



Victorian Murray Floodplain Restoration Project

Nyah Historical Heritage Desktop Assessment

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Lower Murray Water



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Document history and status

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Abbreviations

CHL	Commonwealth Heritage List
EMP	Environmental Management Plan
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
HIA	Historical Heritage Impact Assessment
HO	Heritage Overlay
HV	Heritage Victoria
LGA	Local Government Area
NHL	National Heritage List
NT	National Trust of Australia (Victoria)
the project	Victorian Murray Floodplain Restoration Project
R8	R8 joint venture
RNE	Register of the National Estate
VHI	Victorian Heritage Inventory
VHR	Victorian Heritage Register
VMFRP	Victorian Murray Floodplain Restoration Project
WHL	World Heritage List

Executive Summary

Project overview

Jacobs and GHD teamed in December 2018 to form a joint venture (R8 joint venture) to complete the Victorian Murray Floodplain Restoration Project (VMFRP). The aim is to design infrastructure for Lower Murray Water (LMW) including regulators, levees, roads, access tracks and culverts. R8 has been engaged to provide the historical heritage desktop assessment as part of the VMFRP.

The project involves the construction of five new regulators (N1a, N1b, N2, N5 and N7) and a 1.3 km containment bank to divert, retain and release water within downstream end of the Nyah-Vinifera (Regional) Park.

Under the proposed scheme, water would travel north along Parnee Malloo Creek after entering from the Murray River through the proposed N5 regulator, and then back into the Murray River at the main downstream regulator N2. The N2, N1a and N1b regulators are intended to isolate a large section of Parnee Malloo Creek from the Murray River and detain water in a managed event. The N5 regulator also prevents backflow into the Murray River when water is retained during a managed event. At low flows (below 17,500 ML/d) inundation of the floodplain can occur from backflow through regulator N2.

The project is located within Nyah-Vinifera (Regional) Park, within the Swan Hill Local Government Area (LGA).

Construction activities would occur within the area of investigation identified in Figure 1.1 to Figure 1.3. Construction activities would include:

- establishment of construction sites, set down areas and access routes
- removal of existing structures where required
- construction / installation of new structures.

Construction would involve the use of vehicles and machinery such as trucks, excavators and access equipment.

Desktop review

There are three historical heritage places registered within or immediately adjacent to the area of investigation (Section 1.1, Figure 2.10-Figure 2.12), all of which are listed on the Swan Hill Planning Scheme Heritage Overlay (HO):

- the registered heritage boundary of Former Church (HO201) intersects with the area of investigation;
- the registered heritage boundary of State School No. 3353 (HO202) is located less than 15 m from the area of investigation;
- the registered heritage boundary of Coach Route and *Schinus molle* (Peppercorn trees) (HO203) is located less than 15 m from the area of investigation.

In addition, the Former Church (HO201) as well as the Canoe Tree (HO205) intersect with the inundation area (Section 1.1, Figure 2.13-Figure 2.15).

However, examination of the *Rural City of Swan Hill Heritage Study Stage II* in combination with a review of the modern aerial imagery review has confirmed that the heritage boundaries are not in the correct locations:

- The physical location of the Former Church (HO201) is situated approximately 65 m to the northwest of the area of investigation, within allotment 1B\PP3391 of the Kulki Kulki (Northern Rivers) Scout Camp

- The physical location of Coach Route and *Schinus molle* (Peppercorn trees) (HO203) intersects with the area of investigation within a portion of road reserve to the west of the area of investigation at southern end of allotment 1A\PP3391 of the Kulki Kulki Scout Camp
- The coach route portion of Coach Route and *Schinus molle* (Peppercorn trees) (HO203), while in the name of this heritage place, was not mentioned in the significance statement of the *Rural City of Swan Hill Heritage Study Stage II*, nor was a description of its curtilage (spatial extent) provided. However, it likely crosses two sections of the area of investigation (at Gold Club Track and at Wood Wood), this cannot be confirmed without further research and a site inspection
- The physical location of the Canoe Tree (HO205) is situated within road reserve adjacent to the Murray Valley Highway, and the southern end of allotment 167\PP3391 to the east of the Murray Valley Highway, approximately 85 m to the west of the currently registered curtilage.

Based on an assessment of aerial imagery and a review of relevant historical heritage assessments, there is moderate potential for previously unidentified historical heritage to be present within the area of investigation, due to the possible coach route. Other site types which may be identified in the area of investigation would be places associated with early agricultural or pastoral activities and water management practices.

Impact assessment

The potential impacts are outlined in Table 1.

Table 1: Potential impacts on historical heritage within the area of investigation

Heritage place	Impact assessment
Former Church (HO201)	While the registered heritage boundary of the Former Church (HO201) intersects with the area of investigation, the actual physical location of the church is approximately 65 m to the northwest of the area of investigation, within allotment 1B\PP3391 of the Kulki Kulki (Northern Rivers) Scout Camp. As such, neither the proposed works (Section 3.1) nor the inundation (Section 3.1.1) will impact upon the historic or social significance of the heritage place.
State School No. 3353 (HO202)	The registered heritage boundary of State School No. 3353 (HO202) is correctly mapped, and is approximately 12 m from the area of investigation. As such, proposed works (Section 3.1) will not impact upon the historic significance of the former school site.
Coach Route and <i>Schinus molle</i> (Peppercorn trees) (HO203)	While the registered heritage boundary of Coach Route and <i>Schinus molle</i> (Peppercorn trees) (HO203) is approximately 8 m from the area of investigation, the actual physical location of the stand of peppercorn trees intersects with the area of investigation, within the road reserve at southern end of allotment 1A\PP3391 of the Kulki Kulki Scout Camp. This place comprises the former coach route, the peppercorn trees, and was the former site of the Cobb and Co stables to which the historic trees were associated. As such, the proposed works (Section 3.1) may have the potential to impact on the significance of this heritage place. In addition, the proposed N1a/N1b Containment Bank (Section 3.1.1.2) and overfill Spillway 1 (Section 3.1.1) works at Wood Wood may impact upon any surface remains of the coach route and archaeological features associated with the HO-listed site. The inundation (Section 3.1.1) will not impact upon the historic significance of the heritage peppercorn trees.
Canoe Tree (HO205)	While the registered heritage boundary of Canoe Tree (HO205) intersects with the inundation area (Section 3.1.1), the physical location of the canoe tree is approximately 90 m to the west of the inundation area near the intersection of Miralie-Cocamba Road and the Murray Valley Highway. As such, there will be no impact upon the historic significance of the canoe tree from the inundation.

Approvals, mitigation measures and recommendations

If the scope of works changes to include other features of the heritage places detailed in Table 2, further heritage assessment would be required, and this assessment will need to be updated.

Table 2: Statutory requirements, mitigation measures and recommendations for heritage places within or adjacent to the area of investigation

Heritage place	Statutory requirements	Recommendations	Mitigation measures
Entire area of investigation	Discovery of archaeological sites - under Section 127 of the <i>Heritage Act 2017</i> , If an archaeological site is discovered during construction or excavation on any land, the person in charge of the construction or excavation must as soon as practicable report the discovery to Heritage Victoria (HV).	<p>Due to the possibility for historic archaeology to be impacted, as identified in this desktop assessment (Section 3.2), it is recommended that a Historical Heritage Impact Assessment (HIA) should be undertaken for the project. The HIA should include:</p> <ul style="list-style-type: none"> ▪ Field survey to identify further historical archaeological sites and any unidentified historical heritage places ▪ Assessment of impacts on all historical heritage sites ▪ Detailed identification of mitigation measures and approval requirements ▪ A Heritage Impact Statement. <p>An additional risk is the potential presence of previously unrecorded historical archaeological places being identified within the area of investigation. All historical archaeological places are protected under the <i>Heritage Act 2017</i>, whether they are registered or not. Further historical research to ascertain the likely presence of any historical archaeological places or material within the area of investigation is recommended to reduce the risk of delays to the project. Such delays would include the stoppage of works to avoid damage or destruction of historical archaeological sites and materials while the appropriate approvals are sought. This would enable R8 to proactively consider the nomination of historical heritage archaeological deposits ahead of the works, which would provide R8 with more certainty in relation to timeframes and statutory obligations. The completion of the HIA for the project would mitigate these issues.</p>	<p>General mitigation measures to be implemented across the area of investigation:</p> <ul style="list-style-type: none"> ▪ Historical heritage awareness training should be completed as part of the site induction for personnel and/or contractors prior to the commencement of construction works to ensure: <ul style="list-style-type: none"> - an understanding of where all heritage places are located within the area of investigation - an understanding of the potential heritage places that may be impacted during the project - the procedures required to be undertaken in the event of discovery of historical heritage material, features or deposits, or the discovery of human remains ▪ If an archaeological site is discovered during construction or excavation on any land, the person in charge of the construction or excavation must as soon as practicable report the discovery to HV <p>A copy of this report should be kept onsite and on file with the project records. All contractors and/or project staff should be made aware of the heritage status of the heritage places in the area of investigation prior to works taking place.</p>
Former Church (HO201)	Although the registered heritage boundary of Former Church (HO201) is in proximity to the works, the physical location of the church has been demonstrated to not be within proximity to the area of investigation. Consultation with Swan Hill Council is required to determine, planning	It is recommended that consultation with the Swan Hill Council be undertaken to correct the registered extent of the Former Church (HO201) after the HIA has been completed.	

Heritage place	Statutory requirements	Recommendations	Mitigation measures
	approval requirements considering the current recorded heritage boundary of this place.		
Coach Route and <i>Schinus molle</i> (Peppercorn trees) (HO203)	Although the heritage boundary of Coach Route and <i>Schinus molle</i> (Peppercorn trees) (HO203) is approximately 8 m from works, the physical location of the trees has been demonstrated to intersect with the area of investigation. Consultation with Swan Hill Council is required to determine planning approval requirements.	It is recommended that consultation with the Swan Hill Council be undertaken to correct the spatial data related to Coach Route and <i>Schinus molle</i> (Peppercorn trees) (HO203) after the HIA has been completed.	As there is potential for archaeological features associated with Coach Route and <i>Schinus molle</i> (Peppercorn trees) (HO203) directly impacted by N1a/N1b Containment Bank and Spillway 1 works, the following mitigation measures must be implemented to avoid any adverse impacts where possible to the heritage values of the site: <ul style="list-style-type: none"> As tree controls apply, it is recommended that advice be sought from a qualified arborist to determine the maximum extension of tree roots prior to works to ensure as to the required 'no go zone' around the boundary vegetation to avoid impact and therefore the need for a planning permit.
Canoe Tree (HO205)	Although the heritage boundary of Canoe Tree (HO205) is in proximity to the inundation area, the physical location of the trees has been demonstrated to not be within proximity to the area of investigation. However, as no ground-disturbing works are planned within the heritage boundary, planning approvals are unlikely to be required.	It is recommended that consultation with the Swan Hill Council be undertaken to correct the registered extent of the Canoe Tree (HO205) after the HIA has been completed. Additionally, Canoe Tree (HO205) should be referenced against Aboriginal cultural heritage places on the Victorian Aboriginal Heritage Register, as part of the associated Cultural Heritage Management Plan.	-

Important note about your report

The purpose of R8's engagement under the Victorian Murray Floodplain Rehabilitation Project (VMFRP) is to design infrastructure for Lower Murray Water (LMW) including regulators, levees, roads, access tracks and culverts. The designs are required to be suitable for construction pricing to inform business case prioritisation. The purpose of this infrastructure is to allow floodplains to be watered at the hydraulic design levels nominated by LMW. R8 is also engaged to provide Regulatory Approvals and Cultural Heritage Services. The purpose of these services is for LMW to lodge the necessary approvals documents for the project with the relevant approvals authorities.

The sole purpose of this report and the associated services performed by R8 is to complete an Interim Heritage Report for LMW in accordance with the scope of services agreed between R8 and LMW.

R8 has prepared this report in accordance with the usual care and skill expected of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. However, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

This report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by R8 for use of any part of this report in any other context. This report has been prepared on behalf of, and for the exclusive use of LMW, and is subject to, and issued in accordance with, the provisions of the agreement between R8 and LMW. R8 accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

1. Introduction

1.1 Project location

The project is located within the Nyah-Vinifera (Regional) Park, within the Swan Hill Local Government Area (LGA).

The area of investigation (Figure 1.1-Figure 1.3) comprises the development footprint, as well as a substantial buffer around the development footprint and access tracks, within the Nyah-Vinifera (Regional) Park between Nyah in the south and Wood Wood in the north, and the Murray River in the east and the Murray Valley Highway in the west.

The inundation area (Figure 1.1-Figure 1.3) comprises much of the Nyah-Vinifera (Regional) Park between the Murray River in the east, the accessway into the forest at Wood Wood in the north, the access tracks east of the Murray Valley Highway in the west, and Byrnes Lane in the south. This will comprise an inundation of approximately 488 hectares.

1.2 Purpose of assessment

Jacobs and GHD teamed in December 2018 to form a joint venture (R8 joint venture) to complete the Victorian Murray Floodplain Restoration Project (VMFRP). The aim is to design infrastructure for Lower Murray Water (LMW) including regulators, levees, roads, access tracks and culverts. R8 has been engaged to provide the historical heritage desktop assessment as part of the VMFRP.

The purpose of this desktop historical heritage assessment is to:

- Identify registered historic heritage places potentially impacted by construction works or managed inundation
- Identify likelihood of unregistered historic heritage being encountered in construction areas
- Describe likely approval requirements
- Describe further investigations and/or recommended management measures.

1.3 Desktop assessment

This desktop assessment involved the following activities:

- Register searches
- Review of previous heritage reports and local heritage studies, site cards and other site information (including a review and update of the existing historical archaeology due diligence assessment previously prepared for the project by Jo Bell Heritage Services (Edwards and Bell 2014))
- Background historical research including historical maps and plans
- Synthesis of background information to identify known heritage places both in the area of investigation and within the inundation areas, and areas with potential for previously unidentified heritage places
- Summary of potential impacts and mitigation measures
- Identifying further heritage investigation required to meet legislative requirements and to minimise project risk
- Identifying approval requirements under the *Heritage Act 2017*, local planning schemes, and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

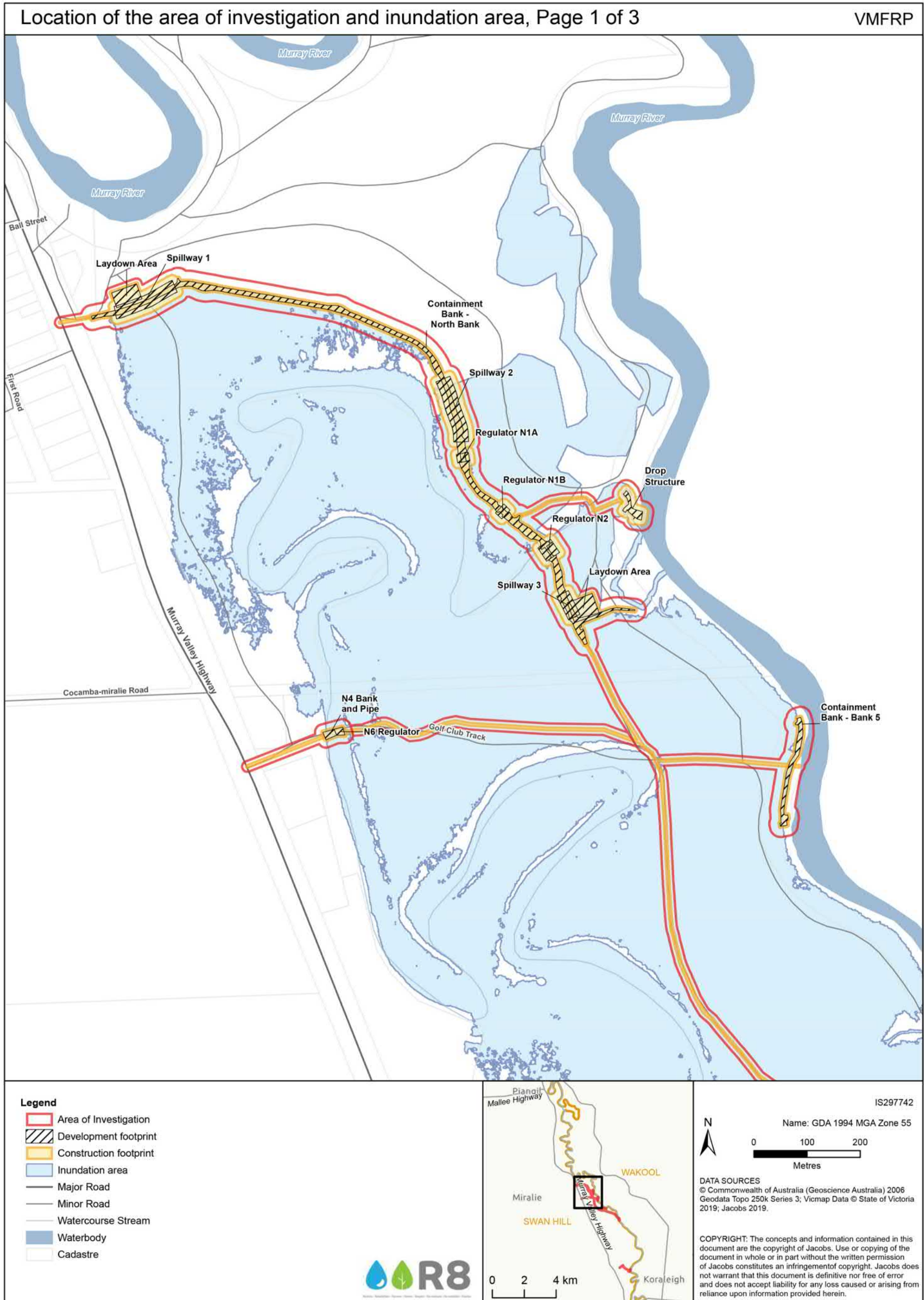
1.4 Authorship

This report was prepared by Caroline Seawright (Project Archaeologist, R8). Mapping was prepared by Nicole Kiely (Senior Consultant – Spatial and Information Services, R8). A technical review was undertaken by Rose Overberg (Principal Heritage Consultant, R8).

1.5 Assumptions and limitations

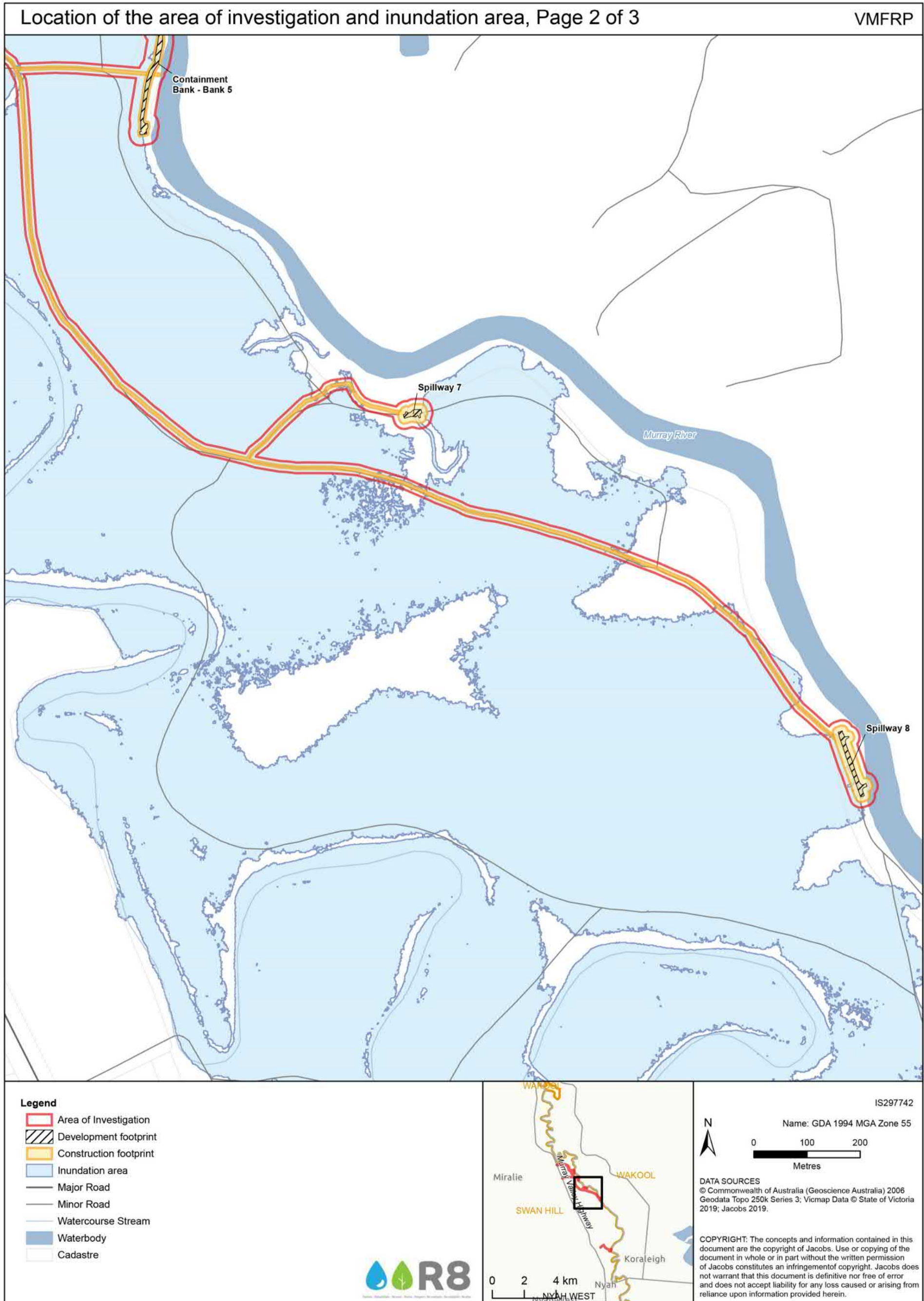
The constraints are as follows:

- The assessment was undertaken using the assessment area provided on 9 December 2019 by Dane Balodis (Senior Spatial Analyst, R8)
- No field investigation was undertaken
- The register searches were undertaken on 10 January 2020 and any findings within this report are based on those search results. As such, this report is accurate as to the date of that generation.



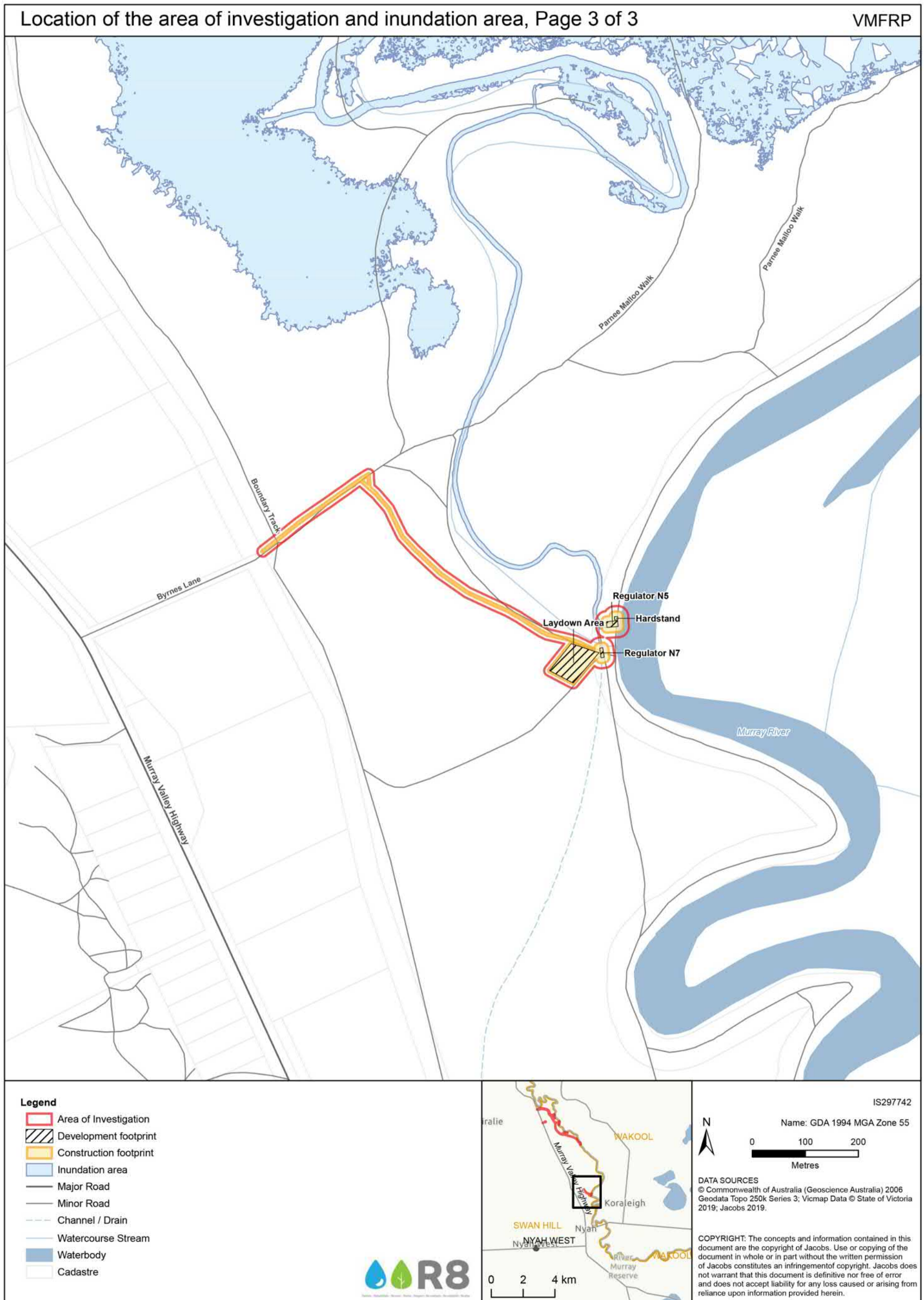
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Figure 1.1: Location of the area of investigation and inundation area (1 of 3)



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Figure 1.2: Location of the area of investigation and inundation area (2 of 3)



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Figure 1.3: Location of the area of investigation and inundation area (3 of 3)

2. Desktop review

2.1 Heritage context

2.1.1 Register searches

The following heritage registers were searched on 10 January and 12 March 2020 by Caroline Seawright (Project Archaeologist, R8) to determine whether any known historical heritage places were present within or in proximity to the area of investigation and to the inundation area:

- Victoria Heritage Register (VHR)
- Victoria Heritage Inventory (VHI)
- Swan Hill Planning Scheme Heritage Overlay (HO)
- Commonwealth Heritage List (CHL)
- National Heritage List (NHL)
- World Heritage List (WHL)
- Register of the National Estate (RNE).

There are three historical heritage places within or adjacent to the area of investigation (Table 2.1, Figure 2.10-Figure 2.12), all of which are listed on the HO. One intersects with the area of investigation, Former Church (HO201), near the entry into Nyah State Forest at Wood Wood; the other two are within 15 m of the area of investigation: State School No. 3353 (HO202), near the entry into Nyah State Forest at Wood Wood, and Coach Route and *Schinus molle* (Peppercorn trees) (HO203), near the intersection of the Murray Valley Highway and Golf Club Track. Tree controls apply to HO203.

Table 2.1: Historical heritage places within proximity to the area of investigation

Heritage database	Register number	Name	Address	Description	Distance from project
HO	HO201	Former Church	Murray Valley Highway, Wood Wood	Former church	Intersecting
HO	HO202	State School No. 3353	Murray Valley Highway, Wood Wood	School	12 m
HO	HO203	Coach Route and <i>Schinus molle</i> (Peppercorn trees)	Murray Valley Highway, Wood Wood	Historic coach route and trees	8 m

There are two historical heritage places within proximity to the inundation area (Table 2.2, Figure 2.13-Figure 2.15), both of which are listed on the HO. These comprise the Former Church (HO201), and Canoe Tree (HO205).

Table 2.2: Historical heritage places within proximity to the inundation area

Heritage database	Register number	Name	Address	Description	Distance from project
HO	HO201	Former Church	Murray Valley Highway, Wood Wood	Former church	Intersecting
HO	HO205	Canoe Tree	Murray Valley Highway, Wood Wood	Tree	Immediately adjacent

2.1.2 Previous historical heritage assessments

There have been three historical heritage investigations undertaken in proximity to the area of investigation (Table 2.3).

Table 2.3: Summary of the existing historical heritage due diligence assessment by Jo Bell Heritage Services

Author	Summary
<p>Edwards and Bell (2014)</p>	<p>Jo Bell Heritage Services undertook an historic due diligence assessment for the Mallee Catchment Management Authority (CMA) as part of the Sustainable Diversion Limits Project. The report was prepared for the proposed regulator structures, track raising and embankments situated on the Nyah-Vinifera floodplain, within the Nyah-Vinifera Park between Nyah and Wood Wood.</p> <p>During the desktop assessment, the report identified only one prior assessment of the Nyah-Vinifera Park, which comprised the Stage II investigations for water management options for the Mallee CMA (Ecological Associates Pty Ltd 2007). As such, the assessment area has not previously been systematically assessed for historic archaeological sites. A register search identified one historical heritage place located within 100 m of the assessment area, comprising the Former Church (HO201) at Wood Wood. Other nearby sites within the assessment area comprised Takasuka Levee Bank (HO186) at Vinifera (approximately 110 m from the assessment area), and Former Ferry Crossing (VHI H7527-0002) at Nyah (1.2 km from the assessment area). No predictive model for archaeological potential was included in the report.</p> <p>The site inspection comprised an investigation of 100 m radius around each of the proposed structures, which comprised the assessment area. No historic archaeological sites or areas of archaeological potential were identified during the site inspection at Nyah or Vinifera. The report noted that this may be due to the narrow scope of the investigation, which did not include access tracks to the structures except where they coincided with proposed track raising. As no historic features or areas of potential were identified, no significance assessments or management detailed recommendations were made.</p>
<p>Allom Lovell and Associates (2001a; 2001b; 2001c; 2001d)</p>	<p>Allom Lovell and Associates completed a Stage II Heritage Study for the Rural City of Swan Hill in 2001, based on the Stage I project (which commenced in 1998), which included the establishment of potential sites of heritage significance, with 204 places were identified across the entire municipality. For each of these sites, the Stage II Heritage Study undertook further investigation, including a reassessment of each site to establish their cultural significance. After further research, Stage II compiled a list of 223 heritage places: six were recommended for inclusion on the VHR, the RNE, and the Swan Hill HO; 73 were recommended for the RNE, and the Swan Hill HO; 128 were recommended for the Swan Hill HO; and 16 places were ungraded due to demolition or insufficient levels of significance.</p> <p>Within Nyah, a total of 11 heritage places were identified, with ten being recommended for the HO and one being ungraded. These were predominantly located within the township of Nyah, with three situated along the Murray Valley Highway. Within Wood Wood, five heritage places were recommended for the HO, all of which were situated along the Murray Valley Highway. Three of these HO places are situated to the east of the highway, within the Nyah State Forest: Former Church (HO201), Coach Route and <i>Schinus molle</i> (Peppercorn trees) (HO203), and Canoe Tree (HO205). The Former Church (HO201) intersects with the current area of investigation, and the Coach Route and <i>Schinus molle</i> (Peppercorn trees) (HO203) is approximately 8 m from the current area of investigation. Two are to the west of the highway: Former State School No. 3353 (HO202), which is approximately 12 m from the current area of investigation, and Pepper Trees (<i>Schinus molle</i>) (HO204), which is not within proximity to either the area of investigation or the inundation area.</p> <p>The Former Church (HO201) was built in 1939 as the Wood Wood Methodist Church. It is a single-storey timber-framed building on a T-shaped plan, comprising a main hall with a small front porch and a rear wing. Each section has a separate gabled roof, clad in corrugated galvanised steel, with unlined eaves. The external walls are clad with sheet metal to dado height, and strapped cement sheet above. The porch has a side entry, with a pair of ledged and braced timber doors, and a timber-framed double-hung sash window to the front. There are rows of similar windows along the side elevations of the hall, but with fixed hopper sashes to the lower half. The rear wing (originally built as the Ultima Methodist Church and relocated to the present site in 1952) has narrow timber-framed louvred windows. Internally, the hall has a strapped Caneite ceiling, and the rear wing has timber lining board to walls and ceiling. After the closure of the church in 1971, the building was acquired by the Scouting Association, who established a camp at the site. The place exhibits significant continuity of use since 1939 that was an important regional focus for Methodist activities until its acquisition by the Scouting Association, and is of local historic and social significance. Its curtilage is described as a 'nominal curtilage of five metres should be maintained around the building, extending right to the property line at the street frontage, in order to preserve the setting and views of the hall'.</p> <p>The peppercorn trees of Coach Route and <i>Schinus molle</i> (Peppercorn trees) (HO203) are situated in a cluster, on the east side of the Murray Valley Highway. The trees are among the few surviving elements associated with this long-obsolete mode of transport which was superseded by the extension of the railway network from the 1890s onwards, and were assessed as being of local historic significance; the history states that, 'The trees are</p>

Author	Summary
	<p>associated with the coach route, and, in particular, the former site of the Cobb and Co stables'. No further details about the stables were mentioned in the heritage study. Its curtilage is described as a one which 'should be preserved to maintain the setting of the trees, nominally the dimension of the canopy overhang plus a nominal five metres, and also extending to the edge of the roadway'. The coach route itself has not been given a heritage curtilage and is not mentioned in the significance statement in and of itself. It lay between the Coach Route and <i>Schinus molle</i> (Peppercorn trees) (HO203) and Canoe Tree (HO205). The coach service operated between 1861 and 1915, when it closed due to the opening of the railway line between Swan Hill and Piangil.</p> <p>The Canoe Tree (HO205) is an Aboriginal scarred tree to the east side of the Murray Valley Highway. The tree is of historic significance as it provides valuable evidence of the occupation of the area by Aboriginal people prior to, and in the early days of, European settlement, and significantly demonstrates the actual process of canoe making. It is a representative example of a scarred tree, of which many examples remain in Victoria, enhanced by its particularly prominent location beside the Murray Valley Highway. Its curtilage is described as a 'nominal curtilage of twenty metres [which] should be maintained around the tree on all sides to preserve its setting, and its views from the Murray Valley Highway'.</p> <p>Former State School No. 3353 (HO202) is a former school complex that was built at its present location in 1909; the existing school building was opened in 1915, although an older school building had been opened in Wood Wood in 1900 (it was relocated to Nyrraby when the new building opened). The school was closed in 1974, due to lack of attendance. From the late 1970s, the site was used as a school camp for students from Swan Hill Primary School, known as 'Camp Golding'. To provide additional accommodation, a second building was relocated to the site: this comprised State School 3386 from Narrung, dated to 1923, where it served as for seven years before being moved to Piambie, where it served as State School No 4162 until its closure in 1970. By 1990, the buildings were in a state of disrepair, and the electrical wiring had been condemned. They remain in poor condition, but are intact. The place was assessed as being of local historical significance. A nominal curtilage should be maintained around the various buildings 'to preserve their setting and their relationship to each other'. The assessment also stated that 'vacant land between the classrooms and the front property line should also be maintained to preserve the roadside views of the school and assist in its interpretation'.</p>
<p>Ecological Associates Pty Ltd (2007)</p>	<p>Ecological Associates Pty Ltd was engaged by the Mallee CMA to undertake Stage II investigations of water management options for the Murray River from Robinvale to Wallpolla Island. One section of the assessment area intersects with the current area of investigation within the Nyah-Vinifera Park between Nyah and Wood Wood.</p> <p>The background history of the assessment area stated that no historical archaeological investigations have been undertaken in the study region. No previously registered sites were identified within the works locations of the assessment area. While two historical heritage assessments had been undertaken of proposed development projects, one at Robinvale and the other at Swan Hill, no historical sites were identified during these assessments. Neither of these two assessments were undertaken within the current area of investigation.</p> <p>A site inspection was undertaken across the assessment area to identify historical heritage places, however this did not include any part of the current area of investigation. These included obtrusive site types (such as historical structures) along with surface and potential subsurface sites. No detailed assessment was undertaken at Nyah, and no historical assessment has therefore been undertaken within the current area of investigation.</p>

2.2 Historical context

2.2.1 Historical background

The area of investigation is situated within the former Tyntynder squatters run which encompassed the present townships of Wood Wood, Nyah, Nyah West, and Vinifera, which in itself, was a subdivision of the larger Swan Hill run. The Swan Hill run was gazetted in 1848, but was owned by Andrew Beveridge from 1845 until its subdivision in 1866. The Tyntynder portion of the run remained under the control of Beveridge until December of 1866, when it was transferred to pastoralist William John Turner Clarke. The land then passed through several hands until 1884, when it was recorded as being owned by George Holloway and George Seward (Spreadborough and Anderson 1983). The Tyntynder Homestead is situated at Beverford, approximately 10 km to the southeast of the area of investigation.

Present-day Wood Wood, situated to the north of the area of investigation, was known as Woortwoort (Department of Lands and Survey 1880s; 1884; Monument Australia 2014; Victorian Places 2015).

The Nyah area was originally settled in the 1880s as 'Taverner Community Village Settlement', but surveyed under the name of Tyntynder in 1893. Tyntynder was formed by Jim Thwaites as a utopian socialist community, in imitation of the New Australia colony founded by William Lane in Paraguay with 238 colonists earlier in 1893, after having acquired the land in 1891; however, the colony failed by 1894 due to Lane's strict rules and abrasive personality. The failing support for socialism combined with a lack of access to water for the fields led to the end of state support for the community. By 1894, the post office opened within the Tyntynder township (Monument Australia 2014; National Library of Australia 2005; Swan Hill Rural City Council 2017). Tyntynder was renamed as Nyah shortly thereafter in the same year, with 'Nyah' possibly having been derived from an Aboriginal word referring to a bend in the Murray River.

From the mid-1890s, farm selection blocks were opened for sale, which was followed by the opening of a school there in 1896 (Victorian Places 2015).

In 1898, the first private pumping scheme was established at Nyah by Jim Thwaites, along with Andrew Heath and five other early settlers, who obtained an official licence to divert forest floodwaters by blocking Gunbower Creek's outlet from the Murray River near Nyah for irrigation purposes in 1899. They accomplished this by excavating a 400 m channel across the present-day Nyah-Vinifera Park Forest, and a tunnel into hillside where they build a 22 m deep shaft. Water was pumped up this shaft by a steam boiler into a concrete basin, from where it was lowered to water the blocks of land below. The basin is extant on land originally owned by Thwaites, situated to the south of the township of Nyah, opposite Thwaites Road on the western side of the Murray Valley Highway, approximately three kilometres to the south of the area of investigation. From there, water was distributed to the other six early settlers by means of a channel (Allom Lovell and Associates 2001c; Swan Hill Rural City Council 2017). In 1909, the State Rivers and Water Supply Commission installed a pumping station at Nyah Bend, to provide water for fruit production within the region (Victorian Places 2015). By 1910, 50 acre blocks of land were used for alfalfa cultivation, and by 1912 much land had been subdivided for fruit trees. By 1919, fruit trees were replaced by vines (Edwards and Bell 2014, p. 21).

As part of the Nyah-Vinifera (Regional) Park, the area of investigation is likely to have been impacted by pastoralism, commercial logging activities, drainage construction, and, to a lesser extent, from tourism (Cusak 2000).

2.2.2 Historical maps and aerial imagery review

In 1851, the assistant surveyor's map of the Murray River between Piangil to Swan Hill shows that the present-day Nyah State Forest as comprising reeds, reed beds, thick high reeds, flooded ground, and swamp which surrounds land then known as Parne-Milloo Island (Figure 2.1).

Tyntynder North parish maps show that, around 1960, land to the north of Nyah was predominantly narrow rural blocks, with several small allotments situated to the east of the Murray Valley Highway and a 'timber reserve' situated between there and the Murray River. The timber reserve generally follows the same alignment of the Nyah State Forest section of the Nyah-Vinifera (Regional) Park. The area of investigation is situated within this timber reserve (Figure 2.2 and Figure 2.3).

These timber reserves appear to date from at least 1921, where the *Nyah Irrigation Settlement Extension* map shows the area that aligns with the Nyah State Forest being described as 'river flats timberland with red-gum and subject to inundation' and 'red gum swamp' (Figure 2.4).

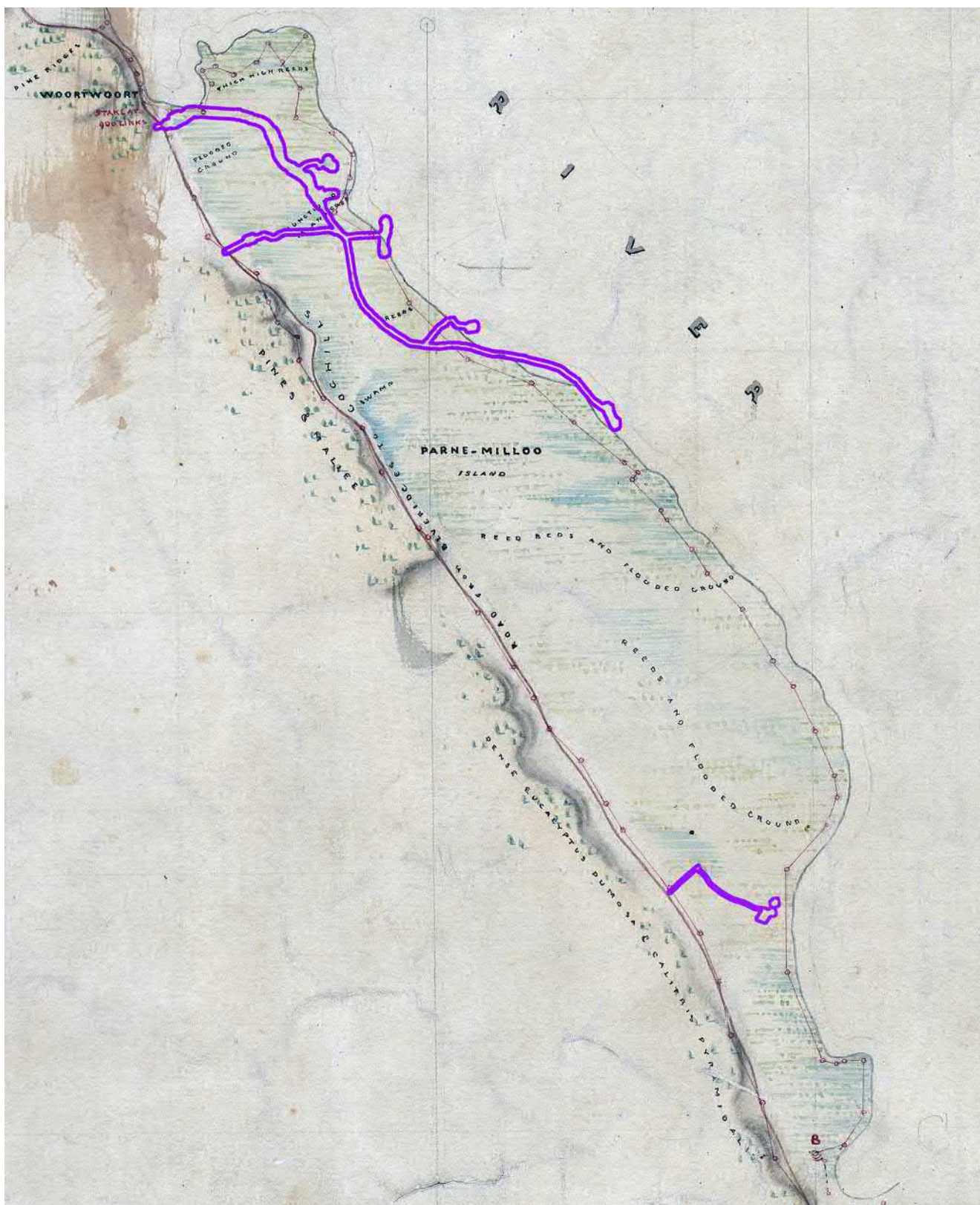


Figure 2.1: Surveyor's map of the Murray River between Nyah to Wood Wood, with the approximate area of investigation outlined in purple (Prichard 1851)

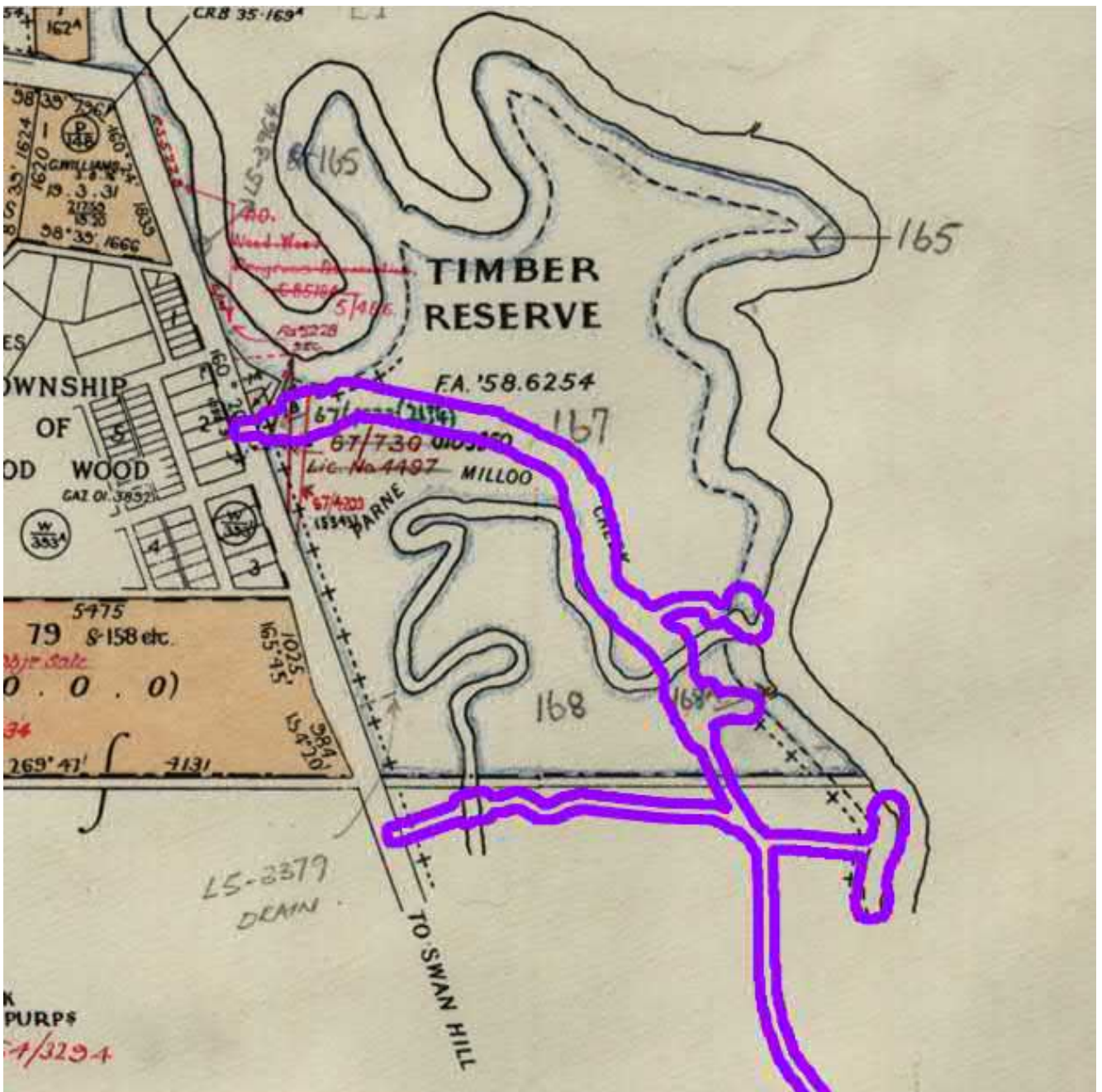


Figure 2.2: Piangil Parish Map with the approximate location of area of investigation outlined in purple; the area of investigation continues southwards onto the Tyntynder North parish map (Department of Lands and Survey 1961)

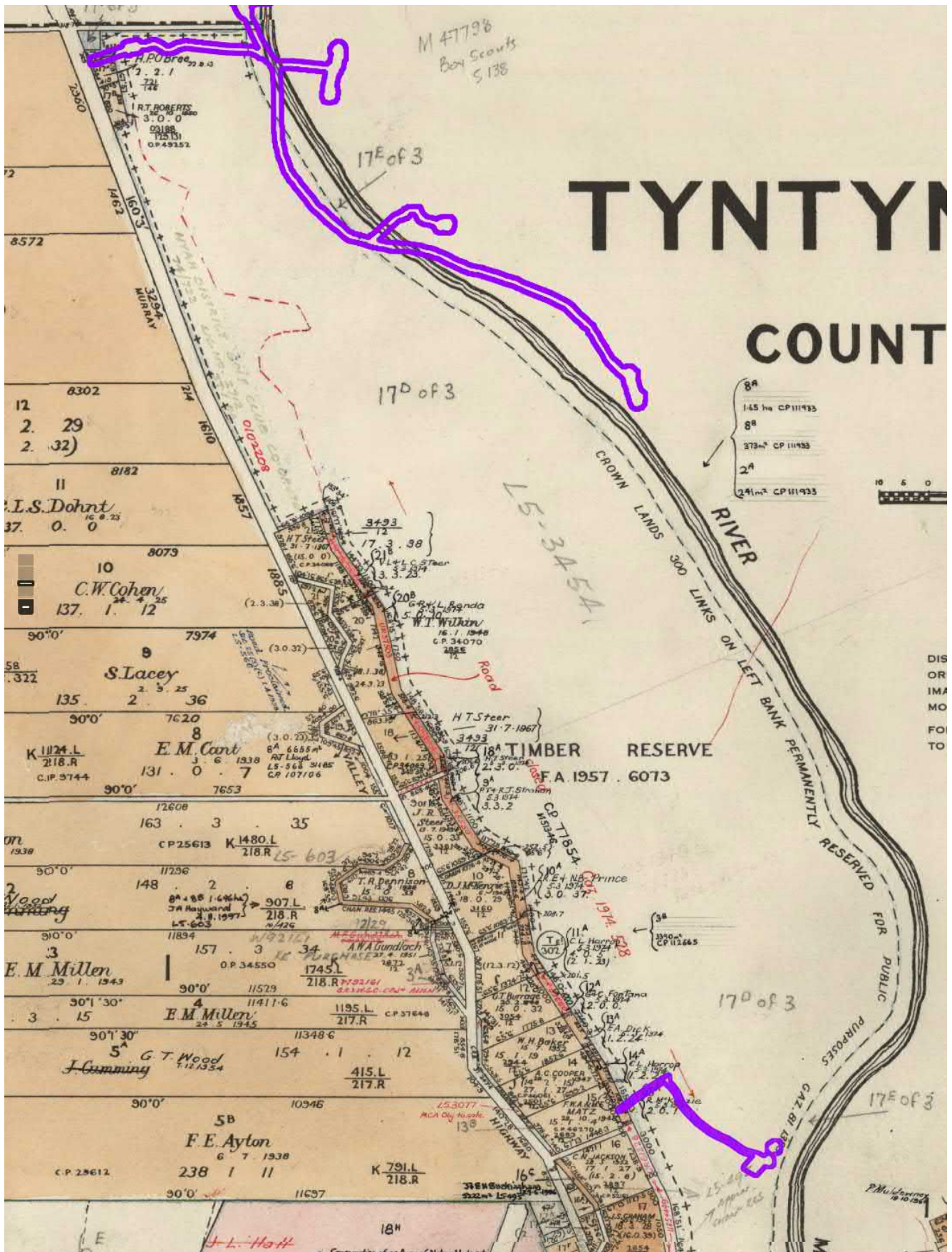


Figure 2.3: Tyntynder North Parish Map with the approximate area of investigation outlined in purple; the Murray River appears to have changed course since this map was created (Department of Lands and Survey 1959)

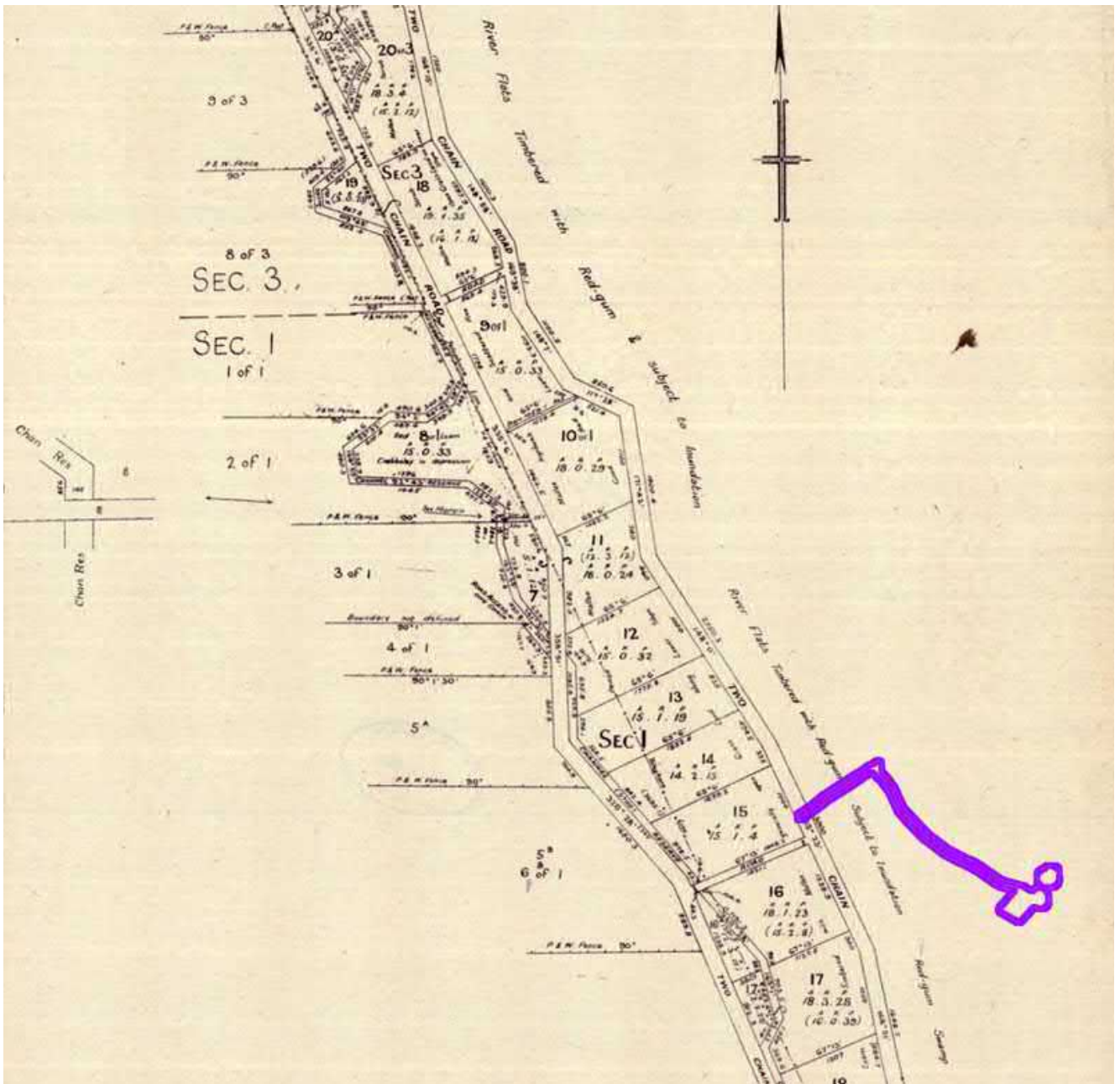


Figure 2.4: Plan of Nyah Irrigation Settlement Extension which describes the present-day Nyah State Forest as 'River Flats Timberland with Red-gum & subject to Inundation' with 'River-gum Swamp' to the south, with the approximate area of investigation outlined in purple (Department of Lands and Survey 1921)

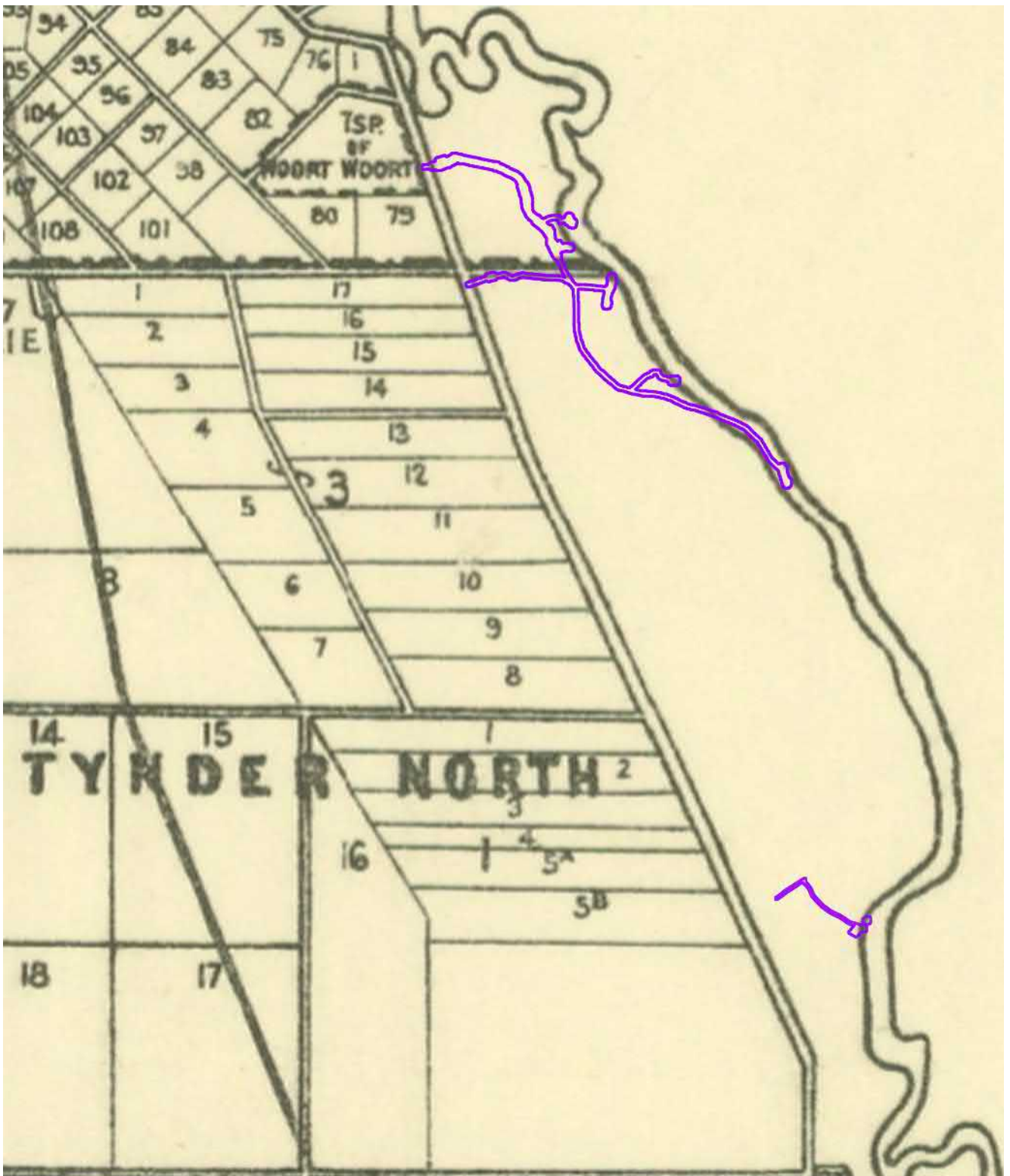


Figure 2.5: Tatchera county map showing allotments within the vicinity of the present-day Nyah State Forest (Department of Lands and Survey 1920)

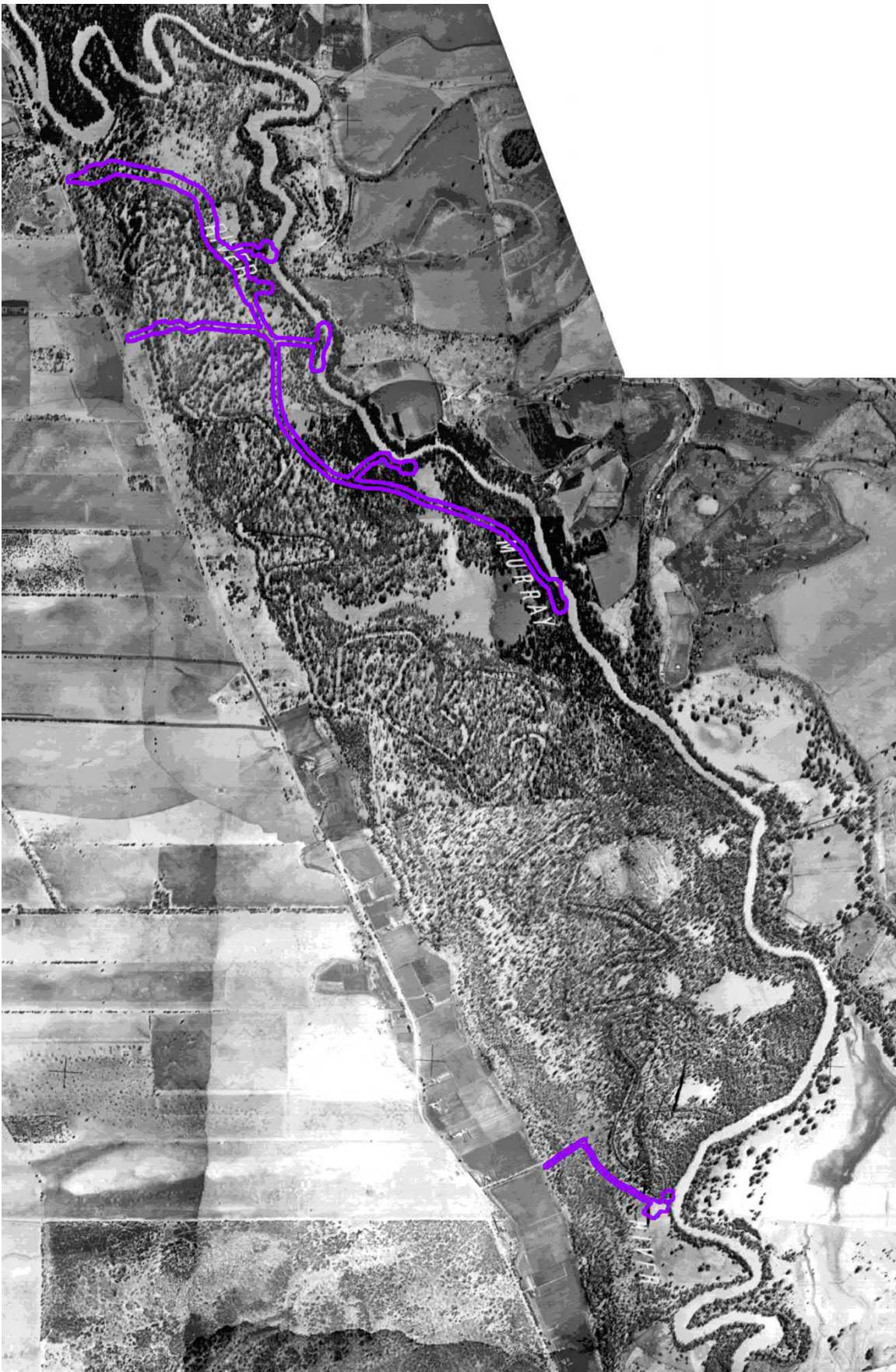


Figure 2.6: 1945 aerial imagery of the area of investigation, outlined in purple (Aerial Survey of Victoria 1945a; 1945b)

Prior to 1921, no allotments were allocated within this floodplain area between Wood Wood (Woort Woort) and Nyah, likely due to the frequent inundation of the land (Figure 2.5). However, a Parish of Piangil map dating from 1906 shows an annotation stating that the land north of Parnee Milloo Creek at Wood Wood as being owned by J Spittle, prior to its relegation as a timber reserve (McGauran 1906). There does not appear to be any further growth within the Nyah State Forest by 1945, suggesting that the Nyah settlement extension reached its eastern limit in 1921, likely for similar reasons (Figure 2.6).

Today, modern aerial imagery shows that Nyah still comprises a country town on the Murray, although it now has its own airport. The area of investigation also intersects with the Murray Valley Highway and several access tracks, the Nyah State Forest, Parnee Malloo Creek, and the Murray River. Much of the area of investigation is not visible in aerial imagery, due to heavy tree cover, but there do not appear to be any obvious historical heritage places visible, beyond a possible channel at the eastern end of the area of investigation at the Nyah Laydown Area. The age of this potential feature (which is located between the Murray River and Cobb Coach Lane, Nyah) is unknown.

The heritage boundary of the Former Church (HO201) appears to comprise a tree-covered empty allotment with a fence, with no extant buildings. The *Rural City of Swan Hill Heritage Study Stage II: Volume 2, Part II - Heritage Place Datasheets: S-Z* (Allom Lovell and Associates 2001c) provides an image of the church dating to 2000 (Figure 2.7). Modern aerial imagery confirms that the church itself is actually situated approximately 65 m to the northwest of the area of investigation, within allotment 1B\PP3391 of the Kulki Kulki (Northern Rivers) Scout Camp, and is not within the registered HO boundary.



Figure 2.7: Former Church (HO201), located within the Kulki Kulki Scout Camp (Allom Lovell and Associates 2001c, p. 551)

As with HO201, Coach Route and *Schinus molle* (Peppercorn trees) (HO203) also does not appear to be located within the heritage boundary recorded on the HO. The *Rural City of Swan Hill Heritage Study Stage II: Volume 2, Part II - Heritage Place Datasheets: S-Z* (Allom Lovell and Associates 2001c) provides an image of the peppercorn tree stand, which is immediately adjacent to the corner of the Murray Valley Highway and an access track. The photograph also shows a building behind the trees, to their northeast (Figure 2.8); modern aerial imagery confirms that the peppercorn tree stand, along with the surrounding trees and the building that are visible in the background, is actually located within a portion of road reserve west of the area of investigation at

southern end of allotment 1A\PP3391 of the Kulki Kulki Scout. The peppercorn trees are immediately adjacent, to the west, of the area of investigation, and with a curtilage that extends 5 m beyond the canopy of the peppercorn trees as outlined in the heritage study, HO203 would intersect with the area of investigation.

Aerial imagery also confirms that adjacent access track, which appears to relate to the coach route and the former site of the Cobb and Co stables, is situated within the Nyah State Forest between Cobb Coach Lane, Nyah, and the southern end of the Kulki Kulki Scout Camp, west of Parnee Malloo Creek. As such, the former coach route intersects with the current area of investigation at within allotment 167\PP3391 and the road reserve immediately adjacent to this allotment, while the peppercorn trees themselves are immediately west of this portion of the area of investigation. While the coach route is not described in the curtilage of HO203 in the heritage study, the coach route most likely intersects with the following two sections of area of investigation:

- Where it likely crosses Gold Club Track between allotment 17A~3\PP3675 and Parnee Malloo Creek
- Where it exits Nyah State Forest to join the Murray Valley Highway at Wood Wood.

However, as the exact location of the coach route is not mapped, these possible locations will need to be research and inspected.



Figure 2.8: Coach Route and *Schinus molle* (Peppercorn trees) (HO203), located adjacent to the Murray Valley Highway, immediately west of the southern end of the Kulki Kulki Scout Camp (Allom Lovell and Associates 2001c, p. 559)



Figure 2.9: Canoe Tree (HO205), located within road reserve adjacent to the Murray Valley Highway (Allom Lovell and Associates 2001c, p. 563)

Similarly, the heritage boundary of the Canoe Tree (HO205) does not appear to have been correctly mapped. The *Rural City of Swan Hill Heritage Study Stage II: Volume 2, Part II - Heritage Place Datasheets: S-Z* (Allom Lovell and Associates 2001c) provides an image of the canoe tree (Figure 2.9), which is to the east of the Murray Valley Highway. Aerial imagery shows that the physical tree is actually situated approximately 85 m to the west of the registered HO boundary within the road reserve adjacent to the Murray Valley Highway and the southern end of allotment 167\PP3391. Canoe Tree (HO205) may align with a scarred tree on the Aboriginal cultural heritage places on the Victorian Aboriginal Heritage Register, and should be referenced against the Cultural Heritage Management Plan.

The heritage boundary of State School No. 3353 (HO202) appears to be correct mapped, as per *Rural City of Swan Hill Heritage Study Stage II: Volume 2, Part II - Heritage Place Datasheets: S-Z* (Allom Lovell and Associates 2001c).

2.3 Predictive statement

Following a search of the above registers, review of the previous literature and analysis of relevant reports, the following predictive statements can be made in relation to the area of investigation and the inundation area:

- Remains of the former coach route through the Nyah State Forest (between Cobb Coach Lane, Nyah, and the Kulki Kulki Scout Camp, Wood Wood) may be identified within the area of investigation
- The most likely site type in the area of investigation would be places associated with early agricultural or pastoral activities and water management practices
- There is moderate potential for previously unidentified historical heritage to be present within the area of investigation, associated with the coach route, as identified in the aerial imagery review, and from the background history and previous historical heritage assessments.

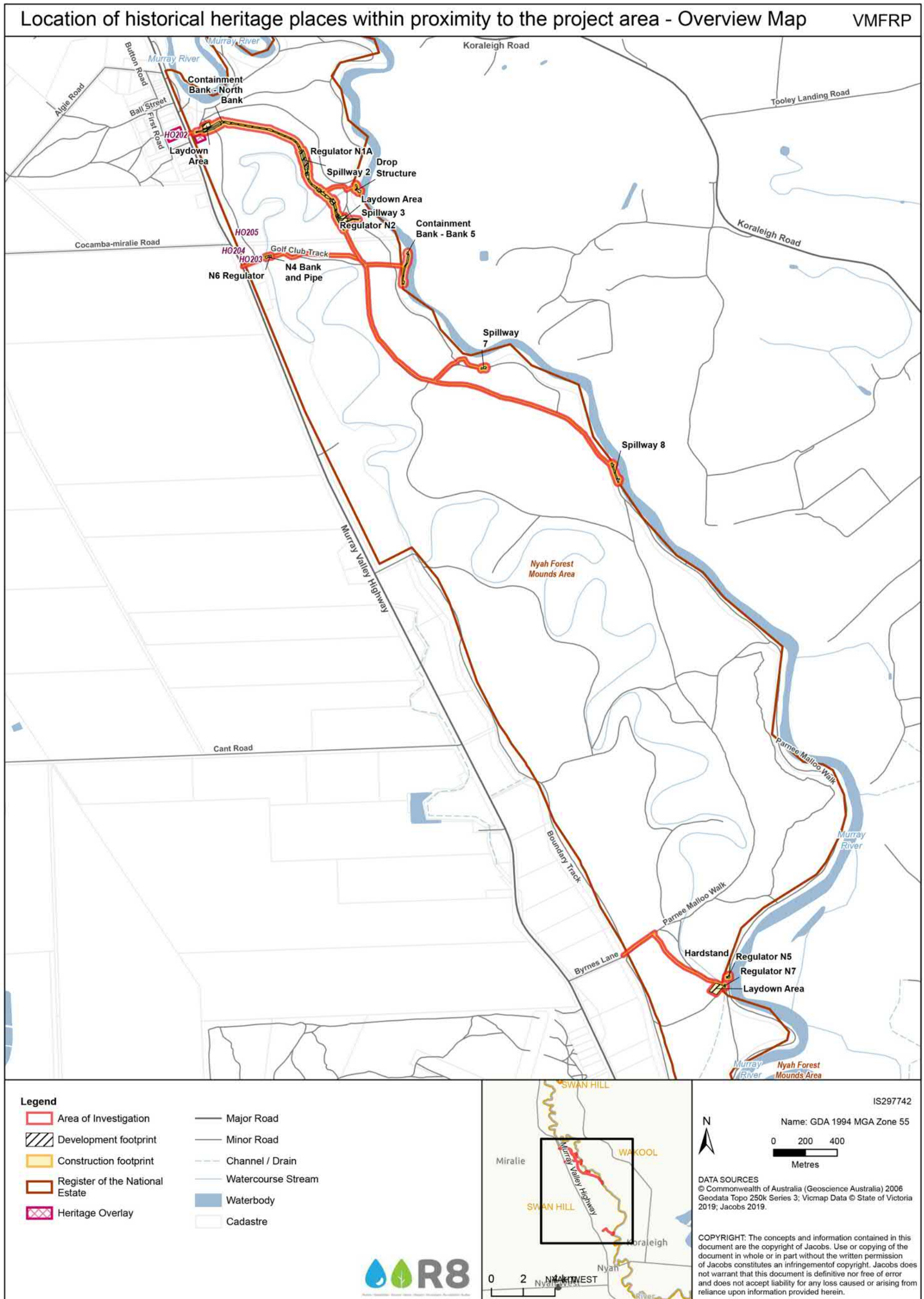
2.4 Summary of desktop findings

There are three historical heritage places registered within or immediately adjacent to the area of investigation, all of which are listed on the Swan Hill HO: the registered heritage boundary of Former Church (HO201); the registered heritage boundary of Coach Route and *Schinus molle* (Peppercorn trees) (HO203); and the registered boundary of State School No. 3353 (HO202) area of investigation. The Former Church (HO201); and the Canoe Tree (HO205) also intersect with the inundation area.

However, examination of the *Rural City of Swan Hill Heritage Study Stage II* in combination with a review of the modern aerial imagery review has confirmed that the heritage boundaries are not in the correct locations:

- The physical location of the Former Church (HO201) is situated approximately 65 m to the northwest of the current area of investigation, within allotment 1B\PP3391 of the Kulki Kulki (Northern Rivers) Scout Camp
- The physical location of Coach Route and *Schinus molle* (Peppercorn trees) (HO203) intersect with the area of investigation within a portion of road reserve to the west of the area of investigation at southern end of allotment 1A\PP3391 of the Kulki Kulki Scout Camp
- The coach route portion of Coach Route and *Schinus molle* (Peppercorn trees) (HO203), while in the name of this heritage place, was not mentioned in the significance statement of the *Rural City of Swan Hill Heritage Study Stage II*, nor was a description of its curtilage (spatial extent) provided. However, it likely crosses two portions of the area of investigation (at Gold Club Track and at Wood Wood), this cannot be confirmed without further research and a site inspection
- The physical location of the Canoe Tree (HO205) is situated within road reserve adjacent to the Murray Valley Highway, and the southern end of allotment 167\PP3391 to the east of the Murray Valley Highway, approximately 85 m to the west of the currently registered curtilage
- The heritage boundary of State School No. 3353 (HO202) is correctly mapped and is located 12 m from the area of investigation.

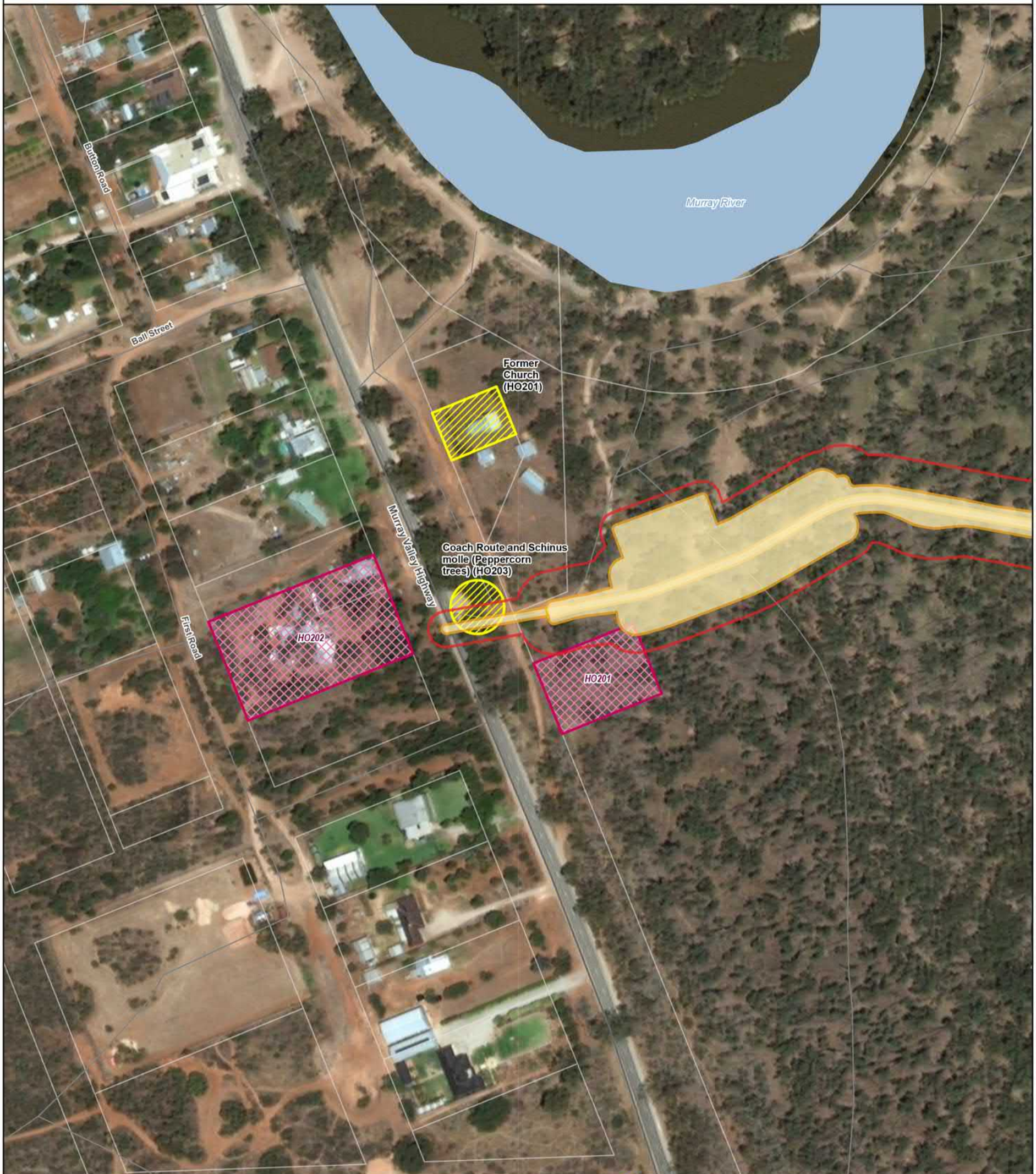
There is moderate potential for previously unidentified historical heritage to be present within the area of investigation, due to the possible coach route the area of investigation as identified in the aerial imagery review, and from the background history and previous historical heritage assessments. Outside of the coach route, site types most likely to be identified in the area of investigation would be places associated with early agricultural or pastoral activities and water management practices.



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Figure 2.10: Location of historical heritage places within proximity to the area of investigation – Overview Map

Location of historical heritage places within proximity to the area of investigation - Page 1 of 2 VMFRP



Legend Construction footprint Area of Investigation Heritage Overlay - Actual Site Locations (Indicative) Heritage Overlay Rail Station Railway Major Road Minor Road Channel / Drain Watercourse Stream Waterbody Wetland Swamp Cadastre			IS297742 Name: GDA 1994 MGA Zone 55 0 20 40 Metres DATA SOURCES © Commonwealth of Australia (Geoscience Australia) 2006 Geodata Topo 250k Series 3; Vicmap Data © State of Victoria 2019; Jacobs 2019. COPYRIGHT: The concepts and information contained in this document are the copyright of Jacobs. Use or copying of the document in whole or in part without the written permission of Jacobs constitutes an infringement of copyright. Jacobs does not warrant that this document is definitive nor free of error and does not accept liability for any loss caused or arising from reliance upon information provided herein.

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Figure 2.11: Location of historical heritage places within proximity to the area of investigation (1 of 2)

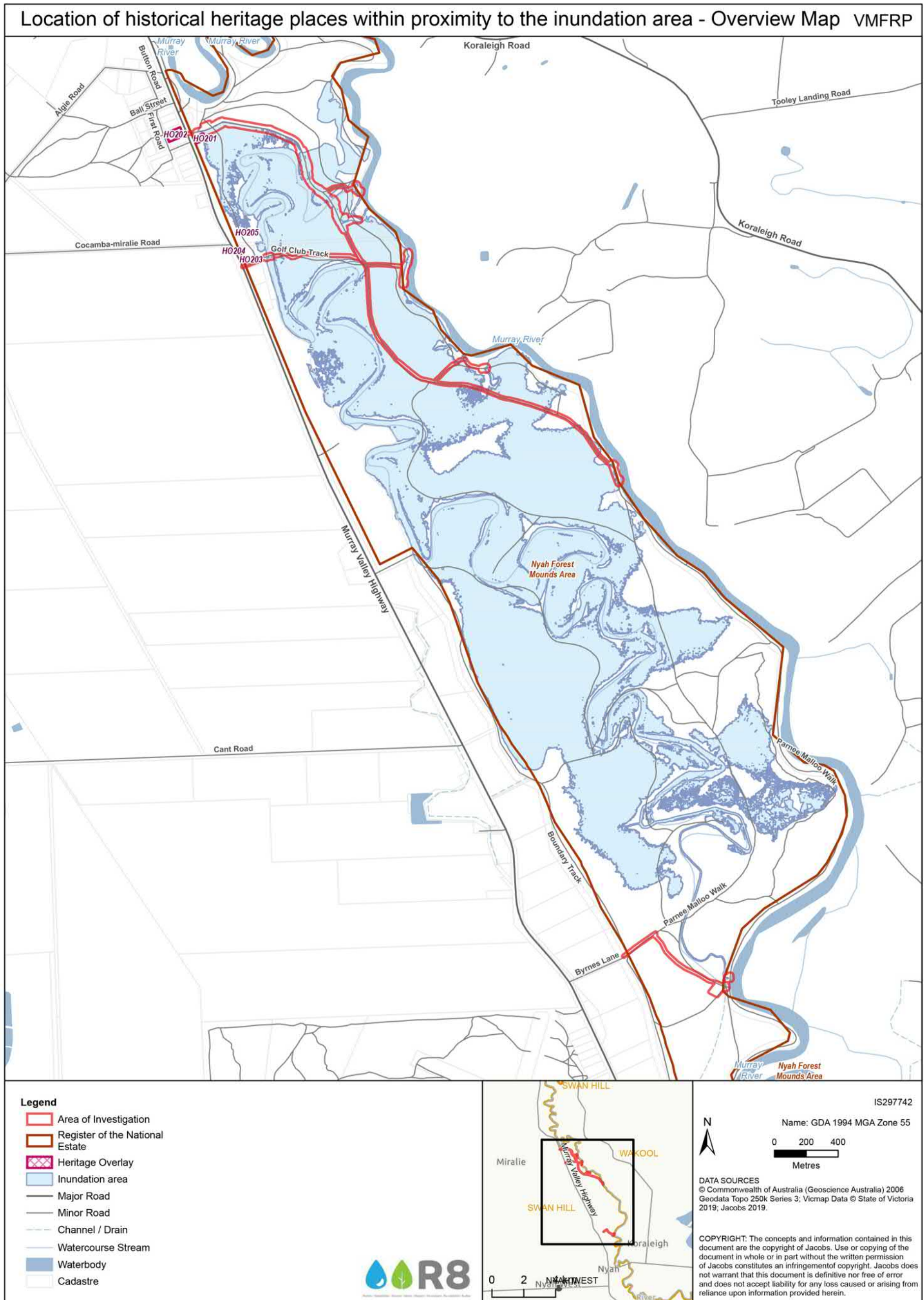
Location of historical heritage places within proximity to the area of investigation - Page 2 of 2 VMFRP



Legend Construction footprint Area of Investigation Heritage Overlay - Actual Site Locations (Indicative) Heritage Overlay Rail Station Railway Major Road Minor Road Channel / Drain Watercourse Stream Waterbody Wetland Swamp Cadastre			IS297742 Name: GDA 1994 MGA Zone 55 DATA SOURCES © Commonwealth of Australia (Geoscience Australia) 2006 Geodata Topo 250k Series 3; Vicmap Data © State of Victoria 2019; Jacobs 2019. COPYRIGHT: The concepts and information contained in this document are the copyright of Jacobs. Use or copying of the document in whole or in part without the written permission of Jacobs constitutes an infringement of copyright. Jacobs does not warrant that this document is definitive nor free of error and does not accept liability for any loss caused or arising from reliance upon information provided herein.

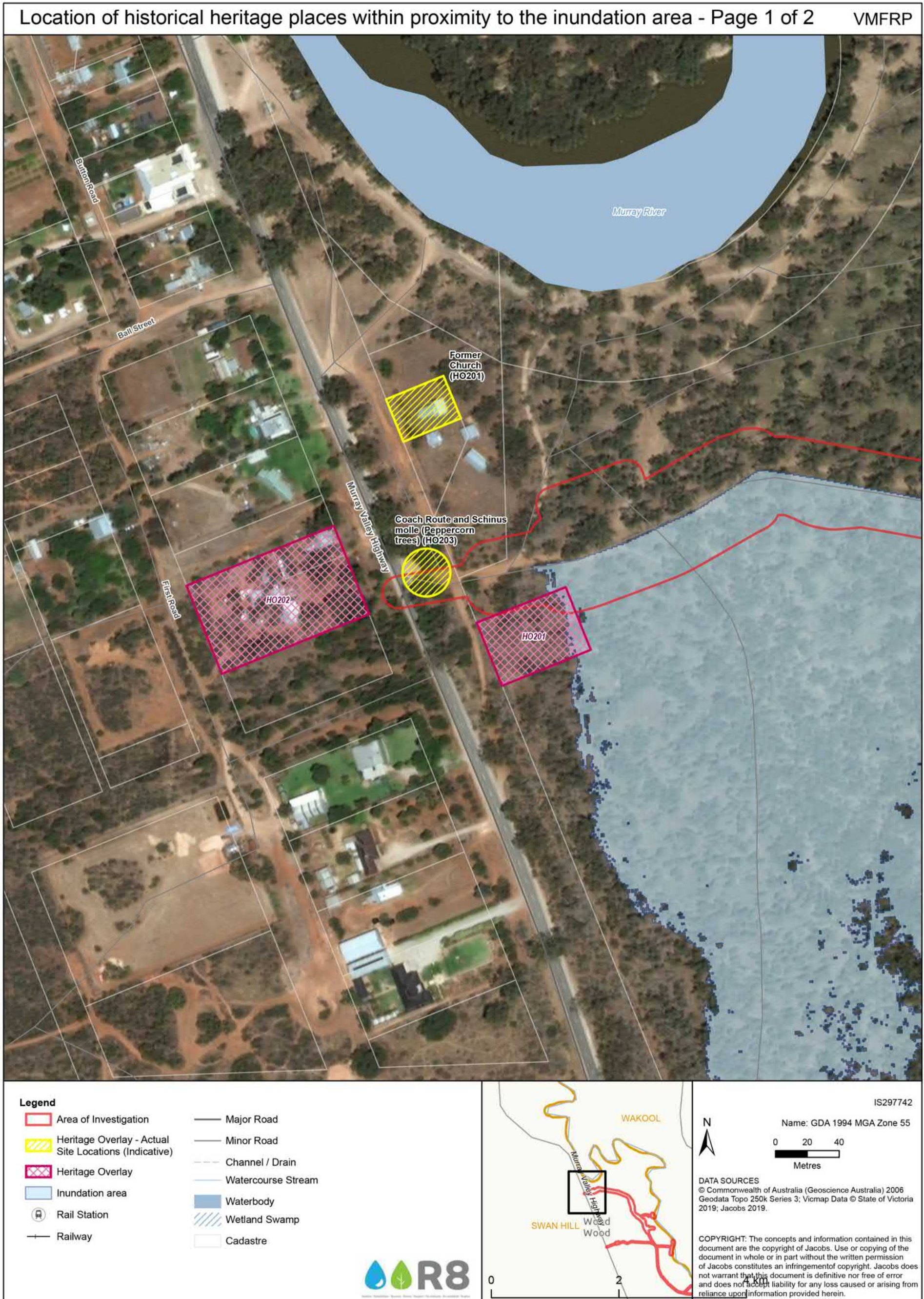
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Figure 2.12: Location of historical heritage places within proximity to the area of investigation (2 of 2)



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Figure 2.13: Location of historical heritage places within proximity to the inundation area – Overview Map



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Figure 2.14: Location of historical heritage places within proximity to the inundation area (1 of 2)



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Figure 2.15: Location of historical heritage places within proximity to the inundation area (1 of 2)

3. Impact assessment

3.1 Proposed works

3.1.1 Main works

The project involves the construction of five new regulators (N1a, N1b, N2, N5 and N7) and a 1.3 km containment bank to divert, retain and release water within downstream end of the Nyah-Vinifera (Regional) Park.

Under the proposed scheme, water would travel north along Parnee-Maloo Creek after entering from the Murray River through the proposed N5 regulator, and then back into the Murray River at the main downstream regulator N2. The N2, N1a and N1b regulators are intended to isolate a large section of Parnee-Maloo Creek from the Murray River and detain water in a managed event. The N5 regulator also prevents backflow into the Murray River when water is retained during a managed event. At low flows (below 17,500 ML/d) inundation of the floodplain can occur from backflow through regulator N2.

The proposed works to achieve the inundation include:

- A main containment bank at the northern end of the floodplain
- A large regulator on the containment bank at Parnee-Maloo Creek, referred to as regulator N2. This is the primary structure for regulating flow on return to the Murray River at the end of a managed event
- Two smaller regulators on the containment bank located on the floodplain and referred to as N1a and N1b. These are to distribute flow across the floodplain
- A box culvert (referred to as regulator N5) to replace an existing pipe culvert. The purpose of this is to contain flow in the system during a managed inundation event and prevent it flowing back into the Murray River
- A box culvert (referred to as regulator N7) to replace an existing pipe culvert. The purpose of this is to contain backflow into the town drainage channel
- Drop structure downstream of regulator N2, at the confluence of the Parnee-Maloo Creek and the Murray River to reduce erosion and provide a plunge pool for downstream fish passage. This will consist of:
 - Rock erosion protection within the basin, gabion cut off beam/weir at the upstream end and rock mattress in the outlet cutting and extending to the edge of the Murray River
 - A second gabion cut off beam at the location where the channel steepens as it re-enters the river
 - Rock mattresses down the river bank into the water.
- Three overfill spillways on the main bank (spillways 1, 2 and 3)
- A small block bank and 2 overflow spillways on flood runners within the forest to maintain flow distribution across the flood plain during high river flows (bank 5 and spillways 7 and 8)
- Decommissioning of 2 structures in Parnee-Maloo Creek (refer below) Creek to allow a more natural and unhindered flow to the creek (Section 3.1.1.1).

Table 3.1: Summary of regulator design specifications

Regulator	Open/Close or regulate flow	Proposed design	Proposed gates
N1a	Open/Close	3 No. 1800W x 1500H Box culverts	Single leaf gate
N1b	Open/Close	3 No. 1800W x 1500H Box culverts	Single leaf gate
N2	Regulate	8 No. 1800W x 2800H to deck. Cast In Situ	Split leaf gate

Regulator	Open/Close or regulate flow	Proposed design	Proposed gates
N5	Open/Close	1 No. 1800W x 1800H Box Culvert	Penstock
N7	Open/Close	1 No. 1200W x 1200H Box Culvert	Penstock

The following design philosophy has been applied:

- The structures are designed to allow natural flows to pass unhindered, to and from the floodplain when the structures are not in use (fully open)
- The arrangement of structures, the containment bank and spillways have been developed to minimise the potential for erosion over the whole range of flow conditions
- The regulating structures would be designed to provide safe downstream fish passage in accordance with the recommended design criteria for native fish.

3.1.1.1 Structures to be decommissioned

Two redundant structures and block bank are to be removed or decommissioned in Parnee-Maloo Creek as listed in Table 3.2.

Table 3.2: Structures to be decommissioned at Parnee-Maloo Creek

Structure	Description and Purpose
N4	Existing asbestos pipe which passes under the nearby road and connects the creek to the floodplain. Location next to a fenced cultural heritage area makes complete removal impractical. Excavate and remove end pipe sections and fill the pipe. Bury the ends with earth fill.
Block bank and flap gate	Embankment spanning the creek, a pipe and flap gate. Function no longer required. To be removed.
N6	Old regulator which is no longer required. Remove the regulator.

3.1.1.2 Containment banks/access tracks

Most of the containment banks would be built on the alignment of existing access tracks. Once the containment bank has been constructed, the tracks would be reinstated on top of the bank with a gravel surface. The containment banks would provide operator access to the regulators. A few short lengths of non-trafficable bank would be required at tie in locations where the bank needs to match the natural river bank.

Some of these tracks would need to be upgraded as part of the project, the extent of which would be confirmed following outcomes from geotechnical investigations, complex cultural heritage assessment (as part of the Cultural Heritage Management Plan) and ground truthing. Design and construction of the final access tracks would need to comply with the mitigation measures.

3.1.1.3 Maintenance

Maintenance will need to be undertaken to existing access tracks to ensure they are suitable for use during construction and operation. This would involve grading and applying additional road base to the surface.

3.1.2 Key construction activities

Construction activities would occur within the area identified in Figure 1.1-Figure 1.3. Construction activities would include:

- Establishment of construction sites, set down areas and access routes
- Removal of existing structures where required
- Construction / installation of new structures.

Construction would involve use of vehicles and machinery such as trucks, excavators, and access equipment.

Importation of construction materials, including regulators and imported soils. Imported soils would comply with Parks Victoria consent under Section 27 of the *National Parks Act 1975*.

An Environmental Management Plan (EMP) would be prepared for the works and would detail the measures to avoid and minimise impacts during construction. Once construction of regulators, stop banks and all associated works are complete, all waste and spoil will be removed from the sites and disposed of as required by the EMP.

3.2 Potential impacts

The potential impacts from proposed works and from the inundation are outlined in Table 3.3.

Table 3.3: Potential impacts on historical heritage within the area of investigation

Heritage place	Impact assessment
Former Church (HO201)	<p>Proposed works</p> <p>While the registered heritage boundary of the Former Church (HO201) intersects with the area of investigation, the actual physical location of the church is approximately 65 m to the northwest of the current area of investigation, within allotment 1B\PP3391 of the Kulki Kulki (Northern Rivers) Scout Camp.</p> <p>As such, proposed works (Section 3.1) will not impact upon the heritage values (historic and social significance) of the heritage place.</p> <p>Inundation area</p> <p>The physical location of the Former Church is approximately 110 m to the north of the inundation area at Wood Wood. As such, there will be no impact upon the heritage values (historic and social significance) of the heritage place from the inundation, which is further detailed in Section 3.1.1 (Figure 2.13-Figure 2.14).</p>
State School No. 3353 (HO202)	<p>Proposed works</p> <p>The registered heritage boundary of State School No. 3353 (HO202) is correctly mapped, and is approximately 12 m from the area of investigation.</p> <p>As such, proposed works (Section 3.1) will not impact upon the historic significance of the former school site.</p>
Coach Route and <i>Schinus molle</i> (Peppercorn trees) (HO203)	<p>Proposed works</p> <p>While the registered heritage boundary of Coach Route and <i>Schinus molle</i> (Peppercorn trees) (HO203) is approximately 8 m from the area of investigation, the physical location of the peppercorn tree stand intersects with the area of investigation when the curtilage described in the <i>Rural City of Swan Hill Heritage Study Stage II</i> is implemented, within road reserve at southern end of allotment 1A\PP3391 of the Kulki Kulki Scout Camp.</p> <p>As such, proposed works (Section 3.1) may impact upon the historic significance of the heritage peppercorn trees, depending on the maximum extension of the peppercorn tree root system.</p> <p>The coach route itself, while in the title of the HO site, was not mentioned in the significance of this heritage place, nor was it mentioned in the curtilage description. However, the remains of the original coach route through what is now the Nyah-Vinifera (Regional) Forest may intersect with the construction footprint of the area of investigation along Golf Club Track and at Wood Wood. The accessway into the Nyah State Park adjacent to the physical location of HO203 appears to have been part of the coach route to which the historic trees were associated. The former site of the Cobb and Co stables, which is only mentioned once in the history section of the heritage citation of the <i>Rural City of Swan Hill Heritage Study Stage II</i> due to its association with the trees, may also be nearby. These archaeological features may be impacted by works.</p> <p>As such, the proposed N1a/N1b Containment Bank (Section 3.1.1.2) and overfill Spillway 1 (Section 3.1.1) works at Wood Wood may impact upon any surface remains of the coach route and archaeological features associated with the HO-listed site.</p>

Heritage place	Impact assessment
	<p>Inundation area</p> <p>The physical location of the peppercorn tree stand is approximately 50 m to the west of the inundation area at Wood Wood. As such, there will be no impact upon the historic or historic significance of the heritage peppercorn trees from the inundation.</p> <p>As the exact location of the remains of the coach route through Nyah State Forest is currently unmapped, it is likely parts of the former route will be situated within the inundation area (Section 3.1.1, Figure 2.13-Figure 2.14). However, the inundation area appears to be situated to the south of the access track at Wood Wood, and is unlikely to impact any remnant coach route remains near the HO-listed site. Additionally, subsurface historic archaeology is unlikely to be subject to direct erosion from inundation.</p>
Canoe Tree (HO205)	<p>Inundation area</p> <p>While the registered heritage boundary of Canoe Tree (HO205) intersects with the inundation area (Section 3.1.1), the physical location of the canoe tree is approximately 90 m to the west of the inundation area near the intersection of Miralie-Cocamba Road and the Murray Valley Highway. As such, there will be no impact upon the historic significance of the canoe tree from the inundation.</p>

4. Approval requirements

The approvals requirements for each of the heritage places assessed within the area of investigation are provided in Table 4.1.

If the scope of works changes to include other features of the heritage places detailed in Table 4.1, further heritage assessment would be required, and this assessment will need to be updated.

Table 4.1: Statutory requirements for heritage places within the area of investigation

Heritage place	Statutory requirements
Entire area of investigation	Discovery of archaeological sites - under Section 127 of the <i>Heritage Act 2017</i> , if an archaeological site is discovered during construction or excavation on any land, the person in charge of the construction or excavation must as soon as practicable report the discovery to HV.
Former Church (HO201)	Although the registered heritage boundary of Former Church (HO201) is in proximity to the works, the physical location of the church has been demonstrated to not be within proximity to the area of investigation. Consultation with Swan Hill Council is required to determine, planning approval requirements considering the current incorrect recorded heritage boundary of this place.
State School No. 3353 (HO202)	The heritage boundary of State School No. 3353 (HO202) is approximately 12 m from works, and as such, is unlikely to be impacted. As such, no approvals from Swan Hill Council are required.
Coach Route and <i>Schinus molle</i> (Peppercorn trees) (HO203)	Although the heritage boundary of Coach Route and <i>Schinus molle</i> (Peppercorn trees) (HO203) is approximately 8 m from works, the physical location of the trees has been demonstrated to intersect with the area of investigation. Consultation with Swan Hill Council is required to determine, planning approval requirements considering the current incorrect recorded heritage boundary of this place.
Canoe Tree (HO205)	Although the heritage boundary of Canoe Tree (HO205) is in proximity to the inundation area, the actual physical location of the tree has been demonstrated to not be within proximity to the area of investigation. However, as no ground-disturbing works are planned within the heritage boundary, planning approvals are unlikely to be required. Consultation with Swan Hill Council is required to determine, planning approval requirements considering the current incorrect recorded heritage boundary of this place.

5. Historical heritage recommendations

5.1 Overall recommendations and project risk

Due to the possibility for historic archaeology to be impacted, as identified in this desktop assessment (Section 3.2), it is recommended that a HIA should be undertaken for the project. The HIA should include:

- Field survey to identify further historical archaeological sites and any unidentified historical heritage places
- Assessment of impacts on all historical heritage sites
- Detailed identification of mitigation measures and approval requirements
- A Heritage Impact Statement.

All historical archaeological places are protected under the *Heritage Act 2017*, whether they are registered or not. Such delays would include the stoppage of works to avoid damage or destruction of historical archaeological sites and materials while the appropriate approvals are sought. This would enable R8 to proactively consider the nomination of historical heritage archaeological deposits ahead of the works, which would provide R8 with more certainty in relation to timeframes and statutory obligations. The completion of the HIA for the project would mitigate these issues.

5.2 Site-specific recommendations

It is recommended that consultation with the Swan Hill Council be undertaken to correct the spatial data related to Former Church (HO201), Coach Route and *Schinus molle* (Peppercorn trees) (HO203), and Canoe Tree (HO205) after the HIA has been completed.

Additionally, Canoe Tree (HO205) should be referenced against Aboriginal cultural heritage places on the Victorian Aboriginal Heritage Register, as part of the associated Cultural Heritage Management Plan.

6. Mitigation measures

The following high level mitigation measures may apply to the project, as outlined in Table 6.1. These can be confirmed during a HIA.

Table 6.1: Proposed project activities and specific management measures for the heritage places within the area of investigation

Proposed activities	Heritage place	Mitigation measures
General activities	Entire area of investigation	<p>General mitigation measures to be implemented across the area of investigation:</p> <ul style="list-style-type: none"> ▪ Historical heritage awareness training should be completed as part of the site induction for personnel and/or contractors prior to the commencement of construction works to ensure: <ul style="list-style-type: none"> - an understanding of where all heritage places are located within the area of investigation - an understanding of the potential heritage places that may be impacted during the project - the procedures required to be undertaken in the event of discovery of historical heritage material, features or deposits, or the discovery of human remains ▪ If an archaeological site is discovered during construction or excavation on any land, the person in charge of the construction or excavation must as soon as practicable report the discovery to HV ▪ A copy of this report should be kept onsite and on file with the project records. All contractors and/or project staff should be made aware of the heritage status of the heritage places in the area of investigation prior to works taking place.
<p>N1a/N1b Containment Bank works</p> <p>Spillway 1 works</p>	Archaeological features associated with Coach Route and <i>Schinus molle</i> (Peppercorn trees) (H0203)	<p>As there is potential for archaeological features associated with Coach Route and <i>Schinus molle</i> (Peppercorn trees) (H0203) directly impacted by N1a/N1b Containment Bank and Spillway 1 works, the following mitigation measures must be implemented to avoid any adverse impacts where possible to the heritage values of the site:</p> <ul style="list-style-type: none"> ▪ As tree controls apply, it is recommended that advice be sought to determine the maximum extension of tree roots prior to works to ensure as to the required 'no go zone' around the boundary vegetation to avoid impact and therefore the need for a planning permit.

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