

S2-FGJV-ENV-PLN-0029

## ABORIGINAL HERITAGE MANAGEMENT PLAN

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## 1. ABBREVIATIONS AND DEFINITIONS

Acronym	Definition
ACHAR	Aboriginal Cultural Heritage Assessment Report
AFL	Agreement for Lease
AHIMS	Aboriginal Heritage Information Management System
AHMP	Aboriginal Heritage Management Plan
EMS	Environmental Management Strategy
BCD	Biodiversity and Conservation Division (part of Department of Planning, Industry and Environment)
CoA	Conditions of Approval
CSSI	Critical State significant infrastructure
DEC	Department of Environment and Conservation (now part of Department of Planning, Industry and Environment)
DECC	Department of Environment and Climate Change (now part of Department of Planning, Industry and Environment)
DPIE	NSW Department of Planning, Industry and Environment
EIS	Environmental Impact Statement
Exploratory Works EIS	<i>Environmental Impact Statement Exploratory Works for Snowy 2.0</i>
EMS	Environmental Management Strategy
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	<i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i>
EPL	Environment Protection Licence
EWAR	Exploratory Works Access Roads
Future Gen	Future Generation Joint Venture
Future Gen-PMS	Project Management System
Heritage Item	An item as defined under the <i>Heritage Act 1977</i> and/or an Aboriginal object or Aboriginal Place as defined under the <i>National Parks and Wildlife Act 1974</i> .
Hydro-electric	Generation of electricity using flowing water (typically from a reservoir held behind a dam or barrage) to drive a turbine which powers a generator
Kosciuszko National Park	A National Park protected under the <i>National Parks and Wildlife Act 1974</i> (NSW) and managed by NSW National Parks and Wildlife Service. It covers an area of 673,543 hectares and forms part of Australia's only Alpine area
KNP	Kosciuszko National Park
Leed	Leed Engineering
Lobs Hole	A former settlement location within Kosciuszko National Park, and primary location of Exploratory Works.
<i>Lobs Hole</i> Spelling	In this document the contemporary spelling <i>Lobs Hole</i> is used except for when a specific older name is referred to, such as for example, <i>Lobbs Hole Copper Mine</i> , when the original spelling is used.
NPWS	National Parks and Wildlife Service
NPW Act	<i>National Parks and Wildlife Act 1974</i>
OEH	NSW Office of Environment and Heritage



Acronym	Definition
PEP	Project Execution Plan
QMP	Quality Management Plan
RAPs	Registered Aboriginal Parties - Aboriginal stakeholders registered for cultural heritage consultation for the project
REMM	Revised environmental management measures
Submissions Report or RTS	<i>Response to Submissions Exploratory Works for Snowy 2.0</i>
SHL	Snowy Hydro Limited
OEH	Office of Environment and Heritage
Project, the	Snowy 2.0 Exploratory Works
WALic	Works Access Licence
WMS	Work Method Statement

## 2. INTRODUCTION

Salini Impregilo, Clough and Lane have formed the Future Generation Joint Venture (Future Gen) to provide the Civil Works Package for Snowy Hydro Limited (SHL) on the Snowy 2.0 Project (the Project).

The Project is a pumped hydro project that will increase the generation capacity of the Snowy Mountains Scheme by up to 2,000mW and at full capacity will provide approximately 350,000MW/h of energy storage. The project includes all activities associated with the civil works requirements for the Snowy 2.0 Pumped Hydro-electric Scheme.

Intake and outlet structures will be built at both Tantangara and Talbingo Reservoirs, which are in the Kosciuszko National Park (KNP) in southern NSW. Approximately 27km of concrete-lined tunnels will be constructed to link the two reservoirs and a further 20km of tunnels will be required to support the facility. The power station complex will be located almost one-kilometre underground.

The project will deliver one of the largest pumped hydro schemes in the world and underscores the importance of the Snowy Scheme's role in the National Electricity Market.

Future Gen was conceived to deliver an integrated engineering, procurement and construction management service for the project. The joint venture is backed by the combined experience of Salini Impregilo, Clough and Lane, through their experience in the infrastructure, mineral and oil and gas sectors throughout Australia and the world.

### 2.1. Purpose

This Aboriginal Heritage Management Plan (AHMP or Plan) forms part of the Environmental Management Strategy (EMS) for Snowy 2.0 – Exploratory Works – Stage 2 (Exploratory Works – Stage 2). The Exploratory Works is the first phase of Snowy 2.0, a pumped hydro-electric storage and generation project which will increase the hydro-electric capacity within the existing Snowy Mountains Hydro-electric Scheme. The Main Works or second phase, will be subject to a separate Environmental Impact Statement (EIS) in 2019.

This AHMP has been prepared to address the requirements of:

- the Infrastructure Approval (SSI 9208) (Approval) issued for Snowy 2.0 Exploratory Works on 7 February 2019;
- the *Environmental Impact Statement Exploratory Works for Snowy Hydro 2.0* (Exploratory Works EIS);
- the revised environmental management measures (REMMs) within the *Response to Submissions Exploratory Works for Snowy 2.0* (Submissions Report or RTS);
- the *Modification 1 Assessment Report - Exploratory Works for Snowy 2.0* (Modification 1); and
- the REMMs within the *Response to Submissions - Exploratory Works Modification 1* (Submissions Report for Modification 1).

The Exploratory Works for Snowy 2.0 includes, but is not limited to:

- an exploratory tunnel to the site of the underground power station for Snowy 2.0;
- horizontal and test drilling;
- a portal construction pad;
- an accommodation camp;

- road works and upgrades providing access and haulage routes;
- barge access infrastructure;
- excavated rock management, including subaqueous placement within Talbingo Reservoir;
- services infrastructure; and
- post-construction revegetation and rehabilitation.

Exploratory Works will be delivered in three distinct stages. These stages will be delivered by two different contractors.

Leed Engineering (Leed) is the contractor who will be carrying out the Snowy 2.0 Stage 1 work on behalf of SHL. Future Gen is the contractor who will be delivering the Snowy 2.0 Stage 2 works on behalf of SHL.

Works to be completed by Leed on behalf of SHL:

- **Stage 1a – Pre-construction Minor Works** - Stage 1a has been approved and commenced in the first quarter of 2019. The scope of pre-construction minor works includes dilapidation studies, survey work, borehole installation, site office establishment, minor access roads, installation of monitoring equipment, installation of erosion and sediment controls, and minor clearing.
- **Stage 1b - Exploratory Works Access Roads (EWAR)** - Stage 1b has been approved and commenced in the second quarter of 2019. The scope includes roadworks and upgrades to enable access and haulage routes during Exploratory Works. This includes upgrades to 26 km of existing roads and creating about 2 km of new roads, two new bridge crossings and two temporary waterway crossings.

*Note: Test excavation, salvage and archival recording of all Aboriginal heritage objects likely to be impacted by Stage 2 works will be undertaken under the Stage 1 AHMP.*

Works to be completed by Future Gen on behalf of SHL:

- **Stage 2 – Exploratory Works** - Pending progress with Stage 1 and the issuing of a Works Access Licence from NPWS works may commence in quarter three (Q3) of 2019. The scope for Stage 2 will be the remainder of the Exploratory Works, including:
  - pre-construction minor activities including dilapidation studies, survey, investigations, access etc; and
  - construction works including exploratory tunnel, portal construction pad, accommodation camp, dredging, barge access infrastructure excavated rock management and additional geotechnical investigation. This includes subaqueous emplacement within Talbingo Reservoir\*.

*\*Note: these activities will not proceed unless the relevant management plans are approved by Department of Planning, Industry and Environment (DPIE).*

Further detail on construction activities and staging is presented in Section 2.8 and Figure 2-1.

**This Plan identifies the project's environmental management measures in relation to the management of Aboriginal heritage for the Exploratory Works – Stage 2. It has been specifically developed for the Stage 2 works.**

Exploratory Works	2019				2020				2021			
Stage 1 – Access Roads												
Stage 2 – Exploratory Works												

**Figure 2-1: Timing of Exploratory Works - Stages 1 and 2**

Stage 2 management plans have been revised from the corresponding Stage 1 management plan, as demonstrated in the document revision section of each Stage 2 plan. The intent of this arrangement is to ensure a consistent approach to managing environmental risk and regulatory requirements for the Exploratory Works project. In the event that both Exploratory Works Stages are undertaken concurrently, and / or in overlapping locations, the Stage 1 management plan will apply to the Stage 1 works, and the Stage 2 management plans will apply to the Stage 2 works. This arrangement would not affect management standards as all relevant measures from each management plan would continue to apply. As the proponent, Snowy Hydro will oversee both stages of the Exploratory Works project.

The timing of the preparation, consultation, submission and approval of this Plan, along with other management plans required by the Conditions of Approval (CoA), is shown within Table 4.4 and Figure 4.4 of the EMS.

Ongoing revisions to this Plan will occur in accordance with Section 1.6 of the EMS, and as required by condition 4 of schedule 4 of the Infrastructure Approval. Circumstances requiring a review, and if necessary, revision of this Plan include submission of incident reports or audit reports, approval of modifications to the CoA and directions of the Planning Secretary under condition 4 of schedule 2. Table 2-1 presents the relationship of heritage aspects with respect of this plan and other management plans prepared for the project.

**Table 2-1: Relationship to other plans**

Activities	Relevant plan	Timing of plan <sup>1</sup>	
		Stage 1	Stage 2
General environmental compliance including inspection, monitoring and auditing.	Environmental Management Strategy	P	R
Aboriginal heritage	This plan	P	R
Historic heritage	Historic and Natural Heritage Management Plan	P	R
Natural heritage - geodiversity	Historic and Natural Heritage Management Plan	P	R
Road construction – Aboriginal heritage management	This plan	P	R
Other earthworks including tunnelling – Aboriginal heritage management	This plan	P	R
Excavated rock and spoil management and temporary placement	Excavated Material Management Plan	P	R

<sup>1</sup> Note: P – prepare, R – revise

Specific on-site management measures identified in this Plan will be incorporated into site documents. These site-specific documents will be prepared for construction activities and will detail the management measures which are to be implemented on the ground. Construction personnel will be required to undertake works in accordance with the mitigation measures identified in the site-specific documents.

## 2.2. Background

SHL is the proponent of the Project which is a pumped hydro-electric storage and generation project proposed to address increasing demands for renewable energy supplies. Snowy 2.0 involves linking Talbingo and Tantangara reservoirs within the existing Snowy Mountains Hydro-electric Scheme (Snowy Scheme) and building an underground power station between the two reservoirs.

Future Gen proposes to carry out the Exploratory Works – Stage 2 project prior to the main construction works for the Project, to inform the detailed design and to reduce project risk. Exploratory Works are required to obtain detailed geological data for the location of the underground power station. An exploratory tunnel is to be constructed to gain this information. The Exploratory Works – Stage 2 project will predominantly be in the Lobs Hole<sup>1</sup> area of KNP. If the Exploratory Works are not undertaken, risks to the design and construct elements of the power station cavern are significantly increased.

The Exploratory Works EIS was prepared to assess the impact of these works on the environment, including an assessment of Aboriginal heritage impacts within Chapter 5.5 and Appendix O<sup>1</sup>.

The Exploratory Works EIS identified that the Exploratory Works would impact on Aboriginal heritage in the form of stone artefact distributions that are located across the majority of proposed impact areas. The presence of these do not pose a constraint to works, however, management and impact mitigation measures are required.

The Aboriginal heritage in the project area recorded during the Exploratory Works EIS, is documented in the *Aboriginal Cultural Heritage Assessment Report (ACHAR)* (Dibden, 2018). The ACHAR documents the initiatives built into the project design to avoid and minimise associated impacts and the mitigation and management measures proposed to address any residual impacts not able to be avoided.

This AHMP provides a framework for the management and mitigation of impacts to Aboriginal heritage in the project area. The test excavation, salvage and archival recording of all Aboriginal heritage objects likely to be impacted by Stage 2 works will be undertaken during the Stage 1 works under the Stage 1 AHMP. Therefore the intent of this document will be to provide guidance for the management of any unexpected Aboriginal heritage objects or values and human remains which, while considered to be unlikely, may be encountered during delivery of the Stage 2 works.

The *Response to Submissions Exploratory Works for Snowy 2.0* (Submissions Report or RTS) included revised environmental management measures (REMMs) within Chapter 8. The Submissions Report for Modification 1 included additional REMMs within Section 8. The

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<sup>1</sup> In this document, the contemporary spelling, *Lobs Hole*, is used except for when a specific older name is referred to, such as for example, *Lobbs Hole Copper Mine*, when the original spelling is used.

management measures from both of these reports have been addressed within this AHMP. The location of all heritage Survey Units and Aboriginal object locales recorded during the Exploratory Works EIS and Modification 1 are shown in Appendix A.

### 2.2.1. Modification 1

In accordance with section 5.25 of the EP&A Act, the Infrastructure Approval issued for Exploratory Works was modified to:

- provide additional geotechnical information for the detailed design of the Snowy 2.0 power station and power waterway;
- provide a reliable long term source of construction power for the duration of Exploratory Works and will reduce the reliance on diesel generation and associated on-site storage and emissions;
- improve the efficiency of the Exploratory Works construction power;
- optimise the detailed design of construction areas and access roads; and
- improve worker safety during construction.

The Modification 1 Assessment Report was submitted to Department of Planning, Industry and Environment (DPIE) in June 2019, and was publicly exhibited between 26 June 2019 and 9 July 2019. A total of nine submissions were received, and following consideration, approval was granted by the Minister for Planning and Public Spaces on 2 December 2019.

Though Modification 1 included several changes, only the geotechnical investigations are relevant to the Stage 2 works and Future Generation's activities for the Exploratory Works project. This AHMP has therefore been revised to address the Aboriginal heritage requirements and management measures from Modification 1 which are relevant to the geotechnical activities.

## 2.3. Environmental Management System

The overall environmental management system for the Project is described in the Future Gen EMS.

This AHMP forms part of Future Generation's environmental management framework for the Project as described in Section 4 of the EMS.

**This Plan aims to transfer the relevant requirements of the Approval documents into a management plan which can be practically applied on the Project site.**

## 2.4. Relationship to Project Management Systems and Other Project Plans

It is a requirement of Volume 4 Employer's Requirements – Project Execution to develop and implement a number of project plans for the project. These plans are defined as deliverables. The AHMP is required to support the deliverable plans.

The Environmental Management Strategy (EMS) will form part of the Project Management System (Future Gen-PMS) and will include any requirements specified in the contract documents, where appropriate. All Future Gen-PMS procedures will support, interface or directly relate to the development and execution of the plan.

The Project Execution Plan (PEP) is the overarching document that outlines the minimum requirements for project management on the project. The PEP is not a standalone document and has been prepared with consideration to other project plan requirements. The PEP will also detail the interfaces between other project plans and provide information on the responsibility and management of the interfaces and project works.

All project plans are reviewed by the Quality Manager and/or Systems Manager to ensure consistency with the Quality Management Plan (QMP) and Future Gen-PMS.

## 2.5. Purpose and Objectives

In this plan, Aboriginal heritage refers to the stone artefacts and archaeological deposits located on and in the ground in the heritage Survey Units as identified in the ACHAR and mapping in Appendix A.

The purpose of this Plan is to describe how the Project proposes to minimise and manage construction impacts on Aboriginal heritage during construction of the Project.

The key objective of the AHMP is to describe the management measures that are to be implemented to ensure that impacts to Aboriginal heritage are minimised and within the scope permitted by the CoA. To achieve this, SHL and Future Gen will:

- ensure appropriate measures are implemented to address the relevant CoA and the REMMs listed within the Submissions Report and Submissions Report for Modification 1 as detailed within Table 3-1 and Table 3-2 of this Plan;
- ensure appropriate measures are implemented during construction to minimise impact to ground surfaces which are known or predicted to contain Aboriginal heritage, if feasible;
- ensure that it is clear where and when unmitigated impacts to Aboriginal heritage can occur;
- ensure that it is clear when and where further archaeological assessment and salvage excavations occur; and
- ensure that it provides useable guidance and protocols for the management of unexpected Aboriginal heritage objects or values and human burials.

Maps showing the location of the Survey Units which contain Aboriginal heritage provide the framework for management and are provided in Appendix A of this AHMP. This mapping is available as GIS layers and would be used for management of Aboriginal heritage prior to and during construction.

## 2.6. Plan Preparation

In accordance with condition 14 of Schedule 3 of the Approval, the AHMP has been prepared by a suitably qualified and experienced person in accordance with guidelines made or approved under the *National Parks and Wildlife Act 1974* (NPW Act). This plan was prepared by Dr Julie Dibden, NSW Archaeology Pty Ltd and Rebecca Parkes, from Lantern Heritage. Dr Julie Dibden was endorsed as a suitably qualified person by DPIE in a letter dated 31 May 2019. This plan was prepared and consulted on for both the Stage 1 and Stage 2 Exploratory Works and has been updated for the Stage 2 Exploratory Works.

## 2.7. Consultation

### 2.7.1. Aboriginal Consultation (Exploratory Works)

The Snowy Mountains is country to several groups and many Aboriginal people have cultural and spiritual associations that have long histories embodied in objects which can be seen on the ground and other intangible values related to the past and current concerns and aspirations. The project area itself is located within the lands of the Wolgalu people.

A formal process of Aboriginal community consultation has been conducted as a component of assessment of heritage impacts (as documented in the ACHAR) in accordance with the guidelines



as set out in the NSW OEH's Aboriginal cultural heritage consultation requirements for proponents 2010 (NSW DECCW 2010b).

The Registered Aboriginal Parties (RAPs) for this project are:

- Iris White, on behalf of the Ngarigo people;
- Corroboree Aboriginal Corporation;
- Bega Local Aboriginal Land Council;
- Lindsay Connolly, Steve Connolly and Ramsey Freeman;
- Brungle-Tumut Local Aboriginal Land Council;
- Arnold Williams, on behalf of the Ngunnawal Elders Corporation;
- Ellen Mundy and Ngarigo people; and
- John Dixon and Ngarigo people.

In addition, Snowy Hydro has consulted independently with the Wagonga Local Aboriginal Land Council and the Northern and Southern Kosciuszko National Park Aboriginal Community Memorandum of Understanding Groups.

### **2.7.2. Aboriginal Consultation (Modification 1)**

Snowy 2.0 RAPs have been involved in assessing all areas of the proposed modification (Modification 1) for its Aboriginal sociocultural and archaeological heritage values through involvement in the Aboriginal Cultural Heritage Assessment process. No cultural information specific to the areas of the proposed modification have been identified by RAPs. The RAPs were provided with a copy of the Modification 1 assessment report.

### **2.7.3. Consultation of the AHMP**

In accordance with condition 14(b) of the Approval, the AHMP is to be prepared in consultation with the National Park and Wildlife Service (NPWS), the NSW Office of Environment and Heritage (OEH), RAPs and NPWS Tumut Brungle Gundagai Aboriginal Community Executive Advisory Committee.

On 4 October 2018, the draft AHMP was issued to stakeholders, seeking review of this Plan. The draft AHMP has been endorsed by one RAP group and constructive feedback has been provided by OEH.

This document is an updated version of the final version of the AHMP for the Exploratory Works – Stage 1, prepared following a review process with the RAPs, NPWS Tumut Brungle Gundagai Aboriginal Community Executive Advisory Committee, OEH and NPWS.

On 17 April 2019, the Plan was issued to stakeholder agencies for review and comment. Comments from consultation have been incorporated into this Plan where appropriate. Response to the comments have been provided back to the stakeholder agencies.

On 5 July 2019, the Plan was issued to DPIE and SHL for review and comment. Comments from consultation have been incorporated into this Plan where appropriate. Response to the comments have been provided back to the Stakeholder Agencies. Comments are summarised in Table 2-2.

A separate document, titled Agency Consultation Evidence Report has been prepared detailing the consultation process. This document has been provided to DPIE.



**Table 2-2: Stage 2 consultation with stakeholder agencies summary**

Date	Consultation	Outcomes
<b>Stage 2 Consultation</b>		
27 May 2019	Plans issued to OEH for review.	-
4 June 2019	Agency briefing meeting on AHMP held with EPA, OEH, NPWS, DoI Fisheries & SHL	-
13 June 2019	Comments received from OEH	Update management plan in response to comments.
4 July 2019	Incorporated agencies' comments and updated plan. Updated plan submitted to SHL and to DPIE on 5 July 2019.	-

Revision 1 of the AHMP (prepared in response to Modification 1 of the Infrastructure Approval), was issued to the following agencies for consultation:

- NPWS on 10 October 2019;
- Heritage unit (previously OEH) on 24 October 2019; and
- DPIE's Biodiversity & Conservation unit on 28 October 2019.

Comments have been incorporated into the Plan where appropriate. NPWS requested that Future Generation consult with the DPIE Biodiversity and Conservation Unit for the revision of this plan. This has occurred. The DPIE Biodiversity and Conservation Unit had no comments.

#### 2.7.4. Ongoing Consultation

Consultation with the RAPs would be ongoing during the life of the project. This would include, but not be limited to:

- consultation in regard to processes and strategies as outlined in this AHMP;
- ensuring that Aboriginal stakeholders are able to have reasonable access to cultural heritage sites on site. The process to obtain access will include Aboriginal stakeholders making the request for access to the Snowy Hydro project manager. Snowy Hydro will then facilitate access construction site with the contractor where it is safe to do so; and
- consultation in the event of any unexpected Aboriginal heritage values/objects or burials being found during the construction of the project.

In the event of an unexpected find of Aboriginal heritage the matter of care and control of Aboriginal objects retrieved during salvage excavations will be managed in accordance with the Unexpected Finds Procedure (Appendix B). The methodology will follow on from the approved method within Stage 1 AHMP in accordance with Appendix B Mitigated Impacts Salvage methodology. As per Stage 1, all salvaged items will be collected, sorted and stored by the archaeologist engaged to manage the heritage programs, who will consult with the RAPs in regards to the care and control of salvaged objects and return of items post salvage.

## 2.8. Construction Activities

This Plan relates to Stage 2 works. Stage 2 will include the following:

- pre-construction minor works (not construction activities) including:
  - building/road dilapidation studies;

- survey works;
- installing groundwater bores in the Ravine beds on site for water supply;
- establishing a temporary site office;
- minor access roads to facilitate the pre-construction minor works;
- installation of environmental impact mitigation measures, including the installation of monitoring equipment, erosion and sediment controls, and fencing;
- minor clearing or translocation of native vegetation within the approved disturbance footprint for the pre-construction minor works;
- the exploratory tunnel which is approximately 3.1 km long and will lead to the site of the underground power station;
- horizontal and other test drilling, investigations and analysis in situ at the proposed cavern location and associated areas, and around the portal construction pad, access roads and excavated rock management areas all within the disturbance footprint;
- borehole drilling and geophysical surveys for further geotechnical investigation of the Snowy 2.0 power station and power waterway at Marica, Talbingo and Tantangara;
- ongoing groundwater monitoring using existing boreholes and access tracks within KNP;
- ongoing maintenance and rehabilitation of existing access tracks required for groundwater monitoring and geotechnical investigations within KNP;
- additional geotechnical drilling is proposed to enable investigation and detailed design of critical bridge works (Nungar Creek bridge) on Tantangara Road;
- additional laydown areas at Talbingo north for the transfer of plant and materials are proposed within Modification 1 to improve constructability;
- a portal construction pad for the exploratory tunnel. This will provide the entrance structure to the tunnel and an area for infrastructure and equipment needed to support tunnelling activities;
- an accommodation camp for the Exploratory Works construction workforce;
- barge access infrastructure to enable access and transport by barge on Talbingo Reservoir. This includes one new barge ramp at Talbingo Spillway in the northern part of Talbingo Reservoir and one new barge ramp at Middle Bay near Lobs Hole at the southern part of Talbingo Reservoir;
- excavated rock management, including subaqueous placement within Talbingo Reservoir\*. Up to 750,000 m<sup>3</sup> of excavated rock will need to be tested for its geochemical properties (i.e. whether the rock is reactive or non-reactive) before being managed by a combination of the following options:
  - re-use – suitable material can be used as construction materials for roads or similar. Some materials will be provided to NPWS for use in road maintenance and upgrades in other areas of KNP;
  - on land placement – material will be placed in one of two on land emplacement areas. The eastern emplacement area has been designed to safely treat reactive material during temporary storage. The western emplacement area will be used for temporary storage of materials for re-use or offsite disposal (*Note: no material is to remain at any emplacement area and must be either sub-aqueously placed at Talbingo Reservoir or removed to a*

*suitable place outside of KNP within three years of completion of the exploratory works (should Snowy 2.0 Main Works not proceed));*

- subaqueous placement within Talbingo Reservoir – suitable material will be placed at a suitable location within Talbingo Reservoir, subject to a number of water quality controls and monitoring; and
- services infrastructure such as diesel-generated power, water and communication;
- post-construction revegetation and rehabilitation, management and monitoring.

*\*Note: these activities will not proceed unless the relevant management plans are approved by DPIE.*

### 2.8.1. Works approved through Modification 1

The Exploratory Works - Modification 1 works scope is included in Table 2-3. For clarity this has been divided between Stage 1 and Stage 2 works.

The revised project boundary (disturbance footprint) for the project, as approved through Modification 1 of the Infrastructure Approval, has been included in Appendix D of this plan. Table 2-3: Exploratory Works - Modification 1 works scope (Stage 1 and Stage 2)

Stage 1	
Activity	Description
Lobs Hole Substation	<p>Additional disturbance area required for the construction power connection to an existing transmission line (Line 2) at Lobs Hole for power supply to the Exploratory Works accommodation camp and construction areas. This will provide a reliable and long-term source of construction power and will reduce the reliance on diesel generation and associated on-site storage requirements and emissions. Works in this area will include establishing a substation, connection infrastructure, access roads and ancillary construction areas. Works in this area will include establishing a substation, connection infrastructure, access roads and ancillary construction areas.</p> <p>This will include:</p> <ul style="list-style-type: none"> <li>• construction of a 330/33 kV substation within Kosciuszko National Park and adjacent to Line 2, which forms a 330-kV connection between Upper Tumut Switching Station and Yass Substation;</li> <li>• geotechnical investigation works to inform the detailed design of the construction power substation;</li> <li>• replacement of one transmission support structure (Structure 54) within the existing transmission easement. This will involve removal of the existing structure and establishment of one new steel lattice tower, approximately 50 m in height;</li> <li>• short overhead 330 kV transmission line connections (approximately 100 m in length) between the substation and the new Structure 54;</li> <li>• 33 kV feeder connection between the substation and the Exploratory Works construction power network. This will be either overhead lines or underground cables;</li> <li>• establishment and upgrade of access tracks and roads to the new substation and transmission line structures;</li> <li>• installation of a fibre optic communication link into the new substation from the approved communication network; and</li> <li>• ancillary activities, including brake and winch sites, crane pads, site compounds and equipment laydown areas.</li> </ul> <p>(Illustrated in Appendix D, Figure 1i).</p>
Camps Bridge and Wallaces Creek	<p>Additional disturbance area around Camp Bridge and Wallaces Creek Bridge required for improved constructability of the crossings. Works within these areas will include vegetation clearing, levelling earthwork, erection of falsework, sediment controls, laydown, parking and movement of equipment.</p> <p>(Illustrated in Appendix D, Figures 1h and 1i).</p>

Lobs Hill Ravine Road and Construction Boundary Changes	<p>Minor changes to the project boundary identified through detailed design including:</p> <ul style="list-style-type: none"> <li>revised road upgrade for Lobs Hole/Ravine Road to improve access, drainage and safety;</li> <li>minor additions to construction areas for design optimisation.</li> <li>removal of dangerous trees on Lobs Hole Ravine Road. This will involve either complete or partial removal of up to 91 trees that have been identified to pose a safety risk to road users on Lobs Hole Ravine Road and Mine Trail Road;</li> </ul> <p>(Illustrated in Appendix D, Figures 1b to 1f and Figure 1i).</p>
Operating Hours	Modify operating hours from existing 7 am to 6pm to 6 am to 8 pm in November to March.
Miscellaneous	<p>Continued use of existing communications towers within KNP that were previously approved by the NPWS under a separate review of environmental factors (REF R – Wallaces Creek Geotechnical drilling) environmental impact assessment carried out under the NSW National Parks and Wildlife Act 1974 (NPW Act) and its regulation for the geotechnical investigation program; and</p> <p>Increase in peak traffic volumes. Additional vehicles will be required to access the site to facilitate construction of Exploratory Works, however no change in impacts to the road network are expected.</p> <p>(The location of the communications towers illustrated in Appendix D Figures 1a, 1f,1l).</p>
<b>Stage 2</b>	
<b>Activity</b>	<b>Description</b>
Borehole drilling and geophysical surveys	<p>This includes:</p> <ul style="list-style-type: none"> <li>borehole drilling and geophysical surveys for further geotechnical investigation of the Snowy 2.0 power station and power waterway at Marica, Talbingo and Tantangara;</li> <li>clearing of up to 2.79 hectares (ha) of additional vegetation for access tracks and drilling pads. About 1.33 ha within Smokey Mouse potential habitat;</li> <li>trimming of overhanging dangerous branches on adjacent trees (these trees will not require removal);</li> <li>mulching of trees and vegetation;</li> <li>establishment of an additional 1 km of access tracks (4 m wide), including minor earthworks;</li> <li>placement of geofabric (as required) and import of stabilised material;</li> <li>establishment of eight drilling pads and boreholes at top of the cavern area, with an area of 900 m<sup>2</sup> per pad, including minor earthworks, placement of geofabric (as required) and import of stabilised material (as required);</li> <li>undertaking geophysical surveys near Talbingo and Tantangara reservoirs;</li> <li>establishment of two drilling pads and boreholes at both Tantangara and Talbingo with an area of 900 m<sup>2</sup> per pad, including approximately 400 m of additional access tracks and minor earthworks (as required);</li> <li>establishment of in-reservoir boreholes including one in Talbingo Reservoir and two in Tantangara Reservoir;</li> <li>drilling of additional nested vertical boreholes at each of the drilling pads up to a depth of 1,100 m;</li> <li>conversion of the investigation boreholes into monitoring bores;</li> <li>undertaking geophysical surveys;</li> <li>rehabilitation of the drilling pads and access tracks following completion of works;</li> <li>ongoing maintenance of existing access tracks required for geotechnical investigations within KNP.</li> </ul> <p>(Illustrated in Appendix D Figure 1j, 1k, 1l, 1m and 1n).</p>
Talbingo Laydown	<p>Outside of KNP, SHL is proposing to add four laydown locations to facilitate the construction of the communications cable linking Lobs Hole with the Tumut 3 Power Station.</p> <p>These are proposed on existing hardstand areas along the northern foreshore of Talbingo Reservoir within Snowy Hydro owned land. Additional widening of Spillway Road for accessibility is required.</p>

	(Illustrated in Appendix D, Figure 1o).
Tantangara Access	Two additional geotechnical boreholes are required to facilitate the detailed design of cuttings, bridge foundations, retaining wall foundations, and drainage structures near Nungar Creek. (Illustrated in Appendix D, Figure 1m and 1n).
Operating Hours	Modify operating hours for the use of Upper Lobs Hole Ravine Road from 7 am to 6pm to sunrise to sunset.

### 3. ENVIRONMENTAL REQUIREMENTS

#### 3.1. Legislation

Legislation relevant to Aboriginal heritage management includes:

- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act);
- *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act);
- *Native Title Act 1993* (note there are no native title claims relevant to this area); and
- *National Parks and Wildlife Act 1974* (NSW) (NPW Act).

Relevant provisions of the above legislation are explained in the register of legal and other requirements included in Appendix A1 of the EMS.

#### 3.2. Conditions of Approval

Project approval was granted by the Department of Planning, Industry and Environment (DPIE) on 7 February 2019 with the following Aboriginal heritage management conditions included in the Infrastructure Approval. The relevant conditions are presented in Table 3-1.

**Table 3-1: Conditions of approval relevant to Aboriginal heritage management**

Condition	Requirement	Where addressed
Sch 3, Cond 11	The Proponent must ensure that the development does not affect any Aboriginal heritage items outside the approved disturbance area (see Appendix 3).	AHMP - Sections 5.2 and 6.1.
Sch 3, Cond 12	The Proponent must undertake archival recording, test excavation and/or salvage of the items listed in Table 3-1 in Appendix 3, in accordance with the approved program under the Aboriginal Heritage Management Plan.	AHMP Stage 1 Exploratory Works
Sch 3, Cond 13	The Proponent may damage the Aboriginal heritage items listed in Table 3-2 of Appendix 3 without carrying out any further management or mitigation measures.	AHMP Stage 1 Exploratory Works & - Section 6.1 of this plan
Sch 3, Cond 14	Prior to carrying out any development that could affect the Aboriginal heritage items listed in Table 3-1 in Appendix 3, unless the Planning Secretary agrees otherwise, the Proponent must prepare an Aboriginal Heritage Management Plan for the development to the satisfaction of the Planning Secretary. This plan must:	This Plan AHMP - Section 2.6 AHMP - Section 6.1
	(a) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary;	
	(b) be prepared in consultation with the NPWS, BCD, RAPs, NPWS Tumut Brungle Gundagai Aboriginal Community Executive Advisory Committee;	Section 2.7
	(c) include a description of the measures that would be implemented to mitigate the impacts of the development on the Aboriginal heritage items listed in Table 3-1, including: <ul style="list-style-type: none"> <li>• test excavation and salvage of certain sites; and</li> </ul>	AHMP Stage 1 Exploratory Works – (Note: All archival recording, test excavation and/or

Condition	Requirement	Where addressed
	<ul style="list-style-type: none"> <li>archival recording of cultural features within the approved disturbance area shown in Appendix 3;</li> </ul>	salvage of the items listed in Table 3-1 in Appendix 3 were undertaken in Stage 1 AHMP)
	(d) include a description of the measures that would be implemented to <ul style="list-style-type: none"> <li>maintain reasonable access for Aboriginal stakeholders to cultural heritage sites on site;</li> <li>consult the RAPs on the conservation and management of Aboriginal cultural heritage onsite;</li> <li>protect and monitor the Aboriginal heritage sites outside the approved disturbance area;</li> <li>manage the discovery of human remains or previously unidentified Aboriginal artefacts;</li> <li>store and manage any salvaged Aboriginal heritage items; and</li> <li>ensure workers on site receive adequate training and inductions on Aboriginal heritage management.</li> </ul>	Section 2.7 Section 2.7 Section 7.1 Appendix B AHMP Stage 1 Exploratory Works (Appendix B) and Appendix B of this Plan Section 7.2
Sch 3, Cond 15	The Proponent must implement the approved Aboriginal Heritage Management Plan for the development.	This Plan

### 3.3. Revised Environmental Management Measures

Environmental safeguards and management measures are included in the Exploratory Works EIS in Section 6.3. During preparation of the Submissions Report, REMMs were developed and are included in Section 8 of the Submissions Report.

REMMs relevant to Modification 1 are included in Section 8 of the Submissions Report for Modification 1.

The environmental management measures relevant to this Plan are listed in Table 3-2 below. If additional measures are cross-referenced from another section of the Exploratory Works EIS or Submissions Report, these measures are also included. The revised environmental management measures from Modification 1 have also been incorporated into Table 3-2.

**Table 3-2: Revised environmental management measures relevant to Aboriginal heritage**

Impact	Ref #	Environmental management measure	Where addressed
Aboriginal heritage	HER01	An Aboriginal Heritage Management Plan (AHMP) will be prepared and implemented to guide the process for management and mitigation of impacts to Aboriginal cultural and heritage. The AHMP will:	This plan
		<ul style="list-style-type: none"> <li>be prepared in consultation with RAPs, NPWS Tumut Brungle Gundagai Aboriginal Community Executive Advisory Committee and OEH;</li> </ul>	Section 2.6
		<ul style="list-style-type: none"> <li>Set out guidelines for ongoing consultation and opportunities for cultural values assessment;</li> </ul>	Section 2.6
		<ul style="list-style-type: none"> <li>include procedures relating to the conduct of additional archaeological assessment, including monitoring and salvage excavations after clearance, if required. Should the additional archaeological assessment be required to occur prior to</li> </ul>	AHMP Stage 1 Exploratory Works Section 6 Appendix B



Impact	Ref #	Environmental management measure	Where addressed
		finalisation of the AHMP, the archaeological assessment will be prepared as a separate document, with any recommendations for monitoring incorporated into the AHMP;	
		<ul style="list-style-type: none"> <li>set out a protocol for unexpected Aboriginal heritage values and human skeletal material</li> </ul>	Appendix C
		A 50 m buffer zone from the bank of the Yarrangobilly River will be established to protect the likely presence of Aboriginal cultural items, except for those areas required for creek or river crossings and road construction.	Section 6 and Table 6-1
Loss of Aboriginal cultural heritage	HER02	Specific management and mitigation measures are listed for specific heritage item below:	Table 5-3 Table 5-4
		<ul style="list-style-type: none"> <li>monitoring after vegetation clearance and salvage excavation will occur for heritage sites – SU2, SU6, SU7</li> <li>salvage excavation will occur for heritage sites – SU10, SU12, SU25</li> </ul>	AHMP Stage 1 Exploratory Works Section 6 and Table 6-1 of this plan Appendix B of this plan
		Aboriginal cultural heritage management measures to be included in the AHMP and implemented during construction include:	Section 6 and Table 6-1 of this plan
		<ul style="list-style-type: none"> <li>impacts to ground surfaces should be kept to an absolute minimum;</li> </ul>	Section 6 and Table 6-1 of this plan
		<ul style="list-style-type: none"> <li>for Survey Units which are assessed to be of higher significance values, mitigated impacts in the form of partial impacts only (i.e. conservation of part of an Aboriginal site or Survey Unit) and/or salvage in the form of further research and archaeological analysis will occur prior to impacts. Should the additional archaeological analysis be required to occur prior to finalisation of the AHMP, the archaeological analysis will be prepared as a separate document, with any recommendations for monitoring incorporated into the AHMP;</li> </ul>	AHMP Stage 1 Exploratory Works Section 6 and Table 6-1 of this plan Appendix B
		<ul style="list-style-type: none"> <li>salvage excavations in the Survey Units in order to mitigate impacts to the archaeological resource in the project area; and</li> </ul>	AHMP Stage 1 Exploratory Works Section 6 and Table 6-1 of this plan
		<ul style="list-style-type: none"> <li>the AHMP is to include management measures of any further Aboriginal cultural heritage values which may be identified during construction.</li> </ul>	Appendix C
Aboriginal heritage	M1.4	The Aboriginal heritage management plan (AHMP) will be updated to account for the additional areas assessed for the proposed modification.	Table 6-1 Table 4-2 Table 5-4 This plan

### 3.4. Licences and Permits

No permits are required in respect of the current project.

Environment Protection Licence (EPL) 21266 has been issued for the Project for the scheduled activity of extractive activities. The EPL details conditions which must be complied with when undertaking the extractive activities works. This plan is written in accordance with all requirements in the EPL.

Works Access Licence No. 2 – Stage 1 Exploratory Works, Main Roads and Survey Works, has been issued to the proponent (SHL) by NPWS to permit works to be undertaken in the KNP for

Stage 1 Exploratory Works. A Works Access Licence will be required for Stage 2 Exploratory Works.

### 3.5. Guidelines

The guidelines, policies and standards relevant to this Plan include:

- Office of Environment and Heritage 2011, *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW*, OEH NSW, Sydney;
- Department of Environment, Climate Change and Water 2010, *Code of practice for archaeological investigation of Aboriginal objects in New South Wales*, DECCW NSW, Sydney;
- Department of Environment, Climate Change and Water 2010, *Aboriginal cultural heritage consultation requirements for proponents*, DECCW NSW, Sydney;
- National Parks and Wildlife Service 1997, *Aboriginal cultural heritage standards and guidelines kit*, NPWS, Sydney.

## 4. EXISTING ENVIRONMENT

### 4.1. Aboriginal Heritage

The Snowy Mountains is country to several groups and many Aboriginal people have cultural and spiritual associations that have long histories embodied in objects and intangible values related to the past and current concerns. Recent archaeological research has indicated an Aboriginal presence in the Snowy Mountains since the early Holocene period (from around 9,000 years ago) (Theden-Ringl 2016). The project itself is within the country of the Wolgalu people.

The Aboriginal heritage in the project area was recorded during the Exploratory Works EIS, as documented in the ACHAR.

The Aboriginal heritage Survey Units (inclusive of all Aboriginal stone artefacts and archaeological deposits) recorded within the project corridor during the Exploratory Works EIS are listed in Table 4-1. The Aboriginal heritage Survey Units (inclusive of all Aboriginal stone artefacts and archaeological deposits) recorded within the project corridor during the Modification 1 assessment are listed in Table 4-2. The location of all the Survey Units and Aboriginal object locales are shown in Appendix A. The following sections summarise Aboriginal heritage within the project area based on the information provided within the Exploratory Works EIS and Modification 1 Assessment.



**Table 4-1: Summary description of Survey Units - including the AHIMS sites, Aboriginal object locales recorded during survey and test excavation (Test Transects)**

ID	Start	Finish	Description	Disturbance	Predicted/known artefact density	Aboriginal objects
SU1	628044. 6037763	628223. 6039044	Lower simple slope landform. Dry sclerophyll forest with a thick shrubby understory. Shale bedrock; occasional cobbles and shatter. Erosional context.	Previous timber extraction for domestic and mining use. Natural erosional processes. Water race race/road.	Very low/ negligible	Nil recorded
SU2	627823. 6038005	628089. 6039134	Flat landform. Dry sclerophyll forest with a thick shrubby understory. Thickets of blackberry. Depositional context.	Previous timber extraction for domestic and mining use. Construction of water race/road.	Moderate	Nil recorded
SU3	626834. 6037907	628280. 6037746	Flat landform. Dry sclerophyll forest with occasional grassy glades. Depositional context.	Previous timber extraction for domestic and mining use. Historic gardens. Construction of water race and road. Recreational use.	Low/Moderate	AHIMS 56-6-0009 SU3/L1 SU3/L2 SU3/L3 Test Transect 1 Test Transect 2 Test Transect 3 Test Transect 4
SU4	626834. 6037911	626705. 6038354	Crest/knoll landform. Cleared with some regrowth saplings. Scattered shrubs and blackberry. Shale bedrock. Negligible topsoil. Highly eroded with no or limited soil.	Previous clearance, original homestead site. Mining.	Low	AHIMS 56-6-0045 SU4/L1 SU4/L2
SU5	626765. 6038102	626577. 6038570	Flat landform. Patches of regenerating dry sclerophyll forest and open grassland. Depositional context.	Previous clearance, cultivation and gardening. Mining. Recreation.	Moderate	SU5/L1 SU5/L2 Test Transect 1 Test Transect 2 Test Transect 3 Test Transect 4 Test Transect 5

ID	Start	Finish	Description	Disturbance	Predicted/known artefact density	Aboriginal objects
SU6	626563. 6038141	626520. 6038637	Crest landform. Regenerating dry sclerophyll forest and open grassland. Shale bedrock. Generally negligible topsoil. Highly eroded to bedrock.	Previous clearance, historic occupation. Mining. Recreation.	Moderate/high	SU6/L1 SU6/L2 SU6/L3 SU6/L4 Test Transect 1 Test Transect 2
SU7	625939. 6038408	626381. 6038621	Crest landform. Regenerating dry sclerophyll forest. Shale bedrock. Erosional context.	Previous clearance, historic occupation including 1920 school.	Moderate	Nil recorded
SU8	626550. 6038617	626173. 6038961	Flat landform. Patches of regenerating dry sclerophyll forest and open grassland. Depositional context.	Previous clearance, cultivation and gardening. Mining. Recreation.	Low	AHIMS 56-6-0043 Test Transect 1 Test Transect 2 Test Transect 3 Test Transect 4
SU9	626223. 6038599	626124. 6038885	Steep simple slope. Patches of regenerating dry sclerophyll forest. Erosional context.	Previous timber extraction for domestic and mining use.	Negligible	Nil recorded
SU10	626142. 6038654	626025. 6039021	Crest landform. Regenerating native shrubs; mostly grassland. Shale bedrock. Erosional context.	Previous clearance, historic occupation including police station.	Moderate/high	SU10/L1 SU10/L2 SU10/L3 Test Transect 1 Test Transect 2
SU11	625700. 6038734	626110. 6039080	Flat landform. Patches of regenerating dry sclerophyll forest and open grassland. Depositional context.	Previous clearance, historic occupation including Washington Hotel, cultivation and gardening. Recreation.	Low	AHIMS 56-6-0041 AHIMS 56-6-0047 SU11/L1 SU11/L2 SU11/L3 Test Transect 1 Test Transect 2 Test Transect 3

ID	Start	Finish	Description	Disturbance	Predicted/known artefact density	Aboriginal objects
SU12	625700. 6038734	626110. 6039080	Flat landform. Patches of regenerating dry sclerophyll forest and open grassland. Depositional context.	Previous clearance, cultivation and gardening. Recreation.	Moderate/high	AHIMS 56-6-0042 AHIMS 56-6-0046 SU12/L1 Test Transect 1 Test Transect 2 Test Transect 3 Test Transect 4 Test Transect 5 Test Transect 6 Test Transect 7 Test Transect 8
SU13	625526. 6039474	625463. 6039162	Crest landform. Regenerating dry sclerophyll forest and open grassland. Shale bedrock. Erosional context	Previous clearance, timber extraction for domestic and mining use.	Low	SU13/L1 SU13/L2
SU14	625680. 6039417	626438. 6039390	Steep simple slope. Regenerating dry sclerophyll forest. Erosional context.	Previous timber extraction for domestic and mining use.	Negligible	Nil recorded
SU15	625934. 6039145	626558. 6039131	Crest landform. Regenerating dry sclerophyll forest. Shale bedrock. Erosional context.	Previous clearance, timber extraction for domestic and mining use.	Low	Nil recorded
SU16	625871. 6039011	626571. 6039160	Gentle simple slope. Regenerating dry sclerophyll forest. Erosional context.	Previous timber extraction for domestic and mining use.	Low	SU16/L1 SU16/L2 SU16/L3 SU16/L4
SU17	626658. 6038178	626644. 6037763	Crest landform. Regenerating dry sclerophyll forest. Shale bedrock. Erosional context.	Previous clearance, timber extraction for domestic and mining use. Dwellings etc of 'Struggle Street'.	Low	SU17/L1
SU18	626255. 6037617	627342. 6037529	Gentle simple slope. Regenerating dry sclerophyll forest with some grassland. Thickets of blackberry. Erosional context.	Previous timber extraction for domestic and mining use.	Low	SU18/L1

ID	Start	Finish	Description	Disturbance	Predicted/known artefact density	Aboriginal objects
SU19	628321. 6037830	628289. 6039033	Steep simple slope. Dry sclerophyll forest. Erosional context.	Previous timber extraction for domestic and mining use.	Negligible	Nil recorded
SU20	628712. 6027495	627141. 6031868	Generally, gently undulating crest landform. Dry sclerophyll forest. Erosional context.	Previous timber extraction.	Low	SU20/L1 SU20/L2 SU20/L3 SU20/L4 SU20/L5 SU20/L6 SU20/L7 SU20/L8 SU20/L9 SU20/L10 SU20/L12 SU20/L12
SU21	629075. 6027804	626360. 6038292	Gently undulating crest landform at south end, becoming steep to north. Dry sclerophyll forest. Erosional context.	Previous timber extraction.	Low	Nil recorded
SU22	625213. 6039987	624901. 6039838	Crest landform. Regenerating dry sclerophyll forest. Shale bedrock. Erosional context	Previous clearance, timber extraction for domestic and mining use.	Low	SU22/L1 SU22/L2 SU22/L3
SU23	625132. 6040059	624350. 6040552	Gentle simple slope. Regenerating dry sclerophyll forest. Thickets of blackberry. Erosional context.	Previous timber extraction for domestic and mining use.	Low	SU23/L1 SU23/L2 SU23/L3
SU24	625535. 6039474	625163. 6040069	Gently undulating crest landform at south end, becoming steep to north. Dry sclerophyll forest. Erosional context.	Previous timber extraction.	Low	SU24/L1
SU25	627154. 6031875	627038. 6032150	Gently undulating crest landform. Dry sclerophyll forest. Erosional context.	Cleared electricity easement.	Low	AHIMS 56-6-0038 AHIMS 56-6-0039 AHIMS 56-6-0040

ID	Start	Finish	Description	Disturbance	Predicted/known artefact density	Aboriginal objects
SU26	617274. 6056791	616718. 6059014	Generally steep simple slopes.	SMA infrastructure.	Negligible	Nil recorded
SU27	618303. 6056461	616989. 6058557	Generally steep simple slopes.	SMA infrastructure.	Negligible	Nil recorded

**Table 4-2: Summary of survey units that intersect with the proposed modification (Modification 1) footprint**

Survey unit	Modification 1 element within survey unit	Landscape context	Predicted/known artefact density in SU	AHIMS sites within survey unit
Talbingo Reservoir, Lobs Hole and Ravine Road				
RSU2	Additional EW EIS boundary	Flat landform. Dry sclerophyll forest with a thick shrubby understory. Thickets of blackberry. Depositional context.	Moderate	None within survey unit.
RSU3	Additional EW EIS boundary	Flat landform. Dry sclerophyll forest with occasional grassy glades. Depositional context.	Low/Moderate	56-6-0009 (Ravine; Lob's Hole; KNP91-59) 56-6-0495 (RSU3/L1) 56-6-0496 (RSU3/L2) 56-6-0497 (RSU3/L3) Test Transect 1 Test Transect 2 Test Transect 3 Test Transect 4
RSU4	Additional EW EIS boundary	Crest/knoll landform. Cleared with some regrowth saplings. Scattered shrubs and blackberry. Shale bedrock. Negligible topsoil. Highly eroded with no or limited soil.	Low	56-6-0045 (KNP91-60) 56-6-0498 (RSU4/L1) 56-6-0499 (RSU4/L2)

Survey unit	Modification 1 element within survey unit	Landscape context	Predicted/known artefact density in SU	AHIMS sites within survey unit
RSU11	Additional EW EIS boundary	Flat landform. Patches of regenerating dry sclerophyll forest and open grassland. Depositional context.	Low	56-6-0041 (KNP91-21; Ravine) 56-6-0047 (RSU11/L1) 56-6-0487 (RSU11/L1) 56-6-0488 (RSU11/L2)
RSU12	Additional EW EIS boundary	Crest/knoll landform. Cleared with some regrowth saplings. Scattered shrubs and blackberry. Shale bedrock. Negligible topsoil. Highly eroded with no or limited soil.	Low	56-6-0042 (KNP91-22) 56-6-0046 (KNP91-61) 56-6-0478 (RSU13/L2) 56-6-0537 (RSU12/L1) Test Transect 1 Test Transect 2 Test Transect 3 Test Transect 4 Test Transect 5 Test Transect 6 Test Transect 7 Test Transect 8
RSU13	Additional EW EIS boundary	A crest landform of low elevation with a south westerly aspect. Vegetation in regenerating dry sclerophyll forest and open grassland. Geology is shale presenting as outcropping, cobbles, shatter and gravels. Soils are skeletal and very gravelly. The landform is eroding.	Low	56-6-0478 (RSU13/L2) 56-6-0483 (RSU13/L1)
RSU17	Reduced footprint	A crest landform overlooking major water course to the east. The aspect is northerly. Vegetation regenerating dry sclerophyll forest with areas of blackberry thicket. Geology is shale and sandstone conglomerate. Shale presenting as outcropping, shatter, cobbles and gravels. Soils are a shallow skeletal gravelly loam. Erosional context.	Low	56-6-0477 (RSU17/L1)
RSU18	Reduced footprint	A series of gentle simple slopes of gentle to steep gradients with a northerly aspect. Vegetation is regenerating dry sclerophyll forest, wattle regrowth with some grassland. Numerous thickets of blackberry. Erosional context.	Low	56-6-0476 (RSU18/L1)

Survey unit	Modification 1 element within survey unit	Landscape context	Predicted/known artefact density in SU	AHIMS sites within survey unit
RSU21	Additional EW EIS boundary Proposed TBM load extent (Lobs Ravine Road upgrade)	Gently undulating crest landform at south end, becoming steep to north. The aspect is mostly northerly. Vegetation is a dry sclerophyll forest. Geology is meta-sedimentary shale presenting as outcrops, shatter, cobbles and gravels. The SU is slightly rocky. Soils are a shallow skeletal gravelly loam. Erosional context.	Low	None within survey unit.
RSU22	Additional EW EIS boundary	Crest landform. Regenerating dry sclerophyll forest. Shale bedrock. Erosional context	Low	56-6-0504 (RSU22/L3) 56-6-0505 (RSU22/L2) 56-6-0507 (RSU22/L1)
RSU23	Borehole BH 7012 and Borehole BH7201 and associated access track MOD 1 disturbance boundary	Gentle simple slope. Regenerating dry sclerophyll forest. Thickets of blackberry. Erosional context.	Low	56-6-0502 (RSU23/L3) 56-6-0503 (RSU23/L2) 56-6-0506 (RSU23/L1)
RSU24	Additional EW EIS boundary	Gently undulating crest landform at south end, becoming steep to north. Dry sclerophyll forest. Erosional context	Low	56-6-0536 (RSU24/L1)
RSU26	Additional EW EIS boundary	A series of narrow [c.10-20m wide] spur crests of gentle to moderate gradient with a west north westerly aspect. Vegetation is Eucalypt and wattle regrowth woodland with an understorey of grasses with areas of impenetrable infestations of blackberry and briar rose. Geology is shale presenting as outcrops, shatter, cobbles and gravels. The SU is very slightly rocky. Soil is a skeletal shallow light brown gravelly loam. The SU is comprised of large amorphous landforms situated well away from water.	Negligible	None within survey unit
RSU28	Lobs Hole substation disturbance area	A series of short moderate to steep simple slopes with gradients ranging from 20° to 32°. The aspect is mainly northerly. SU dissected by minor drainage lines. Vegetation is scattered shrubs with occasional small Eucalypt becoming very dense in areas. Heavy infestations of blackberry throughout SU. Geology is a mix of conglomerate and meta-sedimentary shales presenting as outcrops, cobble, gravels and very high levels of shatter. The SU is very rocky. Tuff and chert occurring naturally as rounded and angular pebbles. Traces of low-quality quartz was observed in the background stone profile, none of which is likely to be artefactual. Soils are skeletal and very gravelly. The landform is eroding.	Negligible	None within survey unit

Survey unit	Modification 1 element within survey unit	Landscape context	Predicted/known artefact density in SU	AHIMS sites within survey unit
RSU29	Lobs Hole substation disturbance area	A very gently to gently undulating crest landform with a south-westerly aspect. Vegetation is an open mixed age Eucalypt forest with an understorey of banksias and heath. Geology is metasedimentary presenting as outcrops, shatter, cobbles and gravels. Large area of smooth conglomerate boulder outcropping along break of slope along western boundary of SU. Outcrops are greater than 2 metres wide. Soils are a shallow brown gravelly silty loam. Landform is eroding.	Negligible	56-6-0048 (KNP91-63) 56-6-0540 (RSU29/L1)
RSU31	Borehole BH 7001 and associated access track	A very narrow [c.20-30m wide] spur crest of gentle to moderate gradient with a south westerly aspect. Very steep slopes off the crest. Vegetation on upper slope is an open scrub with grasses becoming an open Eucalypt forest with an understorey of heath and banksia on the lower slope. Geology is a metasedimentary presenting as shatter, cobbles and gravels. Occasional small discrete bedrock outcropping. SU becomes very rocky at higher elevations. Soil is a gravelly loose loam.	Negligible	None within survey unit.
RSU32	Borehole BH 7012 and Borehole BH7212 and associated access track MOD 1 disturbance boundary	Moderate to steep simple slopes with gradients ranging from 20° to 32°. The aspect is mainly south westerly. SU dissected by minor drainage lines. Vegetation is scattered shrubs with occasional small Eucalypt becoming very dense in areas. Heavy infestations of blackberry throughout SU. Geology is a mix of conglomerate and meta-sedimentary shales presenting as outcrops, cobble, gravels and high levels of shatter. The SU is very rocky. Tuff and chert occurring naturally as rounded and angular pebbles. Traces of low-quality quartz was observed in the background stone profile, none of which is likely to be artefactual. Soils are skeletal and very gravelly. Erosional context.	Negligible	None within survey unit
RSU35	Additional EW EIS boundary	A simple slope landform of moderate gradient with a southerly aspect. Vegetation is a dense forest of Eucalypt, blackberry, wattles and grasses. Forest floor has a thick cover of litterfall. Geology is metasedimentary presenting as gravels. Soil is rich brown slightly gravelly loam. The landform is aggrading.	Negligible	None within survey unit
Marica				
MSU6	Borehole No.8 and access track	Forested ridge crests and simple slopes; undulating; heavily wooded; conglomerate geology with an abundance of water worn cobbles and pebbles.	Negligible	None within survey unit
MSU7	Boreholes No. 10-15 and associated access tracks	Forested ridge crests and simple slopes; steep valley sides; heavily wooded; conglomerate geology with an abundance of water worn cobbles and pebbles.	Negligible	None within survey unit
Tantangara Reservoir				



Survey unit	Modification 1 element within survey unit	Landscape context	Predicted/known artefact density in SU	AHIMS sites within survey unit
TSU1	Proposed geophysics line	A low relief, gently undulating crest of an east facing spur. The aspect is easterly. The landform overlooks a major watercourse, the former Murrumbidgee River, now Tantangara Dam. Geology is volcanic presenting as outcropping, cobbles and gravels. The area has occasional low outcrops of volcanic rock and is thickly vegetated with native grasses and Hakea shrubs. Increased outcropping exposures on the higher points across the SU. Soils area a slightly gravelly brown silty loam. Soil depths are variable from shallow to c.25cm maximum. Short drainage lines which flow from springs run easterly along the length of crest on the northern and southern boundaries.	Very Low	57-4-0127 (Quarry Rd 1) 57-4-0287 (TSU1/L4) 57-4-0288 (TSU1/L7) 57-4-0289 (TSU1/L6) 57-4-0290 (TSU1/L5) 57-4-0310 (TSU1/L2) 57-4-0311 (TSU1/L3)
TSU2	Borehole No.3 & 4 and associated tracks	A gently undulating crest of a north east facing spur. The aspect is north easterly. The SU overlooks the former Murrumbidgee River. The area is covered with dense patches of Hakea; small heath shrubs and native grasses. Geology is volcanic presenting as outcropping, cobbles and gravels. Occasional low outcropping of highly eroded volcanic bedrock. Soils area a dark brown sandy loam. Soil depths are variable from shallow to c. 30cm maximum. Short drainage lines which flow from springs run easterly along the length of crest on the northern and southern boundaries.	Very Low	57-4-0125 (Quarry Road 5) 57-4-0126 (Quarry Road 3) 57-4-0224 (Quarry Road 4) 57-4-0255 (TSU2/L9) 57-4-0263 (TSU2/L6) 57-4-0264 (TSU2/L8) 57-4-0265 (TSU2/L2) 57-4-0266 (TSU2/L3) 57-4-0267 (TSU2/L5)
TSU4	Existing access tracks	A very gently sloping east facing low relief crest landform. The area is vegetated with Hakea shrubs; occasional trees and an understorey of native grasses and scattered heath. Geology is volcanic presenting as outcropping, cobbles and gravels. Soil is a fine sandy loam up to a maximum depth of c.40cm. Short drainage lines which flow from springs run easterly along the length of crest on the northern and southern boundaries.	Low	57-4-0123 (Quarry Road 2) 57-4-0124 (Quarry Road 6) 57-4-0252 (TSU4/L1) 57-4-0257 (TSU4/L3) 57-4-0258 (TSU4/L4) 57-4-0260 (TSU4/L2) 57-4-0261 (TSU4/L6)
TSU5	Existing access tracks	A very gently sloping broad terminal spur crest directly above a valley floor and creek. The aspect is easterly. A deeply incised east-west drainage line traverses the southern boundary. Vegetation is low Hakea shrub and low heath groundcover. Occasional mature snow gums located along the edge of crest. Geology is volcanic presenting as outcropping, cobbles and gravels. Numerous low outcropping of highly eroded volcanic rock on crest proper and only skeletal soils remain. Soil is a shallow fine sandy loam up to a maximum depth of c.20cm.	Very low to low	57-4-121 (Quarry Road 8) 57-4-122 (Quarry Road 7) 57-4-0251 (TSU5/L5) 57-4-0259 (TSU5/L3) 57-4-0294 (TSU5/L4)


## 5. ENVIRONMENTAL ASPECTS, IMPACTS AND RISKS

### 5.1. Environmental Aspects

An environmental aspect is an element of an organisation's activities, products, or services that has or may have an impact on the environment (ISO 14001 Environmental management systems). The relationship of aspects and impacts is one of cause and effect.

Key aspects of the Project that could result in Aboriginal heritage impacts are identified in Table 5-1. The extent of these impacts will depend on the nature, extent and magnitude of construction activities and their interaction with the natural environment (Column 2). This is further exacerbated by environmental factors (Column 3). This identification process has considered the proposed project activities and the types of potential impacts to Aboriginal heritage.

**Table 5-1: Project aspects and impacts relevant to Aboriginal heritage items**

	Aspects (Construction and human activities likely to cause damage to Aboriginal heritage items)	Impacts to Aboriginal Heritage items	Environmental Factors (Conditions)
	<b>Direct</b> Vegetation clearing Topsoil stripping Bulk earthworks Soil movement and transfer <b>Indirect</b> Off-road human and vehicular activity during and after construction Increased visitation by Exploratory workforce at Lobs Hole Increased recreational visitation to Lobs Hole after Exploratory Works Soil erosion	<b>Direct</b> Physical disturbance and damage to heritage items <b>Indirect</b> Inadvertent or deliberate damage to Aboriginal items The removal of Aboriginal items via inadvertent damage/theft Soil disturbance through excessive erosion from surface water runoff	Presence of unknown Aboriginal heritage items

### 5.2. Impacts to Aboriginal Heritage

#### 5.2.1. Exploratory Works EIS

The assessment of harm is conducted within an analytical framework based on Survey Units (Table 5-3). An impact assessment is outlined in the table below. It is noted that not all areas within Survey Units would be impacted during the activity, and accordingly, impacts will be partial rather than comprehensive. It is noted that in particular, a riparian exclusion zone of 50 m in width adjacent to the Yarrangobilly River, will result in a conservation outcome of any Aboriginal object incidence within that zone.

Anticipated impacts to Aboriginal heritage are set out in the tables below. Not all heritage Survey Units and Aboriginal artefact locales located during the Exploratory Works EIS would be impacted during construction of the development. The location of all Survey Units and Aboriginal object locales recorded at the Project Site is shown in Appendix A.

### 5.2.2. Exploratory Works – Modification 1

The assessment of harm is conducted within an analytical framework based on Survey Units (Table 5-4). An impact assessment is outlined in the table below.

Modification 1 will involve areas of additional ground disturbance not previously included in the Exploratory Works EIS. The Modification 1 construction footprint will result in additional impacts to Aboriginal objects within RSU3 and RSU12. The Aboriginal objects within RSU3 were previously approved for unmitigated impacts as part of the Exploratory Works project and therefore additional management measures are not required. The additional level of ground disturbance within RSU12 is likely to require salvage excavation as a mitigation strategy within affected areas of archaeological sensitivity. Salvage excavation within RSU12 was previously approved for the Exploratory Works project.

The proposed modification includes the use of existing vehicle access tracks. Five Aboriginal sites have been identified on or within 5 m of existing access tracks (refer Table 6.4); however, will not be impacted as ground disturbance is not proposed in these areas.

The proposed modification footprint at Tantangara will include ground disturbance within three survey units (TSU1, TSU2 and TSU3) with low to moderate predicted artefact densities, and is within 20 m of recorded Aboriginal object locales. It is acknowledged that construction activities may impact Aboriginal objects and will constitute partial impacts to these survey units. The relatively discrete nature of the impacts from these activities do not require impact mitigation given the low to moderate predicted artefact densities. Notwithstanding, more extensive future impacts from the Main Works construction footprint (subject to approval) are likely to trigger salvage excavation for these survey units and it will be more appropriate to design a salvage strategy in response to future broad-scale impact areas.

**Table 5-2: Summary description of Survey Units including the AHIMS sites, Aboriginal object locales recorded during survey and test excavation (Test Transects) located in impact zones (Exploratory Works EIS).**

SU ID	ID	Impact
SU3	SU3/L2	Mine Trail Road Upgrade
SU3	SU3/L3	Mine Trail Road Upgrade
SU4	56-6-0045	Mine Trail Road Upgrade
SU4	SU4/L2	Excavated Material Stockpile
SU4	SU4/L1	Excavated Material Stockpile
SU6	SU6/L3	Excavated Material Stockpile
SU6	SU6/L4	Excavated Material Stockpile
SU6	SU6/L1	Excavated Material Stockpile
SU6	SU6/L2	Other - Between Stockpiles
SU10	SU10/L3	Lower Lobs Hole Ravine Road Upgrade
SU10	SU10/L2	Lower Lobs Hole Ravine Road Upgrade
SU10	SU10/L1	Lower Lobs Hole Ravine Road Upgrade
SU16	SU16/L1	Accommodation Camp
SU16	SU16/L4	Accommodation Camp
SU16	SU16/L2	Accommodation Camp
SU16	SU16/L3	Accommodation Camp
SU13	SU13/L2	Lower Lobs Hole Ravine Road Upgrade
SU24	SU24/L1	Lower Lobs Hole Ravine Road Upgrade
SU23	SU23/L1	Middle Bay Wharf Access
SU23	SU23/L3	Middle Bay Wharf Access
SU25	56-6-0039	Upper Lobs Hole Ravine Road

**Table 5-3: Aboriginal heritage management measures for each heritage Survey unit (Exploratory Works EIS)**

ID	Aboriginal Objects	Significance	Type of harm	Degree of harm	Management measure
SU1	Nil recorded	-	Direct Construction Pad Mine Trail Road Extension	Partial Not all of SU would be impacted	Unmitigated impact: Avoidance or salvage not required
SU2	Nil recorded	Potentially moderate local significance	Direct Construction Pad Mine Trail Road Extension	Partial Not all of SU would be impacted	Monitoring after vegetation clearance and salvage excavation, if required Note – the Stage 1 AHMP has been updated to 'Unmitigated impact: Avoidance or salvage not required'. All salvage works are managed by SHL through the Stage 1 AHMP. Approval of this change would result in salvage or avoidance not being required for SU2.
SU3	AHIMS 56-6-0009, SU3/L1, SU3/L2, SU3/L3, Test Transect 1, Test Transect 2, Test Transect 3, Test Transect 4	Low/moderate local significance	Direct Mine Trail Road Upgrade	Partial Not all of SU would be impacted	Unmitigated impact: Avoidance or salvage not required
SU4	AHIMS 56-6-0045, SU4/L1, SU4/L2	Low local significance	Direct Mine Trail Road Upgrade Excavated material stockpile	Partial Not all of SU would be impacted	Unmitigated impact: Avoidance or salvage not required
SU5	SU5/L1, SU5/L2, Test Transect 1, Test Transect 2, Test Transect 3, Test Transect 4, Test Transect 5	Moderate local significance	Direct Excavated material stockpile	Partial Not all of SU would be impacted	Nil required; Impacts minimal
SU6	SU6/L1, SU6/L2, SU6/L3, SU6/L4, Test Transect 1, Test Transect 2	Moderate local significance	Direct Excavated material stockpile	Partial Not all of SU would be impacted	Monitoring after vegetation clearance and salvage excavation
SU7	Nil recorded	Potentially moderate local significance	Direct Excavated material stockpile, Other	Partial Not all of SU would be impacted	Monitoring after vegetation clearance and salvage excavation
SU8	AHIMS 56-6-0043, Test Transect 1, Test Transect 2, Test Transect 3, Test Transect 4	Low local significance	Direct Excavated material stockpile	Partial Not all of SU would be impacted	Unmitigated impact: Avoidance or salvage not required

ID	Aboriginal Objects	Significance	Type of harm	Degree of harm	Management measure
SU9	Nil recorded	Low local significance	Direct Excavated material stockpile	Partial Not all of SU would be impacted	Unmitigated impact: Avoidance or salvage not required
SU10	SU10/L1, SU10/L2, SU10/L3, Test Transect 1, Test Transect 2	Moderate local significance	Direct Lobs Hole Ravine Road Upgrade, Other	Partial Not all of SU would be impacted	Salvage excavation
SU11	AHIMS 56-6-0041, AHIMS 56-6-0047, SU11/L1, SU11/L2, SU11/L3, Test Transect 1, Test Transect 2, Test Transect 3	Low local significance	Direct Lobs Hole Ravine Road Upgrade, Other	Partial Not all of SU would be impacted	Unmitigated impact: Avoidance or salvage not required
SU12	AHIMS 56-6-0042, AHIMS 56-6-0046, Test Transect 1, Test Transect 2, Test Transect 3, Test Transect 4, Test Transect 5, Test Transect 6, Test Transect 7, Test Transect 8	Moderate local significance	Direct Lobs Hole Ravine Road Upgrade	Partial Not all of SU would be impacted	Depending on the extent of impacts, salvage excavations may be appropriate Note – the Stage 1 AHMP has been updated to 'Unmitigated impact: Avoidance or salvage not required' following further investigations at this site. All salvage works are managed by SHL through the Stage 1 AHMP. Approval of this change would result in salvage or avoidance not being required for SU12.
SU13	SU13/L1, SU13/L2	Low local significance	Direct Lower Lobs Hole Ravine Road Upgrade	Partial Not all of SU would be impacted	Unmitigated impact: Avoidance or salvage not required
SU14	Nil recorded	Low local significance	Nil	Nil	N/A
SU15	Nil recorded	Low local significance	Direct Accommodation camp	Partial Not all of SU would be impacted	Unmitigated impact: Avoidance or salvage not required
SU16	SU16/L1, SU16/L2, SU16/L3, SU16/L4	Low local significance	Direct Accommodation camp	Partial Not all of SU would be impacted	Unmitigated impact: Avoidance or salvage not required
SU17	SU17/L1	Low local significance	nil	nil	N/A

ID	Aboriginal Objects	Significance	Type of harm	Degree of harm	Management measure
SU18	SU18/L1	Low local significance	Direct Mine Trail Road Upgrade Rock emplacement Area	Partial Not all of SU would be impacted	Unmitigated impact: Avoidance or salvage not required
SU19	Nil recorded	Low local significance	Direct Construction Pad	Partial Not all of SU would be impacted	Unmitigated impact: Avoidance or salvage not required
SU20	SU20/L1, SU20/L2, SU20/L3, SU20/L4, SU20/L5, SU20/L6, SU20/L7, SU20/L8, SU20/L9, SU20/L10, SU20/L12, SU20/L12	Low local significance	Nil	Nil	N/A
SU21	Nil recorded	Low local significance	Direct Lobs Hole Ravine Road upgrade	Partial Not all of SU would be impacted	Unmitigated impact: Avoidance or salvage not required
SU22	SU22/L1, SU22/L2, SU22/L3	Low local significance	Direct Lower Lobs Hole Ravine Road Upgrade	Partial Not all of SU would be impacted	Unmitigated impact: Avoidance or salvage not required
SU23	SU23/L1, SU23/L2, SU23/L3	Low local significance	Direct Middle Bay Wharf Access Wharf laydown	Partial Not all of SU would be impacted	Unmitigated impact: Avoidance or salvage not required
SU24	SU24/L1	Low local significance	Direct Lower Lobs Hole Ravine Road Upgrade	Partial Not all of SU would be impacted	Unmitigated impact: Avoidance or salvage not required
SU25	AHIMS 56-6-0038 AHIMS 56-6-0039 AHIMS 56-6-0040	Low local significance	Direct Lobs Hole Ravine Road Upgrade Laydown	Partial Not all of SU would be impacted	Salvage excavation in the area of the three AHIMS sites in this Survey Unit for the purposes of providing a comparative analysis with the archaeology in Lobs Hole (regardless of low significance)
SU26	Nil recorded	Low local significance	Direct Talbingo access	Partial Not all of SU would be impacted	Unmitigated impact: Avoidance or salvage not required
SU27	Nil recorded	Low local significance	nil	nil	N/A

\*Note: All test excavation, salvage, archival recording and protection will be undertaken under the approved AHMP – Stage 1 Exploratory Works



**Table 5-4: Modification 1 Aboriginal heritage impact assessment and management measures**

ID	Aboriginal sites relevant to Modification 1	Significance	Additional impact type for the survey unit	Degree of harm	Management measures in the Exploratory Works EIS	Changes to management or additional management required from Modification 1
<b>Talbingo Reservoir, Lobs Hole and Ravine Road</b>						
RSU3	56-6-0495 (RSU3/L1) is within modification footprint 56-6-0009 (Ravine; Lob's Hole; KNP91-59) is within 5 m of modification footprint	Low to moderate local significance	Direct Modification construction footprint	Partial Not all of SU will be impacted	Unmitigated impact: Avoidance or salvage not required	None
RSU12	56-6-0537 (RSU12/L1) is Adjacent to river crossing where modification footprint represents wider construction corridor	Moderate local significance	Modification construction footprint	Partial Not all of SU will be impacted	Direct impact: Depending on the extent of impacts, salvage excavation may be appropriate	Increased impacts have determined that salvage excavation is required within RSU12
RSU24	56-6-0536 (RSU24/L1) was previously within Exploratory Works footprint but is now outside modified footprint	Low local significance	56-6-0536 (RSU24/L1) is no longer within Exploratory Works construction footprint	No additional impacts anticipated	Unmitigated impact: avoidance or salvage not required	None
RSU29	56-6-0048 (KNP91-63) is within modification footprint	Generally of negligible significance with the exception of certain micro topographies which may potentially be of low/moderate local significance	Direct Modification construction footprint	Partial Not all of SU will be impacted	No impact is currently approved for this survey unit.	Unmitigated impact: Avoidance or salvage not required. Note: site 56-6-0540 (Ravine SU29/L1) is 30 m west of the proposed modification footprint and features a hatchet head. This site will be avoided. Establish no-go zone to ensure no inadvertent impacts



ID	Aboriginal sites relevant to Modification 1	Significance	Additional impact type for the survey unit	Degree of harm	Management measures in the Exploratory Works EIS	Changes to management or additional management required from Modification 1
<b>Marica</b>						
N/A	Site 57-6-0323 (Kiandra Plain) is on existing track	Low local significance	None On existing track that will not be upgraded	Not applicable	No management previously prescribed	None
<b>Tantangara Reservoir</b>						
TSU1	57-4-0310 (TSU1/L2) is within 20 m of proposed geophysics line	Very low significance	Direct Geophysics line will introduce new impacts to TSU1	Partial Not all of SU will be impacted	No impact is currently approved for this survey unit. Note: future impacts from Main Works are likely to apply to this survey unit.	None: unmitigated impacts Unmitigated impact is suitable based on low archaeological significance
TSU2	57-4-0265 (TSU2/L2) and 57-4-0266 (TSU2/L3) is within 20 m of geophysics line and close to Borehole No.3 & 4 and associated tracks	Generally of low to moderate significance	Direct Boreholes and associated pads, associated tracks in geophysics line will introduce new impacts to TSU2	Partial Not all of SU will be impacted	No impact is currently approved for this survey unit. Note: future impacts from Main Works are likely to apply to this survey unit.	None: unmitigated impacts This survey unit will warrant salvage excavation if greater impacts are proposed.
TSU4	Sites 57-4-0123 (Quarry Road 2) and 57-4-0261 (TSU4/L6) occur on existing access tracks	Generally of low to moderate significance	None: On existing track that will not be upgraded	None	No impact is currently approved for this survey unit. Note: future impacts from Main Works are likely to apply to this survey unit.	None: no ground disturbance is proposed and no impacts are anticipated.
TSU5	Sites 57-4-121 (Quarry Road 8) and 57-4-122 (Quarry Road 7) occur within 5 m of existing access tracks	Generally of low to moderate significance	None: On existing track that will not be upgraded	None	No impact is currently approved for this survey unit. Note: future impacts from Main Works are likely to apply to this survey unit.	None: unmitigated impacts Unmitigated impact is suitable based on low archaeological significance

\*Note: All test excavation, salvage, archival recording and protection will be undertaken under the approved AHMP – Stage 1 Exploratory Works

### 5.3. Environmental Risk Assessment

The environmental aspects and impacts for soil are further considered within Appendix A3 of the EMS. This includes a risk assessment process. The risk assessment is based on (1) the likelihood of an impact occurring as a result of the aspect; and (2) the consequences of the impact if the event occurred.

## 6. ENVIRONMENTAL MANAGEMENT MEASURES

### 6.1. Management Measures

A range of environmental requirements and control measures are identified in the Exploratory Works EIS, Submissions Report and CoA. Safeguards and management measures will be implemented to avoid, minimise or manage impacts to Aboriginal heritage across the site.

Specific safeguards and management measures to address the impacts to Aboriginal heritage are outlined in Table 6-1.

This section of the plan provides the management measures that will be used to manage and mitigate potential impacts of the project on Aboriginal heritage. This section aims to outline the appropriate actions that will be undertaken for the purposes of managing impacts to Aboriginal heritage and to comply with the conditions of Infrastructure Approval.

In this section the following matters are addressed:

- the procedures for the management of known and predicted Aboriginal objects within the Project area;
- the procedures to be followed if any unexpected Aboriginal heritage values and/or human remains are found during the development works;
- the impact mitigation procedures to be followed (salvage excavations);
- the process for how the AHMP procedures will be managed and adhered to during the construction and operation of the project;
- the process that will be followed for continuing consultation with the Aboriginal stakeholders, NPWS Tumut Brungle Gundagai Aboriginal Community Executive Advisory Committee and the NSW OEH, where required.

For the purposes of this AHMP, the activity is inclusive of all ground disturbing impacts relating to the Exploratory works. Aboriginal objects in the form of stone artefacts were recorded in a number of heritage Survey Units across the project area. The majority of Survey Units in which Aboriginal stone artefacts have been recorded are predicted to contain additional items which, because of ground cover (grasses etc.), were undetectable during field survey. The construction of the project may therefore result in impacts to known stone artefact locales and undetected artefact distributions as described in respect of each Survey Unit.

Due to the cultural significance of the Aboriginal heritage in the development area, a strategy of impact mitigation is required. Where feasible the Project will avoid and minimise impacts to ground surfaces containing heritage items, to ensure as little impact as possible to Aboriginal objects in the Project area. It is also appropriate to salvage artefacts from certain Survey Units (via archaeological excavation) prior to commencing construction works on the site as a form of impact mitigation.

In summary, it is appropriate to implement practical measures that may be taken to protect, conserve or salvage Aboriginal objects in the Project area. *(Note: Timing and completion of the management measures described in this document have been incorporated into the project program as some activities will require substantial time-frames to complete before construction commences).*

The following management and mitigation measures are proposed.

#### **6.1.1. Further Investigation**

All test excavation, salvage, archiving and reporting will be completed under the approved Stage 1 AHMP.

#### **6.1.2. Conservation**

The development of a conservation strategy is not relevant or warranted in respect of the Aboriginal heritage in the Project area. However, impacts to ground surfaces should be kept to an absolute minimum where possible.

As noted previously, a riparian exclusion zone adjacent to the Yarrangobilly River measuring 50 m wide (except for nominated river and creek crossings and road construction) will result in a conservation outcome in these areas.

The management of the riparian exclusion zone adjacent to the Yarrangobilly River would entail appropriate identification of the area on sensitive area plans and the installation of temporary barriers and signage denoting the no-go areas.

#### **6.1.3. Mitigated Impacts**

All test excavation, salvage, archiving and reporting will be completed under the approved Stage 1 AHMP.

The mitigation measures in Table 6-1 are applicable to Stage 2 scope of works.

**Table 6-1: Aboriginal heritage management measures**

ID	Measure / Requirement	Stage	When to implement	Responsibility	Source document
General					
AH01	Training will be provided to all project personnel, including relevant sub-contractors on Aboriginal heritage requirements from this plan through inductions, toolboxes and targeted training. Training would include details or heritage values of the project site and the procedure in the event of discovery of unexpected heritage values or bones (potential human remains).	All	Pre-construction and construction	Contractor	Schedule 3 Condition 11 and 14
AH02	For areas avoided by construction, exclusion zones would be put in place to ensure archaeological deposits are not incidentally damaged. These would be fenced with parawebbing or some other similar fencing that would exclude entry by people or plant to avoid incidental impacts on the site.	All	Pre-construction and construction	Contractor	Schedule 3 Condition 11 and 14
AH03	Impacts to ground surfaces will be kept to an absolute minimum where practicable.	All	Construction	Contractor	Schedule 3 Condition 11 and 14
AH04	A 50m buffer zone adjacent to the Yarrangobilly River measuring 50 m wide (except for nominated river and creek crossings and sections of Mine Trail Road) will be established and appropriately demarcated prior to construction. The exclusion zone will be: designated as an exclusion zone and identified on the Sensitive Area Plans; and marked in the field with temporary barriers and signage denoting a “no-go” area.	All	Pre-construction and construction	Contractor	Schedule 3 Condition 11 and 14
AH05	If any part of the project (such as an ancillary facility) is located in an area which has not been subject to Aboriginal heritage field survey and assessment, an assessment by a suitably qualified archaeologist will be undertaken before that part of the project proceeds.	All	Pre-construction and construction	Contractor	Schedule 3 Conditions 11, 13 and 14
AH06	If the project design changes and further impacts are proposed to any Aboriginal object, sites which are currently outside of the identified impacted area the changes will be referred to a suitably qualified archaeologist for review. This may warrant the implementation of additional impact mitigation strategies.	All	Pre-construction and construction	Contractor	Schedule 3 Conditions 11, 13 and 14
Unexpected finds					
AH07	The unexpected finds procedure included within Appendix C will be followed in the unlikely event that unexpected Aboriginal heritage objects or values are identified during construction.	All	Pre-construction and construction	Contractor	Schedule 3 Condition 11 and 14
AH08	In the unlikely event that human remains are found during construction, the protocol outlined in Appendix B would need to be followed.	All	Construction	Contractor	Schedule 3 Condition 11 and 14

Note: All test excavation, salvage, archival recording and protection will be undertaken during Stage 1 Exploratory Works.

## 7. COMPLIANCE MANAGEMENT

### 7.1. Monitoring and Inspection

Weekly environmental inspections of the Aboriginal heritage in the Project area will occur in accordance with Section 8 of the EMS. The inspections will review the heritage located in each area in which works are scheduled to occur, are occurring and have occurred, in order to ensure that appropriate management and mitigation strategies are implemented, in accordance with this AHMP.

Once Aboriginal heritage salvage works are completed, weekly environmental inspections would focus on the protection of items retained and protected in situ. A suitably qualified archaeologist would then be required only in the instance of an unexpected find on site.

### 7.2. Training

All site personnel will undergo site induction training relating to Aboriginal heritage management issues prior to commencement on site.

In order for site workers and contractors to be able to know what processes to follow in regard to this AHMP, they would be provided training on heritage matters through the Project induction.

Ongoing environmental training will be provided to site personnel in the form of toolbox talks, daily pre-start meetings, construction methodology briefings and environmental awareness training.

Further details regarding the staff induction and training are outlined in Section 5 of the EMS.

### 7.3. Protocol for Continued Aboriginal Community Consultation

Consultation with the Registered Aboriginal Parties will be on-going throughout the construction. Consultation will include but not be limited to:

- ensuring that Aboriginal stakeholders are able to have reasonable access to cultural heritage sites on site. The process to obtain access will entail Aboriginal stakeholders making the request for access to the Snowy Hydro project manager. Snowy Hydro will then facilitate access to the construction site with Future Gen. Future Gen will arrange access where it is safe and reasonable to do so; and
- notification in the event of an unexpected find.

### 7.4. Incidents and Auditing

In the event of the occurrence of an incident, the Future Gen Environment Manager will immediately inform SHL who will contact Department of Planning, Industry and Environment in accordance with the requirements of condition 5 of Schedule 4 of the Infrastructure Approval.

In the event that a non-compliance is identified, Department of Planning, Industry and Environment will be notified in accordance with the requirements of condition 6 of Schedule 4 of the Infrastructure Approval. Details of incident and non-compliance reporting can be found in Section 7 and Section 8 of the EMS.

In the event that any unexpected Aboriginal objects and/or Aboriginal skeletal remains are found, the steps within the Unexpected Finds Procedure in Appendix B will be followed.

Audits will be undertaken to assess the effectiveness of the management measures, compliance with this AHMP, Exploratory Works EIS, Submissions Reports and other relevant approvals,

licences and guidelines. Audits include the Independent Audit in accordance with Schedule 4 Condition 9 of the Infrastructure Approval.

Audit requirements are detailed in Section 8 of the EMS.

### **7.5. Reporting**

Reporting will include monthly internal project reports and six-monthly compliance reports as required by the Infrastructure Approval. The six-monthly reports will track compliance against the CoA and the REMMs. Compliance reporting will be undertaken in accordance with Schedule 4, Condition 7 and 8 of the Infrastructure Approval. Reporting requirements and responsibilities are documented in the Section 8 of the EMS.



## APPENDIX A – LOCATION MAPPING OF KNOWN ABORIGINAL HERITAGE ITEMS

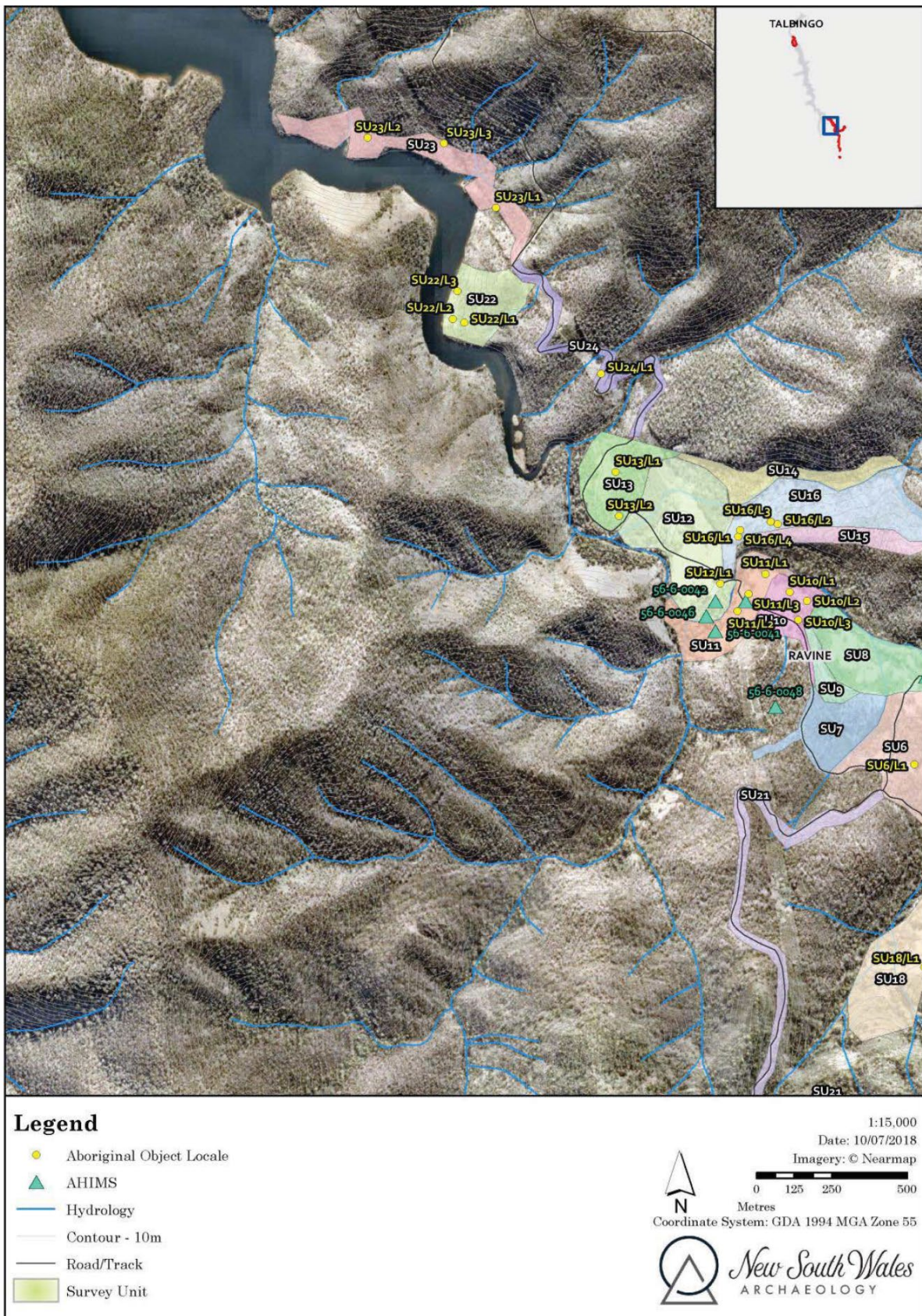


Figure A.1: Location of Aboriginal items Lobs Hole west



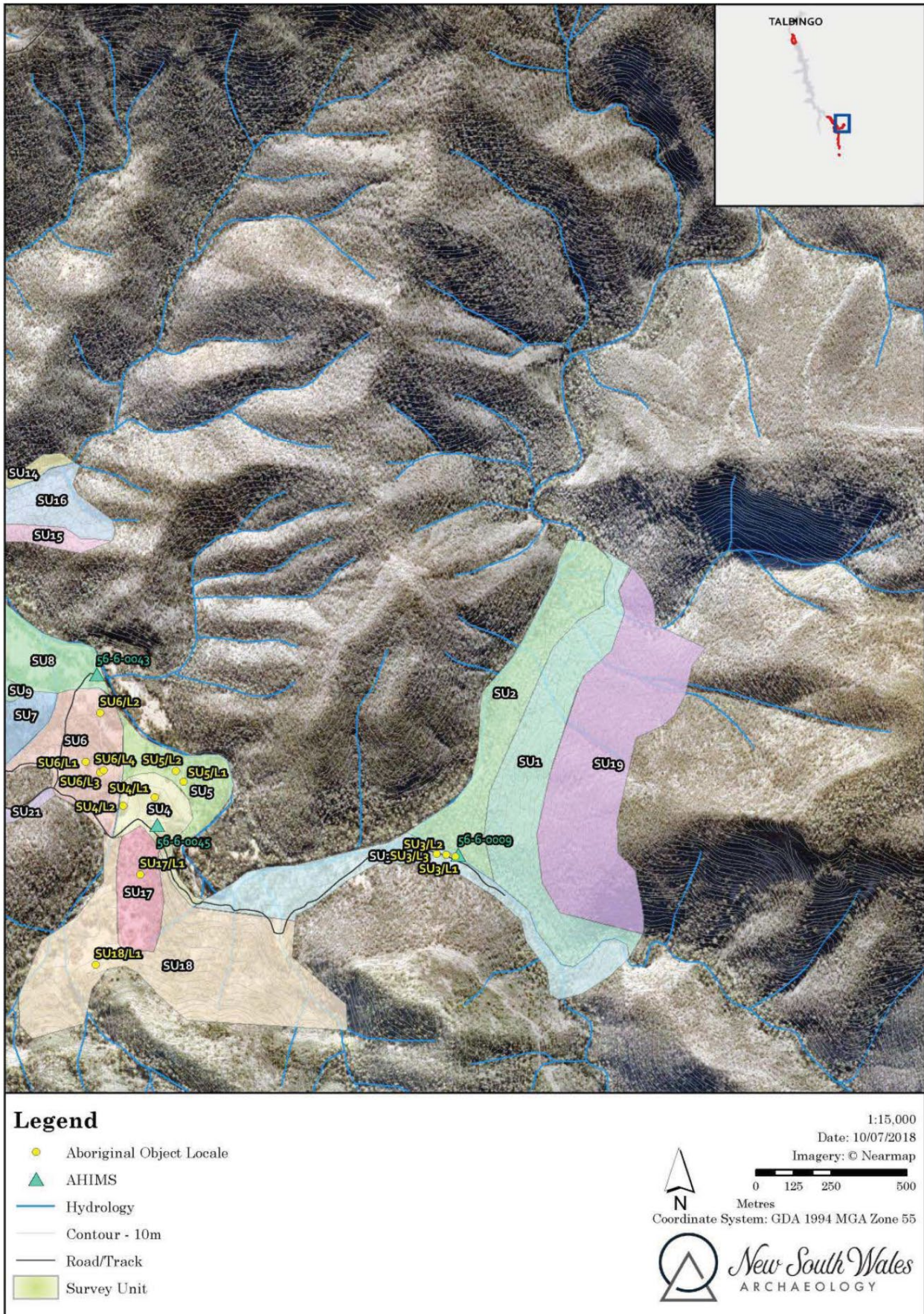


Figure A.2: Location of Aboriginal items Lobs Hole east



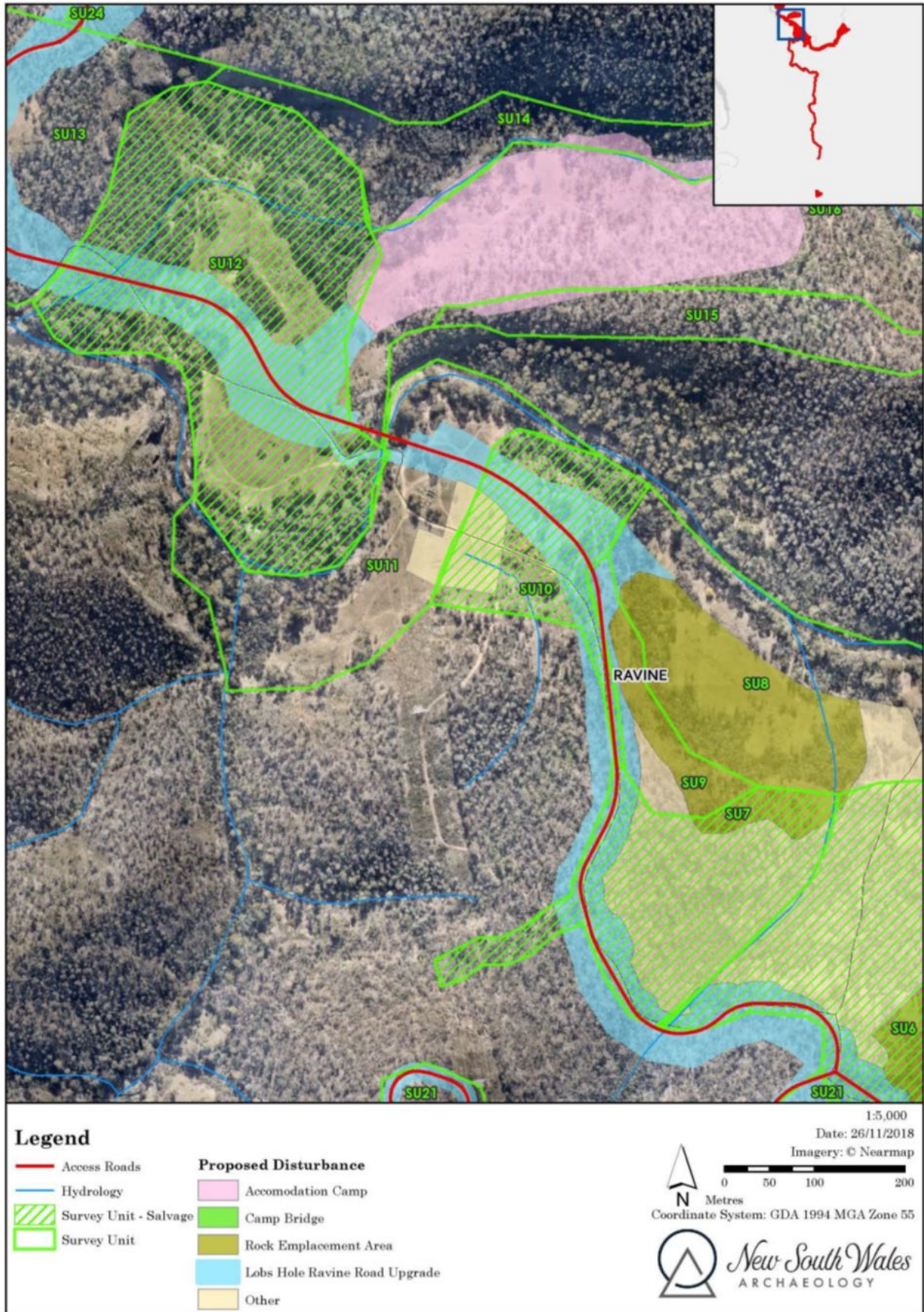


Figure A.3: Survey units at Lobs Hole (note location of SU7)



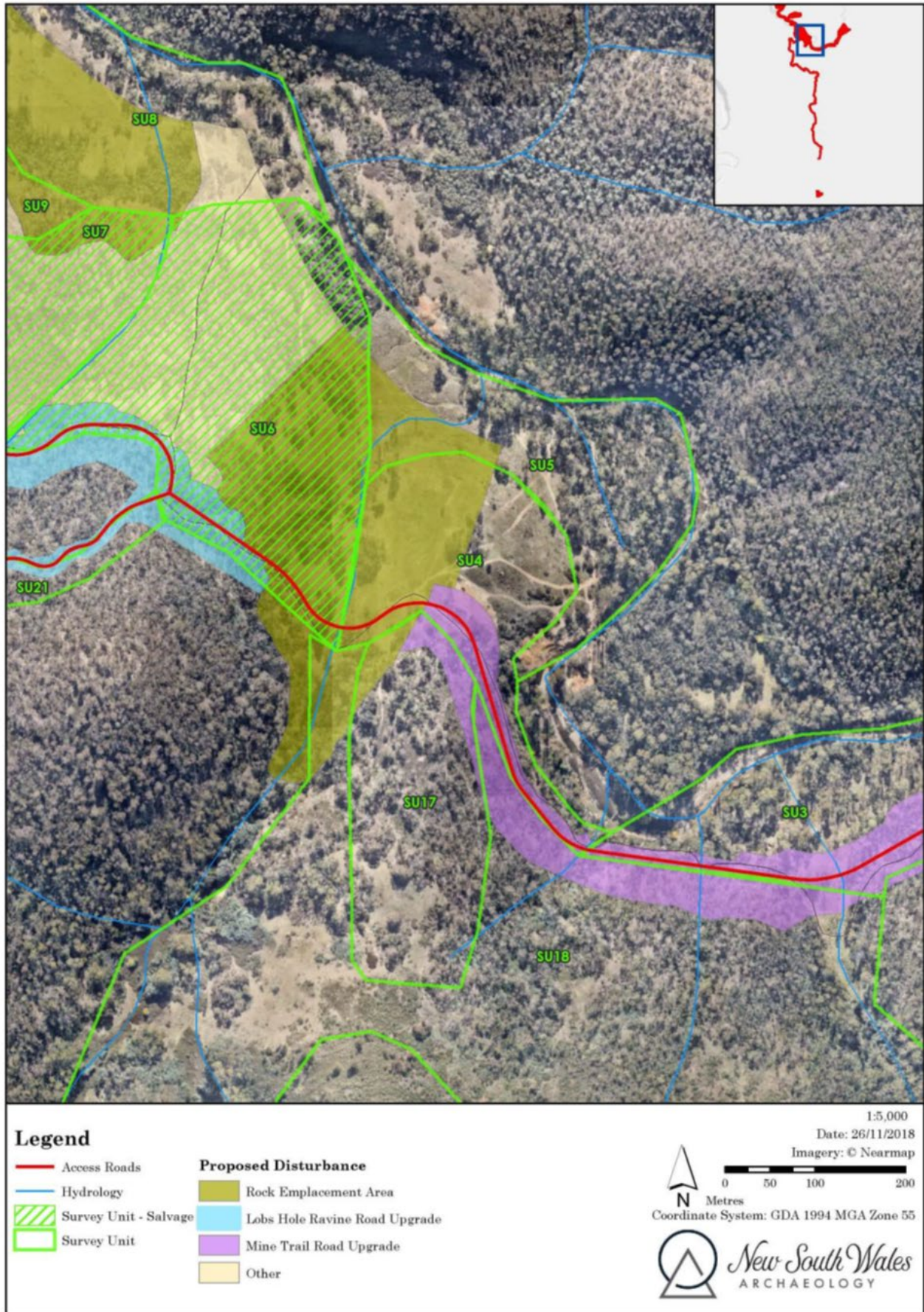


Figure A.4: Survey units at Lobs Hole (note location of SU6)



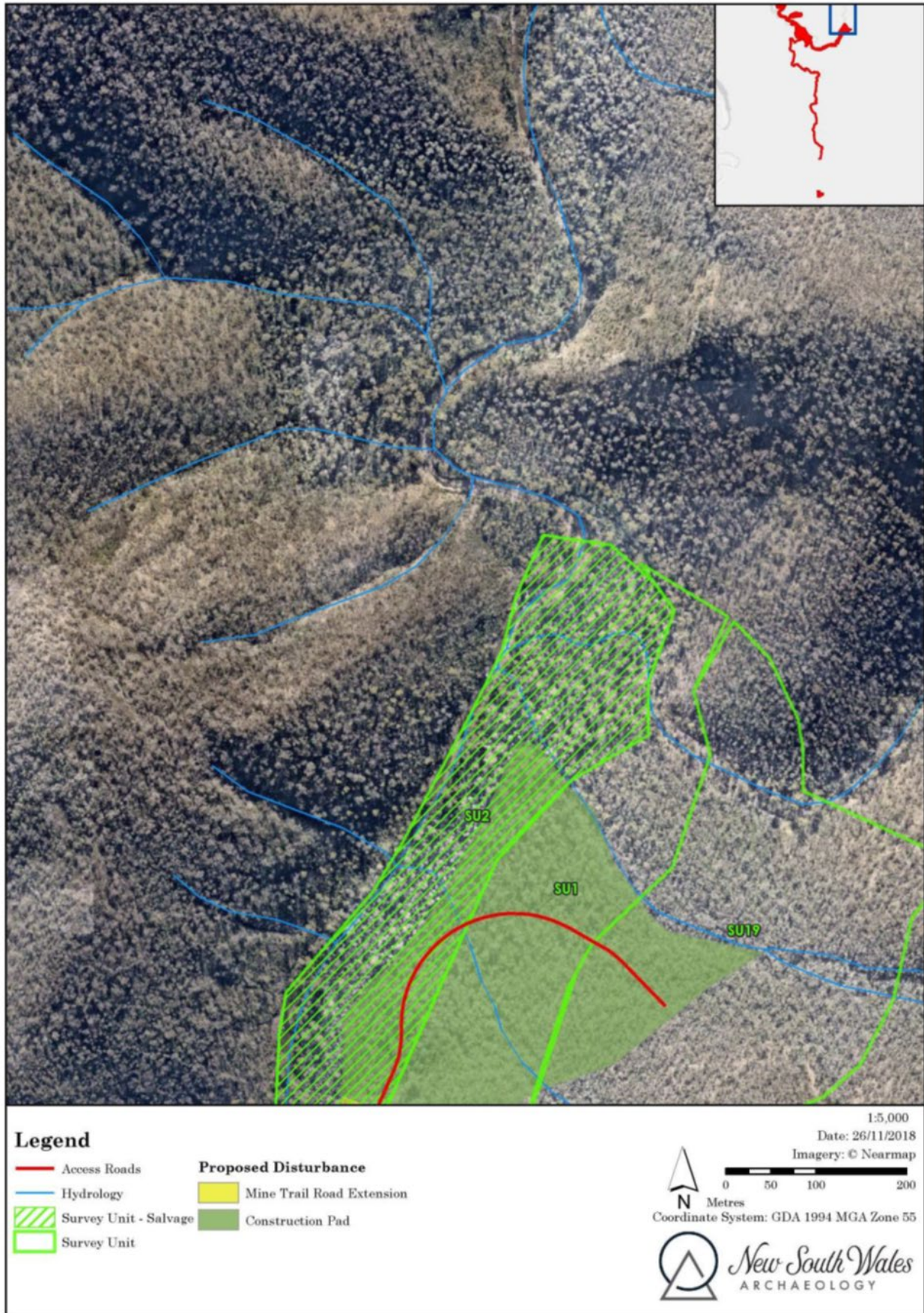


Figure A.5: Survey units at Lobs Hole. Note SU2 near end of Mines Trail



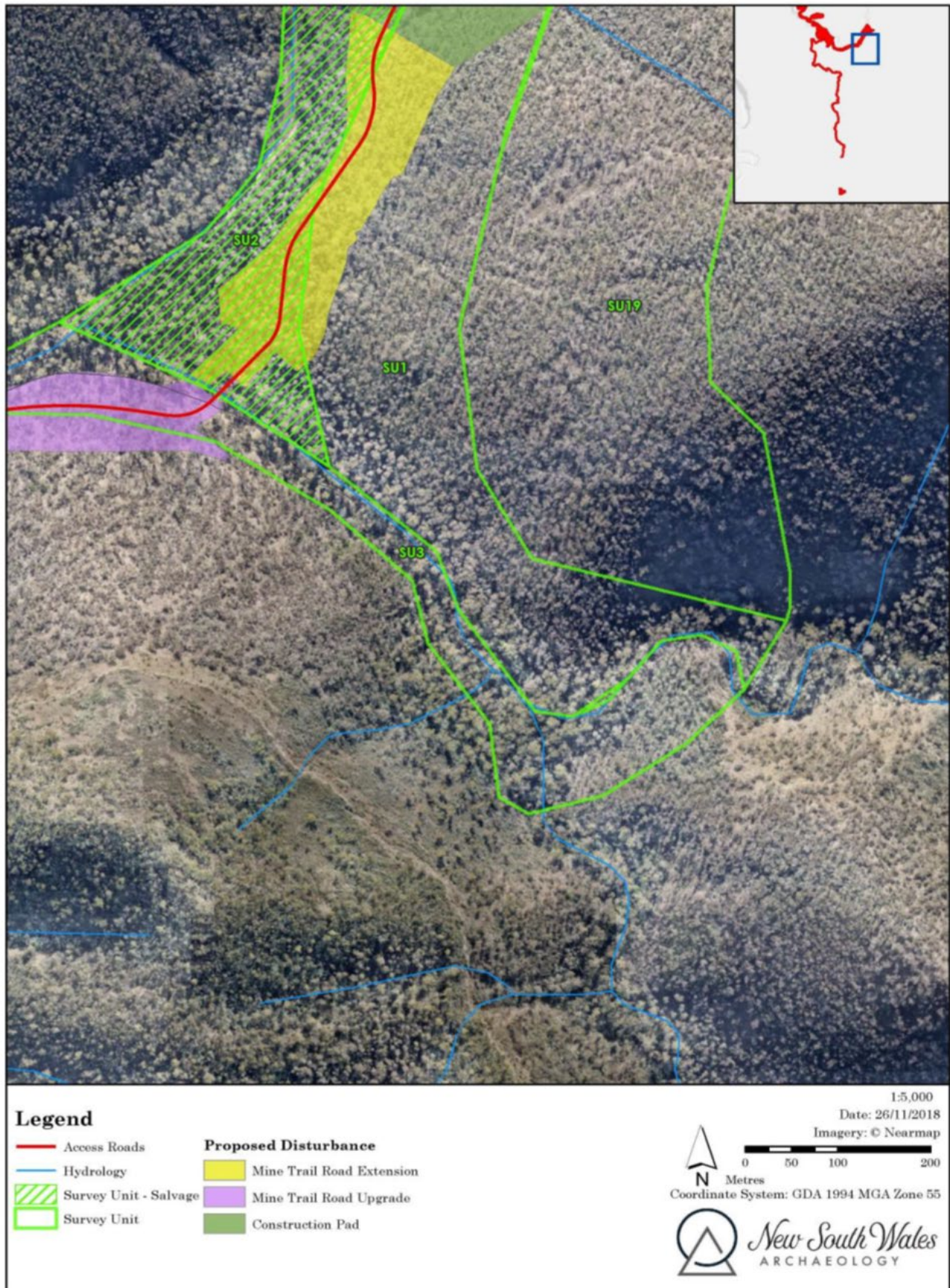


Figure A.6: Survey Unit 2 at Lobs Hole. Note SU2 near end of Mines Trail



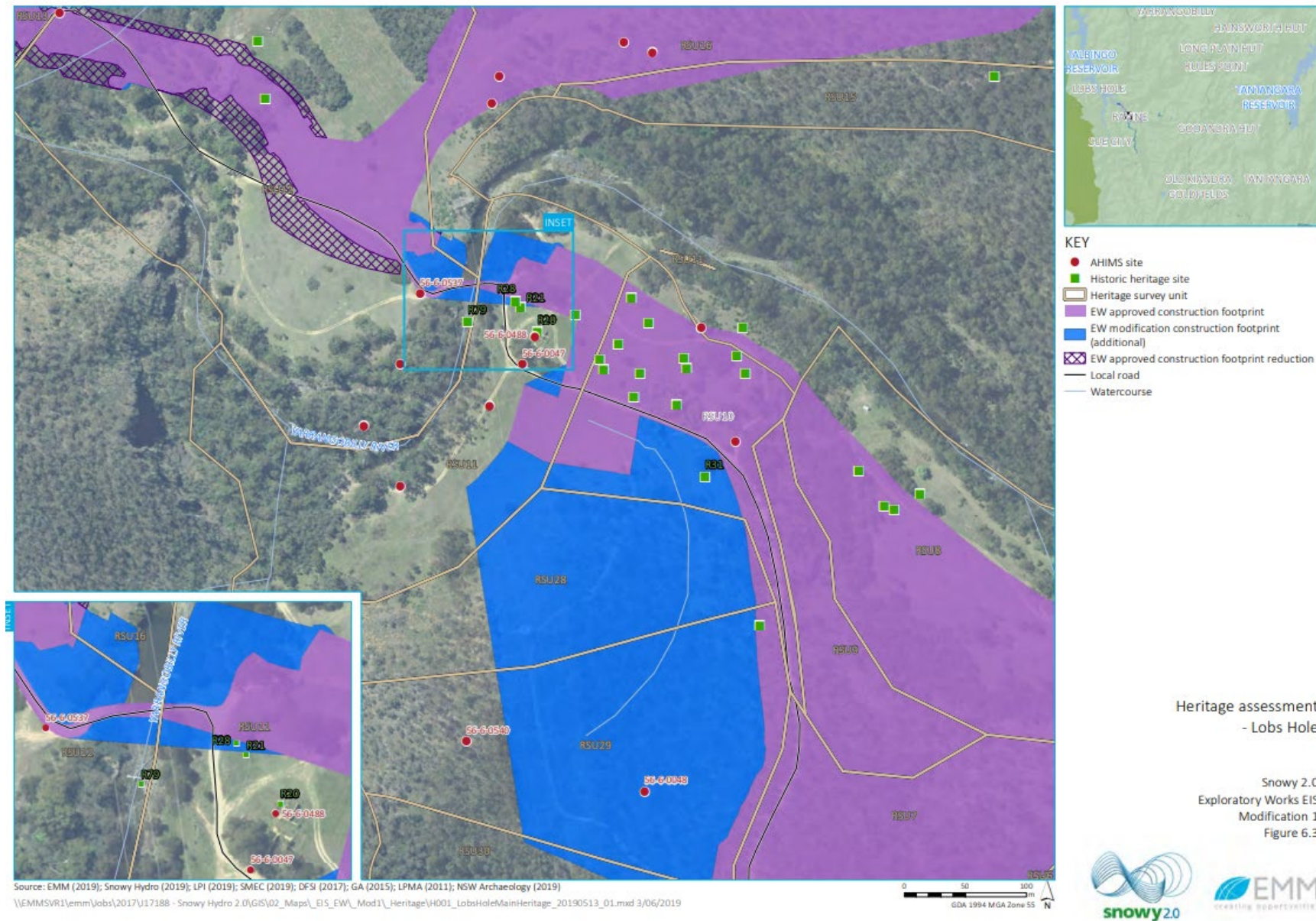


Figure A.7: Heritage assessment - Lobs Hole (Modification 1)



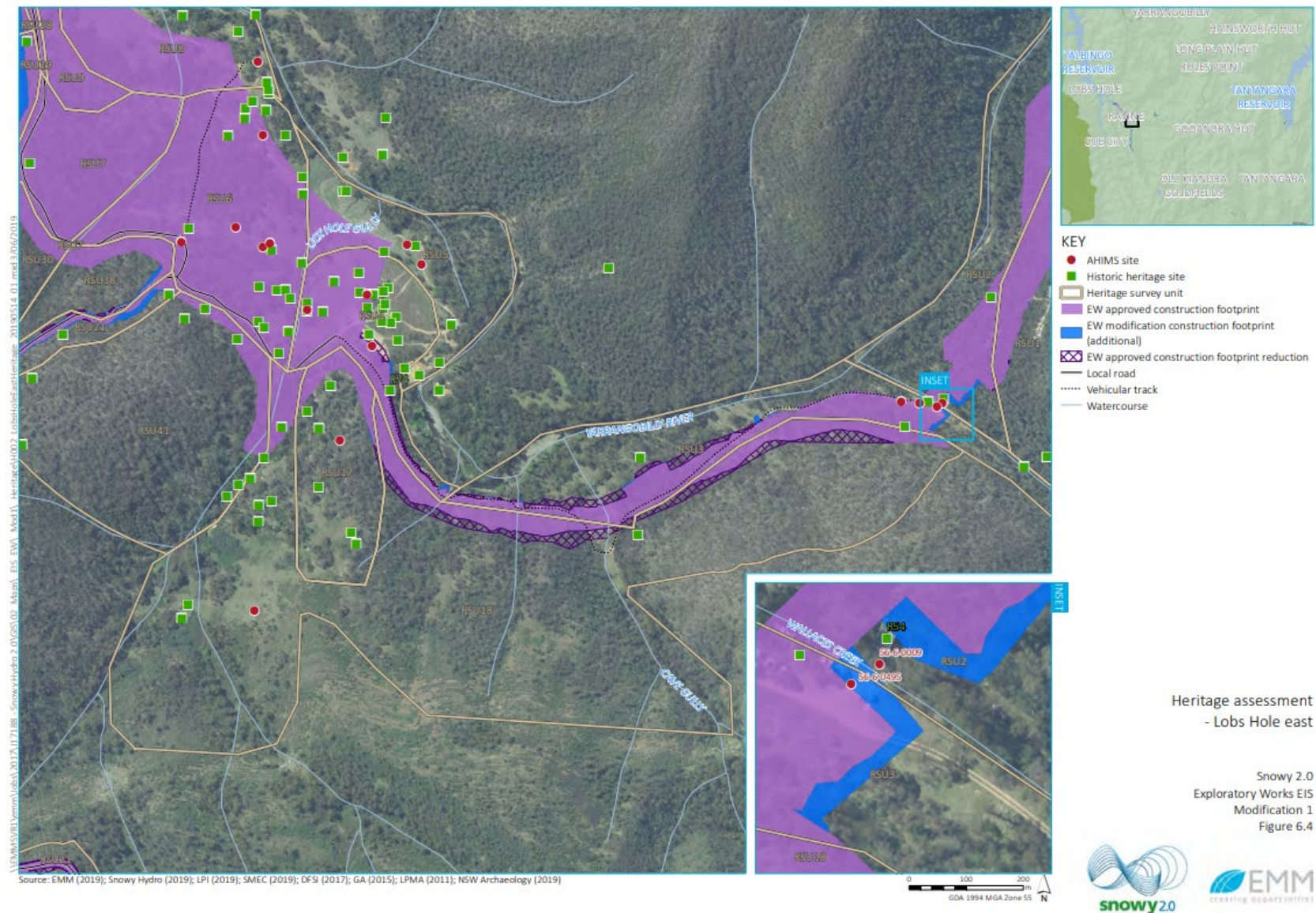


Figure A.8: Heritage assessment - Lobs Hole east (Modification 1)



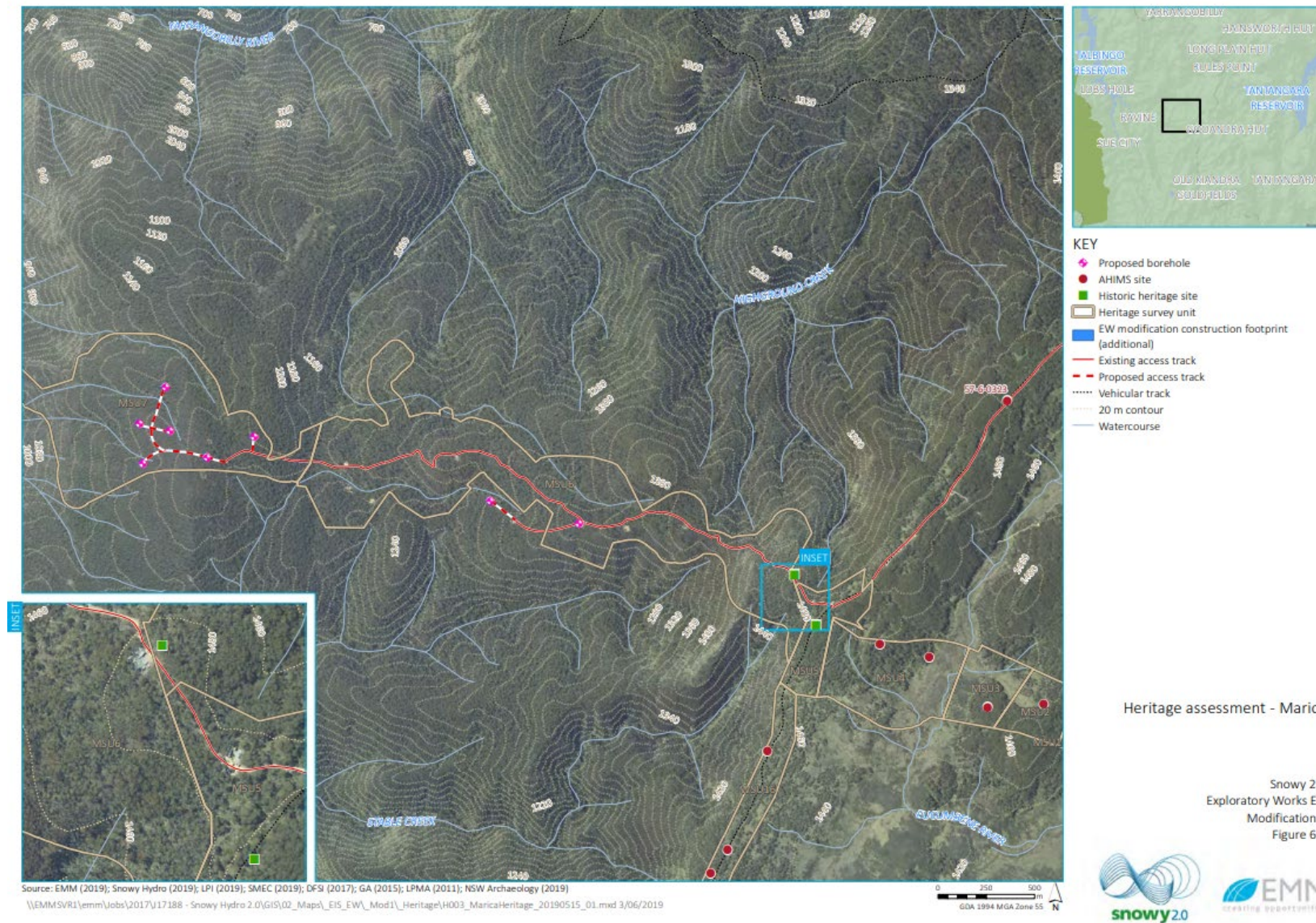


Figure A.9: Heritage assessment - Marica (Modification 1)



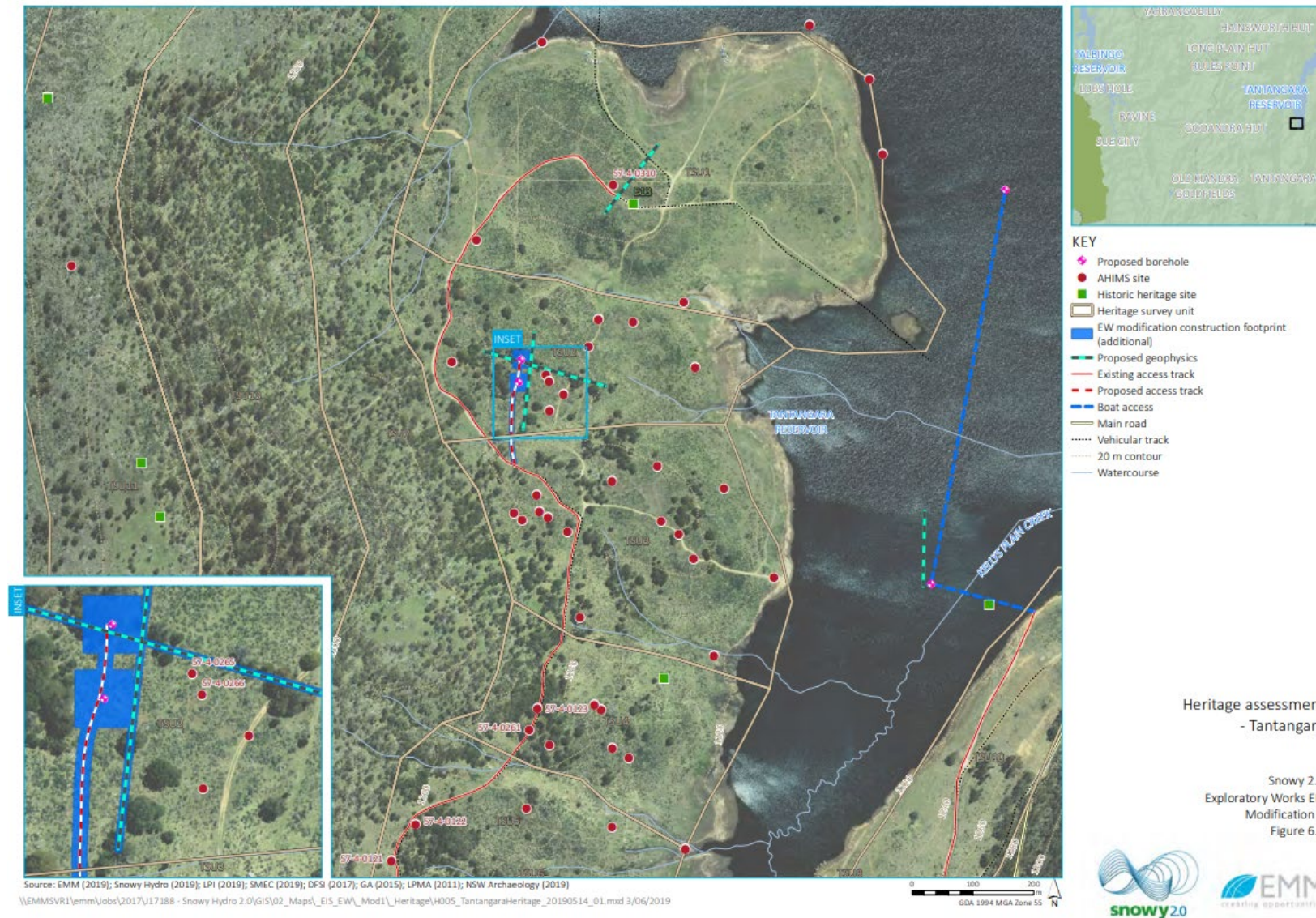


Figure A.10: Heritage assessment – Tantangara (Modification 1)



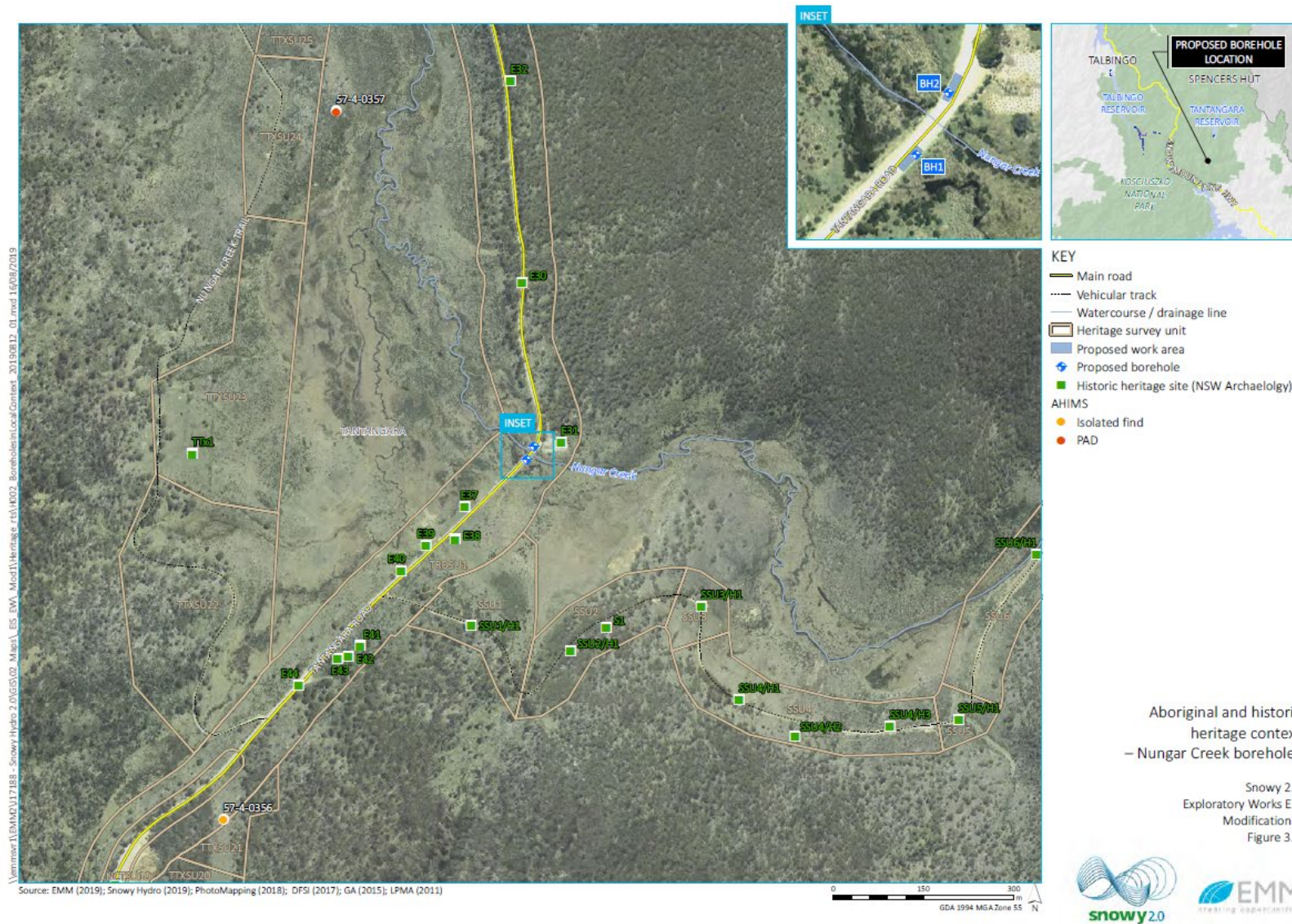


Figure A 11: Aboriginal heritage context - Nungar Creek boreholes



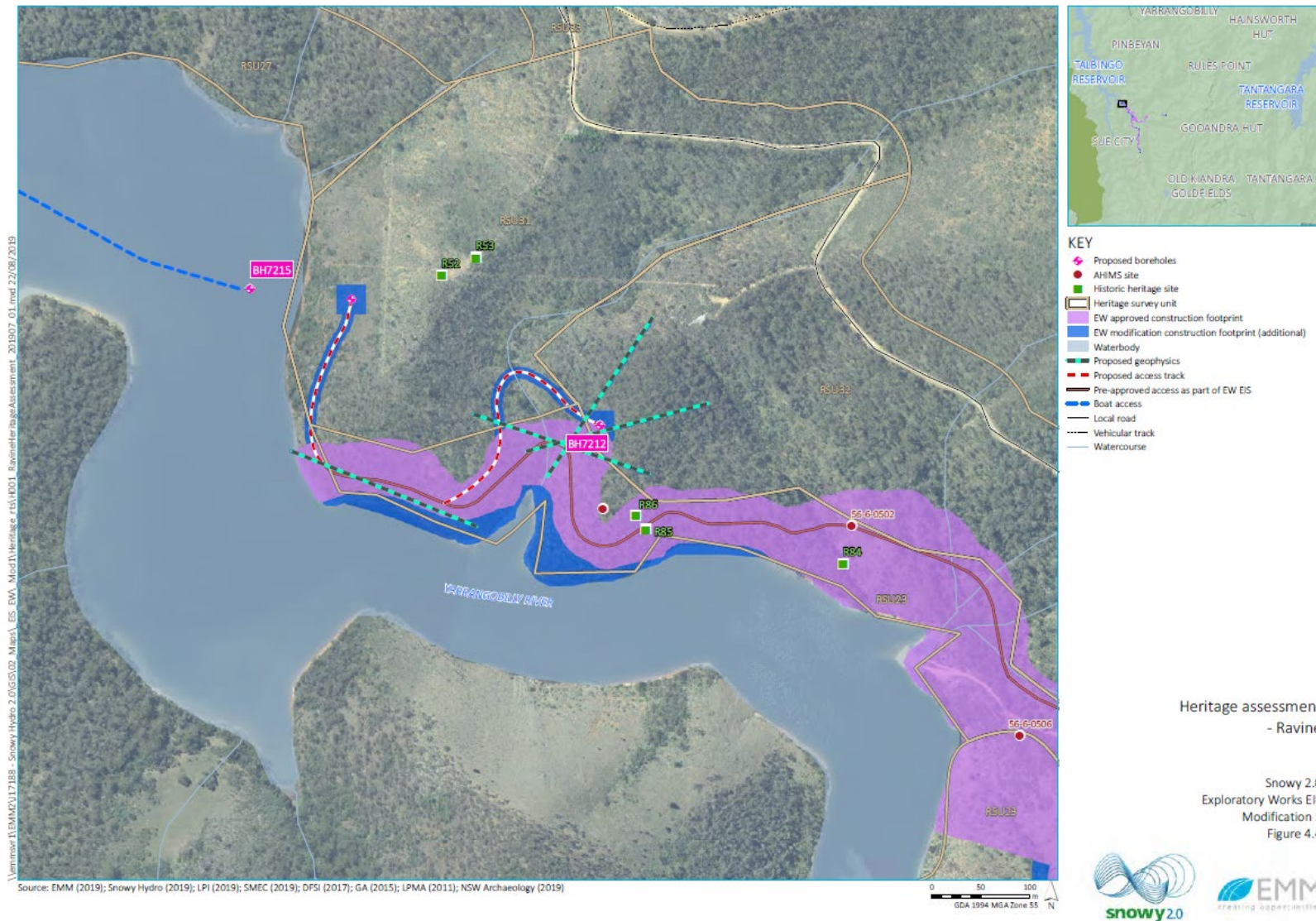


Figure A 12: Heritage assessment Ravine (Talbingo Reservoir)

## APPENDIX B – UNEXPECTED FINDS PROCEDURE

In the unlikely event that unexpected objects or values are encountered during construction (such as very high artefact distributions in areas previously assessed to contain low densities), the following steps should be followed:

1. All construction that could potentially harm the objects or values must cease. Only construction that is required to comply with occupational and environmental health and safety standards and/or to protect the cultural heritage should occur.
2. The person who identified the objects or values must immediately notify the person in charge of the activity. The Project Superintendent or Supervisor and the Future Gen Environmental Manager is to be notified.
3. The item is to be protected by the establishment of a no-go zone.
4. The Future Gen Environmental Manager is to notify Snowy Hydro.
5. If the item is likely to be a human bone, follow the ancestral human remains process below and notify the Police.
6. Works may continue outside of the minimum 20 m barrier.
7. A suitably qualified archaeologist is to be notified within 24 hours of the discovery.
8. The archaeologist is to attend site where required and conduct a preliminary assessment and recording of the item. The location and context of the object or value is to be recorded.
9. Within five (5) days of the objects or values being discovered, if Aboriginal, the archaeologist is to facilitate the involvement of any relevant RAPs and, in consultation, recommend the most appropriate course of action.
10. Where the item is an object, the discovery must be reported to the NSW OEH as soon as practicable.
11. The archaeologist must assess the scientific significance of the objects or values. If the objects or values are assessed as being of:
  - a. **Low scientific significance** (eg isolated artefacts or disperse/small artefact scatters less than three artefacts, eroding earth features) and where avoidance is impossible, no further work is required once the steps outlined above have been completed.
  - b. **Moderate or higher scientific significance**, it is preferable to avoid impact if possible. If avoidance is not possible, a salvage excavation should be undertaken, if relevant. The aims of the salvage excavation will be to obtain as much information as possible from the material and/or deposit.
    - i. Salvage must occur within 30 working days unless constraints (eg weather) occur. The archaeologist must facilitate the involvement of any relevant RAPs and develop a suitable methodology for salvage excavation in consultation with the RAPs. The location and context of the cultural heritage material must be recorded in detail and an Aboriginal Site Impact Recording Form completed and submitted to NSW OEH within four (4) months from the end of salvage excavations. A report detailing the excavation, analysis and results must be provided to NSW OEH within twelve (12) months of completion of the salvage.
    - ii. In the event that objects are salvaged, regardless of significance, they must be curated in accordance with conventional archaeological practice, that is, the material must be identified, packaged, labelled with reference to provenance, appropriately catalogued and packed securely. The proponent must arrange for the secure storage of Aboriginal cultural material in a specified location until it can be transferred to the relevant RAPs or buried in country. A report must be produced to accompany the curated material.
    - iii. Curated Aboriginal objects together with the aforementioned report must be provided to the relevant RAPs within three (3) months of the salvage being completed.

- iv. If reburial of any cultural material is to take place, it must be in accordance with the relevant RAPs requirements or to the satisfaction of the archaeologist. The archaeologist must complete and submit any related Aboriginal Site forms to NSW OEH within 30 days of the reburial taking place.
- 12. Within 60 days of being notified, complete and submit relevant recording forms to NSW OEH.
- 13. Work may commence within the area of exclusion when:
  - a. the appropriate protective measures have been undertaken;
  - b. where the relevant cultural heritage records have been updated and/or completed; and
  - c. there is no other prudent or feasible course of action.

### **Ancestral human remains**

Should suspected ancestral human remains be encountered, the following process will be adhered to:

- 1. Do not further disturb or move the remains.
- 2. Immediately cease work in the vicinity and cordon area off (with buffer of 2m).
- 3. Notify the NSW Police.
- 4. Notify a suitably qualified archaeologist and the NSW OEH Environment Line on 131 555 as soon as practicable and provide available details of the remains and their location.
- 5. In the event that the bones are not human, works may recommence.
- 6. If the bones are human, and are archaeological in nature (ie likely to be Aboriginal remains), the relevant Aboriginal communities must be notified.
- 7. If the bones are required to be subject to Police investigation, then direction from the Police shall be followed.
- 8. If the bones are considered to have historic heritage value, the Historic and Natural Heritage Management Plan shall be followed.
- 9. For bones that are considered to be Aboriginal remains, an Archaeological Management Plan will be prepared. An assessment will also occur to determine whether the impact is consistent with the Infrastructure Approval, or if modification is required.

## APPENDIX C – ENDORSEMENT OF PERSONS TO PREPARE MANAGEMENT PLANS



**Planning &  
Environment**

Planning Services  
Resource & Energy Assessments  
Contact: Paul Freeman  
Tel: 9274 6587  
Email: [paul.freeman@planning.nsw.gov.au](mailto:paul.freeman@planning.nsw.gov.au)

Mr Antonio Betti  
Project Director  
Future Generation JV  
Level 4, 77 Berry Street  
NORTH SYDNEY NSW 2060

Dear Mr Betti

**Snowy 2.0 Exploratory Works (SSI 9208)  
Endorsement of Persons to Prepare Management Plans**

I refer to your letter dated 29 May 2019, requesting the Secretary's endorsement of persons to prepare Stage 2 management plans for the Snowy 2.0 Exploratory Works in accordance with Infrastructure Approval SSI 9208.

The Department has carefully considered the information you provided on the nominated experts and considers that they are suitably qualified and experienced to prepare the plans.

Accordingly, the Secretary has endorsed the following persons to prepare the management plans:

- Dr Julie Dibden - Aboriginal Heritage Management Plan;
- Dr Julie Dibden, Dr Rebecca Parkes and Dr Ian Percival - Historic and Natural Heritage Management Plan; and
- Ms Roisin Batch, Mr Derek Low, Ms Hilary Chapman and Mr John Wright – Water Management Plan.

If you wish to discuss this matter further, please contact Paul Freeman on 9274 6587.

Yours sincerely

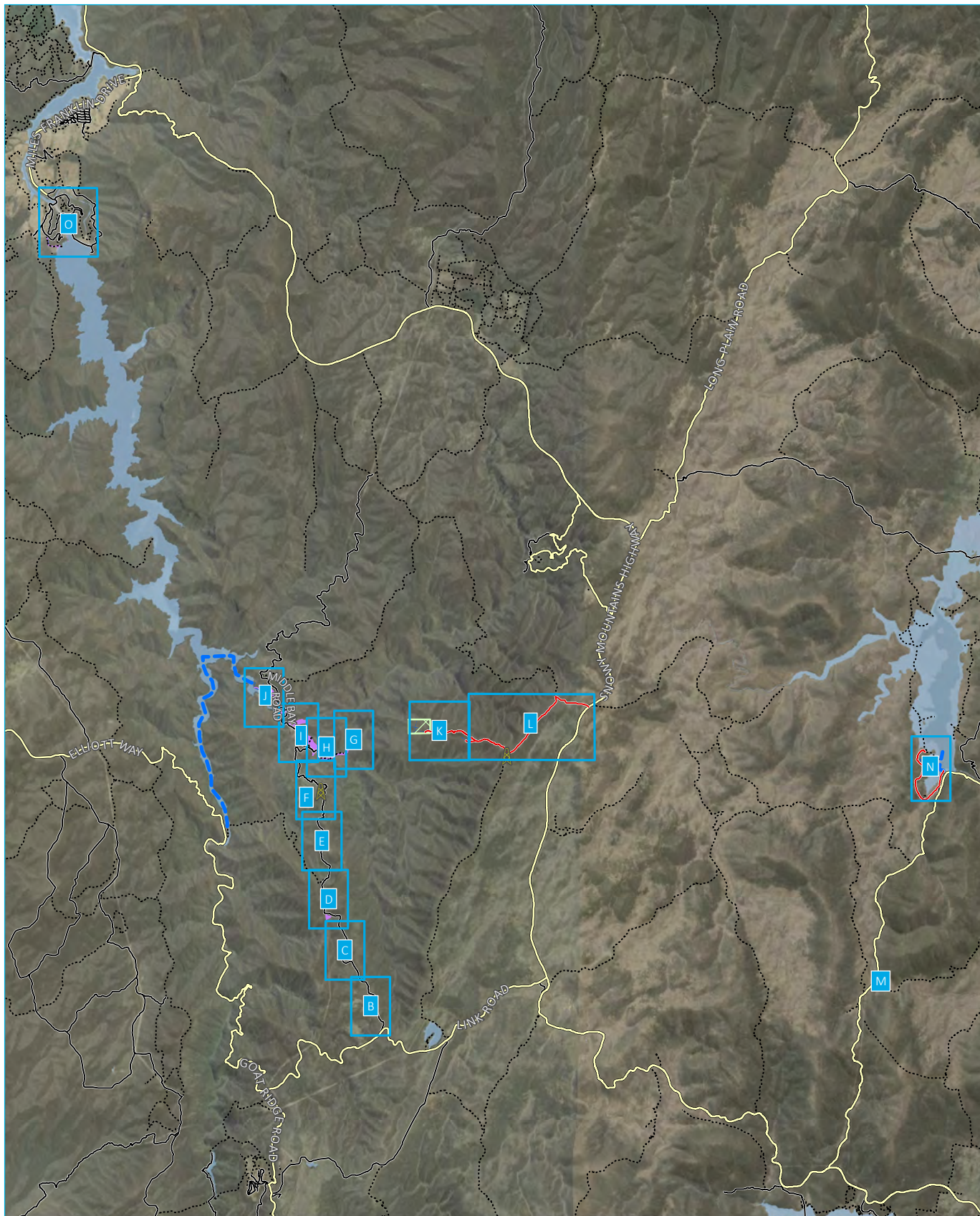


31/5/19

Nicole Brewer  
**A/Director**  
**Resource and Energy Assessments**  
as nominee of the Secretary



## APPENDIX D – EXPLORATORY WORKS – PROJECT BOUNDARY FIGURES



Source: EMM (2019); Snowy Hydro (2019); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

## KEY

- Proposed temporary communications upgrade location
- Existing access track
- Boat access
- Main road
- Local road
- Vehicular track

- Map index
- EW approved construction footprint
- EW modification construction footprint (additional)
- Boreholes requiring on-site adjustment
- Waterbody

0 5 10 km  
GDA 1994 MGA Zone 55

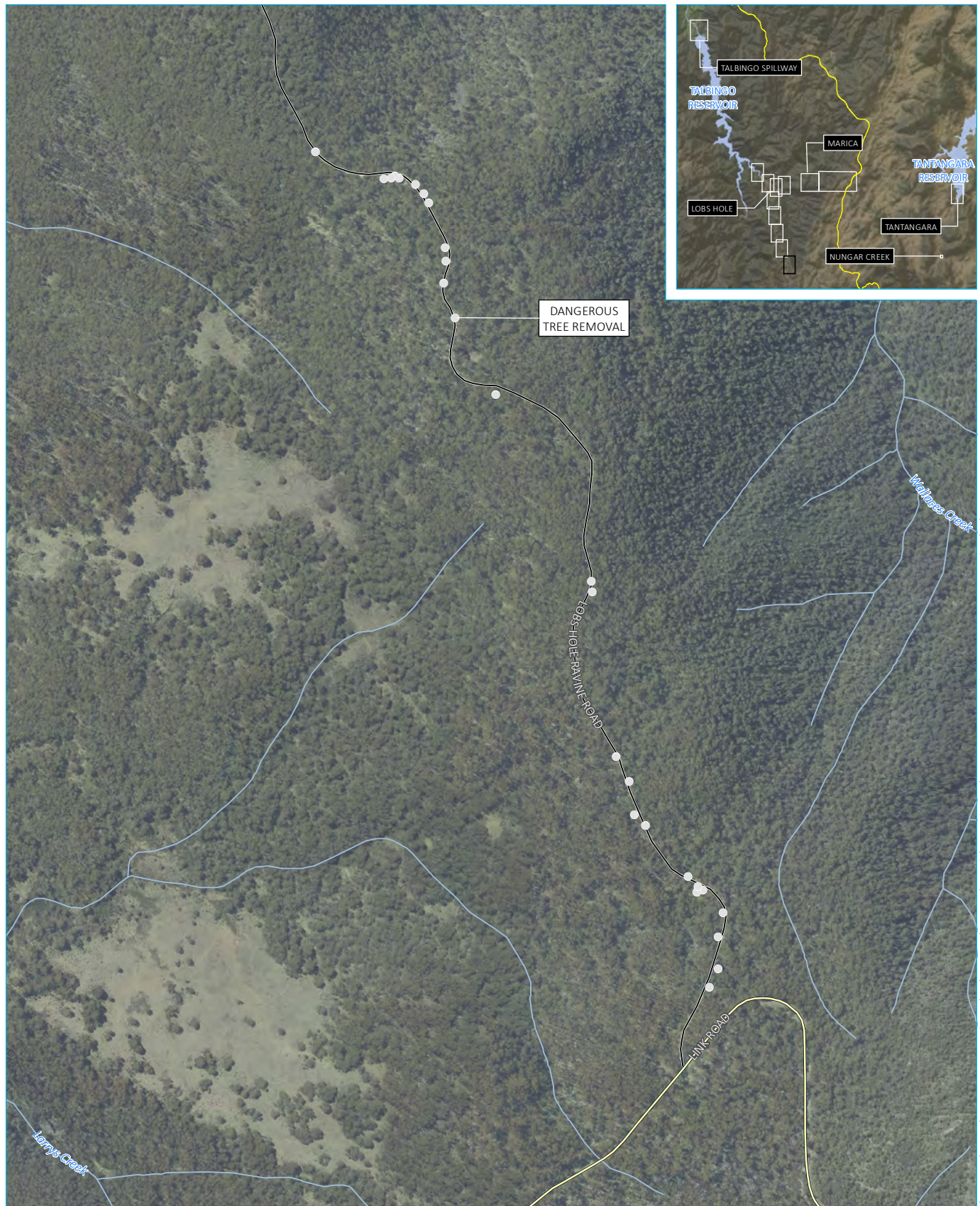
## Exploratory Works project boundary - overview

Snowy 2.0  
Exploratory Works EIS  
Modification 1  
1 a



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Source: EMM (2019); Snowy Hydro (2019); PhotoMapping (2018); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

#### KEY

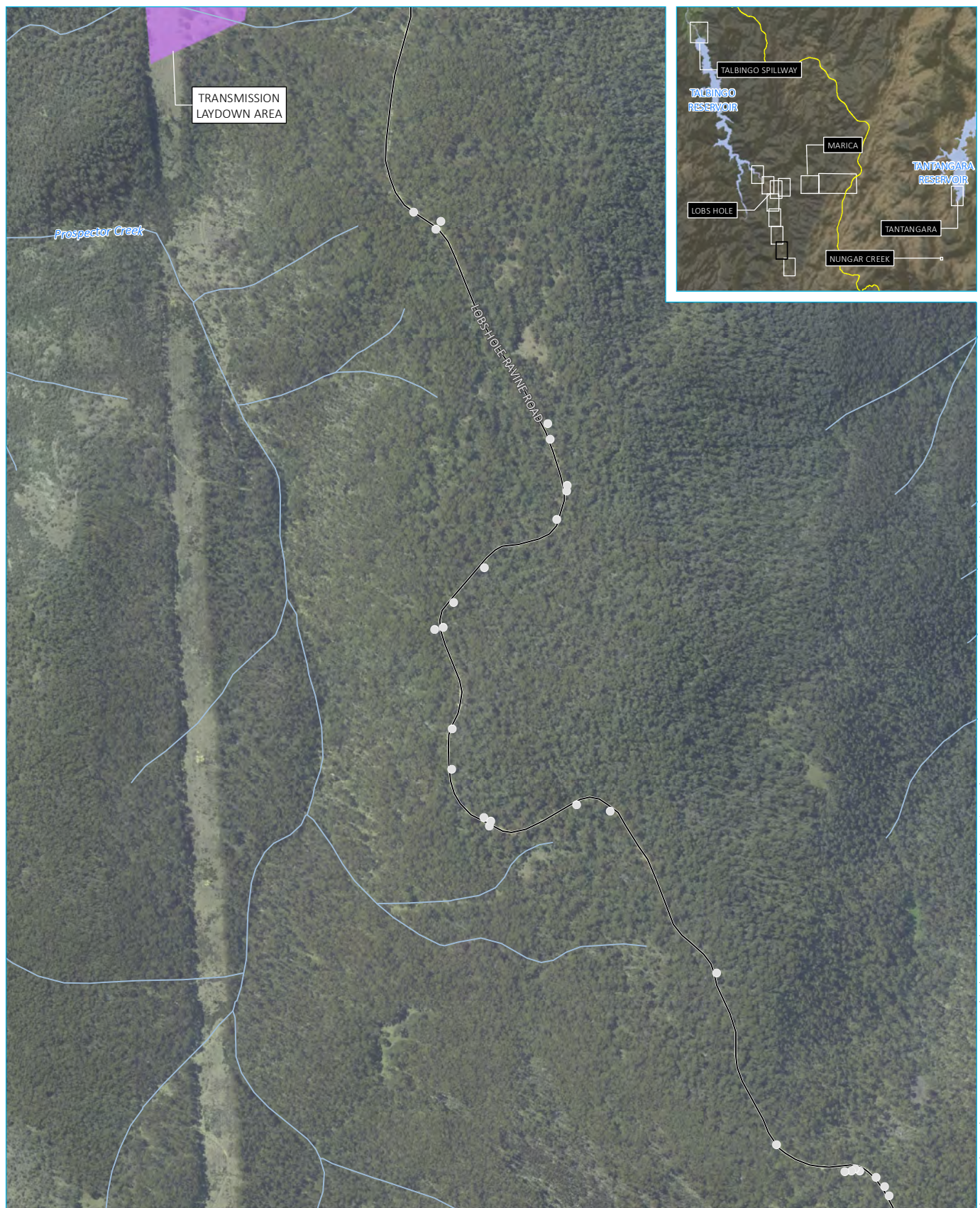
- Dangerous tree
- Main road
- Local road
- Watercourse/drainage line

Exploratory Works project boundary  
- Lobs Hole Ravine Road (Upper) 1

Snowy 2.0  
Exploratory Works EIS  
Modification 1  
1 b







Source: EMM (2019); Snowy Hydro (2019); PhotoMapping (2018); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

#### KEY

- Dangerous tree
- Local road
- Watercourse/drainage line
- EW approved construction footprint

Exploratory Works project boundary  
- Lobs Hole Ravine Road (Upper) 2

Snowy 2.0  
Exploratory Works EIS  
Modification 1  
1 c







Source: EMM (2019); Snowy Hydro (2019); PhotoMapping (2018); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

#### KEY

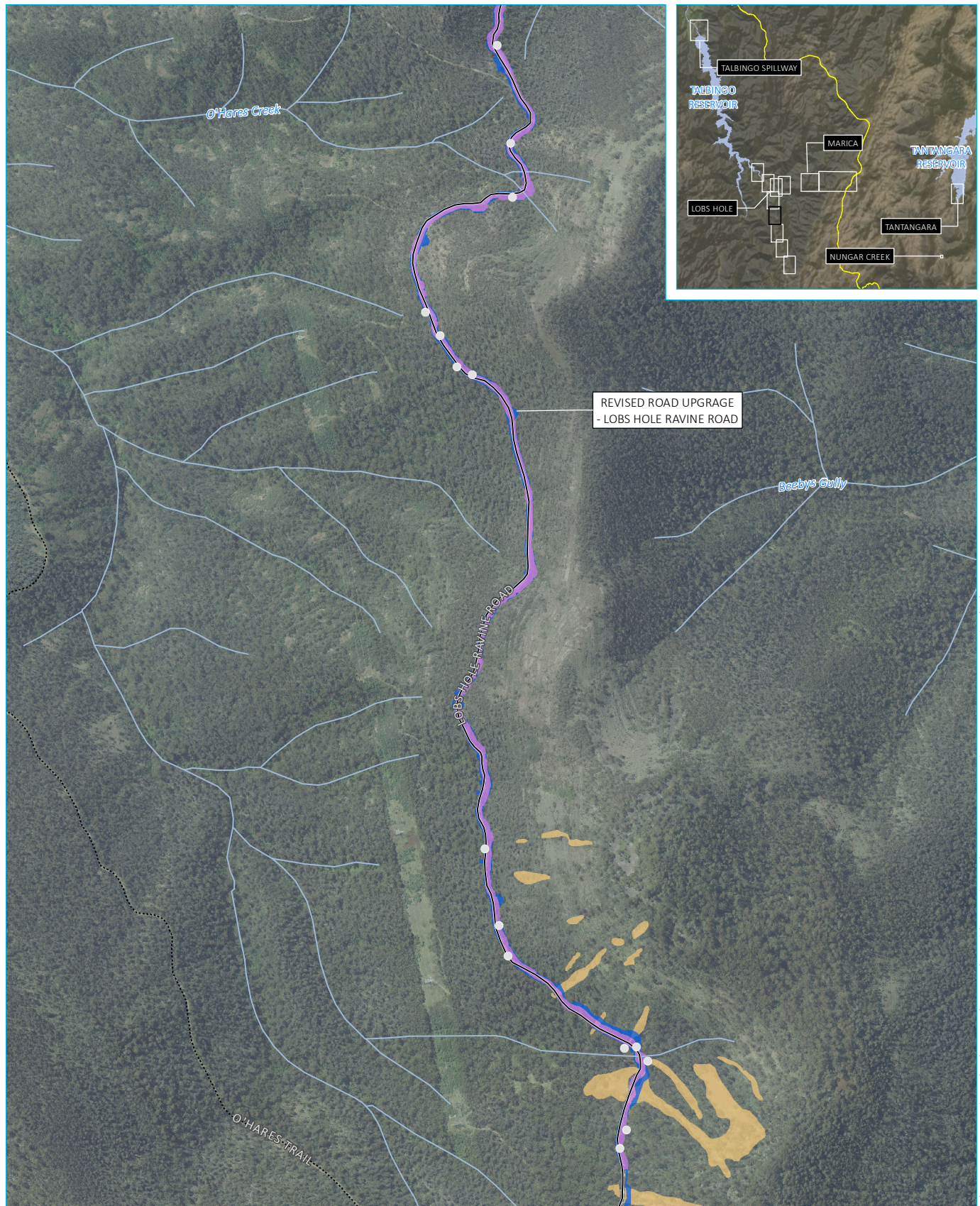
- Dangerous tree
- Local road
- ..... Vehicular track
- Watercourse/drainage line
- EW approved construction footprint
- EW modification construction footprint (additional)

Exploratory Works project boundary  
- Lobs Hole Ravine Road (Upper) 3

Snowy 2.0  
Exploratory Works EIS  
Modification 1  
1 d







Source: EMM (2019); Snowy Hydro (2019); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

#### KEY

- Dangerous tree
- Local road
- ..... Vehicular track
- Watercourse/drainage line
- EW approved construction footprint
- EW modification construction footprint (additional)
- Boulder stream

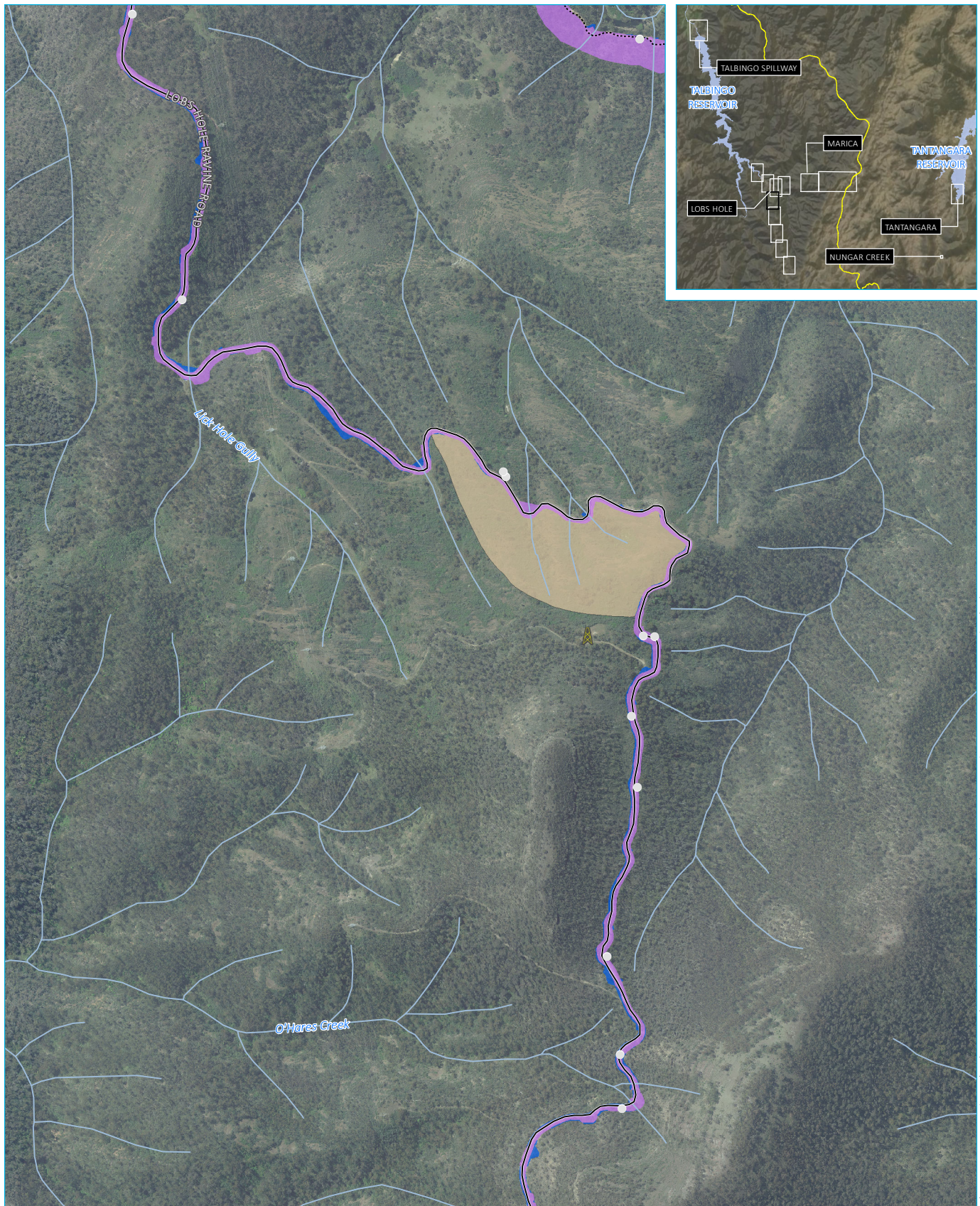
Exploratory Works project boundary  
- Lobs Hole Ravine Road (Lower) 1

Snowy 2.0  
Exploratory Works EIS  
Modification 1  
1 e



OV17188 - Snowy Hydro 2.0GIS02\_Maps\Map1\AppendixB\_rts\G001\_MOD1\ProjectElements\_20191127\_05.mxd 27/11/2019





Source: EMM (2019); Snowy Hydro (2019); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

#### KEY

- Dangerous tree
- ▲ Existing temporary communications
- Local road
- ..... Vehicular track
- Watercourse/drainage line
- EW approved construction footprint
- EW modification construction footprint (additional)
- Fossil area

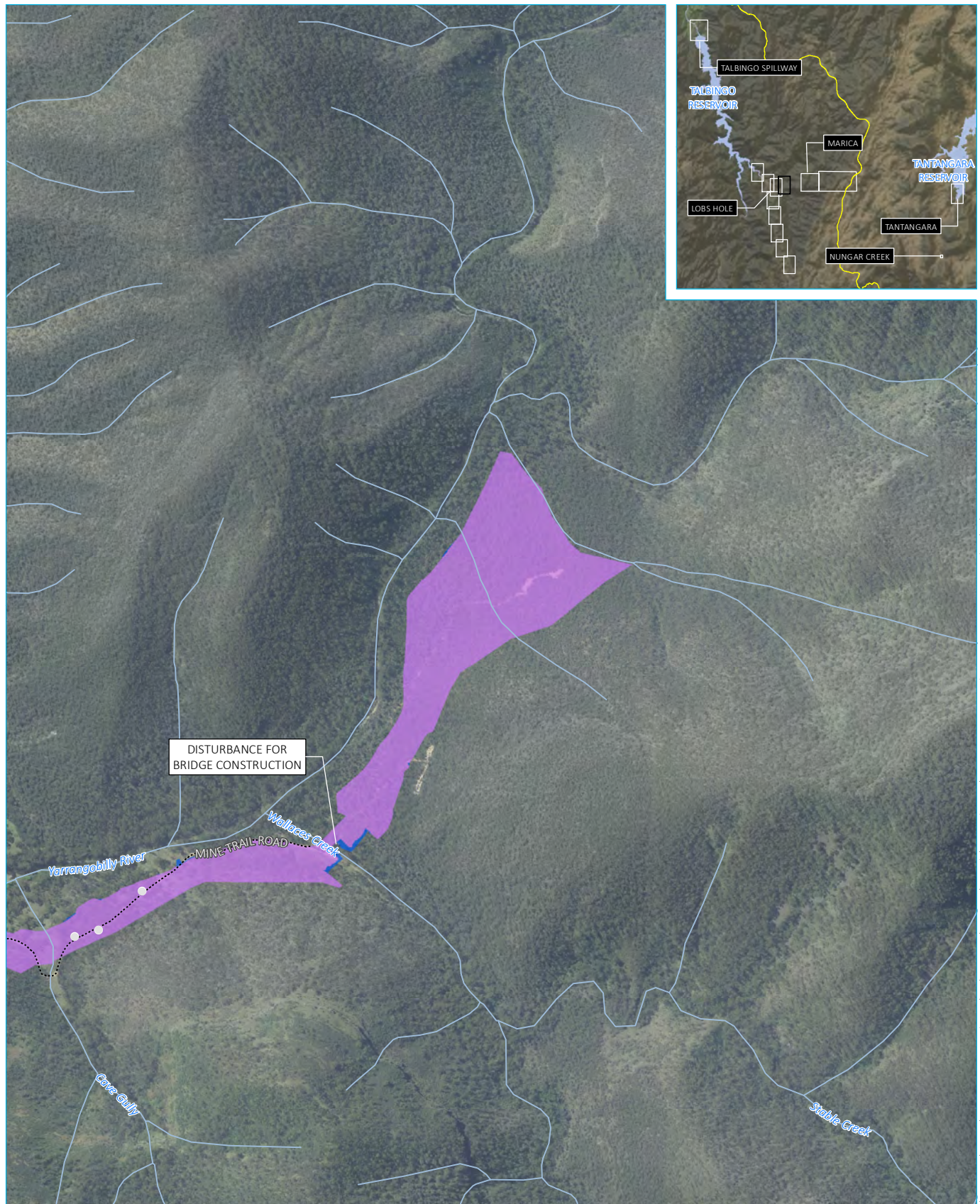
Exploratory Works project boundary  
- Lobs Hole Ravine Road (Lower) 2

Snowy 2.0  
Exploratory Works EIS  
Modification 1  
1 f



OU17188 - Snowy Hydro 2.0GIS02\_Maps\_EIS\_EWA\_Mod1\AppendixB\_rts\G001\_MOD1ProjectElements\_20191127\_05.mxd 27/11/2019





Source: EMM (2019); Snowy Hydro (2019); PhotoMapping (2018); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

#### KEY

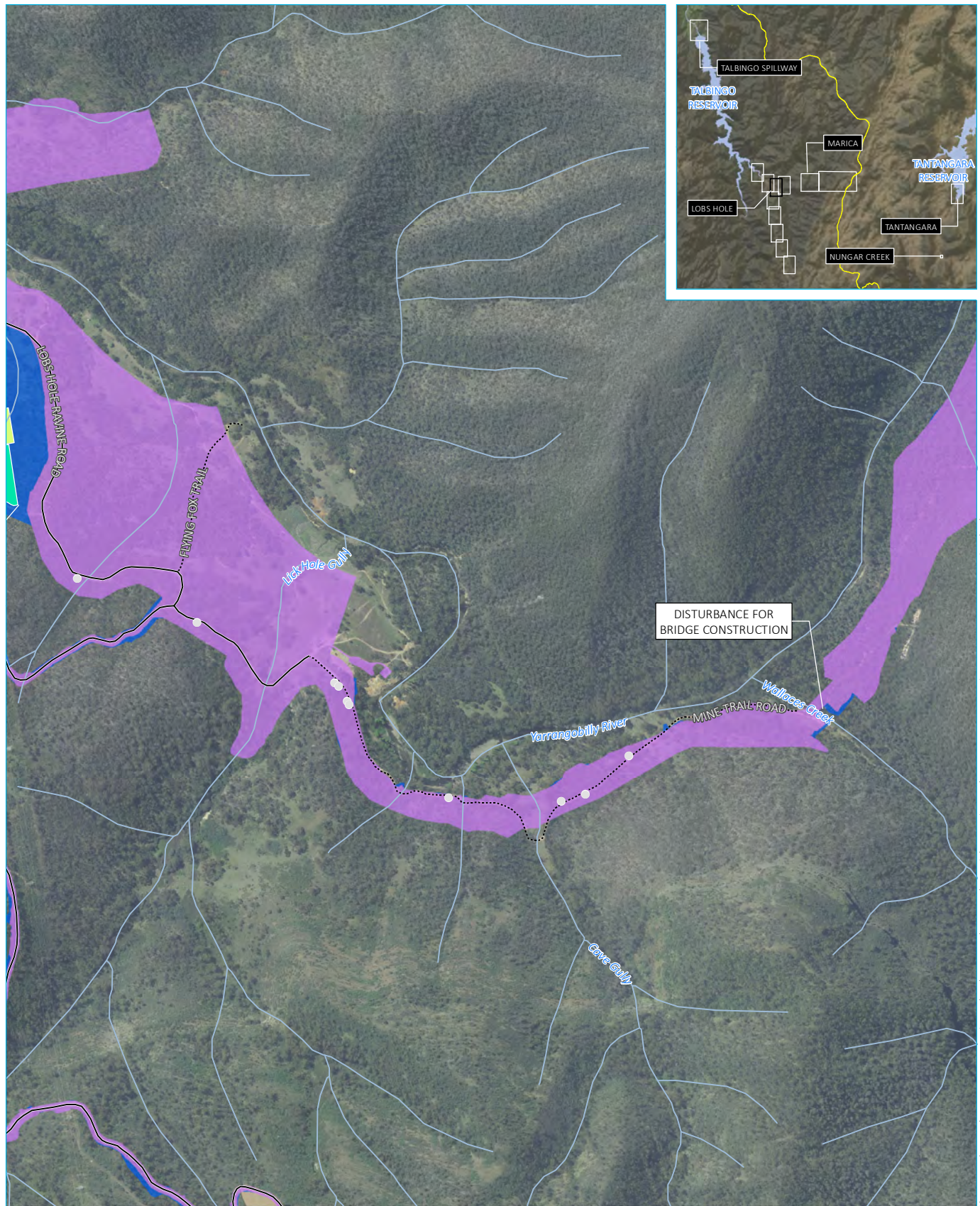
- Dangerous tree
- ..... Vehicular track
- Watercourse/drainage line
- EW approved construction footprint
- EW modification construction footprint (additional)

Exploratory Works project boundary  
- Mine Trail Road 1

Snowy 2.0  
Exploratory Works EIS  
Modification 1  
1 g







Source: EMM (2019); Snowy Hydro (2019); PhotoMapping (2018); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

#### KEY

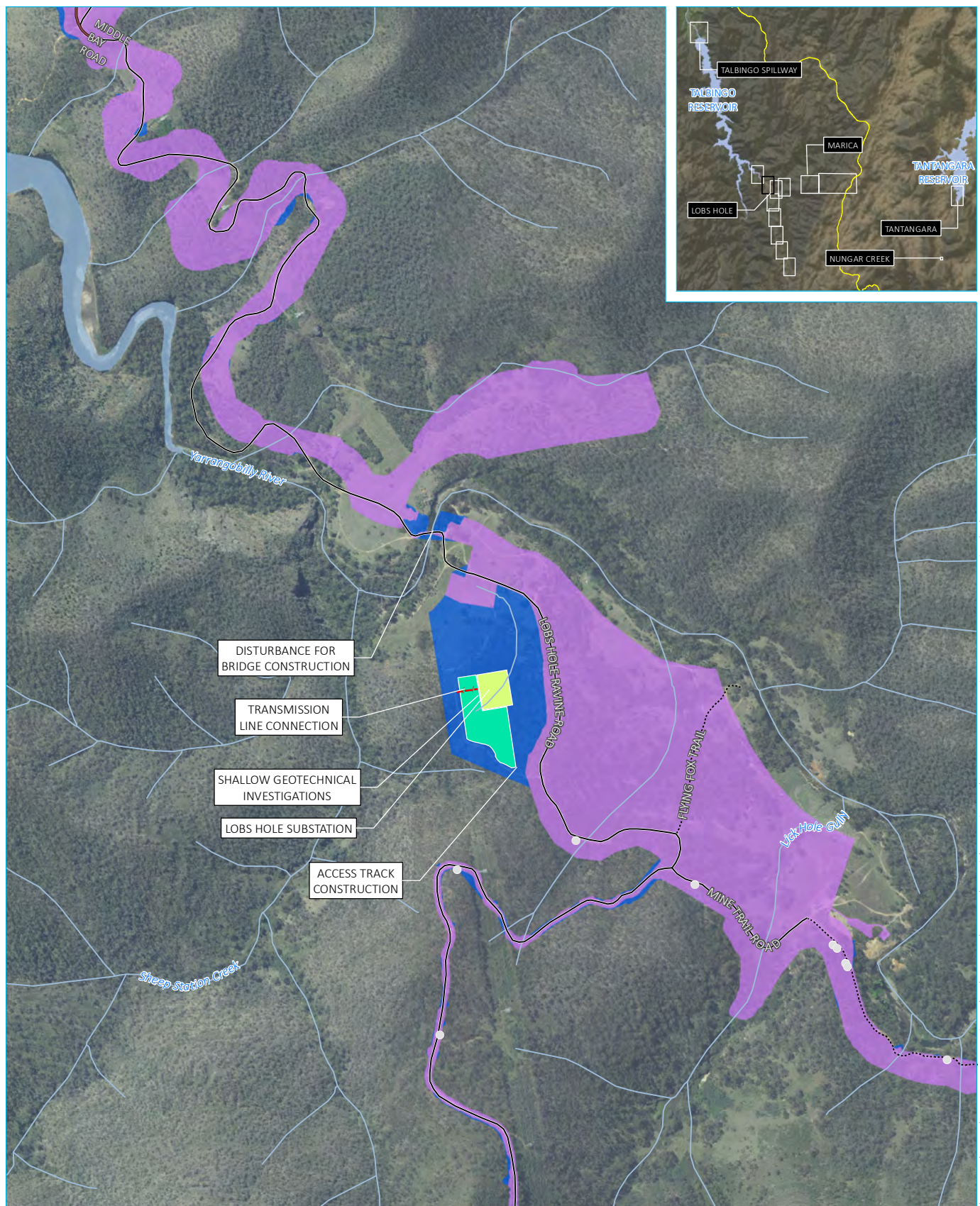
- Dangerous tree
- Local road
- ..... Vehicular track
- Watercourse/drainage line
- EW approved construction footprint
- EW modification construction footprint (additional)
- Indicative laydown area
- Proposed substation
- Fossil area

Exploratory Works project boundary  
- Mine Trail Road 2

Snowy 2.0  
Exploratory Works EIS  
Modification 1  
1 h







Source: EMM (2019); Snowy Hydro (2019); PhotoMapping (2018); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

## KEY

- Dangerous tree
- Approved EW access
- Transmission line connection
- Local road
- ..... Vehicular track
- Watercourse/drainage line
- EW approved construction footprint
- EW modification construction footprint (additional)

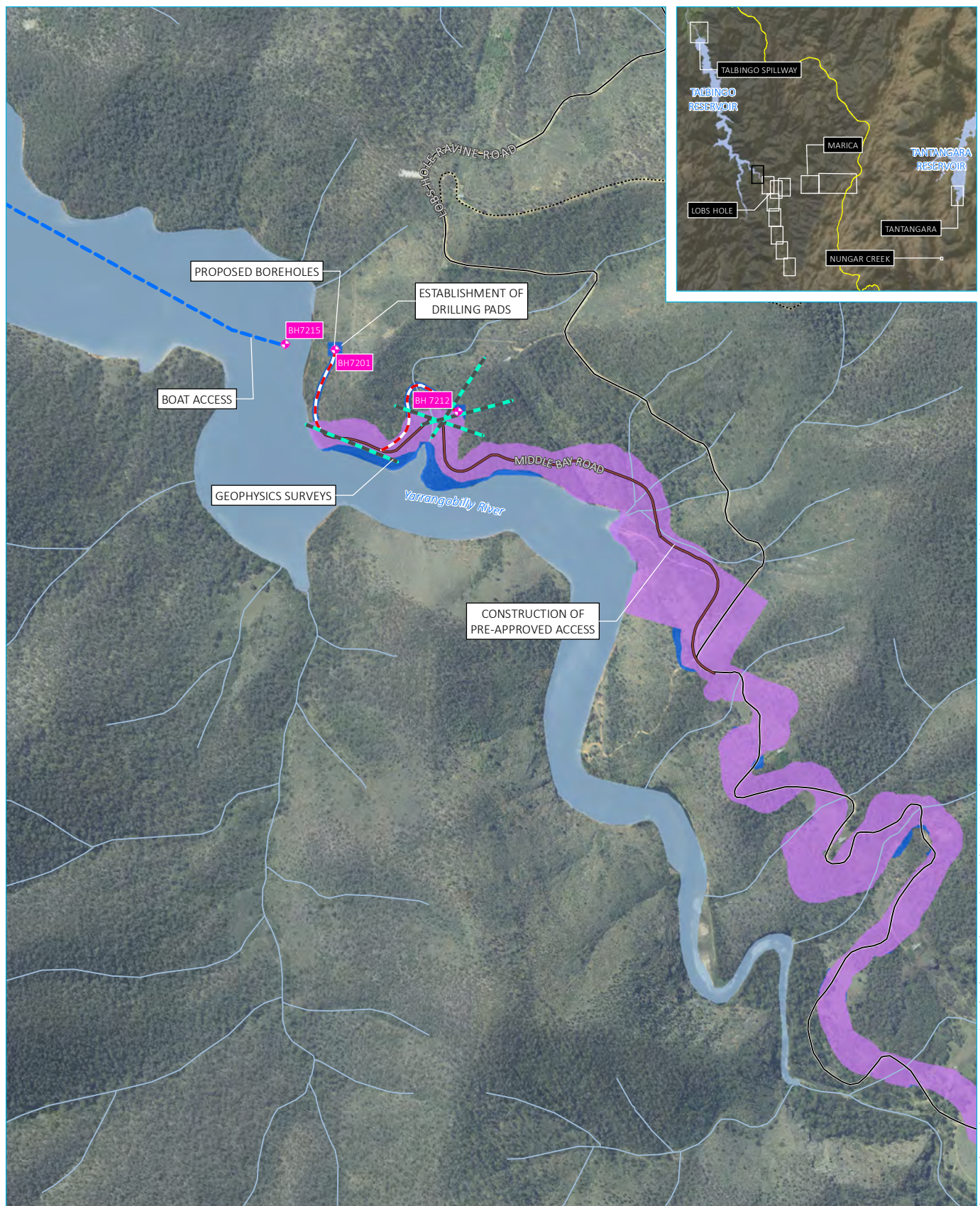
- Indicative laydown area
- Proposed substation
- Waterbody

## Exploratory Works project boundary - Lobs Hole

Snowy 2.0  
Exploratory Works EIS  
Modification 1  
1 i







Source: EMM (2019); Snowy Hydro (2019); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

#### KEY

- ◆ Proposed borehole
- Proposed geophysics
- Proposed access track
- Approved EW access
- Boat access
- Local road
- ⋯ Vehicular track
- Watercourse/drainage line
- EW approved construction footprint
- EW modification construction footprint (additional)
- Waterbody

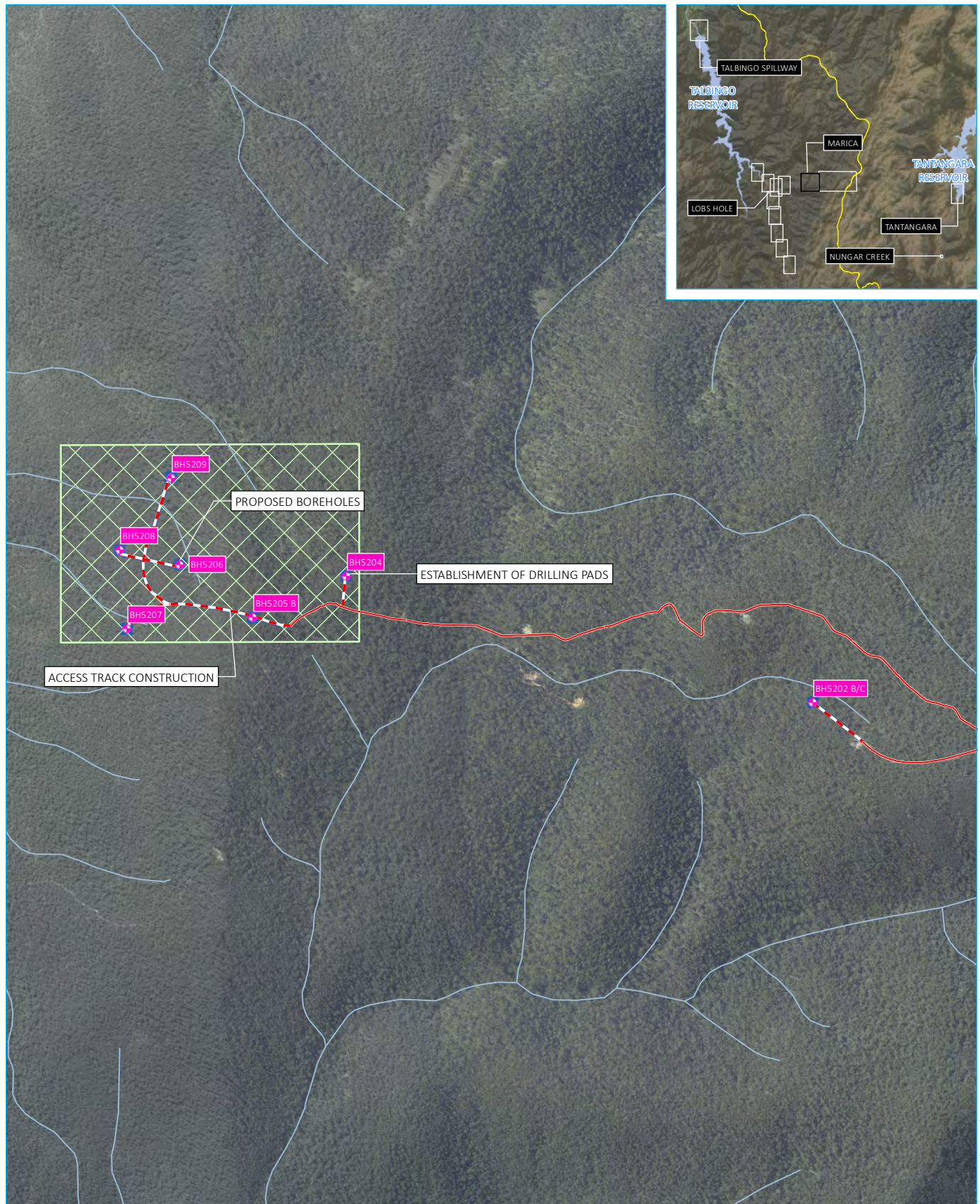
0 50 100  
m  
GDA 1994 MGA Zone 55

Exploratory Works project boundary  
- Lobs Hole Ravine Road

Snowy 2.0  
Exploratory Works EIS  
Modification 1  
1 j







Source: EMM (2019); Snowy Hydro (2019); PhotoMapping (2018); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

#### KEY

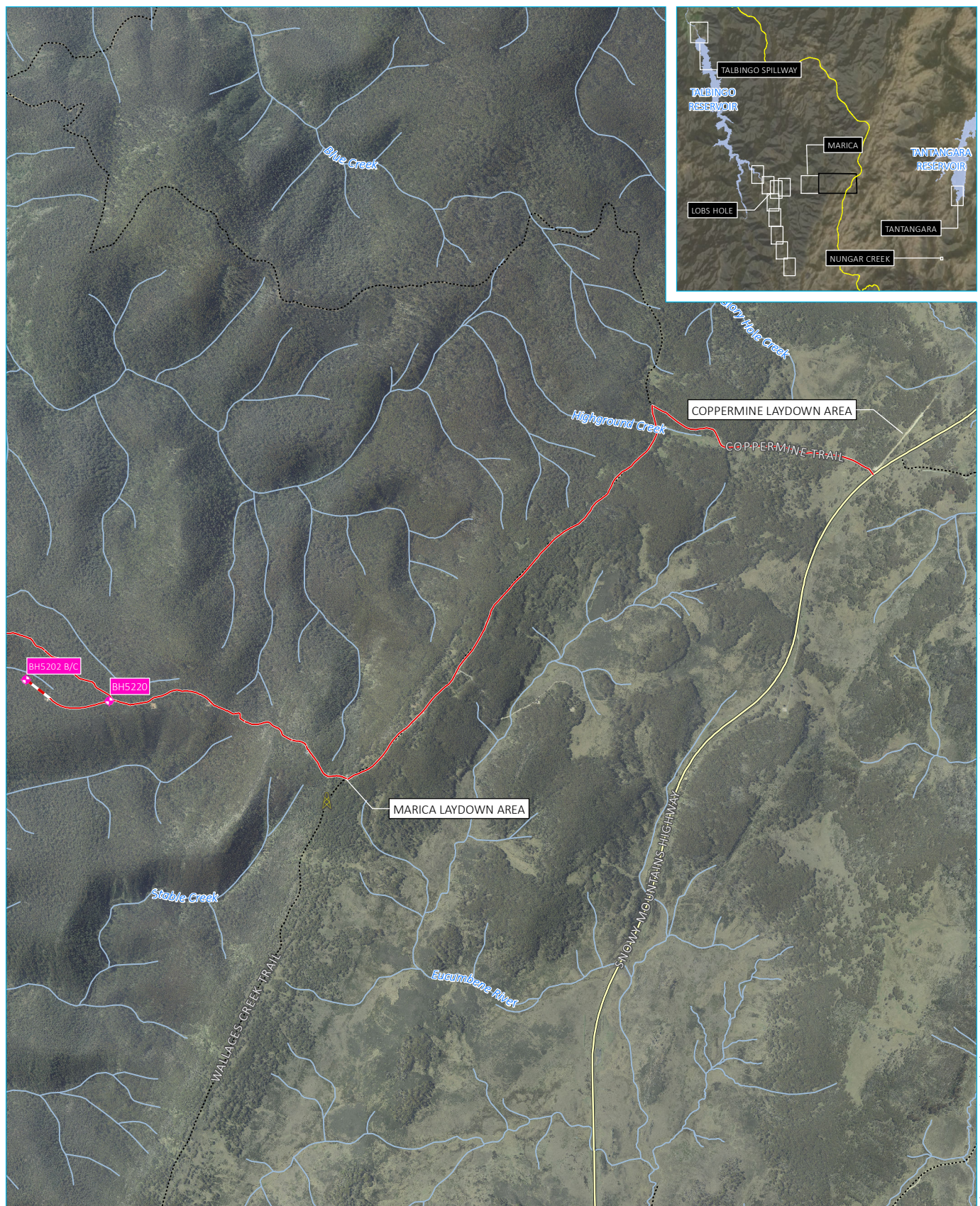
- ✦ Proposed borehole
- Existing access track
- - Proposed access track
- Watercourse/drainage line
- EW modification construction footprint (additional)
- Boreholes requiring on-site adjustment

Exploratory Works project boundary  
- Marica 1

Snowy 2.0  
Exploratory Works EIS  
Modification 1  
1 k







Source: EMM (2019); Snowy Hydro (2019); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

#### KEY

- ◆ Proposed borehole
- ▲ Existing temporary communications
- Existing access track
- - - Proposed access track
- Main road
- ..... Vehicular track
- Watercourse/drainage line
- EW modification construction footprint (additional)

Exploratory Works project boundary  
- Marica 2

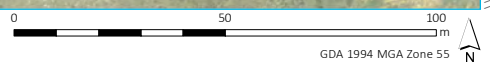
Snowy 2.0  
Exploratory Works EIS  
Modification 1  
11











Source: EMM (2019); Snowy Hydro (2019); PhotoMapping (2018); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)



#### KEY

-  Proposed borehole
-  Main road
-  Watercourse/drainage line
-  Proposed work area

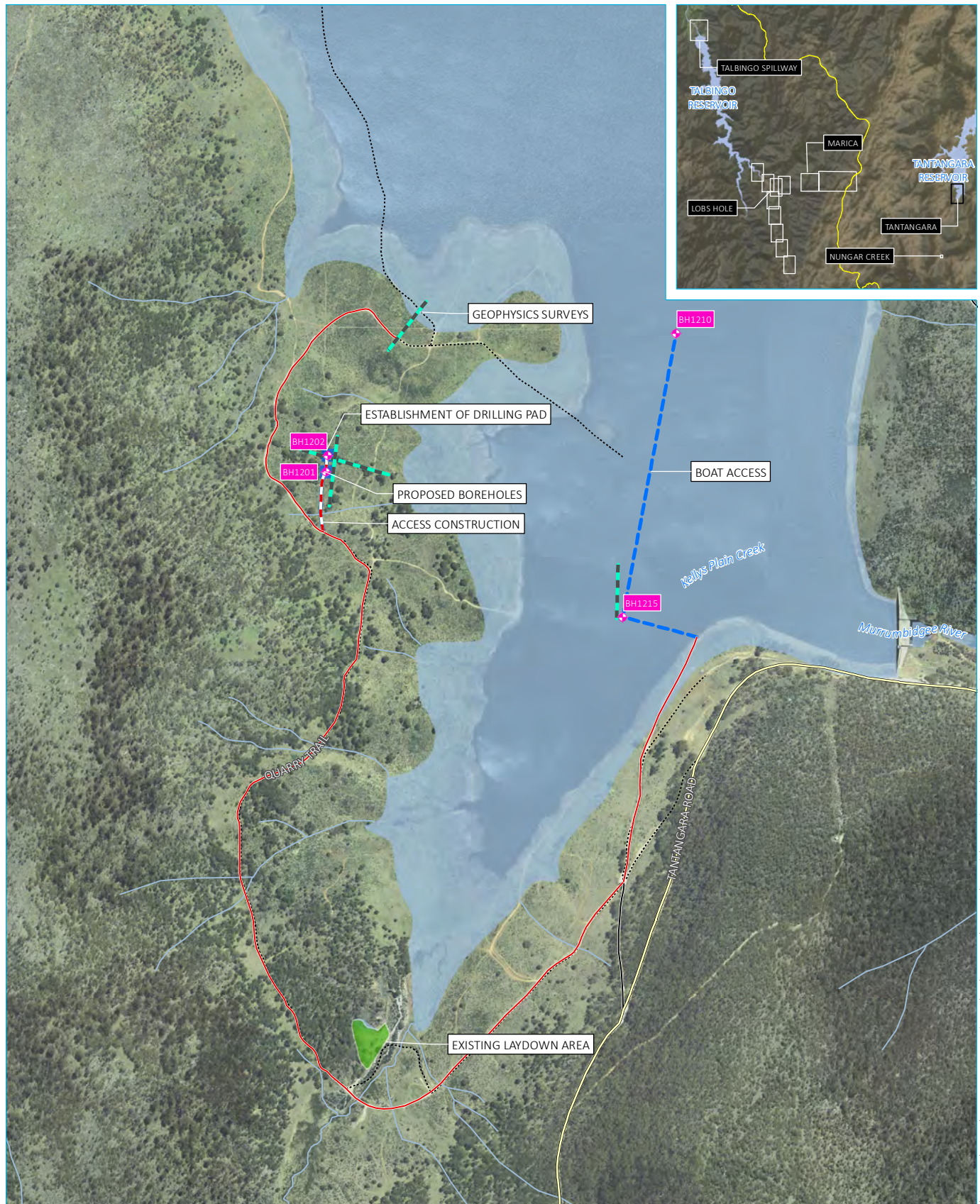
Exploratory Works project boundary  
- Nungar Creek

Snowy 2.0  
Exploratory Works EIS  
Modification 1  
1 m



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Source: EMM (2019); Snowy Hydro (2019); PhotoMapping (2018); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

#### KEY

- |                       |   |
|-----------------------|---|
| Proposed borehole     | Watercourse/drainage line                           |
| Proposed geophysics   | EW modification construction footprint (additional) |
| Existing access track | Existing laydown area                               |
| Proposed access track | Waterbody   |
| Boat access           |   |
| Main road             |   |
| Local road            |   |
| Vehicular track       |   |

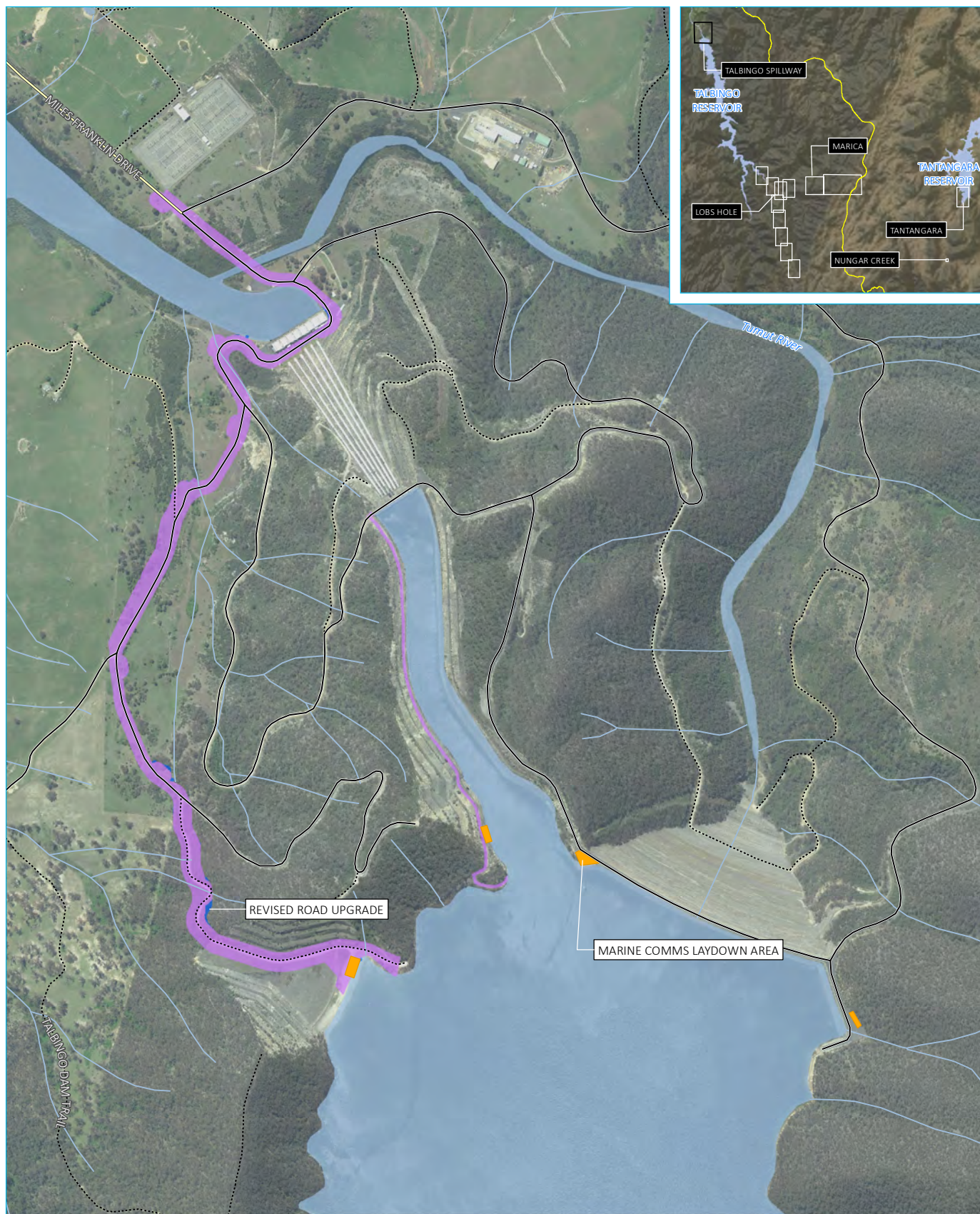
Exploratory Works project boundary  
- Tantangara Reservoir

Snowy 2.0  
Exploratory Works EIS  
Modification 1  
1 n



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Source: EMM (2019); Snowy Hydro (2019); PhotoMapping (2018); SMEC (2019); DFSI (2017); GA (2015); LPMA (2011)

#### KEY

- Main road
- Local road
- Vehicular track
- Watercourse/drainage line
- EW approved construction footprint
- EW modification construction footprint (additional)
- Marine comms laydown (proposed)
- Waterbody

Exploratory Works project boundary  
- Talbingo spillway

Snowy 2.0  
Exploratory Works EIS  
Modification 1  
10

