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Gold Rush environmental change and its potential impact on Aboriginal archaeological sites in Victoria

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Abstract
It is becoming increasingly apparent that the impact of gold mining on Aboriginal cultural heritage is much more complex than originally understood. The results of Cultural Heritage Management Plan (CHMP) assessments in Bendigo are making clear that ground surfaces reworked during the gold rush can retain in situ Aboriginal artefacts. Research carried out as part of the Rivers of Gold Project is demonstrating that such reworked surfaces, and new landforms associated with mining, exist across many of Victoria’s river valleys. Improved knowledge of the environmental history of gold mining suggests several implications for the way Aboriginal archaeology is managed. A new project jointly funded by Aboriginal Victoria and La Trobe University proposes to address this issue. The project will use existing research to model the kinds of impacts experienced on landforms, which waterways may have been affected, and the likely distance from waterways where disturbance may be evident. The aim is to develop tools that will integrate information about the effects of mining on landforms with existing legislative and management frameworks to achieve better outcomes for Aboriginal archaeology and cultural heritage management.

Environmental effects of gold mining
The large-scale mining for gold that began in Victoria in 1851 had an immediate destructive effect on the environment. The general impact on streams, forests, and air quality has been noted by several authors who have pointed to the widespread cutting of forests for timber, the destruction of river valleys by digging and washing the soil, the release of sediment into waterways, and the creation of toxic fumes as a result of roasting ores (Frost 2013; Garden 2001; McGowan 2001; Peterson 1996; Powell 1976:37–41; Rae 2001). More recently, detailed research into the effect of mining on river systems has highlighted a number of different ways in which river systems and floodplains were changed as a result of mining (Lawrence and Davies 2014; Lawrence et al. 2016; Davies et al. 2016), all of which have implications for the preservation of Aboriginal cultural heritage.

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parliamentary proceedings and government enquiries. It was not resolved until the passage of legislation in 1904 finally made it possible to successfully prosecute polluters (Lawrence et al. 2016). In the 100 years since the sludge controversy, most floodplain deposits have been revegetated, but they are still recognisable in eroded river banks where several metres of redeposited mining waste may be present (Figure 4). Around Bendigo, the work of historical geographer Lynette Peterson has resulted in the formal identification and mapping of a layer of mine tailings now referred to by its map label, ‘Faf’ (Kotsonis and Joyce 2003a, 2003b; Peterson 1996).

A further effect on rivers was the complete relocation of the channel. Goldfields towns began building ‘sludge drains’ from the late 1850s to shift the sludge downstream (e.g. Hansen Partners et al. 2003:170–252; Jean and Moloney 2015:64–72). This involved digging a new channel for the river and lining it with timber, masonry and brick. These channels are invariably straighter than the original course of the river, so that meanders have been cut off. Historical maps indicate that they are also frequently some distance away from the location of the previous river bed, as in the case of Creswick where the sludge channel diverted the creek up to 500 m from its previous location (Davies et al. 2013:61). These channels remain the riverbed in many regional towns and cities today, with the original river long built over and forgotten.

The sites where mining took place, and the parts of rivers that were channelised, may be severely impacted, but they are also localised in extent and identifiable through archival research. In contrast, the location of sludge layers was less well-documented at the time, and these layers can extend for many kilometres downstream into districts without any obvious connection to gold mining. Research carried out as part of the Rivers of Gold Project has demonstrated the widespread impact of sludge on rivers (Davies et al. 2018). It has been calculated that mining released approximately 650 million m$^3$ of sludge into Victorian rivers between 1851–1891. It is also apparent that up to three quarters of Victoria’s major river systems were affected by mining sludge.

**Impacts on Aboriginal cultural heritage**

Each of the environmental effects described above could be expected to have a different impact on Aboriginal cultural heritage. Where ground has been removed, as in sluicing, it is anticipated that any evidence for Aboriginal activity once within that ground, such as artefacts or hearths, would also have been removed. Features such as hearths would have been destroyed, but artefacts potentially could have been moved downstream along with the unworked stone that comprised part of the
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Figure 2: Little River Gold Dredging Company dredge, Mongarlowe River, 1900 (Clift 1975:Plate 6)

Figure 3: Paddock at Newstead formerly worked by the Victoria Gold Dredging Company
sludge. Where dredging has taken place, artefacts may have been discharged as part of the sludge. Dredges retained most of the gravels on-site, however, and used it as backfill in the ponds, so it is possible that artefacts likewise would have been retained within the dredged area. If so, they would be completely decontextualized as dredging destroyed the natural stratigraphy and spatially displaced the deposits.

Sludge may be expected to have had a more positive effect on artefacts. The slow-moving silts and sands created new stratigraphic layers on the floodplains that buried previous ground surfaces. In such situations, artefacts should be well-preserved within their original spatial and stratigraphic contexts. This is the case at several locations along Bendigo Creek, where artefacts have been identified beneath sludge layers during the preparation of CHMPs (e.g. Filhia 2018; Oataway et al. 2018). Additionally, the relocation and channelising of rivers may have worked to preserve artefacts as the original channels may be relatively undisturbed. However, these artefacts may not be identified during the CHMP process where predictive modelling relies on the current location of waterways, rather than the location of pre-1836 rivers. In other words, CHMPs triggered by proximity to modern rivers may be in the wrong place for targeting earlier rivers.

The project

In light of increasing knowledge about the widespread and various impacts of mining, Aboriginal Victoria (AV) and La Trobe University have joined together in a new collaborative project that will provide the modelling needed to underpin improved management of Aboriginal places and artefacts. Together, they are funding a La Trobe Industry PhD scholarship that will support a PhD candidate, starting in June 2018, based in part at La Trobe and in part at Aboriginal Victoria. While at AV, the candidate will be able to work with staff in Melbourne and in regional offices, and will also work with Aboriginal communities.

The project will be a desktop study in which existing evidence will be reviewed and integrated into a GIS database to generate predictive models of ground disturbance. Evidence to be considered will include historical maps and archival documents, scientific reports, data from the Aboriginal Cultural Heritage Register and Information System (ACHRIS), and the results of previous CHMPs. By working closely with AV staff, the candidate will be able to develop familiarity with existing legislation, guidelines and processes. The candidate will be able to make the best use of AV’s relationship with the relevant Traditional Owners, Registered Aboriginal Parties and the Victorian Aboriginal Heritage Council while working at Treasury Place and in regional Victoria.

The core of Victoria’s Aboriginal cultural heritage protection and management system is the CHMP process. This process utilises a statutory trigger model, with areas of cultural heritage sensitivity and significant ground disturbance representing critical elements of these triggers. The system therefore relies heavily on sound information and understanding about Aboriginal places in the Victorian landscape, and the impacts of European activity. As alluded to above, without such information, the triggers—and therefore the CHMP process—target areas that may no longer be sensitive for Aboriginal places, or miss areas that may be sensitive. The result is a distorted Aboriginal heritage statutory system which will
not serve Aboriginal people, land users or the broader Victorian community optimally.

It is envisaged that this research will greatly increase our understanding of the impacts of gold mining on the Victorian landscape, which will then translate into direct regulatory reform of the CHMP triggers in the impacted areas. In addition, the research will lead to refined CHMP field methods and therefore improved CHMP outcomes in these areas of Victoria, greatly improving our knowledge of Aboriginal places in the landscape and how these were affected by this significant disturbance, while providing accurate and appropriate cultural heritage management conditions for land users. Finally, AV and relevant Registered Aboriginal Parties will be in a far better position to develop policy priorities to protect Aboriginal places in these areas of the state more efficiently. The efficient allocation of resources in strategic cultural heritage management is especially important for Registered Aboriginal Parties operating with limited funding.

Conclusion
It is anticipated that the Rivers of Gold Project will help to resolve some of the issues currently experienced in former mining areas where recent ground disturbance is known but not well-understood. The project also has a broader significance. Non-Aboriginal activities have caused a number of changes to rivers and wetlands in the past 150 years, of which mining is only one. Previous work connected with CHMPs has pointed to the archaeological implications of the drainage of wetlands such as Carrum Swamp and at Kalkallo (e.g. de Lange 2013; McAlister and McConachie 2018). Changed erosion and sedimentation caused by agriculture and land clearance has been widely documented by soil scientists since the 1940s (e.g. Forbes 1950). The resulting new stratigraphic layers, known as Post-Settlement Alluvium, have been identified on floodplains in many parts of Victoria. The results of this project may be able to establish a basis for better understanding the many complex changes to the Victorian landscape in the recent past, and their impacts on Aboriginal archaeology.

References

Filihi, M. 2018 Beneath the sludge: Bendigo's gold-mining past and the endurance of Dja Dja Wurrung cultural heritage, paper presented to Victorian Archaeology Colloquium 2018, La Trobe University, Melbourne, Australia
McAlister, R. and F. McConachie 2018 Investigating cultural heritage landscapes: A case study from Kalkallo, paper presented to Victorian Archaeology Colloquium 2018, La Trobe University, Melbourne, Australia
Oatway, K., W. Truscott, and L. Tepper 2018 Evolving knowledge along Bendigo Creek, Epsom, Victoria, paper presented to Victorian Archaeology Colloquium 2018, La Trobe University, Melbourne, Australia
Peterson, L. 1996 Reading the Landscape: Documentation and Analysis of a Relict Feature of Land Degradation in the Bendigo District, Victoria. Monash Publications in Geography and Environmental Science, Number 48, Melbourne: Department of Geography and Environmental Sciences, Monash University


Rae, I. 2001 Gold and arsenic in Victoria’s mining history. Victorian Historical Journal 72(1–2):159–172

Ritchie, N. and R. Hooker 1997 An archaeologist’s guide to mining terminology. Australasian Historical Archaeology 15:3–29