this early period, Wattle Flat was way beyond the Limits of Location. Mr Lyndall probably had a small hut and was squatting on the land whilst fattening up his livestock for market. No further mention of the surname Lyndall in association with Wattle Flat has been located in historical records, but the report does give account that the area 'Wattle Flat' had been named, at least locally, by 1824 and was in use for farming purposes before gold was found in the area. Cook and Garvey (1999: 300), suggest that before the gold rush the area was known as Greens Wattle Flat and consisted of small farms and orchards. However, they do not cite their source of information. Early maps of the area show no recorded existence of Wattle Flat by 1822 (Figure 6). Even when the region was becoming more populated by 1837 with a lot of the land around Bathurst having already been granted or sold, Wattle Flat was still not officially recorded (Figure 7).

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Figure 6 An 1822 Map of NSW by John Oxley, showing Bathurst and the future location of Wattle Flat, at that time uncharted land, outside the 'limits of location' (National Library of Australia, MAP 3599).

It is known from the 1824 newspaper report that the area existed as Wattle Flat and that there was at least a hut there, but it is still not officially recorded on the 1846 'Parishes, Towns and Grants' map of the region (*Figure* 8). More evidence of its named existence was discovered in an 1847 New South Wales Government Gazette paper. On 7th of December 1847 there is a notice in the Gazette that a Mr Davis of Wattle Flat has an unclaimed letter to be picked up from the Post Office (presumably Bathurst Post Office). Still, by 1854, when mining operations were definitely underway there, Wattle Flat is not recognised on William Hughes' Map of NSW (*Figure* 9).



Figure 7 An 1837 Map of NSW by Robert Dixon, showing Bathurst and Sofala. Settler names associated with large portions of land are starting to appear, but no Wattle Flat as yet (National Library of Australia, MAP RM 831b).



Figure 8 An 1847 Parishes, Towns and Grants' map of Bathurst County, showing Sofala but, still not officially recording Wattle Flat (National Library of Australia, MAP RaA 8).



Figure 9 W. Hughes 1854 Map of NSW shows Sofala but Wattle Flat is not shown as mining operations were only just underway there (Old Maps Online Web Ref P4334).

The location of the original Wattle Flat hut is unknown. However, Wattle Flat, as it's known today, is approximately 31 kilometres north north-east form Bathurst, and 5 kilometres south of Sofala - on the Turon River. The Sofala district meets its northern boundaries and to the south is the Wingdon district, on the east is Limekilns, and the mountain ranges just to the west. The Township comprises an area of approximately 2501 hectares (6181 acres and 25 square kilometres), and is situated in the centre of an amphitheatre of hills at the top of a high range that's boarded by the Turon River. The general lush landscape attests to the richness of the soils, whilst the high altitude (averaging 910 metres above sea level) allows an attractive mountainous and undulating aspect with impressive steep gullies and spurs. In 1851, a traveller just out of Goulburn, NSW recounts "A horseman leading a 'packer' overtook us one afternoon at the Bargo River crossing. He said, I suppose you chaps have heard of gold being found over on the Turon" (MacAlister 1907: 185). An 1872 description of the area (well after the initial gold rush period) relates that many original, gently sloping creek banks have been entirely sluiced away to form vertical cliffs, and alluvial and reef mining shafts stud the ground, giving evidence of the richness and extent of its gold history (Gipps and Campbell 1873: 5). The region has rich alluvial and extensive quartz reefs which provide reason, almost exclusively, for the continued European existence in the area.

In the period just before the gold rush erupted, Australia's estimated population was 187,243 people. Three out of every four males were unmarried and the average rural worker received an annual wage of £18 (Higgins 1990: 5). This large supply of single

male workers, combined with the perception of easily won wealth, was a major factor contributing to the general charge forward to Australia's gold rush.

During 1851, miners were making their way to Sofala and the Turon Diggings in their thousands and the township grew substantially. As put by one participant, "*it was a hummer; truly an epoch-marking event which set the world a-blaze with excitement and made Australia's name known from pole to pole*" (MacAlister 1907:185). As Wattle Flat is on the way to Sofala – and offered a landscape where rich alluvial gold could be obtained fairly easily – a great many stopped there to try for gold, initially along the banks of Big Oakey and Little Oakey Creek, but soon after, over the entire region (Gipps and Campbell 1873: 17). A note about Wattle Flat's potential, dated June 1851, written by J.R. Hardy to the Colonial Secretary states, "*Sir, I have the honour to advise you of a point which I believe would repay parties working for gold*" (Miller 1962: 3). Cook and Garvey (1999: 292), assert gold was first found at Wattle Flat in September 1853 at Uncle Tom's Hill. Hodge (1998: 20), states it was Surface Hill that attracted the first interest. However, Hardy's note from 1851 represents a primary source and is the more accurate source to ascertain the beginning of gold mining at Wattle Flat – give or take a month.

Sofala, just barely established (originally called the Western Goldfields), acted as a supplies station for Wattle Flat and for many years maintained its status as a prosperous goldfield. In November 1852, a visitor to Sofala described a bustling place that was "daily receiving large accessions to its population... the river bed becoming enlivened with the carrying on of mining operations" (MacKay 1852: 46), and at Wattle Flat things were no different. The Turon goldfields started near the Turon River's junction with Macquarie River and included all of the hills and tablelands that flanked the Turon River and its various tributaries, including the entire Wattle Flat region (www.walkabout.com.au/locations/NSWSofala.shtml).

By July 1851, word was that Oakey Creek was the place to find gold. At Wattle Flat – according to one participant, Chas MacAlister - Big Oakey and Little Oakey Creek's were "where the chief rush had set in". There were, by the end of August 1851, an estimated 15 000 gold seekers (on the Western Goldfields) of every nationality and, as described by MacAlister (1907: 187), people "from the noblest types of humanity, to the meanest sneakthief that ever pinched a pair of bootlaces". A traveller through Wattle Flat in 1852 noted that holes were dug in every gully or hollow, only about five feet deep, into "loose topsoil and tawny coloured clay where the gold is found with little labour" (MacKay 1852: 4). One party working a 'long tom' (a sluice box used to wash gold-bearing dirt which, along with the shovel and pan, was commonly used in the early gold mining period) in the lower sections of Big Oakey Creek had been doing very well with finds of "nuggetty gold" (MacKay 1852:5). In early 1852, the Bathurst Free Press and Mining Journal (28 February 1852 P3) ran a notice that in Mr Trappitt's store "a lad of about twelve years old brought in four pennyweights of small nuggetty gold which he had picked up with the point of his knife on the ridge which divides the two Oakey Creeks [right at Wattle Flat]". The Wattle Flat fields were productive enough to attract a 'rush' and though not yet placed on a map, the area was known.

By mid-1853, things changed and Uncle Tom's Hill (at Wattle Flat) was the new place to find gold. However, the landscape necessitated much more time consuming and expensive reef mining. In general terms, two phases of mining are discernible at Wattle Flat: an early period of alluvial mining in rich gold bearing shallow soils, and reef

mining, to extract the gold contained in underground quartz veins wedged between the region's rock formations.

The first reefing operations were along the main road to Sofala, initially at Uncle Tom's Hill but followed closely at Skid Hollow Creek (Wattle Flat). These began with the extraction of quartz from three veins that ran almost vertically into the earth – and averaged 19.5 dwts. of gold per ton of quartz. The next reef workings were at Whelan's Hill, on the slope running down to Little Oakey Creek. After this initial start, reef mine leases were taken out. In November 1852, a traveller wrote that diggers living in calico tents were working all the slight hollows and swamps, squashed together at the head of Big Oakey and Little Oakey Creeks and the smaller tributaries around Wattle Flat. Only one miner was working a small tom by himself in Solitary Creek (MacKay 1852: 5).

With the rush already set in, the Government started charging fees of the miners at Wattle Flat. On the 2nd of February 1853, they placed authority over the entire area – under the *Act of Council No* 43 – by proclaiming Wattle Flat as a goldfield on Crown Land. The area included from the south side of Upper Turon Road (near Sofala), boarded to the east by the same road (Upper Turon Road), south by the Wiagdon area, and west by the first mountain ranges (NSW Government Gazette, 2nd of February 1853) (*Figure 10*).



Figure 10 Showing the approximate Government Crown Land area for the Wattle Flat goldfields (shaded area).

Solafa already had - by 1852 – stringent and expensive gold mining licences in place, but no mining rights were needed to mine a plot of land at Wattle Flat. When winter floods hampered Wattle Flat's 1852 mining operations in 1852, many of the shabby wooden huts and calico tents were taken down as miners left for less regulated diggings. The

miners that remained had good results for the year, but more floods in mid-1853 again hampered operations (Hilyard 1980: 4). By the end of 1855, the Department of Minerals and Resources wrote in their history of the western goldfields, that only one company (no name is given) was active in the whole Sofala-Wattle Flat area and that mining was only being carried out by individuals. Around Wattle Flat, the mining operations involved both alluvial and reef mining. Companies and individuals brought in stamping machines and charged reef miners to crush the quartz they had collected.

Newspapers from the mid-1850s give insights into some of the activities of the Wattle Flat miners. For example, the Bathurst Free Mining Press, on 29 July 1854, reported that a large number of diggers had gathered at Wattle Flat to watch a prize fight for £50 between a game young miner named Tom Gard and a pugilist known as 'The Butcher' (The Butcher winning). Coincidently, Wattle Flat later produced its own boxing legend, the local borne Jim Fogarty, who in the early 1860s was a big name in Sydney's boxing industry (Neary 1983: 44).

Other evidence for early mining at Wattle Flat can be seen in a letter dating May 1854. Here, the newly appointed Gold Commissioner for the Western Districts writes "On the Wattle Flat table land…very rich deposits have been found; and there are at present from 400 to 500 diggers on this flat" (Miller 1962:10).

In January 1855, the Bathurst Free Press and Mining Journal shows that long-term mining interests were starting to develop at Wattle Flat when it reported "an American party at Wattle Flat applied for an acre of land near Solitary Creek. They planned to construct a large dam sufficient to contain water for three or four months for digging purposes, and also to erect a puddling machine" (to agitate heavy clays from gold-bearing gravel, the separated clays were then washed away with water).

Approximately one month later on February 3, 1855, the Bathurst Free Press and Mining Journal reported "Wattle Flat is going a-head and no doubt will prove on an average one of the most productive gold fields in the Western district. I have visited them lately, and can assure you a more industrious scene could not be witnessed than that presented by the diggers in that locality". Typical of many Australian goldfields, with less alluvial mining, more reef mining and a long-term view towards generating wealth, the common calico tent and bark humpy on the goldfields (*Figure 11*) was replaced by more substantial buildings of brick and stone. By 1855, Wattle Flat had a population of several hundred, a permanent main store (still standing today, see *Figure 12*), two hotels, a police barracks and lock-up, a National School (opened in mid-1858), and an Anglican Church (Cook and Garvey 1999: 292, 301).

However, difficulties arose when the relatively easily obtained alluvial gold started running out. By the early 1860s, individual miners – who were now thinking of long-term profits – were combining their resources to form companies with enough capital to undertake the more costly, but still profitable, quartz reef mining. Examples of these newly formed companies are seen on the 31st of December, 1862, in the NSW Government Gazette, where applications for the registration of two reef mining companies, the 'Band of Hope Quartz Tunnelling Company' and the 'Wattle Flat Quartz Reefing and Crushing Company' are shown. Through the 1860s and into 1870s, shafts were dug to obtain reef quartz to crush for its gold content. Shafts were dug in very hard rock and the quartz needed to be conveyed to the nearest crushing battery. The process was expensive, time consuming and labour-intensive. However, it could be

lucrative and at one time there were about a dozen quartz crushing batteries around Wattle Flat. Even this number was generally considered to be insufficient to keep up with the mined quartz (Hodge 1998:17).



Figure 11 A standard calico tent of the times (left) and a basic bark structure (right) (http://hdl.handle.net/10462/deriv/68202).



Figure 12 Ireland's Store in 1864, showing from left Norrie, Mary-Jane, Doris, Lil, Vera and John Ireland, Kit McCarthy and Elvie Hart (Hodge 1998:20).

A large party of 150 Chinese miners arrived in Sofala in 1856 and by 1861 there were 642 living in the township. Chinese miners were also working the Wattle Flat gold fields and have left evidence of their presence. This is noted in the State Heritage Inventory listing (Number 1080658) for Little Oakey Mine which states: "On the other side of the Creek [Big Oakey Creek] is a Chinese water race". By 1859, the gold mining industry at Wattle Flat was in full swing with alluvial and reef mining, but change was under way.

Alluvial gold was becoming more difficult to find so miners began joining together to form companies with increased capital that could cover the costs of exploiting the quartz veins (Hilyard 1980: 2).

A journalist for the Bathurst Free Press and mining Journal wrote on 7th November 1960, that one of the problems resulting from so much reef mining was having the quartz crushed. He wrote "indeed there is so much quartz now raised as will last to Christmas, supposing that no more were brought to the surface. The quantity crushed by this machine is about ten tons per day, for which a charge is made of £2 per ton". In 1873, Gipps and Campbell wrote that at Wattle Flat "the surrounding country is thick with old alluvial holes whilst the original sloping banks of the creeks have been entirely sluiced away ...into steep cliffs bearing witness to the richness and extent of gold" (Gipps and Campbell 1873:14). The same writers state that at Wattle Flat in 1873 "Though several leases have been taken up on the crown and on both slopes of this hill [Surface Hill] only one mine is at present working. It belongs to a Sydney company and is called the Lion of Wattle Flat" (Gipps and Campbell 1873:14). Evidence of companies forming on the goldfields to combine capital can be seen in the Sydney Morning Herald on 20th March 1872 when it was reported that "Mr. Campbell and party, on the Big Oakey Reef, are turning up stone better than ever...I hear that this party is about to form their ground into a company".

Under these conditions, quite a few successful reef mines were in operation at Wattle Flat. By 1872, Hodge (1998:21-23) claims there were approximately 700 gold leases in the Wattle Flat district, 36 of these were underground operations (reef mines) and there was a population of approximately 600. In time, miners' rights and mining leases changed hands too many times for the authorities to keep track of and many blocks eventually became freehold title. By the time Gipps and Campbell wrote their 1873 account of the Wattle Flat Goldfields, the main reef mines were Spring Creek, Surface Hill, The Caledonian Mine, The Commerce Mine, Prospect Reef, Storey's Reef, Brlle of Wattle Flat Mine, The El Dorado Reef, Bullock Flat, Monks Hill, Solitary Reef, The Magenta, Pipers Creek, Lynch and Party, Specimen Hill, Gard's Paddock, Golden Hope, British Empire Comet, Green Man, Casey's Hill, Married Mans Gully, Swede's Hill and Clay Flat Spur to name just a few.

Several dry seasons leading up to 1876 stopped alluvial mining altogether, the quartz crushers were at minimum output and many old leases were cancelled and not retaken. In 1875, Hugh Bridson, a Mining Registrar, wrote "The puddlers [alluvial miners] at Wattle Flat are idle for want of water" (Cited in Gipps and Campbell 1873:69). During this period, ground works were undertaken to secure water from constructed dams and water-races. However, mining operations were still greatly impeded. The Mining Registrar at Sofala recorded that: "the Sofala Division owes its prosperity to the fact that the miners residing there, especially at Wattle Flat and that neighbourhood, have been enabled to take up small portions of land, which they cultivate, and with the assistance of a few cattle or other stock, which they pasture on the commons or reserves, many of them make a comfortable *living*". A good season of rain in 1879 kept gold mining moving along, before five years of dry weather caused a slump. Nevertheless, many diggers continued on at Wattle Flat cultivating plots of land. In 1882, reef mining at Solitary Reef continued, and another stamping/crushing machine was built at Spring Gully (close to Solitary Reef). Around this time, the Tom brothers constructed a ten head stamping machine along one of the Oaky Creeks - the exact location is unknown (Hilvard 1980: 2). Reef mining at a commercial level and low level alluvial mining continued within the study area until approximately 1959 and is still conducted on a smaller scale today.

By the 1880s, mining in the area had slowed mainly due to prolonged dry weather, but was still limping along including at Solitary Reef. The 1881 census records that Wattle Flat's population was 400 people, 100 of whom were miners. In 1882, the Mining Registrar described the miners at Wattle Flat as surviving predominantly on earnings from their cultivations of wheat, hay, maize, and potatoes - however, miners were generally loathe to disclose their true gold finds to the mining registrars and so were probably still obtaining a reasonable income from gold. In 1887, the Government began boosting the mining industry by giving annual financial backing to reef mines they deemed viable. This resulted in reef mining at Wattle Flat being immediately revitalised and the census records indicate that 200 reef miners were employed there (Hodge 1998:24). The Big Oakey Mining Company was doing well at Surface Hill in 1887 and major gold discoveries enhanced operations at the 'Queenslander' mine. Through the 1890s, a small amount of alluvial mining was still going on, depending on water availability. The Oakey Creek Gold-Mining Company located a "fine, solid reef 1.6 *metres thick*" and built a tramway to transport the quartz to a new ten head stamping battery (Bathurst Free Press and Mining Journal 7 November, 1888). However, by the late 1890s, reef mining around Wattle Flat was again in decline. By 1908, J. S. Atherton and his sons were still earning a living from reef gold out of the Queenslander mine, which continued well into the 1900s, but after about 1919, no good quantities of gold were obtained from Wattle Flat (Hilyard 1980: 2-5).

Types of Gold Mining at Wattle Flat

Character of the Archaeological Resources

A brief indication of the types of mining and their associated physical materials will be useful for later interpretation and archaeological management of features located at Wattle Flat. This section will provide a basic knowledge of the mining practices carried out at Wattle Flat. This will facilitate a picture of the area's archaeological character, allow comparative analysis, determine significance, suggest priority research areas, reveal historic phases, and indicate specific geographic zones.

There are a literally thousands of informal, technical and scientific terms used to describe gold mining and gold mining processes – and where necessary, these will be explained individually. During the 1850s, gold mining in Australia was an innovative field and new developments in equipment and methodology were being introduced regularly. More successful operations tended to upgrade their equipment periodically and as new technology became available. Other gold mining companies carried on for years with worn-out equipment and outdated techniques (Ritchie and Hooker 1997: 3 & 7). Predominantly, two types of gold mining were carried out at Wattle Flat:

- 1 alluvial (usually small operations with minimal equipment)
- 2 quartz reef mining (larger more expensive operations, requiring quite a lot of manpower and equipment)

Alluvial mining – a term used for obtaining gold from alluvial deposits (deposits of sand and gravel that has been washed and transported by water). Gold pieces or flakes, having been moved by water flow from an original source such as a vein, are typically only a small portion of the total deposit in an area. Since heavy metals like gold are considerably more dense than sand, they tend to accumulate at the base of other alluvial deposits. Alluvial mining usually only requires the use of either a gold pan or washing cradle (sluice) and water to wash alluvial soils and recover gold (*Figure 13*). The water

washes away dirt and the bulk of the lighter materials, while the heaver gold particles sink to the bottom and are trapped behind in 'riffles' in the metal (Ritchie and Hooker 1997: 3 & 7).



Figure 13 Two common methods of alluvial mining, panning (left) and cradle (right) pictures from (<u>https://the-australian-gold-rush.wikispaces.com/Mining</u>).

Quartz reef mining - a 'quartz reef' is a term for a vein of quartz (entirely different to a biological reef, such as coral reefs). Quartz is one of the most common minerals in the earth's crust, and can contain gold. Usually, mine shafts are required to mine quartz from reefs. Sometimes, deep underground shafts, often in hard rock need to be dug. The gold is brought to the surface as small particles embedded in lumps of quartz. The quartz then needs to be crushed into a fine dust by a stamping battery (*Figure 14*). On the bottom of each stamping battery stamp is a heavy iron steel shoe that crushes the quartz. Each stamping battery is driven by a cam shaft which was turned by a water, steam or motor driven wheel. The steel shoes go up and down between wooden guides, pounding the quartz fed into steel boxes underneath the stamper. Ideally, stamping batteries would work 24 hours a day. The crushed quartz is mixed with water to make mud which runs down sloping tables – called concentrating tables – trapping any gold on blankets or wooden gold catching sheets. After approximately 1900, copper sheets coated with mercury were placed on top of the sloping tables - the gold particles stuck to the mercury, and could be collected from there (Ritchie and Hooker 1997: 18).



Figure 14 An abandoned five head stamping battery used for crushing quartz (http://trexterra.blogspot.com.au).

Previous Mining Site Studies

This section considers what other archaeological studies associated with Australia's early gold mining industry have identified as important, their research framework and recommendations. This provides useful background information, gives a context for the broader interpretation of Wattle Flat's archaeology and allows comparisons to be made. Also, evidence from past studies can give a general indication of patterns of preservation of materials, which will further help with the interpretation of relics and sites within Wattle Flat.

A number of previous archaeological studies associated with Bathurst's European history are worthy of mention. Bairstow (1992), completed an inventory of historical sites associated with separate periods of settlement in Bathurst, several of which were given heritage significance, although none are specifically related to gold mining.

In 2007, a heritage study was completed for Bathurst Regional Council by Hickson and McLachlan, again only recording sites within the immediate Bathurst region. They did however, place some new listings on the State Heritage Inventory. While none were specifically related to gold mining, they suggested areas where further research be conducted.

In 2012, Higginbotham completed an Archaeological Management Plan for Bathurst Regional Council that took a broader regional perspective than previous studies. Higginbotham's aim was to enable the conservation and management of historical

archaeological resources in the Bathurst region and to provide a usable methodology for Bathurst Regional Council to promote the region's heritage and archaeology. The study identified opportunities for conservation, further research, interpretation, display, and opportunities for education. Several sites of state significance were recorded. Importantly, Wattle Flat was identified as an area of exceptionally significant mining history incorporated within a significant mining landscape. This study correctly places the archaeological significance of Wattle Flat's mining history and its associated mining landscapes as exceptionally significant to the history of New South Wales. It also investigates them as Industrial Sites with a Mining and Mineral Extraction context, a theme that will be continued here.

Higginbotham (2013) also undertook an Archaeological Management Plan for sites associated with Bathurst's early Government Settlement, from 1850 to 1840. It describes the sites and associated institutions of this period, assesses their significance as high, makes conservation and management recommendations, and investigates opportunities for their interpretation and display.

Several past studies – of a similar nature to this current study – have been completed for colonial period mining sites in NSW – although not within close vicinity to Wattle Flat and they are mostly Conservation Management Plans. For example, Bickford (1994), Stedingern Archaeology (2001), Mayne (2001), Cabonne Council (2001), M and J Tracey (2003), Heritage Concepts Pty Ltd (2006, and OzArc (2011). The nature of these projects and their findings will be examined to help develop an appropriate research plan and management recommendations for the Wattle Flat mining areas.

The remains of colonial period gold mining operations at Peak Hill, NSW, were archaeologically examined by Anne Bickford (1994). The work was undertaken due to proposed disturbance from new mining operations at the site. Most of the infrastructure associated with mining operations was represented by concrete footings for mine machinery dating between 1894 and 1917. Part of a Lancashire boiler and the base of a skip were recommended to be preserved for future display, the rest of the site's relics were assessed as having a low significance. Nevertheless, all of the sites features that were to be disturbed were accurately recorded. No overall statement of significance was given because the site had been highly disturbed. It was recommended that no features needed to be preserved *in situ* and demolition of the site was sanctioned.

Louise Bavin-Steding of Stedingern Archaeology (2001) conducted a Historical Archaeological Assessment on the 1901 Broula King Gold Mine at Bumbaldry in NSW. The general themes assessed were industry, environment, labour, technology and townships. The mine found significant for was to be its historical, archaeological/technical and social contribution to Australia's regional and state history. The mine's relics show part of Australia's history and are considered to represent the region's identity. It was recommended the site be fenced and remain undisturbed.

An entire goldfield landscape was viewed by Alan Mayne (2001) for his book '*Hill End: Reading an historic Australian goldfields Landscape*'. Here, Mayne identifies that significant small and isolated rural communities (now with long occupancy in comparison to days past), have a history and culture that exists only because of their explicit association to colonial period gold mining activities – as is the case with Wattle Flat. As such, Mayne

argues that the entire town is an historical site of National heritage significance because the momentum of development, which is inseparable from the gold rush, is still continuing today (just at a different rate). Two areas are outlined where caution is required in studies associated with gold mining. One is the tendency for heritage studies to inflate the significance ratings of mining relics within the context of Australian gold mining. Secondly, caution should be taken not to emphasise gold mining at the expense of other important aspects of history.

In 2001, Cabonne Council undertook a heritage study at the site acknowledged as the first gold rush location in Australia, now called Ophir Reserve. The heritage study identified hundreds of items of historical interest, including mine tunnels, shafts and cuts, water races, and hut and tent sites. Council's aim was to conserve sites of mining activity from the 1850s onward for public interest, inspection and interpretation. No significance assessment was undertaken, but the project conserved and protected many items of historical interest and incorporated them in a two kilometre long sign-posted walking track, with maps and interpretive descriptions. The project has been very successful in providing historical insight and other points of interest to Ophir's visitors and has significantly increased tourism in the area.

M and J Tracey (2003) investigated the remains of a reef mining operation at Adelong Falls Gold Workings Reserve, for a Conservation Management Plan instigated by Tumut Shire Council. The principal components of the site are colonial period ruins associated with a Reefer Battery (a reef mining complex) and all of the associated structures. The remains were assessed as highly significant in representing mining activities on the Adelong Goldfields, a gold extraction landscape, and were acknowledged as an integral component in the establishment and ongoing development of the Adelong township.

Heritage Concepts Pty Ltd (2006) undertook a Conservation Management Plan for Junctions Reef Dam at Belubula River, Mandurama, NSW. The dam was purposely designed to supply water for mining operations at Junction Reef, which, starting in 1897 was part of the Lyndhurst goldfields. As the oldest representation of this type of dam in Australia, the dam complex was assessed as having high State Heritage significance. This significance rating was given, in part, due to the dam's role in the development and survival of an Australian town, and in recognition of the subsequent built industrial gold mining landscape.

In 2011, OzArk completed a Historical Heritage Assessment at Mount Boppy Gold Mine near Cobar, NSW. The assessment was undertaken to assess what damage more gold mining operations would cause, specifically the detrimental effects to built structures, relics, mine shafts, a blazed tree and a rubbish pile. Due to previous impacts from successive past mining activities, the site was considered a safety hazard with only a low level of local heritage significance. Recommendations included conducting a program of archaeological recording prior to further impact, and fencing and signage where no impacts were proposed.

These previous studies demonstrate that, unless dilapidated, the remains from colonial period gold mining activities generally hold a high level of historical significance and often on a State or National level. Themes surrounding the industry, the environment, labour use, technology and the development and survival of townships are important

factors. Also important are issues associated with social contribution, gold mining landscapes, and the development of public interest (tourism).

Archaeological Context and Research Questions

Archaeological Context

Researchers of Australian gold mining often record difficulties in accurately identifying and interpreting mining sites because the remains are scattered, looted, in poor condition or represented only by tailing mounds and mullock heaps (Lennon 1978: 126). However, over the past ten years, mining sites have been recognised as having a significant role in Australia's history and several Australian colonial period gold mining sites in NSW have been the subject of comprehensive archaeological investigation (as discussed above). The sites associated with Wattle Flat's colonial period mining are relevant to Australia's development, it's population, economy, settlement and early way of life in NSW. The mining sites at Wattle Flat are visually prominent and have not previously been recorded in detail. Therefore, a recorded knowledge of their components and workings will complement other similar Australian studies.

Research Questions

This section discusses the types of research questions that can be asked from the archaeological remains at Wattle Flat, depending on their physical condition.

There is now a reasonable amount of knowledge about colonial period mining sites and their associated infrastructure. Any questions asked of the material remains should firstly be broad in nature and attempt to ascertain the character of the site's features. Archaeological investigations should also reveal how an item or items assisted the site living or working function, examine if any specific user choices are noticeable, and determine whether there is scope for the item to be associated with other features. The overall aim is to ascertain what activities were undertaken at the site. To these aims, the questions asked of the archaeological remains at Wattle Flats mining areas are:

- 1. What artefact types survive at the sites?
- 2. How deep is a features foundation base?
- 3. What evidence is there to inform us of the purpose of the site?
- 4. Is there evidence for, and what is the nature of, settlement at the site?
- 5. Is there evidence for the transport of materials?
- 6. Is there evidence for better or worse quality workman-ship within the areas?
- 7. Is there evidence (documentary or other) for different social or economic status between sites?
- 8. Can the sites inform us further about gold mining in colonial Australia, the methods and the way people lived?
- 9. Can it be ascertained who or how many people were involved in different mining operations?

Research into Wattle Flat's history has provided some information on the nature of gold mining activities there, the miners' lives, and to a lesser degree information regarding communities there. As with all written documents, research needs to be questioned, and

if possible, tested in the field before it can add to our knowledge of the area, the gold mining industry, and the cultural, social and economic situation of the early settlers there. The following section assesses each of the four mining areas under examination at Wattle Flat, starting with Solitary Mine, then Big Oakey Mine, Little Oakey Mine and Queenslander Mine.

Archaeological Potential and Physical Assessment

This section of the Archaeological Management Plan discusses the Wattle Flat study area's potential to hold items of historical significance, based on an analysis of the documentary historical information discussed above and the field reconnaissance conducted on 6th and 10th of February 2017. Archaeological potential refers to a site's potential to comprise or contain archaeological buildings, works, relics, moveable objects or precincts which fall under the provisions of the Heritage Act 1977 (amended). The study area's archaeological potential has been identified through historical research and by considering the archaeological evidence at each site. The archaeological potential of the areas and items have been assessed using a rating of **low**, **moderate** or **high**.

The historical items range in condition from good to poor, but are still noteworthy representations of these types of historical feature in the NSW rural landscape. The remains are considered to span the entire archaeological potential spectrum, from low to high, depending on the actual relic.

It's already been discussed that gold mining at Wattle flat began in 1851, consisting of small scale alluvial mining – with good results – in the rich gold bearing soils around waterways. During this early period, there were no leases or official claims taken out and miners worked wherever they could secure a suitable vacant location. Evidence for these early activities must necessarily rely on archaeological data only, as no other records exist. The Department of Mines records are obtainable from 1875; other information has been obtained from a compilation of various sources including newspaper reports and official statistics relating to gold production for the region.

Available information suggests the study area's potential to reveal archaeological material is high due mainly to the quantity of mining activity, the long times-pan of mining at Wattle Flat and the type of mining conducted there (alluvial, but also reef mining that required infrastructure).

Historical gold mining landscapes – such as at Wattle Flat – comprise natural and cultural features, and include structural elements. Rivers, creeks, springs and built dams supplied water for alluvial workings, for cradling and puddling and to turn water wheels. Likewise, water was essential for reef mining operations to run boilers for steam, the stamper batteries and to wash the crushed material. Often reservoirs, dams and water races were constructed to artificially create a water supply. Therefore, from the historical information, likely items to be located within the study areas are mine shafts, air shafts, mine pits, open cut mines, mined landscape, tailing piles/mullock heaps, cradle remains, boiler equipment, stamping machines/batteries/crusher, water wheel, winch equipment, tent sites, hut sites, store houses, black smith/supply huts, areas of underground potential, grave sites, water races, water dams, and tram way lines. Additional, unanticipated items may also be located and will be described and assessed (in association with their locations) as they arise. The assessment of gold extraction methods and the associated infrastructure, together with settlement/hut

locations and the historical mining landscapes, will be assessed, where possible, as a complete working operation.

Site investigation methodology

A visual assessment of each study area allotment was undertaken to record the archaeological relics there and to determine whether deposits are likely to survive underground, and if so, assess their potential level of intactness.

Site integrity was recorded using a standard table for measuring the level of site disturbance at each investigated location (Table 1).

Description
No signs of disturbance
Small scale ground excavation has occurred, but the relic or site remains
intact
Visible sections of the relic or site have been destroyed or are missing
Ground layers have been heavily excavated, only a small portion of the relic
or site remains for investigation
Major site disturbance has occurred including total relic or site removal
Historical and later period events are suspected at the site

Table 1 Detailing levels of integrity.

This assessment involved a pedestrian-based site investigation. Background research, known European history, existing conditions within the study area and consultation with local land owners and Bathurst Regional Council, suggested the field inspection should encompass a detailed on-foot visual examination. The field-based site assessment was undertaken from 7 to 10 February 2017 by Alister Bowen and Zvonka Stanin (BHM Archaeologists), Ashlee Cutter (Bathurst Regional Council employee), and Chris Green (Wattle Flat Resident).

The field survey aimed to inspect all visible evidence and known locations of gold mining activities, including resultant landscapes within the four identified study areas. The field methodology involved mapping, photographing and measuring the exposed relics and recording site components and other infrastructure as much as practicable.

Weather over the four days of field inspection was sunny, with a near cloudless sky and light winds predominantly from the north-west. Weather conditions did not hamper the site inspections in any way.

An assessment of the historical knowledge for each study area (*Figure 15*) will assist in locating and identifying archaeological remains. The regional background described above is the same for each of the four study areas. Therefore, their specific local histories will begin with the first documented knowledge of each actual areas and its name, followed by the results of the field assessment.


Figure 15 The study areas (outlined in red) relative to Wattle Flat (Wattle Flat 8831-4-S; and Sofala 8831-4-N: 25,000 topographic map, third edition 2012).

Potential for Solitary Reef

Solitary Gold Mine (Lot 7001 DP 1117443) is listed as number 1080664 on the State Heritage Inventory and shown on an 1865 Parish Map as a Gold Field Reserve, Lot Number 34 (*Figure 16 and 17*). It was one of the earliest and largest mines in the Wattle Flat region and close to the township. Significant quartz reef mining operations probably began in the early 1850s. Much information about Solitary Mine has been generously provided by Chris Green, resident of Wattle Flat (2017). The mine's general location, at one time, incorporated Wattle Flat's first Post Office – the home of G. Morehouse. Nearby there were two public houses (hotels) and several stores (*Figure 18*). The Post Office is documented in the Government Gazette, which advertises on April 5th, 1861the opening of the Post Office, and advises residents to have their letters and newspaper sent there. A later Government Gazette, of 7th of February 1867, names Morehouse as the Wattle Flat Postmaster. W. Thomas is named as a Licence for the

'Cricketers Arms' at Wattle Flat (May 1866). The Post Office would have acted as a nucleus for the town, which was conveniently located next to Solitary Mine. In later years (presumably the later 1800s) a main store opened approximately 1.5km north of Solitary Mine, becoming a new nucleus.



Figure 16 Showing the location of Solitary Reef as Lot number 34 on an 1865 Parish Map.

Gipps and Campbell (1875:14) suggest that Solitary Reef began reef mining operations in about 1861, through various miners who took up block claims. However, in time, as the difficulty of working the quartz veins increased with depth, and as the expenses of crushing and carting increased, the several claims were merged and became the property of one company, whose name isn't given, but was probably Campbell's and party.

The Solitary Mine infrastructure included a specific gold processing area incorporating a machinery shed and a large dam as a reliable water source (*Figure 19*). The mine site housed one of the early stamping batteries in Wattle Flat and all quartz mines in close vicinity would have necessarily taken their quartz there to be crushed. In later years, modern gold extraction technologies (presumably the use of chemical extraction methods) were brought to the site in an attempt to more efficiently extract gold from quartz. By 1900, mining operations were still underway, but at a reduced level.



Figure 17 The study area for Solitary Reef (green stars represent reef mining activities and blue circles alluvial mining activity).

At its peak period, Solitary Mine averaged a yield of 10 oz of gold per one ton of crushed quartz (Bathurst Historical Society notes). In 1902, Mr Warden Sharpe (the Inspector of Mines) wrote "*At the Roxburgh Company's mine (the old Solitary) 196 tons were treated for a yield of 17 oz* [approximately 0.5 oz per ton] *valued at £662*" (actual yields were often under estimated to avoid taxes) (Cited in Gipps and Campbell 1873:13). However, new gold-rich quartz veins were being constantly found and the last recorded quartz crushing at Solitary Mine yielded 6 oz of gold to one tone of crushed quartz (Bathurst Historical Society notes). A rare photograph exists showing the main Solitary Mine shaft and six of the men who worked the mine in 1890 (*Figure 20*).



Figure 18 An 1860 survey plan of the Solitary Mine area showing established features of the times (Source C. Green collection 2016).



Figure 19 An 1890 survey plan of the Solitary Mine area showing a built dam and machinery shed (Source C. Green collection 2016).



Figure 20 Mine workers at Solitary Mine in approximately 1890 – the supplies store can be seen in the background (Source C. Green collection 2016).

An article in the Bathurst Free Press and Mining Journal on 20th of March 1860 gives information on the quartz crushing engine at Solitary Creek:

"Quartz Crushing Engine. The erection of this Engine being now complete, the undersigned [J. Tomkins] is prepared to treat with miners for the crushing of their quartz. The charge for crushing will not in any way exceed 30s. per ton,...".

Since the site's total abandonment, sometime during the early to mid-1900s, most of the evidence for mining activities has either been covered over, removed for recycling or taken as scrap materials. The archaeological remains left for interpretation – as with each of the study areas – consists of remnant gold mining remains such as mine shafts, air shafts, mine pits, open cut, mined landscapes, tailing piles/mullock heaps, boiler equipment, stamping machines/batteries/crusher, water wheels, winch equipment, hut sites, store houses, areas of underground potential, water races, water dam, and tram way lines.

Field Assessment

During the field assessment for the Solitary Mine area, archaeological features were mapped and their locations recorded using 55H, GDA 94, GPS Coordinates. These are shown in *Figure 21* and will be discussed below. The working area of the mine has seen recent interpretive improvements, including the building of a walking track, metal mesh protection to cover the main shaft (closest to Sofala Road), an ornamental lifting device (a derrick), and the construction of a large dam. To save repetition, not all mullock piles will be shown in the Figures. The main area for mining activities at Solitary Mine has been heavily disturbed due to past land use practices. SOM stands for Solitary Mine.



Figure 21 Study area and mapped features of Solitary Reef.

SOM 1. This is disturbed ground through a quartz reef working area within the SHI registered site area (SHI Number 1080664). The location comprises minor reef workings and a large shaft - which is protected by wire mesh - and smaller vertical shafts. GPS coordinates are 750834 6328310.

SOM2. This is an open disturbed space within the site interpretation area. It most probably represents part of the original dam overflow and is approximately 20m x 1.5m in size. The ground opening divides two minor reef workings areas, has placed rock sides and does not show any signs of ever having been mined (*Figure 22*). GPS coordinates are 750831 6328290 to 750823 6328311.





SOM3. The recently installed ornamental lifting device (a derrick) over the original Solitary Mine shaft, near Sofala Road. This mine shaft, its associated infrastructure and the men who worked it can be seen in *Figure 20* above. In recent times, the shaft has been used as a water reservoir for the local fire brigade (C Green Pers. Comm.). The winch pulley and derrick over the mine shaft are sturdy reconstructions and should be left in place. The mine shaft is covered by a strong, modern metal mesh grate and is safe to inspect on foot (*Figure 23*). GPS coordinates are 750863 6328303.



Figure 23 Recently installed ornamental lifting device (a derrick), facing east.

SOM4. Shallow shaft on the northern side of some reef workings, the area is mostly grassed over reducing visibility. There is a mullock pile on the uphill side. The area is open space and largely protected from foot traffic due to a new pathway installation (*Figure 24*). GPS coordinates are 750857 6328325.



Figure 24 Showing a shallow mining shaft with mullock pile, facing south-west.

SOM5. A small section of reef workings within the area of a new pedestrian pathway. The area is grassed and not subject to damage through foot traffic (*Figure 25*). GPS coordinates are 750860 6328333.



Figure 25 Showing a small section of reef workings, facing north.

SOM6. This area is a small mine shaft with associated reef workings. The area is partially grassed over and is not in danger of disturbance or subject to foot traffic due to the newly established pathway installation. GPS coordinates are 750845–6328322.

SOM7. Represented by a section of dry-stone wall that was possibly part of the original dam wall. The feature is an incomplete remnant of mining activities that has been damaged through past earthworks at the site (probably as part of mining). Further

damage to this feature will be lessened due to a new pathway (*Figure 26*). GPS coordinates are 750813 6328302.



Figure 26 Showing by a section of dry-stone wall that was possibly part of the original dam wall, facing south-west.

SOM8. This feature is a small dug out area (approx 4 m radius), possibly representing a small quarry. It is situated on the western side of the main quartz reef, near the newly established derrick. The feature may represent an area of alluvial mining, mining exploration or later disturbance to the site (*Figure 27*). GPS coordinates are 750793 6328275.



Figure 27 Showing a small dug out area, purpose unclear, south-east.

SOM9. This feature is probably a base frame for the original 1860s crushing battery. It comprises a low level square timber-log frame that is consistent with the crushing battery base frames observed at the Little Oakey and Big Oakey sites. All the timbers are u-milled logs with cut notches to house other timbers. The frame has been fastened together by large square-head iron screws with a threaded end that are still visible (*Figure 28*). Contributing evidence for the purpose of this feature is that the soils in this location consist of relatively fine grained sandy deposits, consistent with waste material from a crusher and washer. In addition, a water race is visible that channels water from

the south-west, directly past this location. There is a moderate level of ground disturbance in the area. Timber laid down in the 1860s is unlikely to survive the open elements. Therefore, these timbers probably represent replacements of the original frame. A stamping battery that was once positioned at Solitary Mine is now at the Gold Museum in Bathurst (Chris Green pers. comm.). This feature may represent the base of that stamping battery. GPS coordinates are 750772 6328262.



Figure 28 Showing what is probably a base for a 1860s stamping battery, facing south east (left) and facing west (right).

SOM10. A retaining wall (local stone, some shaped) positioned immediately north of feature SOM9; believed to be for the purpose of creating a raised flat area (*Figure 29*). There is a weak lime-based mortar visible within the wall joints. The wall has four cylindrical threaded iron rods (fasteners) protruding from it that are similar to those displayed in the crusher location timbers (SMO9). It is directly in line with the possible stamper base, extending 1.5 metres northward. Its purpose is unknown, but it may have been the base of a water tank used to supply the crusher or it may be the base of the stamper engine mentioned in the Bathurst Free Press and Mining Journal on 20th of March 1860 (mentioned above on page 40). The wall is in a dilapidated state and there is a moderate level of ground disturbance. GPS coordinates are 750787 6328261.



Figure 29 From left to right, front of the wall, a close up, and threaded metal rods.

SOM11. An open quartz mine shaft, in association with the remains of a winch tower once positioned over the shaft. The remaining frame components - situated around the mine shaft – consist of three reused sections of train track, concreted (using a rock and cement mortar) and protruding at angles (leaning inwards) into the ground (*Figure 30*). The protruding rails have been cut off approximately one metre from ground level and the top section of the frame has been removed (probably reused somewhere or sold for scrap metal). The concreted rails are close to, and probably associated with, the south end of the stamper base described for SOM9. The remaining frame sections represent a structure once built over the mine shaft that would have incorporated a frame and pulley system for pulling buckets of rock from the shaft. The rock would then be transported to the nearby stamper battery for crushing. GPS coordinates are 750793 6328252.



Figure 30 Part of the rail tracks just visible through the long grass, facing south-west.

SOM12. This feature represents a purposely dug water race, constructed across sloping ground leading from the south-east of the main mining area. The race is a steep sided dished channel and is approximately 800mm wide and 400mm deep (*Figure 31*). The inclining race fall is gentle at generally less than 10°. As the race traverses across the landscape, it enters a heavily eroded natural drainage line (approximately 350m south of the stamper) then continues directly past the stamping battery location described in SOM9. Where the water race meets the natural drainage line, there is a fork in the race that has deteriorated through erosion over time to disguise its correct direction. However, the fork may indicate that there was once more than one water race in use for the main Solitary Mine workings. GPS coordinates are 750163 6327970 to 750327 6328015.



Figure 31 Showing the water race traversing south east towards the Solitary Mine stamper battery, facing east.

SOM13. This feature consists of two quartz mining shafts dug into the side of a heavily incised and eroded creek line/gully (*Figure 32*). The gully's vertical sides have almost certainly been hydraulically mined (sluiced) for gold. The immediate surrounding area has several shallow alluvial workings, which include holes and mullock piles. The eastern-most shaft is open to the creek line and is approximately 1m in diameter, extending inwards for an unknown distance. The other shaft extends more vertically with an approximate 1.5m diameter entrance. GPS coordinates are 750562–6327996.



Figure 32 Showing the horizontal shaft, facing south (left), and the vertical shaft location, facing west (right).

SOM14. A large (approximately 5m x 7m) open cut section in a creek line that most probably represents hydraulic mining (sluicing) activities. The enlarged section of creek line – with opposing vertical banks - is only 10m north-west of feature SOM13. Where sluicing has occurred, the creek line is billowed out to form a large oval shape with vertical sides (*Figure 33*). GPS coordinates are 750560–6328009.



Figure 33 Showing the vertical section of creek line most probably created by hydraulic sluicing activities, facing north east.

SOM15. This feature is represented by a fenced off mine shaft and associated mullock heap. There is an older, 1.2m high, fence close around the mine shaft and then a newer, larger 2m fence encompassing the 1.2m fence and the shaft (*Figure 34*). Both fences would have been put in place in modern times for safety purposes and hampered a close inspection of the mine shaft. Immediately north of the shaft is a dug out area. The ground is sandy material consistent with the waste product from a stamping battery and dirt washing machine. It is hypothesised that a stamping machine associated with the mine shaft once stood in this location. The visible dug out section is probably due to someone digging out the sandy waste material from the rock crushing and washing operation, for modern-day building projects within the area. Approximately 80m southwest, there is a man-made dam (on private property) of unknown age, but it may have been used to supply the stamping battery with water. GPS coordinates are 750385 6327867.



Figure 34 Fenced mine shaft (left) and fenced mine shaft and dug out sandy area for crushing rock (right), facing north-east.

SOM16. This is a large quartz mining shaft with an associated mullock heap positioned above a track that leads down to the Solitary Mine stamping battery. It is positioned

mid-slope and is covered by modern iron meshed frame, on a concrete base, that is approximately 4m x 4m (*Figure 35*). GPS coordinates are 750406 6328128.



Figure 35 Covered quartz mining shaft with part of the associated mullock heap in the background, facing north.

SOM17. This is a good example of small alluvial workings (*Figure 36*). The miners may have been washing the removed soils or searching for quartz veins or both. These types of diggings appear randomly in the Solitary Mine area, particularly on the hill to the west side of the main shaft (see *Figure 19* above). GPS coordinates are 750396–6328136 to 750493–6328268.



Figure 36 Shallow alluvial workings or searching for quartz veins or both, facing north east.

SOM18. At this location there is a medium sized alluvial working in rocky ground (*Figure 37*). The workings are approximately 500mm deep and with a 3m x 12m outer perimeter. Some of the upper slope diggings stop at a row of natural boulders. The miners may have been searching for quartz veins or simply conducting alluvial mining. GPS coordinates are 750493 6328268.



Figure 37 Showing the medium sized alluvial workings in rocky ground, facing southwest.

There are definite signs of past mining activities at the Solitary Mine area. However, no items were located that could be used to obtain accurate occupation dates. The stamping battery frame and the nearby stone wall (SOM 9 and SOM10) probably represent the oldest features on the site. An interested local Trust - the Wattle Flat Heritage Lands Trust - has constructed a walking trail around some of the items of interest at the Solitary Mine working area, adjacent to the main road – Sofala Road – through Wattle Flat. The project seeks to make the site accessible for a range of passive recreational activities, and to provide quality information on the mining site and surrounding area. Interestingly, the trail passes a point where people can look over Sofala Road to the still standing original Wattle Flat general store, Irelands store (*Figure 38*). The group's work is commendable and should be encouraged. If further work is to be undertaken at Solitary Mine, features SOM 9 and SOM10 could have their immediate surrounds cleared of vegetation to expose the historical features and a roofed structure built over them to give protection from the elements, inhibiting further deterioration. The known history of these two items and any interpretive signage would benefit from a focused research project designed to ascertain more detail on these two features. The area is easy to access, and has some interesting and visible mining features. More extensive walking trails with interpretive signage would complement the work already undertaken by the Wattle Flat Heritage Lands Trust.



Figure 38 Showing Wattle Flats' original general store, 'Irelands store', facing northeast.

Potential for Big Oakey/Surface Hill Mine

Big Oakey Mine (Lot 7015 DP 1060511) is shown on an 1886 Parish Map as a Gold Field Reserve with various Lot Numbers (*Figure 39 and 40*). This mining site (*Figure 41*) was briefly recorded for the Evans Shire Heritage Study in 1985 and also during Higginbotham's 2012 (Volume 2) regional Archaeological Management Plan for Bathurst Shire.

In one reference to the area, Hugh Bridson, the Mining Register officer suggests in 1873 that at Wattle Flat's Surface Hill "Work has been steadily carried on during the year. The tunnel driven to the north has been extended to a distance of 426 feet. Owing to the hardness of the rock and small size of veins it was not deemed advisable to work deeper at present".



Figure 39 Showing the 1886 Parish Plan of the Big Oakey Mine area.

Long before Birdosn's report, alluvial gold mining was had been underway here. According to Gipps and Campbell (1875: 4), the name 'Surface Hill' refers to the rich alluvial gold found scattered around the surface of the hill. The alluvial mining activity is evident from the numerous shallow quartz workings in the area (*Figure 41*). When alluvial gold became scarce, individual miners turned their attention to quartz veins lying within the hill. In 1872, the Sydney Mail and New South Wales Advertiser (24 February P232) wrote that a party of five (C. Campbell, Hugh M'Eee, Dennis Williams, W. Smith and B. Clark) struck a rich vein near Gard's public house at the back of Oakey Creek Mine, which caused another 'rush'. Then, in 1874, the entire hill and much of the surrounding country was leased by the mining companies 'Moyles and party' and 'Princess Beatrice G. M. Co' (Gipps and Campbell 1875).



Figure 40 Showing historical area of Big Oakey Mine Lease, approximately 1880s (Chris Green document).

According to Hilyard (1980:2), the Big Oakey Gold Mining Company commenced operations at Surface Hill in February 1887, with six employed men and capital of £2,000. This is backed up by a Department of Mines document (MR0604), which states that in 1887 the Big Oakey Gold Mining Company, of which Mr. Morgan was the largest shareholder, took over all leases at Surface Hill. By 1889, he had there "18 men, a 10 h.p. crushing battery, a concentrator and winding plant".

Drought hit and in 1892 "the Oakey Creek tributors at Wattle Flat had to stop crushing through want of water" (Sydney Morning Herald 14 March 1892 P.7), but the drought had broken by October and operations began again. On 14 of March 1893, the National Advocate reported that at "a crushing of 85 tons of quartz from the Oakey Creek Mine resulted in the handsome yield of 284oz. of gold."

Intermittent drought didn't stop interest in the mine, as seen by Minni and party taking a mining lease at the Big Oakey Mine. The Bathurst Free Press and Mining Journal (26 March 1895) reported "An important discovery had been made in the Big Oakey mine by Minni and party, who have struck a splendid body of stone 4ft in thickness, showing gold".

In 1900, Mr Warden Sharpe of Hill End visited Wattle Flat and noted "Mining at the Big Oakey Consolidated operations have been confined to the upper levels, and all the ore raised during the period under review has been won from a new gold chute parallel to which produced in sinking 200 feet, nearly £14, 0000 worth of gold" (Cited in Miller 1962:34).

In the same year, Mr Warden Sharpe wrote "*Messrs*. *Crawford and Brothers had their 10 head battery at work crushing quartz and formation from their mine – the Caledonian, at Surface Hill*" (Cited in Miller 1962:13).

In 1902, Mr Warden Sharpe wrote "Reilly and party have raised a considerable quantity of stone from a promising reef a Surface Hill. They had just started at the close of the year to put through a crushing at their battery at Middle Creek" (Cited in Miller 1962:13).

Again in 1902, Mr Warden Sharpe wrote "*At the Big Oakey mine, Ewing and Myring crushed 241 tons of stone for a return of 1550z, valued at £557*" (Cited in Miller 1962:27).



Figure 41 The study area Big Oakey Mine.

A lease document (Number mr0604), written by Mr Jones on 6 September 1937, details that Lionel William Ryan, Jr., took out a lease on Big Oakey mine. Mr Ryan, Jr. was already working a 100 foot long tunnel somewhere at Big Oakey and was in the process of erecting a ten head battery, thereby showing a long standing commitment to mining at Big Oakey.

Higginbotham (2012), examined the Big Oakey Mine area. He noted the site's access was by a steep dirt road that descended to a large adit (a vertical tunnel dug into the side of a hill) and a stamper battery. Associated with the site, Higginbotham noted many existing working components and for a broad scale, regional project, he recorded them in some detail.

To appreciate the site layout, a map is provided below (*Figure 42*).

A 1913 document (Mines Department record number: m0604) for the sale of company shares in the Big Oakey Mine gives a good indication of the mine's working components. The document states that Big Oakey Limited has £40,000 shares in Big Oakey mine, to be sold at £1 each. Fortuitously, the mine's components are given as: "property and plant consisting of an area of about 24 acres, held from the Crown under four leases, an 8 h.p. boiler and winch for haulage purposes, a 10 head battery, 20 h.p. Boiler and engine, cyanide plants, blacksmith's shop and equipment, together with a complement of mining tools. There is also a concrete dam for the storage of water. It should be stated that the battery and dam are situate on a machinery site and water site, respectively, independent of the area held under Mineral Lease".

After this date, an occasional mining party still battled on with the Big Oakey Mine. In 1934, File number (M.0604) of the Mines Department records that "*J.F. Reilly and Party obtained 9.5 oz. from 50 tons of stone*". In 1947, the Big Oakey Gold Mine Syndicate was still crushing payable quartz. In 1952, the inspector of Mines, Mr O'Brien reported that

"no work has been done at the mine for some time". He indicated the remaining plant consisted of "an ore chute to a Dodge 10" x 6" jaw crusher feeding a Russell & Co. 15 stamp battery, 800lbs stamps...driven by a Ruston Linclon 3 VXA class 5 cylinder diesel." No further work at the mine is recorded.



Figure 42 Study area and mapped features for Big Oakey/Solitary Mine site.

As with the Solitary mine area, all of the evidence for mining activities represents reef mining – besides the turned mined landscape – and much of the infrastructure is missing.

Field Assessment

During the field assessment for the Big Oakey Mine area, several archaeological features were mapped and their locations recorded using GPS coordinates. These are shown in *Figure 42* above. The mine's position is in a steep sided valley with best access by foot or four-wheel drive vehicle. BOM stands for Big Oakey Mine. A grid coordinate for each feature is at the end of each item description. All grid references are given using 55H, GDA 94, GPS coordinates.

BOM1.1. This is a mullock heap of large uncrushed stone approximately 20m below the areas main adit (*Figure 43*). A tramline goes from the adit to the stamping battery area. Any excavated materials not suitable for crushing would have been unloaded down the steep decline to form this mullock heap. The site is open, intact and *in situ*. A dirt road ascends steeply and generally northward to the top of the hill, via a dog-leg. GPS coordinates are 752393 6331529.



Figure 43 Showing mullock pile in front of a large adit, facing south-east.

BOM 1.2. An adit with open entrance and interior. The entrance is approximately 1.5m x 2m. The soil around the entrance has collapsed and the shaft is dangerous due to the risk of further collapse (*Figure 44*). Some of the collapsed material has already been cleared from the entrance. To the front of the adit is a large dug out flat platform partly formed by mullock and possibly the location of a former stamping battery plant, although no evidence exists for this. Inside the adit, there is reportedly an intact engine capable of running a stamper (C. Green pers. comm). However, further inspection was considered too dangerous and the engine was not inspected.

There are placed timbers, evenly spaced in the ground near the entrance to the adit that probably once formed the base of the tramline (they are now severely dilapidated).

Timber shoring (logs) and some milled slats could be seen inside. GPS coordinates are 752378 6331541.



Figure 44 From left, the adit entrance; shaft and abandoned rail track; looking out from the shaft.

BOM2. In this location, a purposely flattened section of ground, approximately 1m wide (now washed over with dirt), curve across the contours of this hilly landscape in a southerly direction. This flattened area represents the remains of a small tramway that once ran approximately 200m down to the chute and stamper site. The round support logs, with cut ends, are still in place and spaced evenly along the flattened area that once held the metal rails (*Figure 45*). The tramway extends from the upper adit and quartz workings, to a chute that leads directly to the stamping battery complex. The line is associated with a dry stone retainer wall at the far southern end. There are no metal rails visible along the track. The rails, consisting of good quality iron, most probably were reused elsewhere or sold for scrap. GPS coordinates are 752365 6331478 to 752379 6331523.



Figure 45 Showing cut into hillside and the tramway support timbers, facing west.

BOM3. A stockpile of mullock material, comprising a range of rock sizes (*Figure 46*). The pile is either total waste material discarded in this location or rock ready to be transported via the tramway to the stamping battery below. The mullock pile is approximately 30m x 40m, some of the piled rock includes large chunks with pieces of quartz attached, while others are piles of smaller rock material. GPS coordinates are 752365 6331425.



Figure 46 Discarded crushed rock, photographed form the tramway facing north.

BOM5. This feature is a metal bucket/bin and is possibly one of the tram buckets (*Figure 47*). It comprises a rounded base and reinforced strapping is riveted to both sides and to the bucket base. It is associated through location with a collapsed timber structure. GPS coordinates are 752427 6331402.



Figure 47 A metal bucket or bin that is possibly part of a tram bucket, facing west.

BOM6. Remnants of a metal and timber chute, approximately 50m long, once raised on timber framing, descending from the tramway end point to the stamper battery (*Figure 48*). The complex has been constructed from a combination of timber cut from the bush with some milled timber slats, held by bolts and round shaft metal nails. The feature is dilapidated and most of the bolts and nails have fallen out leaving the metal base lying on the ground. The metal chute is in good condition, collapsed and not intact, but is

lying in its original alignment. GPS coordinates for this location are 752419 6331391 to 752395 6331405.



Figure 48 The chute remnants from left, top of chute; down the runway; bottom section ending at the stamping battery.

BOM7. An abandoned camshaft designed to run a five-head stamper battery (*Figure 49*). The camshaft is approximately 4 m long, has a 50mm radius shaft and is fitted on one end with a wheel designed to take a belt drive. The system is similar to that employed in the standing stamping battery seen in the machinery complex below in BOM15. There are no visible manufacture markings and the item is not *in situ*. GPS coordinates for are 752456 63310418.



Figure 49 An abandoned five-point stamper battery camshaft, facing north-west.

BOM8. Just to the east of the abandoned camshaft is a milled timber and log (round) frame shed. The outer is made of corrugated iron sheeting, approximately 4×5 metres in size (*Figure 50*). It is built on a dug out flat area with a dry-stone retainer wall on the lower side. The interior has an earth floor and the fastenings holding the structure together are mostly round Wire Rhomboid nails that allow some indication of the construction period. The door remnants are iron and there is an interior fireplace, made partly of hand-made, unmarked bricks and some iron sheeting.

There are two problems in accurately dating nails recovered from historical sites in Australia. First, although a manufacture date can be roughly established from physical features, builders often held an initial prejudice against new nail types. This has created a time gap from when historical records demonstrate a nail was available in Australia, to when it was actually used in Australian structures. Second, due to the high price and scarcity of nails, builders often took nails from abandoned structures to re-use, creating a confusing chronological marker (Varman 1993: 182). Nonetheless, nails have proved to be one of the most common artefacts recovered from historical sites in Australia and are an important means of gathering historical archaeological information to help date sites (Michael 1974: 99; Middleton 2005: 55, 61). Wire Romboid nails were the dominant nail used in Australia between 1890 and 1930, thereby giving an indication of the shed's construction period (Varman 1980: 108). GPS coordinates are 752476 6331379.



Figure 50 From left the iron shed; an associated Wire Rhomboid nail; an internal photo of the shed and chimney.

BOM9. Slightly north of the corrugated iron shed (BOM8), a ship tank was located (*Figure 51*). Ship tanks dot the Australian landscape. These cubic, mild steel containers have their origin as shipping contains for water and perishable goods. Invented in 1808 as air tight containers that challenged the conventional wooden barrel, ship tanks where used prolifically in the sea transport industry. Quite often left on wharves and seaside dockings, the scarcity of materials in Australia meant that ship tanks quickly made way inland for a myriad of uses from water storage tanks, to reinforcing at the top of mine shafts, to cooking hearths and dog kennels (Pearson 1992:25). The ship tank's purpose at this site is unclear, although its location suggests it may have been used as a domestic water tank for the corrugated iron hut. The tank is an unmodified, standard four foot, riveted iron tank with a circular opening. It has a damaged side from a falling rock. GPS coordinates are 752473 6331390.



Figure 51 A ships tank, facing east.

BOM10. Immediately down the slope from the corrugated iron shed and the ship tank is a levelled-out section of ground that forms a platform, probably representing another domestic area or the site of a storage shed (*Figure 52*). There are remnants of building materials on the platform including iron sheeting and some brick pieces, and some corrugated iron sheeting down the hill. GPS coordinates are 752479 6331399.



Figure 52 Levelled dirt platform probably for a domestic area or storage shed, facing south.

BOM11. A large and robust, open concrete tank (probably for water storage), with 500mm thick sides, exists in this location (*Figure 53*). Similar tanks have been noted elsewhere with mining operations – such as at the Queenslander Mine. The tank extends approximately $7m \times 4m \times 4m$ along the southern side of a gully line. The tank has been constructed using corrugated iron formwork, as visible through rib marks in the concrete sides and base. Its location, just east of the main battery complex, suggests an association. The tank was probably used to store water for the stamping battery and steam engine. GPS coordinates are 752473 6331412.



Figure 53 Concrete tank, probably for water storage, facing north east.

BOM12. A large, milled, square timber log, 4m by 300mm, now rotting away, was located lying discarded above the water tank (BOM11) (*Figure 54*). The timber piece has strategically drilled holes throughout and notches cut to house associated fittings, possibly part of the supports for the stamper battery or other machinery. As it is laying haphazardly on the ground it is not likely to be *in situ*. GPS coordinates are 752466 6331415.



Figure 54 Showing the milled square timber log, facing south west.

BOM13. An iron gear wheel probably from the stamper battery has been left abandoned just south of the stamper complex. It is approximately 1.2m in diameter, has a cogged exterior radius and central shaft (*Figure 55*). GPS coordinates are 752460 6331412.



Figure 55 The iron cogged wheel, facing south.

BOM14. Two corrugated iron water tanks are sitting discarded on the east side of the battery complex. Both are approximately 2m in diameter with no lid sections, and both are damaged. One of the tanks has a large iron scoop bucket discarded inside (*Figure 56*), possibly used for loading rock into the crusher. GPS coordinates are 752468 6331426.



Figure 56 The discarded tanks (left), and the scoop bucket (right), facing north west.

BOM15. A rectangle-shaped area approximately 10m x 6m, at the base of the rock chute, cut level into the hill that faces the gully, houses what is left of the battery complex (*Figure 57*). The area comprises a range of dilapidated features including parts of a fifteen head stamper; parts of the original 'Ruston' engine; a large fly wheel; stamper stands and large timber framing, a 2m radius water wheel; a pump and water tanks; the remains of another ship tank; and the exit point for the rock chute to name just a few items. The layout can be seen in *Figure 58*. The area includes a concrete platform with drainage into the gully.



Figure 57 Looking east down onto the main stamper battery complex.

The company that built the 'Ruston' engine shown in *Figure 59* was originally called Proctor and Burton, established in 1840 and operating in Sydney as millwrights and engineers. They became Ruston, Proctor and Company in 1857 when Joseph Ruston joined them. In 1894, the company made their first oil run engine. By 1899, Ruston had acquired limited liability status and started putting just his name on the engines, thereby giving a date for the engine remains at BOM15 of no earlier than 1899. Commercial diesel engines weren't available until 1899, so the engine probably represents one of those early diesel engines (http://www.lincolndiesels.com/engines/ruston).



Figure 58 The layout for what is left of the battery complex.



Figure 59 Looking east at the 3 three cylinder diesel or oil powered 'Ruston' engine, which ran the belt that ran the stamper (left). A small petrol engine probably ran a water pump and dates to after the 1930s (right).

Parts of the stamping machine were labelled PN Russell & Co 1871 (*Figure 60*). The company established a large foundry and engineering works at Darling Harbour in Sydney in 1859. They became one of the largest engineering works in the country, manufacturing rail cars, rolling stock carriages, bridges, stamping batteries, steam engines, dredges and iron work for ornamental architecture. The company had standardised designs drawn for steam engines and most of the other equipment they built. The foundry closed abruptly in mid-1875 due to industrial disputes (http://www. PN Russell Co Engineering Works 1859 to 1875.pdf).

Almost certainly, the Ruston engine and the Russell & Co. Stamping battery are the same ones mentioned when the Mines Department inspected Big Oakey Mine (then leased by the Big Oakey Gold Mine Syndicate) in 1952. The inspector, Mr. O'Brien, reported that the remaining plant consists of "an ore chute to a Dodge 10" x 6" jaw crusher feeding a Russell & Co. 15 stamp battery, 800lbs stamps...driven by a Ruston Linclon 3 VXA class 5 cylinder diesel" (Mines Department record MR0604).

GPS coordinates are 752455 6331422 (south west corner) to 752457 6331429.



Figure 60 The flywheel that would have driven the stamper battery belt (left); part of the stamper body and base (labelled PN Russell & Co 187 (middle); and the camshaft for running a fifteen head stamper battery.

BOM16. Situated immediately north of the battery complex, this feature is most probably the location for the small water pump that ran water to the stamper battery. There exists here two concrete lined corrugated iron tanks and one collapsed ship tank (not *in situ* and to the east) (*Figure 61*). The pump location (or foundation) is surrounded by unmarked handmade bricks, with cement mortar. GPS coordinates are 752460 6331444.



Figure 61 Probable location of small water pump associated with the stamper battery.

BOM17. A loose gear wheel from the stamper battery. Removed and laying in the creek bed (approximately 400mm radius) (*Figure 62*). Some damage and evidence of use-wear. GPS coordinates are 752486 6331455.



Figure 62 Showing loose gear wheel from the stamper battery, facing north-west.

BOM18. This is a concrete dam wall stretching fully across Big Oakey Creek at the south side of the mine complex (*Figure 63*). The dam wall is approximately 17m long and 1.5m thick. There is a large circular (approximately 400mm diameter) extending out of the lower central section of the wall and a smaller pipe (approximately 100mm diameter) next to it. The dam is completely silted up and no longer holds water. The dam would have been built for water storage to be used in the mining operations. It is mentioned in the 1913 sales document for the mine (mentioned above), and so must be older than that (Mines Department record number: m0604), and probably represents one of the older dam sites for the region. GPS coordinates are 752507 6331405 centre position.



Figure 63 Showing the dam wall with lower pipe (left), and looking across the top of the dam wall (right), looking south and east in turn.

BOM19. A stamping battery location, including a relatively intact boiler and associated remnants (*Figure 64*). The boiler's front is embossed with PN Russell & Co 1865, thereby giving a manufacture date for the boiler, but not an accurate usage period (PN Russell & Co has already been discussed above). The boiler faces Big Oakey Creek and is located on a brick stand constructed with reasonable quality hand-made bricks. *In situ* logs are visible 3m north of the boiler, likely to be stamper battery supports, although the stamper is missing. A base plate, probably for an engine stand, is located next to the boiler, providing further evidence of stamping battery activities. A dry-stone retaining wall divides the battery complex from the gully below and helps form the levelled area.

Below this wall exits two separate areas of different sand deposit, one course and one very fine. This is where the gold bearing crushed rock would have been washed on amalgamating tables, the discarded sand deposits giving further evidence of stamping activities in this location. GPS coordinates are 752530 6331508.





Figure 64 Showing the PN Russell & Co 1865 boiler, facing south-east and north-east.

BOM20. Loose metal (cast iron) flanged pipes in the vicinity of the boiler and stamper (*Figure 65*). The pipes are 100mm in diameter, 3m long and have metal flanges so the pipes can be bolted together. They most likely represent water pipes to help run the stamper battery or steam pipes from the boiler. GPS coordinates are 752521 6331526.



Figure 65 Showing the 100mm diameter metal stamper/boiler pipes for water, facing east.

BOM21. This feature is a dry-stone wall at the base of a mullock pile (probably made from waste mullock), which helps form a flat working area for the stamping battery and boiler (*Figure 66*). GPS coordinates are 752530 6331513.



Figure 66 Corner section of the dry-stone retaining wall, facing south-west.

BOM22. An iron metal component from the boiler. The iron sheet displays rivets, has curvature and is located below the main body of the boiler and dry-stone retaining wall (*Figure 67*). GPS coordinates are 752532 6331519.



Figure 67 An ion section of the boiler, facing south.

BOM23 and 24. Coarse sand piled up from quartz stamping activity and crushed material washing – below the BOM19 location (*Figure 68*). When the quartz was crushed and washed to remove the gold, the crushed particle matter built up over time to forms piles or areas of sandy ground. GPS coordinates are 752539 6331511 and 752551 6331510.





Figure 68 A large pile of sand, now practically wasned away by water action (left), and a wombat burrow showing this section of ground to be sandy waste from a stamper battery, facing south-east.

BOM25. This feature is a large pile of mullock (approximately 60m x 7m) of various size stone, from fine-grained sands to larger boulders (*Figure 69*). The pile is good evidence for reef mining activities within the area and suggest that a shaft is located nearby (see BOM29). GPS coordinates are 752526 6331527.



Figure 69 A large pile of mullock near the creek bed, facing north-west.

BOM26. Is represented by metal iron sheeting with rivets attached (*Figure 70*). The sheeting is lying on the ground, directly next to - and most likely a component of - the boiler. GPS coordinates are 752525 6331512.



Figure 70 A piece of iron sheeting, facing north east.

BOM27. Located laying on the surface was the base plate of a stamper battery – the base where the rock is positioned to be crushed (*Figure 71*). The boiler, mullock heap, sandy deposits and this stamping battery base plate all suggest that a stamping battery was in this location. GPS coordinates are 752524 6331514.



Figure 71 The well-worn base section of a stamper battery machine.

BOM28. Associated with the mollock heap, discussed and shown above in BOM25, is a walking track going from the boiler to the mullock heap. The track may represent a link between the two separate stamping activity locations (BOM15 and BOM19) during the gold mining operations or it may have been formed by modern day bush walkers visiting these sites. GPS coordinates are 752508 6331499.

BOM29. Twenty metres south-east of Big Oakey Creek and approximately 50 metres south east from the small stamper battery set up, an adit was located, on the north side of Big Oakey Creek. The entrance is small and partially caved in (*Figure 72*). This adit would be dangerous to enter, but represents a standard historical mining feature of this landscape. GPS coordinates are 752455 6331482.



Figure 72 A small adit, practically collapsed, facing north-west.

BOM30 and 31. Two separate adit entry holes in close proximity to each other and to BOM29, most likely exploiting separate quartz veins (*Figure 73*). The adits show that numerous gold-bearing quartz veins exist within the area and are a reminder to exercise caution whilst walking in the area. GPS coordinates are 752444 6331485 and 752452 6331496.



Figure 73 Two separate adit holes close together, facing west and north.

BOM32. Randomly within the landscape, but associated with the mining complex, is an abandoned ship tank located within a small gully off big Oakey Creek (*Figure 74*). Ship tanks are explained and described above in BOM9. The tank's likely use was for water storage, but was abandoned when mining operations ceased. The tank has a large opening cut into one side (or the top), for an unknown purpose, and is not *in situ*. GPS coordinates are 752416 6331 440.



Figure 74 A ship/s tank, facing south-east.

BOM33. Abandoned iron stamper battery wheel with cogs and wear marks (approximately 400mm radius) (*Figure 75*). This item is not *in situ*. It represents a working component of the gold extraction complex described in BOM15. The cog is similar in appearance to the one shown and described in BOM17. GPS coordinates are 752431 6331459.




BOM34. Represents the complex shown and discussed in BOM15.

BOM35. Along the steep dirt track and above the BOM gold extraction complex, a European tree blaze was located. Given European occupation of the area from the late 1850's and the European practice of tree felling (especially for mining operations where a great deal of timber was required), it is likely that much of this area was cleared of its timber and used in the mining operations. Nevertheless, eucalypt trees of some antiquity still remain within the area. Trees may be scarred by a variety of natural, animal, Aboriginal or European activities and therefore all tree scars noted within the study area were recorded, photographed and assessed individually. Feature BOM35 was assessed as part of this current project (*Figure 76*). The tree is approximately 12 metres high, 3 metres around the girth and is in average health, having suffered from loss of limbs and insect attack.

Visible in association with the scar is some re-growth, along with some sections of rotting wood, and axe marks. There are survey markers cut into the heart wood of the scarred tree that read '18', '18' (one on top of the other), a '9' and a '1' and what may be the government arrow symbol. There is also a hole (to the right side of the blaze) that possibly once held a marker. The blaze shape is not the usual 'European shield' shaped scar. However, the steel axe marks, writing and hole suggest it is of European origin as opposed to an Aboriginal scar. The blaze was probably used to mark the boundary of a gold mining lease. As trees die or are removed, European blazed trees are becoming less common. As the tree has distinctive survey marks incised in the blaze it has a moderate historical significance rating, as an example of European survey techniques. Under the criteria set out in Part 2 section 10 (Heritage Significance) of the Heritage Act 2004, the blaze on this tree still satisfies point 'c', 'a distinctive way of life no long longer practiced and in danger of being lost' and also point 'f,' 'a rare or unique example of its kind'. GPS coordinates are 752416 6331331.



Figure 76 The European blazed tree, with markings, facing north.

The Big Oakey/Surface Hill Mine site, probably dating to the 1850s, must have been a hive of activity at the peak of its working life. However, no items were located that could be used to obtain accurate occupation dates. The Romboid nails used in constructing the site's hut give a manufacture period, but not a beginning point for site occupation. Similarly, the stamped boiler date of 1865 gives a manufacture date, but it is not possible to ascertain when the boiler began its working life at the site, even though it probably represents one of the oldest features on the site. If work is to be undertaken at the site for further interpretive purposes, access roads should be upgraded, the main machinery area BOM15 should be cleaned up and made safe, the hut site (BOM 8) should be tidied and made water tight (with period-matching materials), and mine shafts and adits should be made safe. All work is to be conducted in a manner in fitting with the area's heritage status. The known history of the site and any interpretive signage would benefit from focused historical research designed to locate specific relevant documentary data. The area currently has poor access, but some interesting and visible mining history. The area would benefit from a walking trail with interpretive signage.

Potential for Little Oakey Mine

Little Oakey Mine (Lot 7019 DP 1060341 and Lot 315 DP 755790) (see *Figure 78*) is listed as number 1080658 on the State Heritage Inventory, has been recorded in the 1985 Evans Shire Heritage Study and been documented by Higginbotham (2012). Little Oakey Mine is shown on an 1898 Parish Map as a Gold Field Reserve with various Lot or Lease Numbers (*Figure 77*).



Figure 77 Showing the 1886 Parish Plan of the Little Oakey Mine area, in the red circle.

The State Heritage Inventory file suggests the site has considerable and rare potential for interpreting every stage of the gold mining period, especially the 1903 to 1918 reef mining period. Records from the Department of Mines indicate Little Oakey Mine was in operation as a profitable reef mine during this period. The Heritage Inventory listing states the site holds: "an old 5 head stamping battery...erected in 1905" (Figure 78), "a Chinese water race", a "gold mining area", a "Cornish boiler, and a 10 inch Tangyn engine". A five head stamping battery and Tangyn engine was located in the LOM site area. However, no water race was located that could be attributed to Chinese construction nor were there any archaeological signatures of a Chinese presence in the area. Two boilers were located at the Little Oakey Mine site (neither could be identified as definitely Cornish) along with many other remains from past gold mining activities. These will be discussed below.

In 1904, the Inspector of Mines, Mr Warden Sharpe, gave written evidence of the activities at Little Oakey, stating in his report that" *Moyle, Reilly and party in their extended quartz claim at Little Oakey, drove a level 50 foot north and 60 foot south and crushed 158 tons for 251 oz valued at £580*" (Cited in Cited in Osborne 1975:29).



Figure 78 The Little Oakey Mine study area, with workings marked (left) and the five head stamper as shown in the SHI listing photograph.

Higginbotham's (2012: 133), account of the Little Oakey Mine's general area records a stamper battery site (located north of Wattle Flat on the east side of the old Sofala Road), one mine site, and two house sites. He suggests the Little Oakey Mine area is an ideal location for interpretation. The present study agrees and can add to Higginbotham's observations. As with Solitary Mine and Big Oakey, all evidence for mining activities at Little Oakey Mine is associated with reef mining – except for landscape evidence such as disturbed ground through alluvial workings. LOM stands for Little Oakey Mine and the site's material evidence layout can be seen in *Figure 79*.



Figure 79 Study area and mapped features for the Little Oakey Mine site.

Field Assessment

LOM1. This feature represents the remains of a rectangular stone arrangement, approximately 3m by 4m in dimension (*Figure 80*). The dry stone construction has been used to create a level area with stones piled on the eastern side (probably a collapsed chimney). Construction material is dominated by milky quartz, with no mortar. A five metre radius search was conducted around the feature for associated artefacts, with no results. The assemblage most probably represents a small domestic structure, although no evidence exists of a fame or external covering. These remains are typical of small abandoned hut, although often they are associated with exotic tree plantings which are not in evidence here. The site is beside a vehicle track and may be subjected to damage be vehicles, foot traffic or artefact collectors.



Figure 80 Showing a collapsed stone platform, probably a hut site, facing north-east.

A small scale sub-surface archaeological investigation of this location may reveal information on the nature of the hut (if it is a hut) and its occupants, and aspects of their day-to-day lives. This would add to our current knowledge of the cultural, social and economic situation of the site's occupants and of the area more broadly during Australia's colonial period. GPS coordinates for this location are 752368 6332335.

LOM2. Here is a winch and engine mount associated with a mine shaft (on the opposite side of Little Oakey Creek) (*Figure 81*). The winch and engine mount are located on the south-east side of the creek. The winch's size is too big for hauling buckets of mined rock and the engine mount is of a modern design (probably 1950s+) and represents a later phase of mining in the area. GPS coordinates are 752222 6332464.



Figure 81 Showing (left) the winch and (right) the engine mount, facing west.

LOM3. An 'A' frame positioned over and associated with a deep, vertical mine shaft (*Figure 82*). This feature is also associated with the winch and motor mounting discussed in LOM2. The frame and mine shaft is on the opposite side (north-west) of Little Oakey Creek to the winch gear. The materials used are milled timber and natural logs cut straight from the bush, fastened by modern wire nails, and nuts and bolts. The mine shaft has a timber frame, also made using modern nails, and as evidenced by a hinge system, once had a door (approx 1.5m square) that opened on hinges. The use of modern nails and winch system, with no older features, suggests this mining operation was set up in recent times. The large and deep size of the mine shaft suggests it may be a reused shaft. GPS coordinates are 752204 6332457.



Figure 82 Showing the 'A' frame (left) and the reused mine shaft, facing north.

LOM4. A small area on the side of Little Oakey Creek, five metre from a former stamper site, containing a mullock pile (with associated dry stone walling), an 'A' structure (with a pulley system visible) over a timber lined vertical mine shaft (of round timbers cut from the bush), and a cement lined corrugated iron tank (*Figure 83*). Based on the visible flat head modern type nails and chainsaw cuts marks, these features are considered to be modern. GPS coordinates for this location are 752225 6332513.





Figure 83 The 'A' frame over a mine shaft (left) and the associated concrete-lined iron tank.

LOM5. In this location are the remains of a boiler positioned next to timber stamper battery foundations (*Figure 84 and 85*). The equipment is located directly across a dirt track from feature LOM4, on the uphill side of the track. The boiler is approximately 2m by 3m by 2.5m, with no manufacture marks. The boiler's firebox appears to be welded and bolted on an enlarged version of the original. The feature rests on a brick and mortar stand – now collapsing. The bricks are machine-made, of a reasonable quality, and show a standard diamond-shaped frog, giving a manufacture date of between 1850 and 1900.



Figure 84 Showing the boiler with an extended fire box.

Directly adjacent to the boiler, the timber foundations of a stamper battery and engine were located. The stamper battery and engine were removed sometime during the last four years (according to Chris Green Pers. Comm. 2017). Higginbotham (2012) recorded the feature as an *in situ* engine and five head stamper, giving further evidence for its recent removal. GPS coordinates for this location are 752235 6332504.





Figure 85 Showing the engine remains (left) and the stamper battery foundations (right).

LOM6. Approximately ten metres north of feature LOM5, a hut site was located (*Figure 86*). The structure is dilapidated and is approximately 4m by 3m in its outer dimensions, facing Little Oakey Creek. The hut has part of a ship tank laying in front of it, which is not likely to be *in situ*.

The hut's construction method is unusual in that it uses the Australian pole and pug method, with corrugated iron roof. The structure is largely fastened together with wire Rhomboid nails (previously discussed on feature BOM8), suggesting an 1890 to 1930 construction period.

The pole and pug building technique uses vertical structural posts and nailed horizontal saplings spaced at intervals of about 100mm. The whole frame is then packed with mud and wiped smooth on the outer surfaces (*Figure 87*). Although there are some examples of early settlers using pole and pug construction elsewhere in the world, the technique seems to have evolved independently in Australia (Troy 2002: 52).



Figure 86 Showing the dilapidated pole and pug structure facing south (left), and the northern internal wall (right).



Figure 87 Showing two early Australian examples of pole and pug constructions (Lewis 2008: 84).

The ground in the location of the hut has been heavily disturbed. Nevertheless, a small scale sub-surface archaeological investigation may reveal artefacts that provide information on the daily lives of the people who lived here. This would add to our current knowledge of the cultural, social and economic situation of the hut occupants and of Australia's colonial period. GPS coordinates for this location are 752222 6332526.

LOM7. Directly behind the stamper and boiler discussed in LOM5, four (of an original 6) posts were located that probably held water tanks, behind and uphill from the stamper. The four posts are 150mm diameter round logs, dug into the ground and protruding from between 500m to 1m (*Figure 88*). GPS coordinates are 752235 6332498.



Figure 88 Showing the four posts behind the stamper, probably to support a water tank, facing north.

LOM8. Fruit trees (quince, pear and apple), iris, Kurrajong, and other exotic species were noted across the creek from the Little Oakey Mine location: site number 1080658 on the State Heritage Inventory (*Figure 89*). This area is on private land approximately 200m away from the boiler and stamper area. The fruit trees indicate a domestic area and may be miner's huts, although no structural evidence of this exists. GPS coordinates for this location are 752080 6332739.



Figure 89 Showing a quince tree heavy with fruit, facing west.

LOM9. Ten metres east of the main boiler and stamping battery, along a creek line, a sturdily built dry stone dam wall was located – damming the creek – with a sluice gate opening at its base (*Figure 90*). On the outside wall (the northern side) there is a circular overflow pipe in the centre of creek line, with a square entrance supported by a wooden beam. The dam has long ago silted up and is non-effective. The wall extends across the creek and is approximately 17m x 1m and 4m high and is partly collapsed at the centre. Even at its peak working life, the dam capacity would have been small compared to the mining operation's needs, but the level of silting may be more extensive than initially apparent due to the unknown depth of the dam. GPS coordinates are 752097 6332768 to 752080 6332772.



Figure 90 Showing the northern side of the dam wall and the square sluice box.

LOM10. In the location of the registered battery complex, State Heritage Inventory Number 1080658, on the east side of Little Oakey Creek, a boiler and stamping battery still exist relatively *in situ* (*Figure 91*). The *in situ* features include a 5 head stamping battery (with stampers intact); remnants of an engine; a boiler; two damaged ship tanks over a collapsed timber stand, and various drainage and pump features (*Figure 92*). One of the drainage lines is built into the concrete platform and drains back to the creek.

There are exposed metal pipes on the southern side of the battery, various bolt fastenings for the mining infrastructure and an apple tree heavy with fruit.

The levelled stamper platform is dug into a sharp slope above the dam wall and below the old track leading to Sofala. To create the track, the lower side has been retained by a substantial dry stone wall (*Figure 93*).



Figure 91 Showing the stamping battery, boiler and engine set-up (left), and the ship tank water feeder system (right), facing south.



Figure 92 Plan view of Little Oakey stamper battery and boiler complex.

Only one piece of equipment at the complex shows manufacture markings, an embossed horizontal engine that reads: 'Tangye's' and 'BIRMINGHAM 10 IN' (*Figure 93*). This represents James Tangye, a manufacturer of water pumps and horizontal

engines in Birmingham, England, in operation from 1856 through to the mid-1900s (http://www.gracesguide.co.uk/Tangyes). The stamped horizontal engine only allows a broad date for site occupation, but it most likely represents the oldest feature on the site. Wire Romboid nails were used throughout the complex, thereby giving slightly better operation dates of between 1890 and 1930 (Varman 1980: 108). GPS coordinates for this location are 752137 6332784.



Figure 93 Showing the dry stone wall that forms part of the road to Sofala, facing east (left), and a Tangye 10 inch horizontal engine (right).

LOM11. A large flat area and a dry stone retaining wall exists above the stamper complex at the point where the track to Little Oakey Mine moves away from the creek line (*Figure 94*). GPS coordinates are 752124 6332804 to 752199 6332622.



Figure 94 Looking west, uphill, towards the track to the Little Oakey Mine site. The retaining wall can be seen at the range pole.

LOM12. This is likely to be where a stamping battery was in operation. There is a manmade dam approximately 10m to the north and uphill from the site (now with a

collapsed retainer bank). The area is sandy, likely to be the by-product of crushing and washing activities (visible through wombat burrowing) (*Figure 95*). At some point in recent times, a front-end loader has been used to remove a portion of the sand, most probably for a local building project. The flat working area is approximately 10m by 15m. The area is approximately 50m from the small hut site discussed in LOM1 and a quartz mine shaft recorded as LOM13. GPS coordinates for this location are 752326 6332391.



Figure 95 Facing east towards the breached dam wall (left) and the stamper battery site showing the wombat burrow and quarried stamper sand (right).

LOM13. In this location, there is a substantial quartz mining shaft (*Figure 96*). The shaft is almost vertical, has surrounding mullock piles, has a dirt track running past and is within approximately 50m of the small hut site LOM1. There are several other smaller workings in the nearby locality. The mine shaft is open with no timber shoring or cover, has a radius of approximately 4m and is clearly dangerous to approach. GPS coordinates are 752305 6332372.



Figure 96 Facing north-west to view the quartz mining shaft location (left) and a close-up of the actual shaft (right).

LOM14. Approximately a 40m length of the creek bank has been lined with dry stone walling, the purpose is unknown (*Figure 97*). A substantial quartz mining shaft is positioned above the wall, which would account for the source of the rock. The walling is mostly along the eastern side of the creek, however, in one small section, both sides of the creek were lined with dry stone walling. A detailed inspection of the wall's southern end was hampered by blackberry bush. Nevertheless, a good inspection was undertaken of the majority of the wall. The dry stone walling does stop erosion of the creek bank and would have quickened the flow of water through this area. However, the wall is unusual and displays substantial effort, suggesting a technological advantage that at present is unknown. GPS coordinates are 752199 6332322 to 752192 6332379



but further to the south where the blackberry bush is located.

LOM15. During the inspection of the Little Oakey Mine area, two hut sites situated on level ground to the south west and outside of Little Oaky Mine area were inspected LOM15 and LOM16. These sites were also noted by Higginbotham (2012). The hut remains are approximately twenty metres apart, LOM15 is represented by the westernmost hut. The site consists of a dilapidated dry stone platform of approximately 4m by 3m, with one larger mounded section on the southern end, probably the collapsed chimney (*Figure 98*). The feature appears to face southeast and the main material used is basalt, with some quartz. The dry stone platform probably once formed low level walls to a one roomed hut. The remainder of the hut likely consisted of a mix of canvas tent, timber and iron sheeting, none of which remain. The feature is positioned just off the crest of a low level hill above and west of Little Oakey Creek. In nearby association with the hut remains are a peppercorn tree and a crab apple tree. GPS coordinates for this location are 752001 6332382.



Figure 98 The remains of LOM15 hut site, facing south east (left) and north west (right).

LOM16. Associated with LOM15, approximately twenty metres east, similar hut remains were inspected (*Figure 99*). This hut site is situated just off the crest of a low level hill to the south-west of Little Oaky Mine site. The hut remains are represented by a collapsed dry stone feature that now forms a low level pile of rocks (mostly basalt). The pile is approximately 2m by 3m and is higher and more mounded than LOM 15, suggesting the side walls may have been bigger. A mounded section of rock can be seen on the south-west end and likely represents a collapsed chimney. The dry stone walling is more intact on the east side of the feature and some flat metal sheeting (probably flattened kerosene tins) are incorporated into the complex. No other domestic artefacts are obvious. A crab apple tree stands approximately 5m to the north, along with a peppercorn tree to the west.

Through small scale sub-surface archaeological investigations, the hut remains and other material culture associated with both LOM15 and LOM16 have the potential to provide information on Australia's colonial period, the nature of the huts and the day-to-day lives of the people who once lived in them. This would add to our current knowledge of the cultural, social and economic situation of the hut occupants. GPS coordinates for this location are 752035 6332416.



Figure 99 The hut remains of LOM16 showing the collapsed rock walling and the peppercorn tree, both photos facing south-west.

LOM17. Approximately 20m north-east of the two hut sites, still above Little Oakey Creek, an area of shallow quartz mining (approximately a 10m x 5m area) was located. No mine shaft was identified, but rather the quarrying of shallow quartz boulders that has resulted in a disturbed landscape (*Figure 100*). GPS coordinates are 752036 6332415.



Figure 100 A site showing shallow quartz mining activities, facing east.

LOM18. Mullock piles, a mine shaft and a mined landscape were located in this area (*Figure 101*). It is immediately east of Little Oakey Creek and above the previously noted rock wall in LOM14 (and most likely associated with the rock wall). The main shaft has a large 3m radius opening, but only a narrow tunnel. There is no stamper battery equipment or sandy deposits nearby to indicate a stamping battery operation. Quartz material from this mine must have been transported the 150m distance to feature LOM12. GPS coordinates for this location are 752214 6332289.



Figure 101 Part of the large mullock pile, the mine shaft is located above (left); showing a sluiced area forming part of a mined landscape (photos facing north-east).

The Little Oakey Mine area shows clear evidence of past mining activities. Alluvial mining activities in the area probably date to the 1850s, but no good evidence of this date exists. Romboid nails used in the LOM6 hut allow broad occupation dates of between 1890 and 1930. The embossed Tangye horizontal engine gives an even broader period and does not indicate when the engine began its working life at the site. The area does hold material that would be interesting for the general public to view and

be educated about. However, road access should be upgraded, the main working area for LOM5 and LOM10 should be cleaned up and made safe, the hut site (LOM 6) should be cleaned up and protected from the weather as much as possible (using heritage appropriate materials and methods), and all mine shafts and adits should be made safe. The known history of the site and any interpretive signage would benefit from a focused historical research project designed to link relevant documentary data to specific items.

Potential for Queenslander/King Mine

Queenslander Mine (Lot 7339 DP 1142345), on an 1898 Parish Map of Wattle Flat's Gold Field Reserve. It is difficult to discern the actual Queenslander Mine lot numbers (*Figure 102*).



Figure 102 Showing the 1886 Parish Plan of the Queenslander Mine area.

According to C. Mulholland (a geologist and Government Chief Inspector of Mines in 1948), the Queenslander Mine (on Spring Creek) (*Figure 103 and 104*) was discovered in 1888. It was worked continuously by Tomas Morgan, with 20 men employed, until 1900 when it was closed and the plant sold (Mines Department record number: D00308110/Microfilm 2589, 1947). After Morgan closed his operations, the mine sat idle until 1903 when it was re-opened and worked intermittently by various parties. A 1908 document shows J. S. Atherton and sons briefly working the mine, then in 1914 Christy Flynn held the lease and worked a 10 head stamping battery on site. In 1916, flood destroyed the water supply dams and damaged the plant (Mines Department record number: D0030812D/Microfilm 1018, Blanchard 1948) and (Hilyard 1980: 4).



Figure 103 Showing the layout and mine types for Queenslander Mine as it was in 1948 (Government Chief Inspector of Mines in 1948).



Figure 104 Showing the Queenslander Mine study area and the location of some of the reef mining areas.

Only one reference to the name King Mine was located in association with Wattle Flat. This was in a 1904 Mines Department Annual Report stating that J. J. Marshall had secured a lease at the Queenslander Mine a: *"Mine now known as King Mine..."* Mines Department record number: D00308110/Microfilm 2589, up to 1947).

It's not known how long J. J. Marshall worked his lease, but the mine lay idle for some years up until 1936, when the Queenslander Gold Company (owned by G.R.W. McDonald and P. Bernard) took over the lease and worked it until 1939, when, as far as is known, the mine closed for good. At the time of closure, Mines Department records show that the Queenslander Gold Company employed 9 miners, 2 transport drivers, 6 men at a fifteen head battery, and were paying their workers a wage of between £4 and £5 per week.

In order to pull quarried material out of the mine shaft, the Queenslander Gold Company used motor-operated winding gear, and to crush the quartz they used a fifteen head battery fitted with a water pump. A difficulty in working this mine was that the nearest suitable stamping battery area was on the banks of the Turon River, about 3.2 kilometres from the mine. This necessitated the use of expensive motor trucks to cart the mined material for crushing. Estimates by the Mines Department, suggest that approximately 30,000 tons of stone was mined from the Queenslander lease over its lifetime (Mines Department record number: 48/10058 H/Microfilm 2589, 1948). By early 1953, the stamping battery and most of the mining infrastructure had been dismantled and used for scrap (Ref Number R00042793 Mines Department 1936). Later in 1953, L.E. Hall and A. V. Barker purchased the Queenslander lease, but there is no record of them having worked it. In 1969, the Department of Mines documented the area had several steep open cuts (glory holes), there and scrap machinery consisting of tanks, a boiler, 2 drum winches, and loading ramps (Mines Department record number: D00308180/Microfilm 1048, 1869). By 1970, the leaseholder is unknown and the mine wasn't in operation. However, in 1981, a Mr Pulley requested - and received assistance from the Mines Department to establish a suitable treatment method for the recovery of gold from the Queenslander Mine - because the gold content in the quartz was considered to be too low to extract with traditional methods. Cyanidation gold extraction methods were approved, but there is no documentary evidence of this process having ever being undertaken (Ref Number R00005961 Mines Department 1981).

Mining remains at the Queenslander Mine were recorded for the Evans Shire Heritage Study in 1985, and as part of Higginbotham's (2012) investigation. Higginbotham (2012) recorded a dirt track leading south from its junction with Sofala Road, immediately south of the Sofala Cemetery, and two mine shafts alongside Spring Creek. However, due to access problems, he only inspected part of the mining area. During Higginbotham's site visit he noted seven areas of interest including three built dams, several stone walls, an ore chute, the old battery foundations, and mine workings. Most of the evidence for mining activities at the site is associated with reef mining – except for disturbed ground that most likely represents alluvial workings. QM stands for Queensland Mine. The site's artefactual layout can be seen in *Figure 105*.



Figure 105 Study area and mapped features of Queenslander Mine site.

Field Assessment

QM1. A rectangular shaped, vertical quartz shaft was found on the top of a small rise, approximately 5.5m from the property fence line. The shaft is surrounded by mullock with a 3m radius and has been roughly capped/covered by logs (*Figure 106*). GPS coordinates are 750361 6333522.



Figure 106 Showing the mine shaft, mullock and capping, facing north.

QM2. As with QM1, this feature is a rectangular vertical mine shaft. The shaft is midslope on a low level hill (*Figure 107*). No shoring or timber structure is visible. However, but there is one piece of almost hidden galvanised iron metal piping, jutting out vertically from the shaft which likely represents evidence of the more recent 1950s mining activities. GPS coordinates for this location are 750397 6333534.



Figure 107 Showing a mine shaft and shallow ground cut, facing south.

QM3. A deep rectangular mine shaft, mid-slope, with a narrow entrance. The top sections have collapsed, but the shaft is still exposed (*Figure 108*). The shaft is not associated with any visible shoring, but mullock is piled up on both sides – the south side is prevented from sliding downhill by four railway sleepers. There is a dug trench approximately 3m wide and extending from the entrance, 10m in a north-south alignment, possibly following a reef line. This trench is associated with some cut, diagonally positioned timber logs and possibly represents an old tramway line. GPS coordinates are 750398 6333532.



Figure 108 Showing the mine shaft and trench (left) and the shaft entrance (right).

QM4. This feature represents a rectangular quartz mine shaft, mid-slope on a low level hill. The tunnel goes into the hill and has milled timber shoring visible just inside the entrance (*Figure 109*). The shaft's entrance has an approximate 3m radius. GPS coordinates are 750402 6333526.



Figure 109

Showing the entrance to the mining shaft at QM4, facing south.

QM5. A vertical mining shaft (approximately 2m radius), mid-slope on a low level hill and above an open cut mine (*Figure 110*). No timber shoring is visible, although the quartz reef is visible. The shaft is associated with a mollock pile and a single placed log. GPS coordinates are 750395 6333525.



Figure 110 A vertical mining shaft, facing south-west.

QM6. In this location, a large oval open cut area is approximately 25m by x 13m and over 10 metres deep. This represents one of at least three associated major open cuts on the west side of the gully (*Figure 111*).

The large cut would have removed any evidence of earlier alluvial or small quartz workings in this location. There are vertical and horizontal mine shaft entrances in the south and north of the open cut, the largest is approximately 8m in diameter. Mullock surrounds the entire open cut area, with one gap facing the gully (east), where there is the remnant of a small winch (*Figure 112*).

The quartz reef is exposed in the north side of the open cut, with multiple fractures characterising the bedrock. The rock stratigraphy is dense with less quartz in the south. GPS coordinates are 750417 6333518.



Figure 111 Showing the western-most cut of the gully system (left) and one of the shaft openings (right).



Figure 112 Showing the winch equipment abandoned near the mine shaft, facing north.

QM7. In this location, a possible adit was located. The actual adit was not found, having probably been covered by soil wash and gully erosion. However, ground tunnelling appears likely in this location due to a visible ground depression (*Figure 113*), which extends approximately 3m x 10m. GPS coordinates are 750439 6333477.



Figure 113 A ground depression attesting to mining activity in the area, facing west.

QM 8. Here a rectangular shaped, vertical shaft, with a radius of approximately 3m, was located on the lower slope of the main gully. The shaft has been poorly covered with timbers, some are logs straight from the bush while others are milled timbers (*Figure 114*). Mullock and ground disturbance can be seen surrounding the shaft. GPS coordinates are 750454 6333498.



Figure 114 The loosely covered mining shaft, facing west.

QM9. This large open-cut mine has a 2m deep (into the bank) archway, probably created by quarrying out a quartz vein. The open cut is oval-shaped, approximately 25m by 10m and is over 10m deep (*Figure 115*). The archway separates the open cut from the gully. There is green, stagnant water at the base of the open cut and a large mullock pile held by timber supports at the front of the open cut, facing the gully. Some modern pvc piping has been used unsuccessfully to drain water from the mine cut. GPS coordinates are 750440 6333515.



Figure 115 Showing the tunnel to the open cut (left) and inside the open cut (right).

QM10. A collapsed timber support structure – made from bush logs and some milled timber – positioned at the north entrance to the open cut, facing the gully. As the structure has collapsed it has fallen downhill, creating a jumble of timber (*Figure 116*). The structure may have once acted as an 'A' frame support to help winch rock from a mine shaft. The collapsed structure is approximately 5m wide and 4m high, and is fastened together by large timber spikes and screws. The item is too dilapidated and damaged to be accurately identified, and the spikes and screws are of a common type with broad manufacture dates. GPS coordinates are 750464 6333519.





Figure 116 Showing the collapsed structure (left), and part of the frame further downhill, possibly part of an 'A' frame, facing east.

QM11. This is an open-cut area (approximately 5m by 2m), associated with a large underground tunnel (*Figure 117*). It is directly opposite the main gully, the previously noted small winch, and other infrastructure noted in QM6. The interior of the open cut has evidence of blasting in the form of drill holes, and some graffiti. A plastic pvc pipe is positioned on the floor of the cut where a past attempt has been made to drain the water. GPS coordinates are 750460 6333513.



Figure 117 Showing the open-cut with tunnel opening (left) and the watery base (right).

QM12. These iron pieces are remnants of the components of a steam engine (*Figure 118*). They are located on the opposite side of the gully to where the open-cuts QM9 and QM11 are positioned. Neither piece of equipment has any identification markings and may have been handmade by a smithy or boilermaker, as opposed to an iron factory production line. GPS coordinates are 750482 6333501.



Figure 118 Showing the likely handmade boiler and steam engine components.

QM13. A double drum mechanical winch and components, facing generally towards the gully, the open-cuts and mine shafts noted above (*Figure 119*). Due to the timber centres still within the winding drums, the winch is probably associated with a recent mining effort (if over a lengthy period of time, the timber centres would have rotted away through exposure to the elements). The winch is directly in alignment with the open-cut on the opposite gully slope QM11. The winch may be movable and used depending on which shaft or open-cut was in work at the time. It is doubtful that the item is *in situ*, because the cog wheels are dismantled and the winch frame is loose, enabling it to move if put into operation by winching heavy buckets of stone. GPS coordinates are 750483 6333503.



Figure 119 Showing the mechanical winch, probably not *in situ*, facing south-west.

QM14. A concrete structure associated with an abandoned and dilapidated corrugated iron water tank (*Figure 120*). The concrete wall has collapsed on three sides and there is no evidence of a roof structure. This suggests it may have once have been a purposely constructed tank, probably a water tank for mining operations. From the remaining sections, it could be ascertained the tank's size was 9m by 5m and 2.5m high. The feature is very similar to the concrete water tank described at the Big Oakey Mine (BOM11).

Corrugated iron water tank remnants are laying directly north and west of the concrete tank (with west tank still standing). Possibly both iron tanks acted as overflow from the concrete tank. There is no visible pipe work or engine components. The position is elevated and so gravity may have been used to direct water flow, with the pipe work scrapped or reused elsewhere. GPS coordinates are 750490 6333500.



Figure 120 Showing the likely concrete water tank remnants and the corrugated iron water tanks, facing south-west.

QM15. This shows the remains of a vehicle track to a modern rock processing plant (described in QM21). The track is in the gully centre, to the north of Sofala Road, and leads eventually to the Healey family house (*Figure 121*). The track is visible for approximately 100m, can be seen extending into the neighbouring block and past a stamper battery site (Grid ref: 750389 6333780), which is on private property and was not inspected. GPS coordinates are 750507 6333492.



Figure 121 Showing the vehicle track winding through the area, facing south.

QM16. An earthen dam has been constructed using the southern side of a natural gully (*Figure 122*). The dam wall has been breached, most probably through flood, to form a 3m wide channel. This dam is in the southern most extent of the working area for QM12, 13, 14 and 15. GPS coordinates are 750454 6333462.



Figure 122 Showing the breached section in the earthen dam wall, facing south.

QM17. An area of rubbish in a washed out depression on the east side of a gully (*Figure* 123). The ground depression may represent an old adit location or possibly an area of alluvial workings. The discarded artefacts comprises sheets of modern metal and milled timber, all with modern round shaft, flat head, wire nails. The remains are scattered over an approximate 20m radius. GPS coordinates are 750418 6333540 to 750487 6333580.



Figure 123

Showing the ground depression and scattered remains, facing east.

QM18. Part of a creek line branch, now silted up, below the broken dam wall discussed in QM16 (*Figure 124*). The area is possibly the location of an earlier dam or represents a partly washed out and partly silted up area from stamper battery activity. Mullock is piled chiefly to the west side of the feature. GPS coordinates are 750483 6333536.



Figure 124 Facing north to view the partly silted up creek line.

QM19. A rock lined creek bed, extending for over approximately 150m and the full width of the gully floor (approximately 15m) (*Figure 125*). The rock sizes are relatively large at approximately 400mm or more in most cases. The rock is predominantly quartz and pyrite and is therefore not likely to be mullock (C. Green Pers. Comm.). This feature most likely represents stockpiled rock ready for crushing, which has been left over from recent (1960s) open cut mining activities. GPS coordinates are 750494 633576 south-east corner.



Figure 125 Showing the creek bed lined with rock waiting to be crushed, facing north.

QM20. A timber retainer wall constructed to prevent soil from collapsing on part of the main access area to a modern quarry gold processing plant (*Figure 126*). The northern end of the flat space holds a modern day gold processing plant. Above the retainer wall approximately 10m south west, is a probable stamper battery location associated with the track discussed in QM15. GPS coordinates are 750494 6333613.





QM21. Here is a large, relatively modern (1960?), electrically operated, metal piece of plant equipment approximately 8m by 5m, that represents a rock crusher for the purpose of gold extraction (*Figure 127*). It is located on a dug platform on the west side of the rock-lined creek described in QM19. A set of two hoppers, associated with the crusher, are located east of the flat area and retaining wall, and are partly covered by modern timber and corrugated iron sheeting. Among the plant components are modern nails and dust suppression equipment – on the northern end of the machinery. The flat working platform contains strategically placed drainage lines to keep the working area dry. There is also a ramp leading to an access road on the northern end of the complex. Including the retaining wall, the complex is approximately 10m wide and 40m long.

The crusher equipment has a plaque reading 'D. Richardson and Sons LTD' riveted to it. D. Richardson and Sons were part of the company 'Richardson Gears'. David Richardson had completed an engineer's apprenticeship in Glasgow, travelled to New Zealand, and then came to Australia 1887 to establish an engineering company in the 1890s in Footscray, Melbourne. His business began as a general metal engineering works, specialising in gears, fans, windmills, perforated metal and crushing batteries for gold extraction purposes. The company continued to operate into the 1990s under the management of his sons (Boisis 2012).

The plant equipment is marked "Richardson; Buffalo; D. Richardson & Sons LTD. Melbourne, Australia. Job No. P3949 Size 660 DPD", but no reference to these codes

could be located. It is estimated the plant dates to the 1960s period. GPS coordinates are 750466 6333633 south-west corner.



Figure 127 Showing the D. Richardson & Sons LTD plant equipment.

QM22. Some general alluvial diggings are positioned north of the crusher location (*Figure 128*). These are smaller workings and have been heavily disturbed by later 20th century mining and the construction of a dam. More alluvial digging activity is visible in the neighbouring allotment. The dam breach on the east side is most likely due to erosion through use of the track. There is a small square sump on the northern edge of the dam, lined by timber. GPS coordinates are 750431 6333685.



Figure 128 Showing some general alluvial diggings, facing west.

QM23. This shows a fireplace structure that was probably once part of a complete dwelling (*Figure 129*). It comprises a corrugated iron and concrete chimney that has been added to and repaired during a relatively modern period. There was most likely once an associated structure consisting of a basic timbers and sheet iron, although no

evidence exists for this. An abandoned and broken refrigerator is in close vicinity to the chimney and bits of domestic and industrial debris are scattered randomly around. Small-scale, sub-surface archaeological investigation may reveal artefacts that reveal the structure layout and the materials used, and the daily lives of the people who used it. This would add to our current knowledge of the cultural, social and economic situation of people living in this area. GPS coordinates are 750437 6333710.



Figure 129 Showing the chimney structure, facing north.

QM24. This discarded corrugated iron water tank is hidden by bushes in the photo (*Figure 130*). The tank is not *in situ* and may represent a working component to the mining operations or part of the area's domestics. This area also marks the northern end of the rock stockpiled in the creek bed (QM19). GPS coordinates are 750422 6333738.



Figure 130 Showing the discarded corrugated iron water tank in the forefront of tee picture and the northern end of the stockpiled rock, facing east.

QM25. An abandoned and not *in situ* component of the stone crushing plant described in feature QM21 (*Figure 131*). This piece of machinery has 'Hillcrest Eng Lithgow' painted on its side. No other references or manufacturer's plate are visible. It could be 'Hillcrest' equipment from the State Coal Mine at Lithgow, which closed down in 1964,

possibly a gold roughing jig, designed to sort dirt from rock pieces. GPS coordinates for this location are 750417 6333747.





QM26. This is a modern shed with rubbish strewn around, taking up an area of approximately 5m x 8m (*Figure 132*). The shed has been built on fine sandy fill possibly from stamping and sorting activity. The shed and complex (a small chicken coop and a pump house) does not have an association with gold mining activities, but is known locally as a former motorcycle club hut, where bike riders came to have parties (C. Green pers. Comm.). GPS coordinates are 750426 6333767.



Figure 132 Showing a modern day tin shed, facing south.

QM27. This appears to be a large, open man-made dam, with a breached wall, but this is unclear (*Figure 133*). The feature may represent an eroded drainage line from a gold processing plant. The gully and open flat area to the south of the wash-out have been completely filled with mullock, including a heavy muddy sediment at its base and smaller crushed rock higher on the slope (towards the modern shed (QM26). GPS coordinates are 750437 6333768.



Figure 133 Showing the possible open man-made dam area and breached/washed out section, facing south-east.

QM28. In this location there is a pump house most likely associated with the discussed modern shed (*Figure 134*). It has been built from corrugated iron sheeting and round wooden posts cut straight from the bush. There is *in situ* piping where the pump was connected. The feature most likely has no association with gold mining activities. The pump houses dimensions extend approximately 2m x 2m. GPS coordinates for this location are 750435 6333787.



Figure 134 Showing the pump house, facing north.

QM29. Probably a dam site with a breached east wall and associated with some quartz workings (*Figure 135*). The dam area is oval shaped and extends approximately 40mmaximum length. The feature could represent a settling area for water before it was pumped to the crushing machine. There is some fine sandy sediment on the surface of this area, which could represent wash-in from a gold processing location. GPS coordinates are 750406 6333670.


Figure 135 Showing the dam site and its west wall, facing south.

QM30. This feature is represented by a small rock face and a depressed section of ground that probably marks a quartz mining area, although there are no visible shafts or quartz extraction cuts on the rock face (*Figure 136*). This may be an exploratory and then abandoned quartz mining location. The area is located immediately above the dam site. GPS coordinates are 750418 6333640.



Figure 136 Showing the small rock face and depressed area, facing west.

QM31. In this location there is a fenced rectangular shaft with internal timber shoring (*Figure 137*). Round logs cut straight from the bush are visible, supporting and surrounding the top sections of the shaft. The entire area has been fenced in a triangular fashion (most probably for safety) by modern galvanised chicken wire and star pickets. The fenced area extends approximately 3m x 3m. GPS coordinates are 750412 6333597.



Figure 137 Showing a timber lined, rectangular, fenced mining shaft, facing north.

The Queenslander Mine area reveals a snap-shot of a later (probably 1960s) stage in Wattle Flat's mining history. The remains show little of the old-style boiler machinery or stamping equipment, but instead evidence of large scale, more modern electric powered mining activities. Evidence of past alluvial mining activities is visible through the disturbed landscape that probably dates to an early period at Wattle Flat, but with the absence of artefacts, accurate dating is difficult. No items were located that could easily be used to obtain accurate occupation dates. The manufacturer's plate on the crusher plant (QM21) could give more information through a focused research effort. The area does hold material that would be interesting for interpretive purposes, although access is difficult and the random mineshafts make the area dangerous to walk around. However, road access could be upgraded and self-guided walking tracks established, with warnings about the danger of straying off the sign-posted track. Small scale subsurface archaeological investigations on the chimney remains at QM23 could provide information on Australia's colonial period and the day-to-day lives of the people who once lived there. This would add to our current knowledge of the cultural, social and economic situation of the hut occupants. As with the other mining sites discussed, the known history of the site and any interpretive signage would benefit from a focused historical research project, designed specifically to locate relevant documentary data.

Overall Character of the Archaeological Resource

The available documentary evidence shows that, beginning about 1851, there was extensive alluvial mining activities at Wattle Flat. By the 1860s, alluvial mining at Wattle Flat had become sporadic and reef mining was common practice. Since around 1875, nearly all the gold produced from Solitary Reef, Big Oakey and Little Oakey, and the Queenslander mines has been from reef mining (Hilyard 1980: 4). A pamphlet published by Gipps and Campbell (1873), describes the diggings at Wattle Flat during the colonial period and marks a significant turning point for mining activities there. Instead of individual people searching for gold through alluvial methods, miners pooled their capital to form companies that used employees to mine for reef gold. The Gipps and Campbell pamphlet's aim is to draw investors to Wattle Flat's mining ventures such as "The Queenslander" and "The Big Oakey".

The actual number of quartz stamping batteries that worked around Wattle Flat is difficult to ascertain. Probably the best indication is given in an article in the Bathurst Times concerning early mining at Wattle Flat. Writer Will Carter states *"There were nearly a dozen batteries there at one time"* (Cited in Buscombe 1983: 117). Not only did the bulk of mining operations after the 1870s involve reef mining, but the larger mining operations introduced the prospect of long-term employment in Wattle Flat. This changed the nature of settlement – from an itinerate to a more permanent mindset – with people becoming 'locals' and working for 'the mines' (Buscombe 1983: 94). Early alluvial mining activities have left no identifiable material remains – other than shallow ground holes throughout the landscape (a mined landscape). However, past reef mining activities are visible in the form of mine shafts, air shafts, mine pits, open cuts, tailing piles/mullock heaps, boiler equipment, stamping machines/batteries/crusher, industrial wheels, winch equipment, hut sites, water races, water dams, water tanks and tram way lines.

Acknowledging both mining types, the remains of alluvial and reef mining represent different but both historically significant mining landscapes. In addition, three of the mining areas under examination are associated with some form of settlement or hut sites. For example, at Solitary Mine, the original Wattle Flat Post Office, the General Store and early township developed around the mine, and at Big Oakey and Little Oakey Mines there are obvious hut sites among the remains. These locations therefore hold another level of significance as historical areas where settlement has resulted from mining activities.

Impacts from the proposed use of the sites as interpretive attractions

Previous disturbances to the mining landscapes and associated relics include tree growth that has caused upheaval, deliberate round levelling of land (for road and other constructions), the collection of waste sands for building purposes, filling in of mine shafts for safety, the removal of relics for scrap metal, souvenirs and display, and general dilapidation through a lack of maintenance. To use the sites as interpretive attractions may involve upgrading existing access tracks, the establishment of walking trails with information panels, and the physical stabilising of relics. If conducted with care and the knowledge that heritage items are present, these activities are acceptable, will benefit the historical sites and protect them against further disturbance.

The information gained through this study indicates the remains of mining at each study areas is associated with alluvial and reef gold mining activities. As many different mining entities were involved in creating the visible archaeological remains, it is difficult to accurately associate the various relics to their actual user. Therefore, relating social significance directly to an individual person or family name is not possible. In their current state, the remains at the four study areas represent good examples of the early, middle and late stages of gold mining activities at Wattle Flat – and of the early Australian gold mining industry generally. The relics are a significant part of the Australian landscape and, although there are similar remains elsewhere in New South Wales (as discussed above), they hold historical and archaeological significance through an association with Australia's development, the peopling of Australia, evolving economies and settlement.

Bathurst Regional Council has expressed its willingness for the mining remains to be managed as resources and to use the findings of this study to develop planning provisions to protect the sites, enhance their visibility and to establish walking tracks and interpretive signage. In this way the historical, aesthetic and social significance of the areas will be preserved. If no disturbances other than those stated are to occur, no further desk-top, field archaeological investigation or heritage mitigation measures are warranted. If more information is sought, small scale sub-surface archaeological investigations could be undertaken at the identified hut remains and focused historical research could be conducted on specific historical items as indicated within this report.

Assessment of Heritage Significance

The significance of the four mining areas as potential historical or archaeological resources derives primarily from their research potential. This heritage significance assessment will attempt to establish why the places are important. The significance is in the physical fabric of a place, its setting and relationship to other items, their recorded association to a place, and their importance to the local community. An accurate occupation date for the four areas was unobtainable, although their usage period has been estimated to be broadly between 1851 and 1960. An earlier occupation date for mining activities is unlikely due to the timing of Australia's gold rush. The early archaeological information (the mined landscapes) is unlikely to reveal much more historical information about Wattle Flat or the earliest phases of gold mining there. The sites examines here were found to hold mining equipment relating almost entirely to reef mining gold extraction techniques (and the mined landscapes). These remains have limited potential to provide new information, in an historical or archaeological sense, as this information has previously been obtained through historical research at other well preserved sites such as at Hill End, Orange, Grenfell, Young and Adelong Falls as discussed above.

Similar gold mining sites in New South Wales are common and have been extensively studied. Therefore, the gold mining sites at Wattle Flat are unlikely to contribute substantially to a greater understanding of the early and continuing development of Australia, but are important for understanding NSW settlement, the Wattle Flat region, lifestyle, industry and commerce in a way that historical documents cannot convey.

To ascertain the heritage significance of an archaeological site/item, it is necessary to examine the significance of the wider study region, in this case at State level. The criteria listed below are part of the *Burra Charter* of Australia's International Council on Monuments and Sites (ICOMOS), which underpin the assessment, conservation and management of sites, built items and relics in Australia. The NSW Heritage Council has also adopted specific criteria for heritage assessments; all are related to the NSW Heritage Act 1977 (as amended).

Significance assessments are based on seven separate criteria – historic significance, significant associations, aesthetic significance, social significance, technical/research significance, how rare an item is, and an item's representativeness of the cultural or natural history of a local area.

To be assessed as having heritage significance, an item must meet at least one of these significance criteria and retain the integrity of its key attributes. An item must also be ranked according to its local or State heritage significance.

Significant Assessment Definitions are as follows:

Criterion (a): Historical Significance

• an item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (b): **Significant Associations**

• an item has strong or special association with the life or works of a person, or group of persons, or importance in NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (c): Aesthetic Significance

• an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the cultural or natural history of the local area);

Criterion (d): **Social Significance**

• an item has a strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons (or the cultural or natural history of the local area);

Criterion (e): Technical/Research Significance

• an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (f): **Rarity**

• an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (g): **Representativeness**

• an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural history of the local area).

Discussion of Heritage Significance

Criterion (a): Historical Significance

The Wattle Flat gold mining sites have revealed a new historical understanding of the local region's colonial lifestyle, industry and commerce in a way that historical documents cannot.

The estimated period for the sites examined spans from the early establishment of Wattle Flat, through boom times (the entire Australian gold rush period), then to a quite but successful rural township. The Wattle Flat Township started as a farming outpost when farming was just starting to be a viable concern in the region.

The recorded hut remains appear as make-shift accommodation close to the sites where miners worked. Businesses like Ireland's General Store are associated with the mining

activities, would have been among the most significant places (socially) in the district and are important in identifying growth stages (through its permanency) in the development of a remote colonial township in NSW. The different mining remains reveal aspects of how miners and mining companies in the region undertook mining operations between approximately the 1850s to the 1960s. However, mining within the study areas was not always prominently visible in the landscape and archaeological remains often too dilapidated to be interpreted accurately.

Criterion (b): Significant Associations

The archaeological remains at each site are all likely to be associated with small groups of people or a mining company. One person or an individual family in the history of Wattle Flat's mining could not be ascertained through the physical remains. Family names that appear in historical documents are still, in some cases, present in the Wattle Flat region. The historical literature identified family names such as Campbell, Ireland, Morgan or Holmes as having long associations with the region. All have been active members of the community, but are not viewed as historically significant which would require association with major historical events, wealth or special influences on the development of Wattle Flat. No direct association to individuals or family names could be made through the material remains recorded within the study areas. Nor could the huts, retainer walls or infrastructure (besides some machinery) be associated with a builder or builders, although most features appear to be handy work produced by general workers as opposed to skilled labour. No significant associations with any of the mining sites could be confirmed.

Criterion (c): Aesthetic Significance

The aesthetics of a mining site or equipment can relate to the physical appearance of an item or to a landscape setting or both. Such settings can create pleasing visual aesthetics in the landscape, both in a feature that is pleasant to look at or in support for the general European-shaping of a landscape. In turn, individual mining features can show attractive items, textures, built structures and evidence of skill in construction methods.

The remains at mining sites also have the capacity to illustrate early and possibly creative mining methods and infrastructure construction techniques. While it is clear that evidence has survived at the mining sites in this study – even though much of it is dilapidated and not structurally sound or complete – the mining equipment's fabric is visible as well much of the structural design. It is also interesting that much of the material used at the different mining sites has been adapted directly from the natural environment (stone and wood), thereby giving – probably unintended – aesthetics. Some features were also useful for defining broad periods of manufacture, purely through their condition or type (such as the nails). Some traces of architecture and associated materials have survived, and demonstrate creative and technological achievement such as the innovative use of materials and tradesman-ship – particularly in the case of the pole and pug method of hut construction. Even in a collapsed, missing and dilapidated state, the pole and pug hut holds aesthetic significance as do many of the other, more visible, items within the study areas.

Criterion (d): **Social Significance**

Some community consultation was undertaken for this assessment. It was ascertained that all of the mining sites around Wattle Flat hold some community interest and support for their preservation, as they represent an early part of the region's history and are associated with the continued existence of the local region. Some of the residents are direct relatives of miners and commented they would like to see the sites remain undisturbed as a reminder of past times and the way of doing things in the region. The majority of people consulted believed that safety is an issue and that this outweighs any heritage values.

The mining area's social significance is reduced because it does not represent a prominent part of the township itself. The Wattle Flat Heritage Lands Trust provides some accessible information about aspects of Solitary Mine. However, with very little prominence or public visibility, and being in such a dilapidated state, the mining areas investigated are considered to hold only a moderate level of social significance.

Criterion (e): Technical/Research Significance

The recording, analysis and interpretation of the mining areas for this study reveal information on aspects of life in rural NSW from approximately the 1850s to 1960s. The technology used and activities undertaken to mine for gold in rural NSW are known and well documented through numerous previous historical/archaeological studies. The Wattle Flat sites provide an excellent sample of historical and archaeological data for comparative purposes.

The sites show successive phases of mining and construction where the material remains can be used to accurately assess characteristics and similarities in mining activities, the conditions in which miners worked, and the continuing process of change, maintenance or dilapidation.

This recording of the archaeological remains at Wattle Flat will assist in future comparative analysis of different types of gold mining activities in NSW. The data will assist to better understand the practices and traditions of gold mining activities and small scale construction in NSW more broadly. With the level of research already undertaken at NSW gold mining sites, and the dilapidated state of most of the Wattle Flat equipment, the sites recorded only have a moderate level of technical or scientific value.

Criterion (f): Rarity

To be considered rare, a mining site or relic must be outstanding or exceptional in some way such as the type of processing equipment, condition or aesthetic value. Opportunities to obtain evidence from early period Australian colonial gold mining sites are not rare because such sites are commonly found in the NSW landscape. The Wattle Flat mining areas in this study do have archaeologically significant qualities due to their quantity, level of preservation and the pole and pug method of building huts that were all in use over a period of great change in Australian history (the gold rush years). Regardless of their relative abundance in the NSW rural landscape, that the fact

that these are remains from this period exist gives them a moderate level of local and State historical significance.

Criterion (g): **Representativeness**

The concept of representativeness in historical archaeology can often be difficult to define. This is because a site believed to represent a particular group of people, such as the working class or gentry, can often reveal distinct differences within that class of people. The mining sites viewed for this study are representative of an extraction industry and ways of gold mining that are no longer practiced. The sites were created by working class people and in some cases financed by wealthy company stock holders. Whatever the case, the remains at the mining sites have little potential to assist to identify individuals or new characteristics of an Australian colonial period class or previously unknown class differences between the group of people who worked and lived there.

Representativeness can also relate to how an object represents other objects of a similar type, i.e., is something a good example of its type or not? To be representative of a mining site or relic, the components would have to be exemplary, the best example of their type. The Wattle Flat examples are dilapidated or have had substantial components removed. For these reasons, the mining sites and their associated features are considered reasonable representatives of their type.

Research Potential

As stated by the NSW Heritage Office (2006:26), "research potential is the most relevant criterion for assessing archaeological sites. However, assessing research potential ... can be difficult as the nature or extent of features is sometimes unknown, therefore judgements must be formed on the basis of expected or potential attributes. One benefit of a detailed archaeological assessment is that the element of judgement can be made more rigorous by historical or other research".

Bickford and Sullivan (1984:23) suggest the following guiding principles:

Does the site:

- Contribute knowledge which no other source can?
- Contribute knowledge which no other site can?
- Is the knowledge relevant to general questions about human history or other substantive problems relating to Australian History, or does it contribute to other major research questions?

If a positive answer is returned for any of these three questions, then the sites hold research potential. These guiding principles will now be explored in the context of the four Wattle Flat gold mining areas.

Do the sites:

• Contribute knowledge which no other source can?

The archaeological materials associated with the mining areas examined tell us about aspects of gold mining in colonial NSW. The material evidence provides a glimpse into the requirements and aspirations of colonial gold miners and the level of technology they used to maintain a living. There is currently a good level of information on these

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aspects of colonial history. This does not decrease the potential archaeological value of the study areas, as they still provide comparative data with information obtained from other sites.

• Contribute knowledge which no other site can?

The mining areas examined are not unusual, although they do show the use of different mining machinery and include domestic elements. The sites usage period spans an interesting period in Australian history –from the early-establishment of a remote rural frontier to approximately the 1960s. Taking this into account, the sites do have potential to provide information on the development and use of changing technology in Australia.

• Is the knowledge relevant to general questions about human history or other substantive problems relating to Australian history, or does it contribute to other major research questions?

The research theme (Colonial Period Industrial Sites - Mining and Mineral Extraction) has limited potential to contribute to our current knowledge of gold mining activities in colonial period rural NSW and the methods people used to extract gold from the earth. However, through mining features in the study area, we can gain comparative information to increase our broader understanding of gold mining activities. The equipment used, the level of technology people worked with, and the type of material culture recoverable are research areas of interest.

Statement of Heritage Significance

The gold mining sites investigated and their associated components have little potential for totally new archaeological or historical information. The remains represent an early phase in Australia's remote rural history and are connected with the early and middle stages of Wattle Flat's development. The mining remains have connections with local and regional families. The remains include mine shafts, air shafts, mine pits, open cut mines, mined landscape, tailing piles/mullock heaps, boiler equipment, stamping machines/batteries/crusher, water wheels, winch equipment, hut sites, a general store, areas of underground potential, water races, water dams, water tanks and tram way lines. Parts of the sites and equipment at the mining areas demonstrate their original form and function (such as winch equipment, boilers and stamper machinery), but no completely intact remains were located and large parts of each site's equipment have been removed. The sites are considered to have a high level of local significance to Wattle Flat. The remains have a moderate level of State significance due to their dilapidated state and the occurrence of similar sites of this type in NSW. There is some potential for the recorded hut sites to hold cultural material below surface level that can inform us about the miners and aspects of their culture and daily lives. Under these circumstances and in consideration of the background research, the mining sites viewed for this project have the overall ability to reveal moderate levels of new information regarding Australia's colonial period.

Summary of Results

Background research and field reconnaissance confirm that the study areas contain the remains of colonial period gold mining activities that span the period 1850s to the 1960s. The current heritage item boundaries for Big Oakey/Surface Hill mine should be adjusted approximately 300 metres east to include sites BOM19 to BOM28. The north western boundary for Little Oakey Mine should be repositioned approximately 150 metres north west to include sites LOM15, 16 and 17. The southern boundary for Queenslander/King Mine should be adjusted approximately 20 metres south to include sites QM 7, 14, 15, and 16. All remains relate to the Australian historical and archaeological theme of Industrial Sites - Mining and Mineral Extraction in a remote rural setting. There are no good archaeological signatures for when mining operations began at Wattle Flat (1865 is the earliest date found embossed on the boiler engine at BOM19. The mining equipment recorded is good evidence for the mining activities that occurred in the Wattle Flat area. The methods and technology used are historically understood and the sites give limited new historical information on Australia's history. Most of the stamping equipment is believed to have been in use from approximately 1860 – some years after Wattle Flat's establishment as a mining town – and includes the boom period of the Australian gold rush, and back to a quiet agricultural town based predominantly on sheep and cattle farming. Other than the remains listed above, there is a chance that the recorded hut sites will hold further evidence relating to Australia's past. Further evidence may be obtainable through small scale, sub-surface investigations at these sites. To hold archaeological or historical significance, the mining areas have to meet at least one of the significance criteria above and retain the integrity of its key attributes. The mining areas at Wattle Flat hold a moderate level of significance and retain portions of the integrity of their key attributes. The sites have an overall moderate level of archaeological and historical significance and should all be listed as Statutory Heritage Items under Section 5 of the Bathurst Region Local Environment Plan. The physical condition of the mining areas (intactness level) is assessed using the grade range suggested by the Bathurst Regional Council and is generally of: (e) Mixed Disturbance.

There remains one area of potential importance associated with the Wattle Flat mining areas – that of their potential for display. Through using the information recorded in this report, there are no portions of the mining areas that should be reconstructed. However, the two standing hut structures should be protected from the elements. The rest of the archaeological remains discussed are robust and do not need further attention. All of the items and areas should be made safe and clean prior to interpretive display, this would be a good heritage outcome. The best areas for interpretive display – depending on Bathurst Regional Council requirements – are:

- The mining equipment and other infrastructure surrounding BOM15
- The concrete dam at BOM18
- The boiler at BOM19
- The blazed tree at BOM35
- The boiler remains and other infrastructure at LOM5
- The stamper remains and other infrastructure at LOM10
- The 1960s gold processing equipment and associations at QM21

Archaeological Potential

Much of the structural components of the mining sites are collapsed or have been removed from the site. The parts of the equipment and associated features remaining are unmaintained, mostly in a dilapidated state, and dangerous to visit due to unstable equipment or risk of falling into a mine shaft or a mine shaft collapse. Nevertheless, there are considerable remains left of the past mining activities at Wattle Flat and for the reasons stated above, these have high local significance and moderate State significance. Predominantly, their dilapidated state and the known nature of mining in NSW prevents a high significance rating. The remains of gold mining activities at Wattle Flat's have an overall moderate archaeological significance.

Heritage Significance

The mining sites recorded have a low potential to contain previously unknown historical material or information that relates to Australia's colonial period. It is possible to associate mining in the area generally with today's local Wattle Flat residents and assess the conditions under which people worked and, therefore, aspects of their lives. There is a low potential for these sites to contain information that could be associated with a person of note in Australia's history. For these reasons, the mining remains have moderate local heritage significance and moderate State significance, due predominantly to their dilapidated state, no notable associations and the known nature of the remains.

Impact of the Proposed Development

If the proposed interpretative information work at the mining sites goes ahead, there will unavoidably be an impact on the sites, but not necessarily in a detrimental manner. The ground works required would not disturb sites significantly and would facilitate site access on existing tracks, the establishment of walking trails with information panels, and the physical stabilising of relics. Most importantly however, is that the sites are made safe for visitation by cleaning and stabilising any equipment or equipment areas and covering or clearly marking any mine shaft openings. If conducted with the knowledge that heritage items are present and the use of appropriate materials, these activities are acceptable, and will benefit the historical sites and protect them against further disturbance.

Recommendations

Due predominately to the dilapidated state of the mining sites and their known technological value, an overall moderate level of archaeological and historical significance has been given for the historical remains. Plans to develop the sites as interpretive attractions with specific signage can go ahead without any loss of heritage significance. Any repairs or attempts to protect (from the elements) the standing hut structures LOM6 and BOM8 should use materials that are in keeping with their heritage and not alter their fabric or structure – as discussed in this report.

To obtain a greater level of historical information, small scale sub-surface archaeological investigation could be conducted at the stone hut remains at LOM1, 15 and 16. Small scale sub-surface archaeological investigations could also be conducted at the pole and pug structure LOM6. This may reveal information on the nature of the hut's occupants, aspects of their day-to-day lives and add to our current knowledge of the cultural, social and economic situation of miners at Wattle Flat. The recommendations in this Archaeological Management Plan represent the best heritage outcome for preserving the acknowledged remains for future generations to understand and appreciate. In addition, interpretive signage will give the public an appreciation of the purpose of the equipment, the technology of the period and the history of the area. It is recommended that a copy of this report be supplied to Chris Green to assist him with the Wattle Flat Heritage Lands Trust work. As the sites are assessed as having moderate level heritage significance, a heritage-related permit is required for any future development at the sites.

UNEXPECTED DISCOVERIES PROTOCOL

This section constitutes a contingency plan to manage any unexpected Cultural Heritage issues that may be encountered during ground or relic disturbing activities within any of the study area. This contingency plan should be kept on site during the construction phase of any works. The plan provides guidance to construction workers so they may meet their heritage obligations in accordance with the various OEH 2010 guidelines.

Contingency for the Discovery of Historical Cultural Heritage

There is a low potential for previously unknown historical cultural heritage to be discovered during any future works. The most prospective areas are the underground remains (footings or post remains) of a domestic dwelling or mining associated artefacts.

If items of an historical nature are uncovered during construction of a tourism study area, the following procedures must be followed:

• The person should immediately notify the person in charge of the activity. The person in charge should then suspend any ground disturbing works at the location of the discovery and within 15 metres of the extent of the suspected site.

- The person in charge of the activity must then contact the OEH Sydney Branch and report the discovery (on T: 02 98738500).
- A Cultural Heritage Advisor should be employed to survey the site remains and evaluate their significance.

• If the items are considered to be historically significant, the Cultural Heritage Advisor should provide a written management procedure for the site and have it approved by the OEH Sydney Branch.

• On completion of the management recommendations, the study area developments may continue.

Contingency for the Discovery Of Human Remains

The following five-step contingency plan describes the actions which should be taken in instances where human remains or suspected human remains are discovered. Any such discovery within the study area must follow these steps.

- 1. Discovery:
- if suspected human remains are discovered all activity in the vicinity must stop to ensure minimal damage is caused to the remains;
- the remains must be left in place, and protected from harm or damage; and
- a buffer zone of 50 metres should be established and remain in place around the suspected skeletal remains until they have been assessed.
- 2. Notification:
- once suspected human skeletal remains have been found, the NSW Coroner's Office (02 85847777) and the NSW Police must be notified immediately (02 62980555);
- all details of the location and nature of the human remains must be provided to the relevant authorities;
- if it is confirmed by these authorities that the discovered remains are Aboriginal skeletal remains, the person responsible for the activity must report the existence of the human remains to a suitably qualified Cultural Heritage Advisor and the OEH Sydney Branch;
- no media is to be contacted in regards to the discovery of human remains; and
- no photographs of human remains are to be taken without appropriate approval of the local Registered Aboriginal Organisation groups and OEH Sydney Branch.

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