

8 Golden Bar Pit and Waste Rock Stack

8.1 Proposed Works and Project Area

8.1.1 Pit Extension and Waste Rock Stack

Located approximately 9 km south-east of Macraes township, Golden Bar Pit was previously mined between 2004 and 2006. The MP4 project proposes expansions to the east and north-east (Figure 59). The proposed pit extensions are encompassed by a wider pit disturbance area (Figure 60) that will accommodate the various activities associated with open pit mining, including stockpiling ore and topsoil, pipeline benches, vehicle tracks and laydown areas. The area of disturbance may also accommodate changes to pit shells in response to local geotechnical constraints. Unlike the other pit expansions, it is not assumed that all areas within the pit disturbance area will be excavated to natural ground. At Golden Bar actions have been taken to minimise effects on archaeological evidence within the pit disturbance area (see below).

The extant Golden Bar Waste Rock Stack will be expanded to the north-west to accommodate the additional waste rock produced during Golden Bar Pit expansion (Figure 59-Figure 60). All areas within the waste rock stack footprint will be excavated to natural ground.

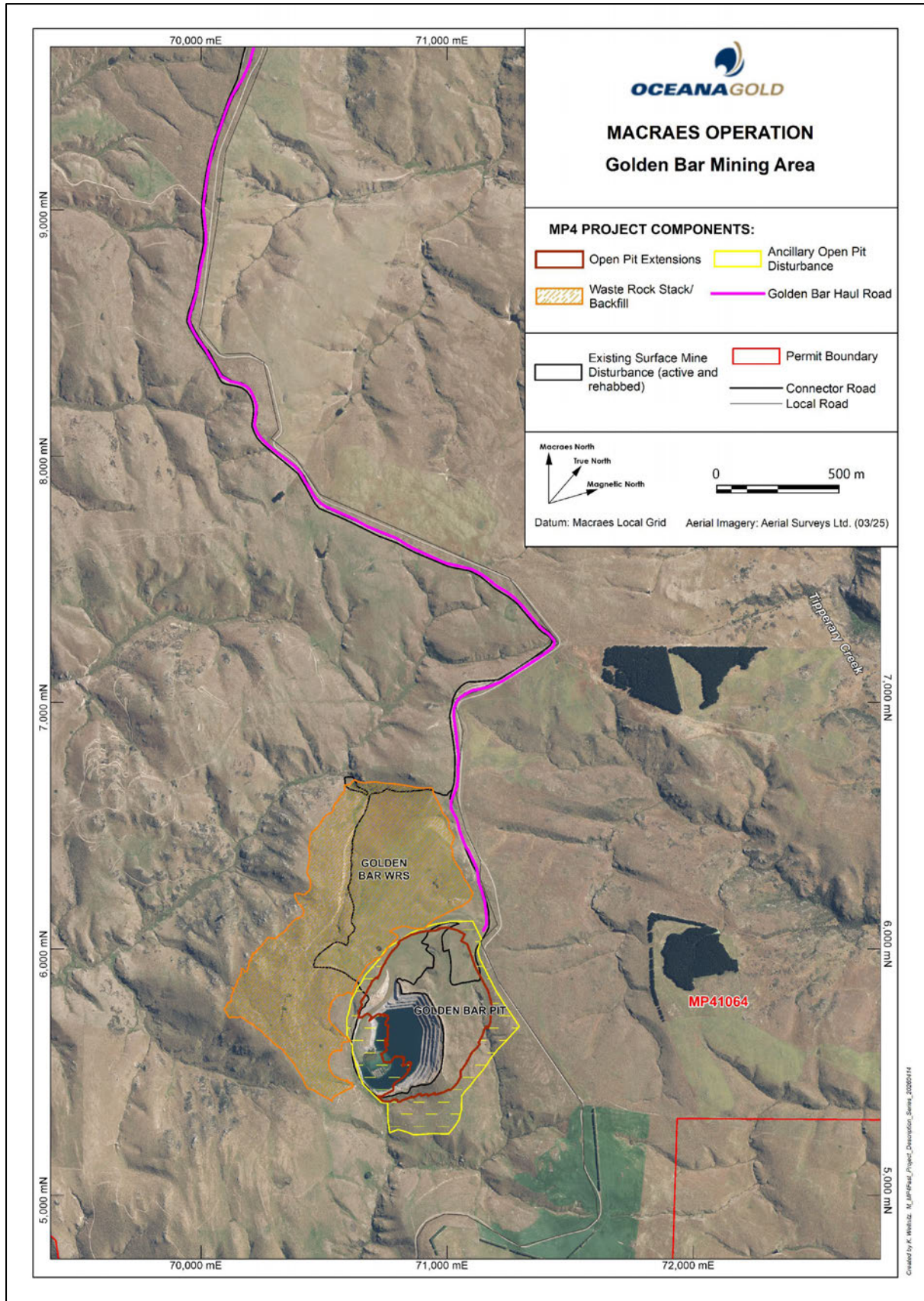


Figure 59. Golden Bar pit extension.¹⁶⁵

¹⁶⁵ OceanaGold.



Figure 60. Pit disturbance area, pit shell, and waste rock stack footprints (2025 OGNZL aerial photography).

8.2 Research Results

8.2.1 Historical Record

Historically, a large portion of the area affected by the proposed pit disturbance area, pit shell, and waste rock stack, was operated as the Golden Bar Mine, and this has carried through into current operations. A detailed history of historic mining at the site is included in Petchey's 1994 *The Golden Bar Mine, Macraes*, and the following history is based on this report.¹⁶⁶ Historical survey plans and reports indicate that the Golden Bar was subject to mining from 1868 until *circa* 1934 or 1942.¹⁶⁷ Applications for various mining licenses were submitted to the Macraes and Naseby Warden's Courts between 1896 and 1934, and several licence areas are recorded in

¹⁶⁶ Petchey, *The Ounce Mine, Macraes: Archaeological Survey*.

¹⁶⁷ Petchey (1994) notes that the reference to underground workings at Golden Bar Mine in 1942 are from an unreferenced report in "The History of Quartz Mining at Macraes Flat, East Otago, New Zealand.", Jeffery, A (1988) and are of questionable accuracy.

survey plans (Figure 61). However, the specifics of this mining, and the extent to which they were carried out, are unclear.

In the 19th century, articles record that prospecting was undertaken at the Golden Bar reef between 1868¹⁶⁸ and 1869¹⁶⁹ by the Golden Bar Company on unspecified sections. Prospecting of the reef was again undertaken *circa* 1874 by the same company.¹⁷⁰ A 1889 survey plan lists Pacific Quartz Mining Company as owners of Sections 4 and 5, and Beryl Q.M.C on Section 3.¹⁷¹ In 1895 William Henry Feahey, Dunedin, applied to conduct mining at Golden Bar under the name 'The Golden Bar Mining Company'.¹⁷² In 1897 the name 'Golden Bar Quartz Mining Company' first appears on a survey plan showing three huts along a creek on Sections 8 and 2 (Figure 61).¹⁷³

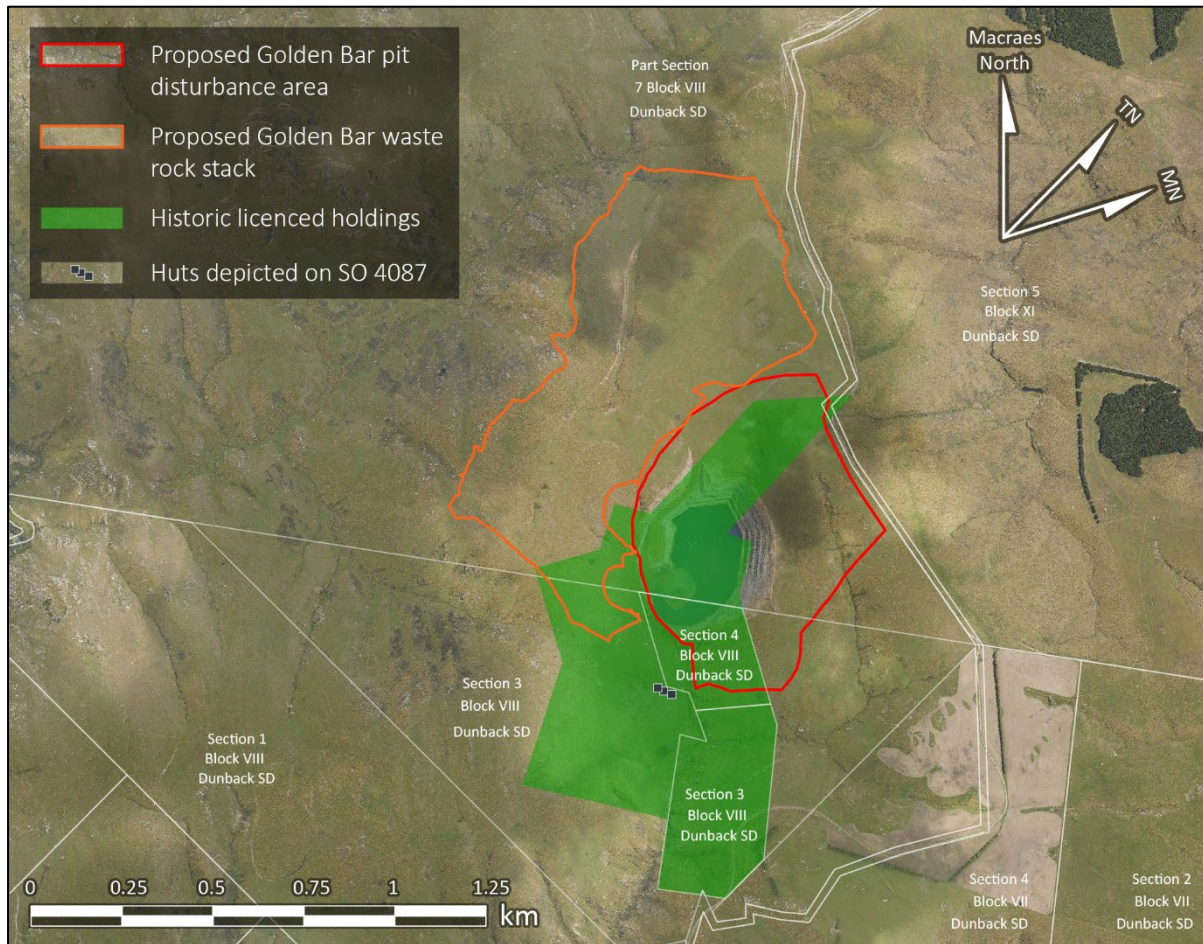


Figure 61. Extent of past licenced holdings¹⁷⁴ and huts on SO 4087 (2025 OGNZL aerial photography).

In the 20th century there were three main operation periods of the Golden Bar Mine. Firstly, the Golden Bar Gold-Mining Company operated between *circa* 1901 to 1907. A gold battery was installed *circa* 1901 (I43/87) and part of an access road from Golden Bar Road was constructed. A second period of operation by a second Golden Bar Gold-Mining Company occurred *circa* 1912 to 1913. This period was marked by further road construction and open cast mining. Finally, *circa* 1924 to 1928 The Mount Moor Gold-mining Company and the

¹⁶⁸ *Otago Daily Times*, "Macraes," 24 July 1868, 6.

¹⁶⁹ *Otago Witness*, "Mining Intelligence," 27 February 1869, 6.

¹⁷⁰ *Otago Daily Times*, "Quartz Mining in Otago," 11 February 1875, 3; *Mount Ida Chronicle*, "Report on the Goldfields of Otago," 28 May 1875, 3.

¹⁷¹ SO 4083.

¹⁷² *Mount Ida Chronicle*, "Page 3 Advertisements Column 2," 10 January 1895, 3.

¹⁷³ SO 4087.

¹⁷⁴ SO 422, 4083, 4087, and 4092.

Golden Bar Mining Company operated at Golden Bar. In 1924 a license was granted for the construction of a dam and water race on Section 8,¹⁷⁵ and in 1927 a gold battery (I43/88) was installed south-east of the current Golden Bar Pit. Historical and archaeological evidence indicates that the battery was originally the Deep Dell Battery, relocated from Horse Flat to Golden Bar Mine. It was established at Golden Bar Mine with almost an identical set up, excluding the cyanide treatment plant.¹⁷⁶

Historic aerial photographs show how the environs of the project area evolved over the latter years of the 20th century and into the 2000s (Figure 62).

8.2.2 Previous Historic Heritage Assessment

Archaeological survey and excavation have been the principal means of identifying historic heritage in the area. ArchSite records three sites in the vicinity of the project area (Figure 63 and Table 17). All three were surveyed and mapped by Peter Petchey in 1994.¹⁷⁷ Site I43/86, Golden Bar Mine, encompasses various mine workings, the 1901 battery, and the 1927 battery. Both batteries are also recorded individually as I43/87 (1901 battery) and I43/88 (1927 battery). Some site features of I43/86 recorded within the footprint of the current Golden Bar Pit have been destroyed, but many others remain largely unaffected. Site extents have been updated as part of this assessment.

Archaeological investigations were carried out by Peter Petchey in September 2003 and March 2004. An archaeological report detailing the investigations was produced by Petchey in 2005.¹⁷⁸ Investigations included the detailed recording and excavation of nine hut features closest to the mine (part of I43/86), and the 1927 gold battery site (I43/88; Figure 64). It was concluded that the excavated features were largely related to mining operations in the 1920s. However, at least one of the hut features (Hut 5) may have been associated with mining operations between the 1890s and the early 1900s. Limited artefactual material was found during excavations, and Petchey hypothesised that rubbish had likely been dumped in nearby unexcavated pits and hollows.¹⁷⁹

Subsequent to this work, most of the features constituting Petchey's 'Main mine workings' at the site (Figure 64) were destroyed during the excavation of the Golden Bar Pit as part of modern mining operations in the area.

Table 17. Details of recorded archaeological sites within or relevant to the project areas.

Site Number	Site Name	Site Type	Details	Archaeological Authorities	Site Condition
I43/86 ¹⁸⁰	Golden Bar Mine	Mining – gold	GOLD MINE	2003/89; 2002/162	Fair
I43/87 ¹⁸¹	Golden Bar	Mining – gold	GOLD BATTERY	2003/89; 2002/162	Good
I43/88 ¹⁸²	Golden Bar Battery	Mining – gold	GOLD BATTERY	2003/89; 2002/162	Good

¹⁷⁵ *Register of Applications Naseby Warden's Court*: Application No. 23/24 (2/8/1924); Application No. 25/24 (2/8/1924); Application No. 26/24 (2/8/1924). All granted to C.G. Moore.

¹⁷⁶ Petchey, *The Ounce Mine, Macraes: Archaeological Survey*.

¹⁷⁷ Petchey, *The Golden Bar Mine, Macraes: Archaeological Survey*.

¹⁷⁸ Petchey, *Golden Bar Mine, Macraes: Archaeological Investigations*.

¹⁷⁹ Petchey, *Golden Bar Mine, Macraes: Archaeological Investigations*.

¹⁸⁰ Petchey, *The Golden Bar Mine, Macraes: Archaeological Survey*; Petchey, *Golden Bar Mine, Macraes: Archaeological Investigations*.

¹⁸¹ Petchey, *The Golden Bar Mine, Macraes: Archaeological Survey*; Petchey, *Golden Bar Mine, Macraes: Archaeological Investigations*.

¹⁸² Petchey, *The Golden Bar Mine, Macraes: Archaeological Survey*; Petchey, *Golden Bar Mine, Macraes: Archaeological Investigations*.

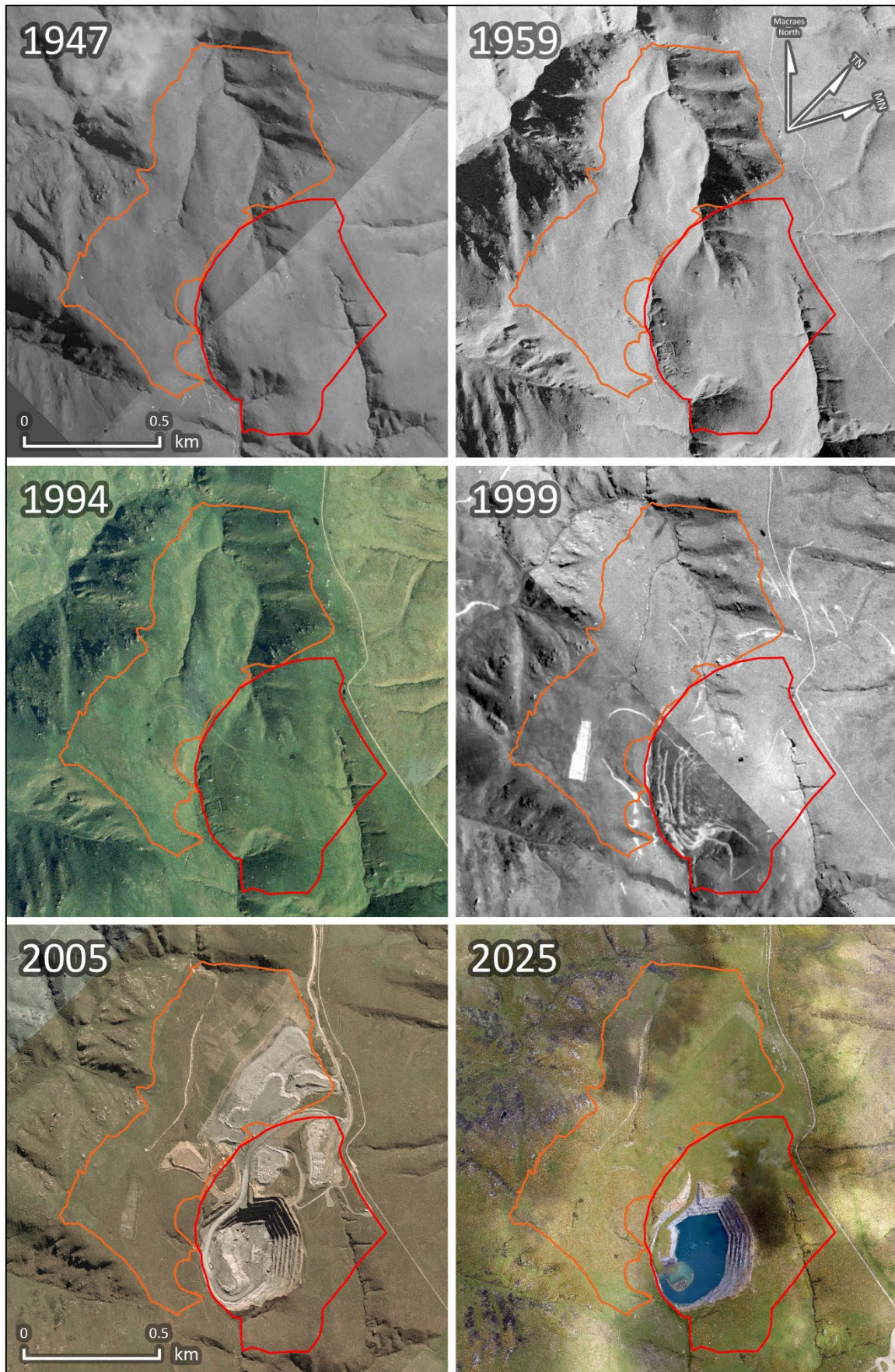


Figure 62. Historical aerial photographs showing the project area over time.¹⁸³

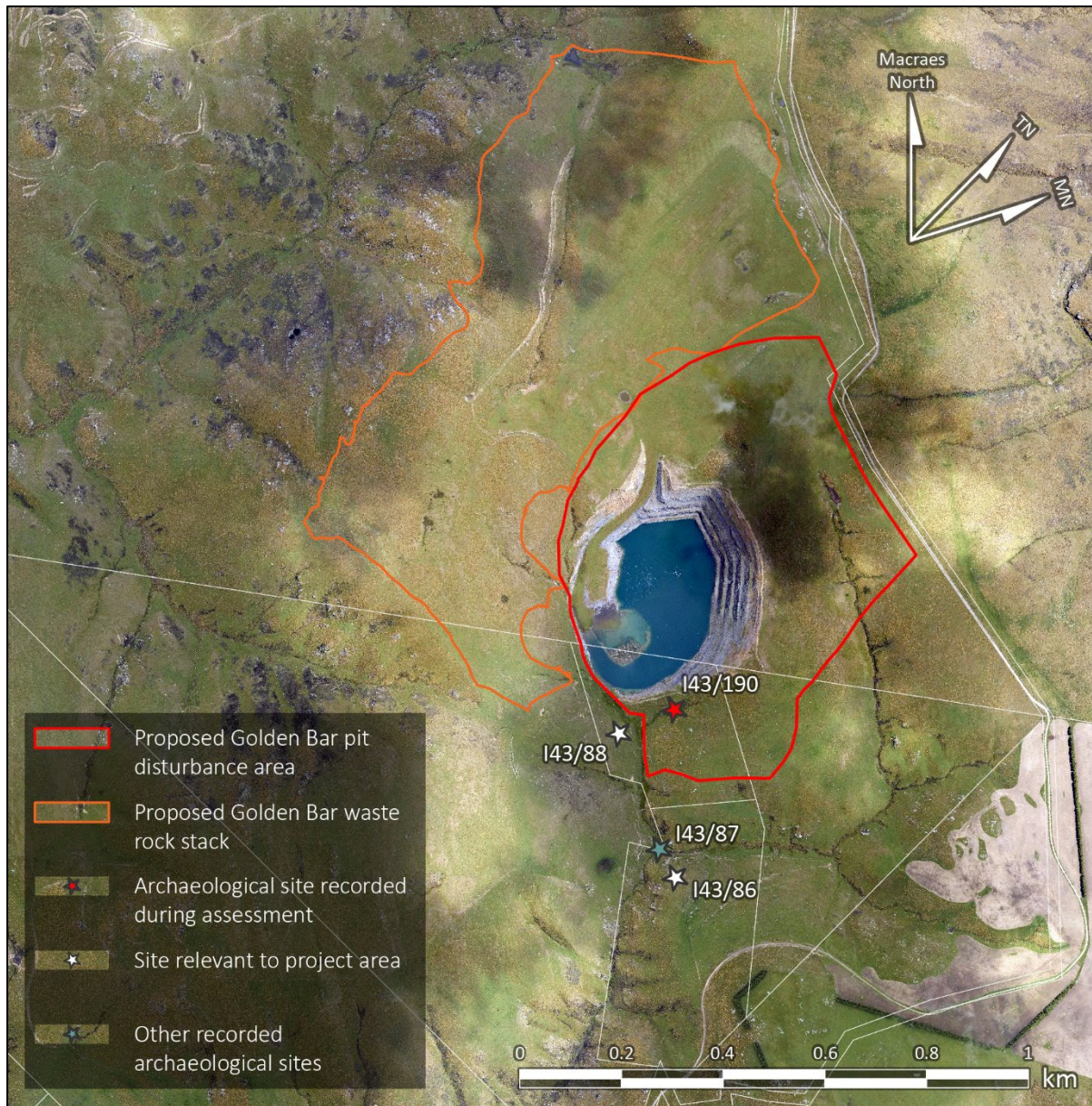


Figure 63. Locations of recorded archaeological sites in and around the project area (2025 OGNZL aerial photography).

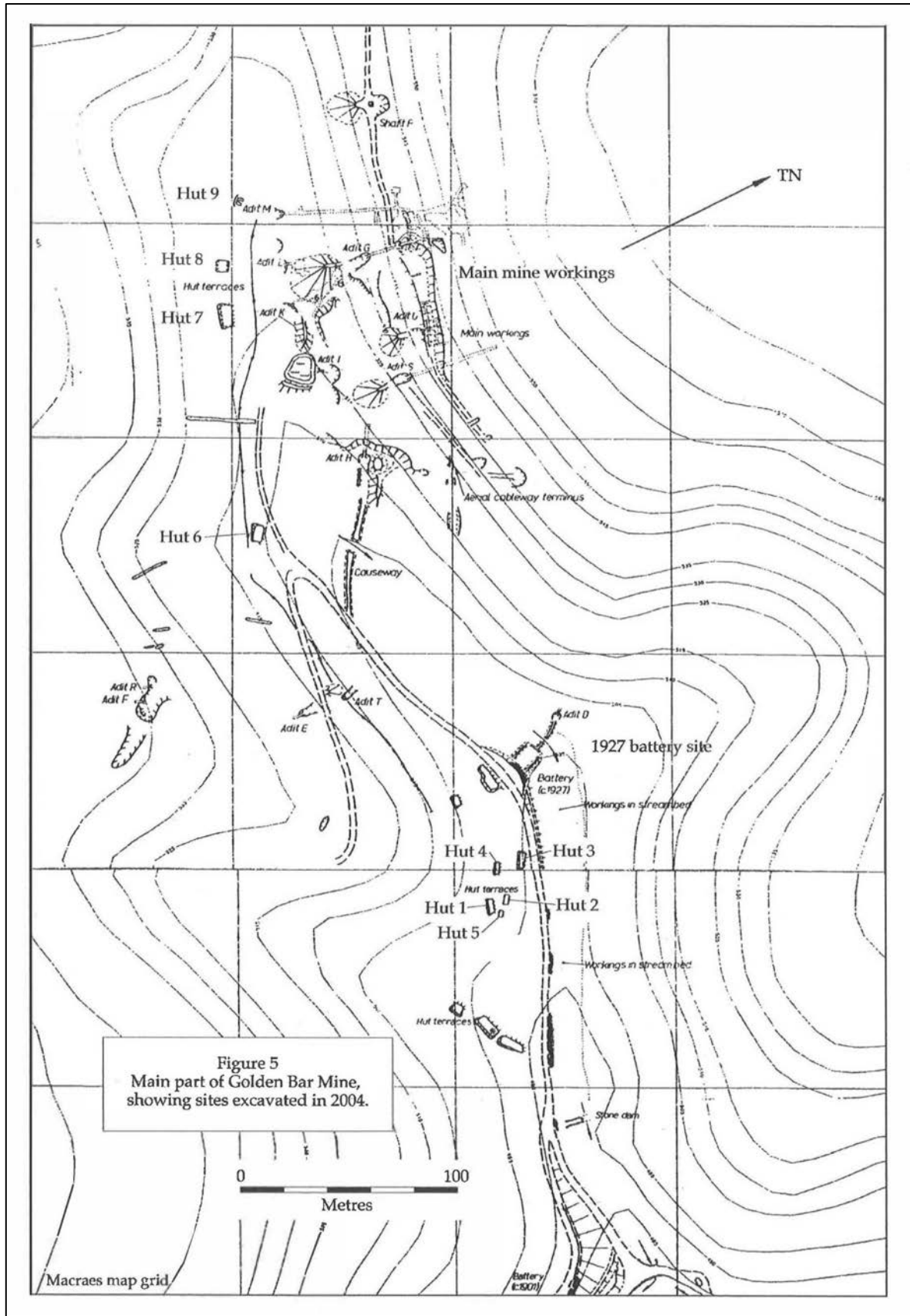


Figure 64. Features excavated under Authority No.2002/162. These include the 1927 battery site (I43/88) and Huts 1-9 (I43/86).¹⁸⁴

¹⁸⁴ Petchey, *Golden Bar Mine, Macraes: Archaeological Investigations*.

8.3 Survey

A survey of the project area was undertaken by Jeremy Moyle and Renée Sadlier on 17 December 2025. Additional site visits were made on:

- 2 March 2026 by Moyle and Sadlier to inspect an area of land disturbance within the proposed waste rock stack footprint.
- 15 April 2026 by Moyle and Russell Cook to survey the gully to the north-east of the current pit.

The general areas where archaeological features, or areas with archaeological potential, were identified in the desktop review and visited for survey are shown in Figure 65.

Aside from the sites discussed below, it was determined that the potential for unrecorded archaeological sites in this project component is low based on the desktop review and survey.

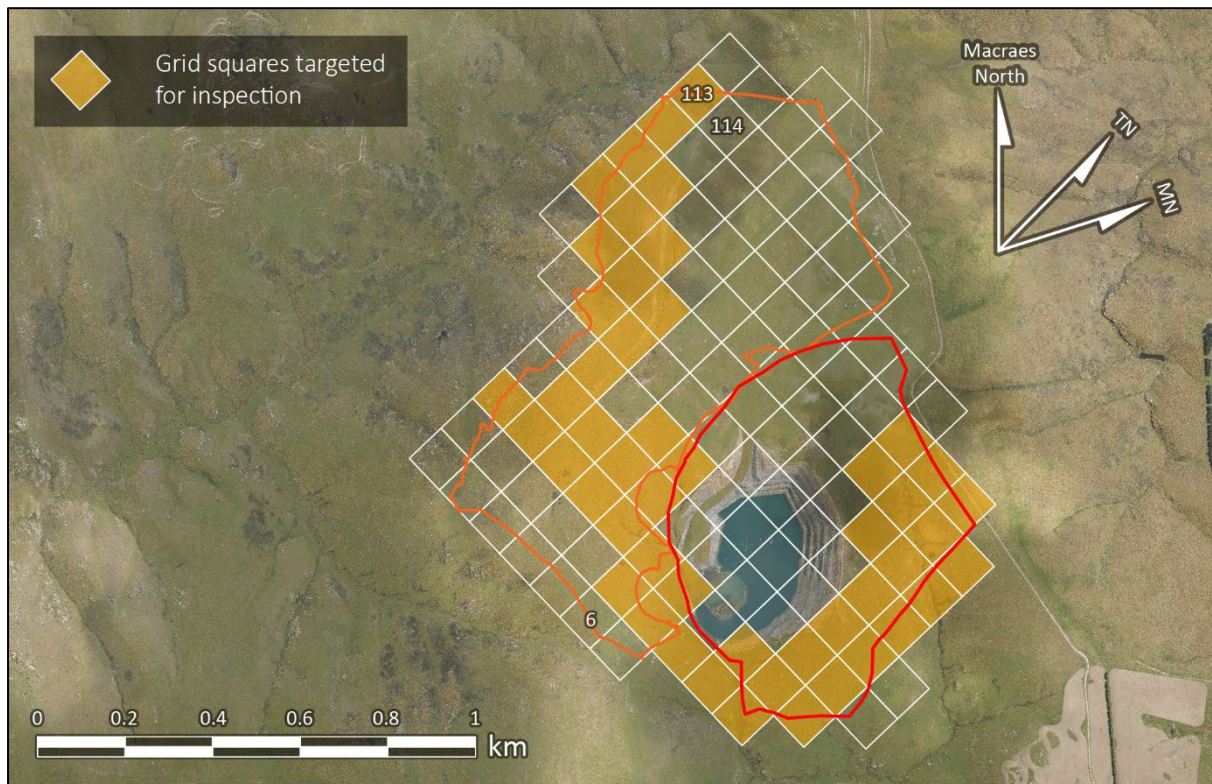


Figure 65. Areas in and around the project area targeted for survey based on historical survey plans and aerial images (2025 OGNZL aerial photography).

8.3.1 Golden Bar Mine and Battery (I43/86 and I43/88)

The Golden Bar mining site (I43/86) encompasses several features associated with the 19th and 20th century mining system as outlined in Figure 66 and Table 18, and includes two battery sites (archaeological sites I43/87 and I43/88). The 1901 gold battery (I43/87) is outside the pit disturbance area and was not included in the survey. Likewise features of site I43/86 which are located outside of the disturbance area, to the south of the surveyed dam (D), were not included as part of the survey.

Modern mining at Golden Bar Pit has destroyed the majority of the 'main mine workings'¹⁸⁵ previously recorded by Petchey, however most of the remaining features were in good condition and were clearly defined.

¹⁸⁵ Petchey, *The Ounce Mine, Macraes: Archaeological Survey*.

Vegetation at the site has been maintained by stock grazing. Some features, namely mine workings, were associated with small scale erosion, likely the result of vegetation loss, water damage and stock movement.



Figure 66. Golden Bar Mine and Battery recorded items. Overall site extent of I43/86 is based on Petchey's 1990s survey (2025 OGNZL aerial photography).

Terraces were located on slopes north-west and south-east of the 1927 gold battery (Figure 87-Figure 88; 143/88). Some terraces were marked with modern steel waratahs, presumably to aid their re-location. Of the 11 building/hut sites identified during this survey, seven were sites previously excavated in 2003-2004¹⁸⁶ including a building terrace above the 1927 battery site (Figure 95) and Huts 1, 3, 4, 6, 7, and 8 (Figure 89-Figure 116). Huts 5 and 9 were not able observed on the ground but their location has been approximated from previous survey maps and LiDAR data. One previously unrecorded terrace was also identified as a possible hut/building site adjacent to the locations of the huts marked on the 1897 survey plan¹⁸⁷ (Figure 72-Figure 73). Two of the previously unrecorded terraces were located adjacent to one another on the hillside south-east of the stone dam. The third previously unrecorded terrace was located to the south-west of the area labelled by Petchey as hut terraces.¹⁸⁸

Table 18. Recorded Golden Bar Mine and Battery items.

Ref	Item	Details
AD	Adit	Adit identified as 'Adit D' by Petchey. Adjacent to tramway on the northern side of the creek, located north of 1927 battery (GB). Opening approximately 800mm tall and easily visible (Figure 67).
AE	Adit	Adit identified as 'Adit E' by Petchey. Located south of Adit T. Surrounding area eroding due to loss of vegetation caused by old mine workings (Figure 68).
AF	Adit	Adit to the south of adjacent Adit R. Identified as 'Adit F' by Petchey. Surrounding mine workings causing erosion due to vegetation loss. Adit opening has been partially closed off (Figure 69-Figure 70).
AG	Adit	Not located during survey. Destroyed during creation of Golden Bar Pit.
AH	Adit	Not located during survey. Destroyed during creation of Golden Bar Pit.
AI	Adit	Not located during survey. Likely destroyed during creation of Golden Bar Pit.
AK	Adit	Not located during survey. Destroyed during creation of Golden Bar Pit.
AL	Adit	Not located during survey. Destroyed during creation of Golden Bar Pit.
AM	Adit	Not located during survey. Destroyed during creation of Golden Bar Pit.
AR	Adit	Adit identified as 'Adit R' by Petchey, adjacent to Adit F (AF) located to the south (Figure 69).
AS	Adit	Not located during survey. Destroyed during creation of Golden Bar Pit.
AT	Adit	Adit recorded as Adit T by Petchey. Located north of Adit E. Opening is obscured by tussock growth (Figure 71).
AU	Adit	Not located during survey. Destroyed during creation of Golden Bar Pit.
BT1	Building/hut terrace	Possible building terrace located close to the huts noted on the 1897 survey of the area (HT). Not identified by Petchey. Next to an area of possible sluicing. No above ground structural evidence.
CW	Causeway	Remains of a tram causeway running north-west to south-east. Identified by earthen embankments (Figure 74-Figure 75), cuts (Figure 76), and steel tramway line (Figure 77). Partially destroyed by the current Golden Bar Pit.

¹⁸⁶ Petchey, *The Ounce Mine, Macraes: Archaeological Survey*.

¹⁸⁷ SO 4087.

¹⁸⁸ Petchey, *The Ounce Mine, Macraes: Archaeological Survey*.

Ref	Item	Details
D	Dam	A dam constructed of dry stacked stone over an earthen embankment, located along the creek approximately 160m south-east of the 1927 battery (Figure 78-Figure 82). Partial collapse of stone wall at northern and southern ends (Figure 79), condition degraded since previous recording by Petchey. Likely related to post-1900 operation of the 1901 battery and/or cyanide plant located approximately 100m downstream (south-east). A license for a dam on the section was granted in 1902. ¹⁸⁹
GB	Gold battery (I43/88)	Constructed in 1927, excavated 2003-2004 by Petchey. Concrete foundations supported plant relocated from the Deep Dell Battery at Horse Flat. Foundations of battery and generator have been clearly defined by previous archaeological investigation (Figure 83-Figure 84). Firebricks associated with the gas producer located on surface in a pile to the north-west of the battery foundations, not in-situ (Figure 85). Clearly defined platform of the tailing pond was located below the road level to the north-east of the battery (Figure 86). ¹⁹⁰
H1	Building/hut terrace	Building terrace identified by Petchey as Hut 1. Partially excavated 2003-2004. Likely location of a small timber hut. Terrace and excavated timber post were easily located (Figure 89).
H2	Building/hut terrace	Was not definitively located during survey, terracing was noted in general area. Partially excavated 2003-2004. Petchey noted Hut 2 was "...located below and to the north-west of Hut 1. It consisted of an irregularly shaped terrace that had been cut into the hillside, measuring approximately 4m by 3m." ¹⁹¹
H3	Building/hut terrace	Possible building terrace located immediately above the old mine road. Identified by Petchey as Hut 3, partially excavated 2003-2004. No above ground structural evidence, terrace clearly defined (Figure 90).
H4	Building/hut terrace	Building terrace, identified by Petchey as Hut 4 partially excavated 2003-2004. Possibly occupied by a small hut. No above ground structural evidence, terrace is well defined (Figure 91).
H5	Building/hut terrace	Not definitively located during survey. Recorded by Petchey as "...located below Hut 1. It consisted of a terrace that measured approximately 4m by 3m, with an earth mound at the eastern end..." ¹⁹² . Partially excavated 2003-2004. The only hut/building site excavated by Petchey with a chimney. Likely associated with mine operation pre-1927.
H6	Building/hut terrace	Large building terrace, identified by Petchey as Hut 6 partially excavated 2003-2004. Possibly related to mining operation rather than domestic residence. "The lines of several drains... partially visible on the surface..." could not be located during the survey. Terrace itself is well defined (Figure 92).
H7	Building/hut terrace	Building terrace identified by Petchey as Hut 7, excavated 2003-2004. Possible location of a timber framed mining building. Located to the south-west of the Golden Bar Pit. Adjacent to Hut 8 (H8). Terrace was clearly defined, and its extent marked with steel waratahs (Figure 87 and Figure 93-Figure 94).

¹⁸⁹ Application No. 1/02. Petchey, *The Golden Bar Mine, Macraes: Archaeological Survey*.

¹⁹⁰ Petchey, *The Ounce Mine, Macraes: Archaeological Survey*.

¹⁹¹ Petchey, *The Ounce Mine, Macraes: Archaeological Survey*, 22.

¹⁹² Petchey, *The Ounce Mine, Macraes: Archaeological Survey*.

Ref	Item	Details
H8	Building/hut terrace	Building terrace, identified by Petchey as Hut 8, excavated 2003-2004. Possible location of a domestic residence, previous excavation identified artefactual material related to domestic activity. Stonework scatter and fibrolite found during excavation. Adjacent to Hut 7 (H7). Terrace was clearly defined, and its extent marked with steel waratahs (Figure 87 and Figure 94).
H9	Building/hut terrace	Not photographed during survey, visible on desktop survey.
HCT	Building/hut terrace	Building terrace identified as Petchey as the possible location of the 'aerial cableway terminus.' Included in description of the 1927 battery site (GB). Partially excavated 2003-2004. No above ground structural evidence, terrace is well defined and location marked with a steel waratah (Figure 95).
HT	Building/hut terraces	'Three hut terraces' identified by Petchey. Recorded on 1897 survey. Terraces are clearly defined (Figure 97). No above ground structural remains.
MR	Stone revetment (culvert)	Area of major revetment is located approximately 50m north-west of dam (D) (Figure 111-Figure 115). This appears to be a culvert, but the inlet and outlet are not evident. Collapse of earth embankment on northern end has caused partial collapse of stone revetting.
P1	Trench	Prospecting trench, located approximately 50m south-east of Hut 7 (Figure 98).
P2	Trench	Prospecting trench, located south of Adit E (Figure 99).
P3	Trench	Prospecting trench, located immediately east of P2 (Figure 100).
P4	Pit	Prospecting pit, located approximately 41m south-east of P3 (Figure 101).
SC	Scarp	Scarp/terrace identified by Petchey. Once adjacent to Adit I which has since been destroyed.
SHP	Shaft	Mining shaft 'P' as identified by Petchey. Destroyed during modern mining in the creation of the Golden Bar Pit.
ST	Stone revetted track	Portions constructed in 1901 and 1912. A track/road, partially supported by stone revetment, is located above the stream level and runs north-west to south-east along the Golden Bar Mine site (Figure 106-Figure 110). Revetment occurs on the north-east facing side of the road. Track widens directly in front of the 1927 Gold Battery.
WR	Water race	Shallow cut earth water race running north-west to south-east (Figure 116-Figure 118). Located to the west of the stone revetted track. Possibly constructed in 1924 in connection with the gold battery (GB), application for water race on Section 8 was granted in 1924.



Figure 67. Adit feature (AD) adjacent to tramway, looking north-west.



Figure 68. Adit feature (AE), looking south.



Figure 69. Adits R and F (AF and AR). Ranging pole nearest Adit F, looking south-west.



Figure 70. Detail of Adit F (AF) shown in previous photo, looking south.



Figure 71. Adit T (AT), looking south-east.



Figure 72. Interpreted as building site (not specifically identified on Petchey map). Sits within a probable sluiced area, looking south-west.



Figure 73. Two building sites marked with waratahs, BT2 in the foreground and BT3 in the background, looking east.



Figure 74. Tram causeway (CW) embankment, looking south-east.



Figure 75. Looking along tram causeway (CW) embankment and towards Adit D (AD), looking north.



Figure 76. Possible tram causeway (CW) cut, looking east.



Figure 77. Tram causeway (CW) steel remains, looking south-east.



Figure 78. Dam (D) in relation to revetted track (ST), looking north-west.



Figure 79. Dam (D), looking south-east. Breach noted by Petchey on the left.



Figure 80. Dam (D), looking north-west.



Figure 81. Creek, looking upstream towards adit (AD) and pit lake, looking north-west.



Figure 82. Creek workings, looking south-east towards dam.



Figure 83. Battery foundations (GB) (I43/88), looking north.



Figure 84. Battery foundations (GB) (I43/88), possible aerial terminus (HCT) marked with steel waratah in the background, looking south.



Figure 85. Firebricks piled to the west of battery, looking north.



Figure 86. Ranging pole in area of previous excavation in gold battery (GB) tailings pond. Background shows tailings along track, battery foundations (GB) and terrace above battery (HCT), looking south.



Figure 87. Building/hut terraces (huts 7 and 8) north-west of the 1927 battery site, extents marked with waratahs, looking south-east.



Figure 88. Plan shot of hut/building sites to the south-east of the battery site, looking west.



Figure 89. Building site with wood post (H1), looking north-west.



Figure 90. Building site (H3), looking west.



Figure 91. Building terrace (H2), looking south-west.



Figure 92. Building site (H6), looking south-east.



Figure 93. Building site (H7), looking south-east.



Figure 94. Building sites (H7 in the background and H8 in the foreground). Extents marked with waratahs, looking south-east.



Figure 95. Aerial cableway terminus (HCT) to the south of 1927 Gold Battery site, looking south-east.



Figure 96. Possible building terraces (see above) next to sluced area, looking south.



Figure 97. Building site (HT), looking south-west.



Figure 98. Bottom of P1, looking south.



Figure 99. Bottom of prospecting trench (P2), looking south.



Figure 100. Prospecting trench (P3), looking south.



Figure 101. Prospecting pit (P4), looking north-west.



Figure 102. Mullock heap (S2), looking south-west.



Figure 103. Mine workings to the west of pit lake and hut 6 (H6), looking west.



Figure 104. Mine workings to the west of pit lake, looking west.



Figure 105. Scarp/terrace (S3), looking east. Former location of Adit I (AI) to the left of the scarp/terrace.



Figure 106. Widening of track at northern end below bottom of prospecting trench (ST), looking south-east.



Figure 107. Stone revetting along track (ST), looking south-west.



Figure 108. Stone revetting along track (ST), looking south-west.



Figure 109. Revetment along track, looking north-west.



Figure 110. Detail of stone revetted track as shown above, looking south.



Figure 111. Major revetment, looking south-west.



Figure 112. Showing the major revetment along the track in relation to the creek, looking north-west.



Figure 113. Major revetment along track, looking south-west.



Figure 114. Condition of major revetment as shown in previous photo, looking north-east.



Figure 115. Plan view of collapsed area in major revetement along track/road (previous two photographs), looking north-east.

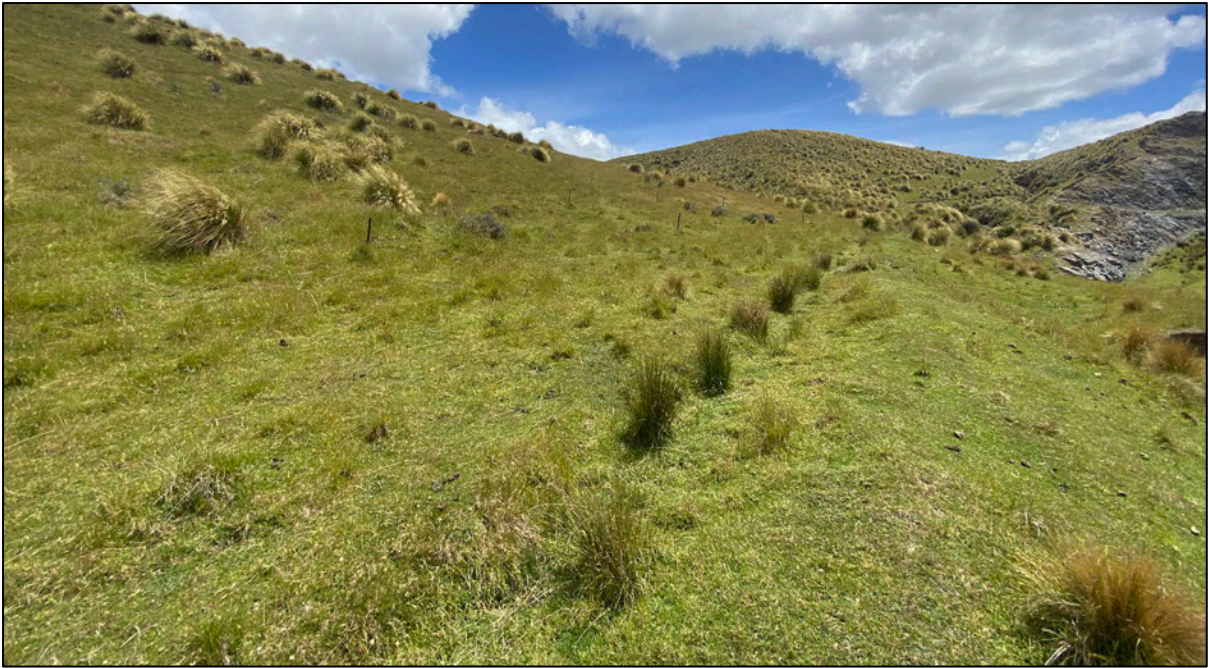


Figure 116. Showing northern most end of the water race (WR). Steel waratahs to the left mark extents of Hut 7 and Hut 8, looking west.



Figure 117. Looking along water race (WR), looking south-east.



Figure 118. Looking along water race (WR), looking north-west.



Figure 119. View south-east towards the battery site.

8.3.2 Sluicings (I43/190)

Site I43/190 – recorded as part of this survey – encompasses an area of overgrown sluicings located north of the 1927 gold battery (site I43/88). The sluicings are located east of Golden Bar Pit but have not been impacted by modern mining operations. Two sluiced gullies converge at the creek to the south. The age of this site is not clear, but it likely dates to the 19th century, prior to the establishment of hard-rock mining in the area.

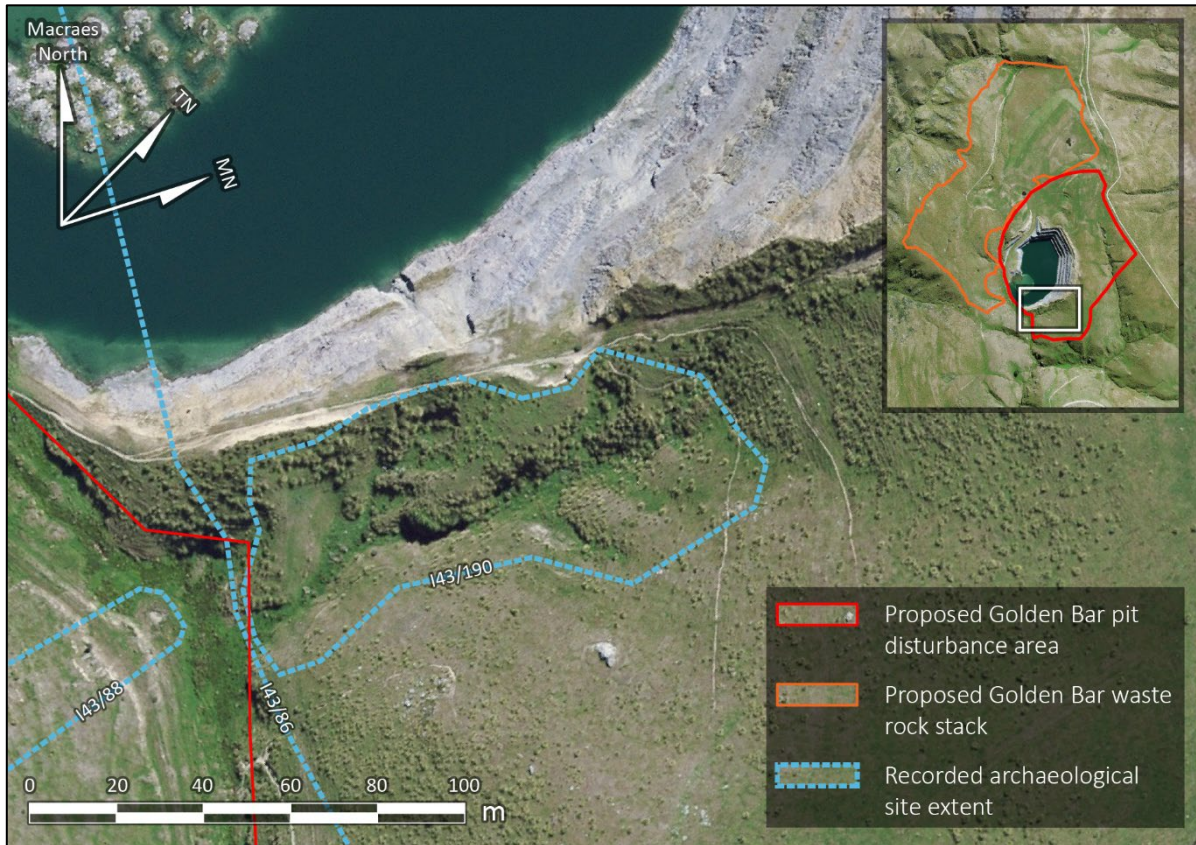


Figure 120. Sluiced areas making up I43/190 (2025 OGNZL aerial photography).



Figure 121. Bottom of sluiced gully, looking north.



Figure 122. Sluced gully, looking north-west.

8.3.3 Waste Rock Stack

The Golden Bar Waste Rock Stack largely covers open paddocks (Figure 123-Figure 124). One area of interest was identified, consisting of an area of disturbed ground (potentially indicating historic mining) within the proposed footprint. This was surveyed on 2 March 2026 by Jeremy Moyle and Renée Sadlier. The ground disturbance appeared to be an area affected by natural slumping (Figure 125).



Figure 123. Area of proposed waste rock stack, looking west.



Figure 124. Area of proposed waste rock stack and pit extension, Grid 6, looking north-west towards the existing waste rock stack.



Figure 125. Slumped ground in the proposed waste rock stack area, looking south-west.

8.4 Heritage Values

The heritage values of the historic heritage items in the project area are assessed in the tables below.¹⁹³

Table 19. Otago RPS heritage values of Golden Bar Mine and Battery.

Site	Value	Assessment
Golden Bar Mine and Battery (ArchSite I43/86 and I43/88)	Archaeological	The Golden Bar Mine and Battery sites are comprised of an interconnected set of archaeological features that provides insight into the hard-rock mining 'system' carried out there.¹⁹⁴ It includes some mine workings, roading access, the battery site, and workers' accommodation. The investigative and interpretive potential of these features is enhanced as they are both clearly identifiable in the open grassland and generally associated with the post 1890s mining in the area (c.f., other sites where features may be overgrown or eroded). They can also provide insight into both domestic life and the specifics of mining at the site beyond the historical record. Historical documents are primarily concerned with and have little to say beyond matters of licencing, returns, and plant. However, the heritage value of the mine has been notably diminished by the loss of the main mine workings as a result of excavation for modern mining. Survey by Petchey in 1994 and later excavations by him in 2004 and 2005 have gone some way towards realising the site's archaeological value. Assessment – Moderate
	Architectural	Negligible
	Cultural	Negligible
	Historic	The Golden Bar Mine is an element of the hard-rock mining industry that was a major part of Otago and New Zealand's life and economy during the latter years of the 19th century and the early 20th century. It is one of many such mines that saw intermittent periods of operation, waxing and waning according to variable returns and available capital. This history is reflected in the mining 'system' preserved in the physical features of the site that represent the various aspects of historic hard-rock mining (see Archaeological Value above). It is also evident in the layers of history present at the site, with early hut platforms dating from the 1890s, and the presence of a later battery site replacing an earlier installation downstream from the project area. Assessment – Moderate
	Scientific	Negligible
	Social	Negligible
	Spiritual	Negligible

¹⁹³ See Section 3.3 for an outline of the assessment method.

¹⁹⁴ Petchey, *The Golden Bar Mine, Macraes: Archaeological Survey*.

Site	Value	Assessment
	Technological	The battery site at the Golden Bar Mine is representative of not just the stamp mills typical of hard-rock mining sites, but also the relative flexibility this technology and its users. Historical and archaeological research has demonstrated that the 1920s battery at Golden Bar was relocated from an earlier battery site at Horse Flat.¹⁹⁵ This is an example of an industrial technology which, in the hands of skilled mechanics, was able to be effectively recycled to facilitate potentially capital-constrained mining ventures.¹⁹⁶ The absence of the machinery itself, aside from concrete foundations, diminishes the site's technological value. Assessment – Moderate
	Traditional	Negligible

Table 20. Waitaki District Plan heritage values of Golden Bar Mine and Battery.

Site	Value	Assessment
Golden Bar Mine and Battery (ArchSite I43/86 and I43/88)	Historical and social	The Golden Bar Mine is an element of the hard-rock mining industry that was a major part of Otago and New Zealand's life and economy during the latter years of the 19th century and the early 20th century. It is one of many such mines that saw intermittent periods of operation, waxing and waning according to variable returns and available capital. This history is reflected in the mining 'system' preserved in the physical features of the site that represent the various aspects of historic hard-rock mining (see Archaeological Value above). It is also evident in the layers of history present at the site, with early hut platforms dating from the 1890s, and the presence of a later battery site replacing an earlier installation downstream from the project area. Assessment – Moderate
	Cultural and spiritual significance to takata whenua	Negligible
	Architectural	Negligible

¹⁹⁵ Petchey, *Golden Bar Mine, Macraes: Archaeological Investigations*.¹⁹⁶ Peter Petchey, 'The Archaeological Interpretation of the New Zealand Stamp Mill', *Australasian Historical Archaeology* 32 (2014): 3–19.

Site	Value	Assessment
	Technological	The battery site at the Golden Bar Mine is representative of not just the stamp mills typical of hard-rock mining sites, but also the relative flexibility this technology and its users. Historical and archaeological research has demonstrated that the 1920s battery at Golden Bar was relocated from an earlier battery site at Horse Flat.¹⁹⁷ This is an example of an industrial technology which, in the hands of skilled mechanics, was able to be effectively recycled to facilitate potentially capital-constrained mining ventures.¹⁹⁸ The absence of the machinery itself, aside from concrete foundations, diminishes the site's technological value. Assessment – Moderate
	Group	Negligible
	Landmark	Negligible

Table 21. Otago RPS heritage values of the sluicings.

Site	Value	Assessment
Sluicings (ArchSite I43/190)	Archaeological	The isolated sluicing site provide some evidence towards occupation and mining in locality prior to later hard-rock mining. Assessment – Low
	Architectural	Negligible
	Cultural	Negligible
	Historic	Negligible
	Scientific	Negligible
	Social	Negligible
	Spiritual	Negligible
	Technological	Negligible
	Traditional	Negligible

Table 22. Waitaki District Plan heritage values of the sluicings.

Site	Value	Assessment
Slucings (ArchSite I43/190)	Historical and social	Negligible
	Cultural and spiritual significance to takata whenua	Negligible
	Architectural	Negligible

¹⁹⁷ Petchey, *Golden Bar Mine, Macraes: Archaeological Investigations*.¹⁹⁸ Petchey, 'The Archaeological Interpretation of the New Zealand Stamp Mill'.

Site	Value	Assessment
	Technological	Negligible
	Group	Negligible
	Landmark	Negligible

8.5 Alternative Options

The waste rock stack footprint has been pared back from that proposed in the initial iteration of the project listed in Schedule 2 of the FTAA. This initially extended into additional gullies to the north-east of the existing pit where there was the potential for archaeological sites to be present. Subsequently, the footprint of the waste rock stack was again altered to avoid affecting any features associated with the historic Golden Bar Mine. It has also been confirmed by OGNZL that activities supporting mining will be designed to avoid the remainder of Golden Bar Mine and Battery features located within the pit disturbance area.

The alteration of the pit shell to avoid the sluicing site would require substantial alteration of the core mining proposal. This is considered both unfeasible and disproportionate given the generally low archaeological values of the site.

8.6 Recommendations

- The 19th century sluicing site (I43/190) should be recorded prior to its destruction. This should be managed under the auspices of an Archaeological Authority from Heritage New Zealand.
- Areas around the archaeological features making up the Golden Bar Mine and Battery (I43/86 and I43/88) should be demarcated and protected on the ground using physical barriers to avoid any accidental disturbance during project works. A maintenance regime for these physical barriers should be established, to ensure they remain visible and effective throughout the project duration.

8.7 Effects of the Proposed Works

Following the adoption of alternative options (where relevant), and the above recommendations, the effects of the project component on the heritage items/points of interest identified are presented in Table 23.

Table 23. Effects of Golden Bar Pit expansion and WRS.¹⁹⁹

Item	Heritage Value	Scale of Change	Effect	Comment
Golden Bar Mine and Battery (ArchSite I44/86 and I44/88)	Moderate	Negligible	Less than minor adverse	The proposed works will not affect any archaeological features associated with the Golden Bar Mine and Battery sites (I43/86 and I43/88). The <i>Blasting Assessment</i> prepared as part of the wider MP4 project did not anticipate any vibration effects on the dry-stone structures with I43/86.²⁰⁰

¹⁹⁹ See Section 3.4 for the assessment rubric.

²⁰⁰ Nick Elith, *MP4 Project Fast Track Blasting Vibration and Airblast Effects Assessment OGNZL Macraes New Zealand* (Unpublished report for Oceana Gold (New Zealand) Ltd, 2026), Section 5.2.

Item	Heritage Value	Scale of Change	Effect	Comment
				The sites setting will be modified, but this is considered as being a negligible change from the current situation.
Sluicing (ArchSite I43/190)	Low	Major	Less than minor adverse	The expansion of the pit shell will destroy the 19 th century sluicing site.

9 Golden Bar Haul Road

9.1 Proposed Works and Project Area

9.1.1 Haul Road Reinstatement and Associated Infrastructure

A disused haul road is present adjacent to Golden Bar Road (Figure 126-Figure 128). This haul road connects the Golden Bar Pit to the wider Macraes haul road network. As part of the MP4 project it is proposed that this will be recommissioned to service the expansion of the Golden Bar Pit. The precise nature of works associated with this recommissioning has not yet been established, but it is expected that all ground within the haul road infrastructure corridor (the project area) will be substantially graded to create the necessary road surface. A pipeline and pump stations will also be established within the corridor. Disturbance of the existing ground level of up to 500mm can be expected in the project area. Beyond the project area, silt ponds established as part of the original haul road use will also be recommissioned.

9.2 Research Results

9.2.1 Historic Record

Golden Bar Road dates to at least 1867. By this date a track, roughly following the current Golden Bar Road alignment along the ridgetops, is noted on an early topographic survey.²⁰¹ Trig D is also noted as present by this time. By 1874 the road reserve had been surveyed.²⁰² Several plans indicate mining and occupation sites in the gullies to the south-west of the road, but nothing in the immediate vicinity of the road alignment (Figure 129).²⁰³ Historic aerial photographs show little change over time beyond the appearance of modern mining to the north (Figure 130). The proposed project area aligns with the haul road formation established for the operation of the Golden Bar Mine in the early 2000s.²⁰⁴

9.2.2 Previous Historic Heritage Assessment

ArchSite records two sites in the vicinity of the project area (Figure 131). These sites, I42/33 and I42/41, were both recoded during a 1991 survey by Jill Hamel.²⁰⁵ These were subsequently identified during MP4 fieldwork as being outside of the project area (see below). No Archaeological Authorities have been issued for either of these sites.

Table 24. Details of recorded archaeological sites within or relevant to the project areas.

Site Number	Site Name	Site Type	Details	Archaeological Authorities	Site Condition
I42/33 ²⁰⁶	N/A	Mining – gold	PROSPECTING PIT	N/A	Fair
I42/41 ²⁰⁷	Trig D	Mining – gold	TRIG STATION	N/A	Good

²⁰¹ SO 4535.

²⁰² SO 625.

²⁰³ SO 421, 4095, and 4089

²⁰⁴ Pers. comm., Debbie Clarke (OceanaGold).

²⁰⁵ Hamel, *Changes in Gold Mining at Macraes*.

²⁰⁶ Hamel, *Changes in Gold Mining at Macraes*.

²⁰⁷ Hamel, *Changes in Gold Mining at Macraes*.



Figure 126. Project area (2025 OGNZL aerial photography).

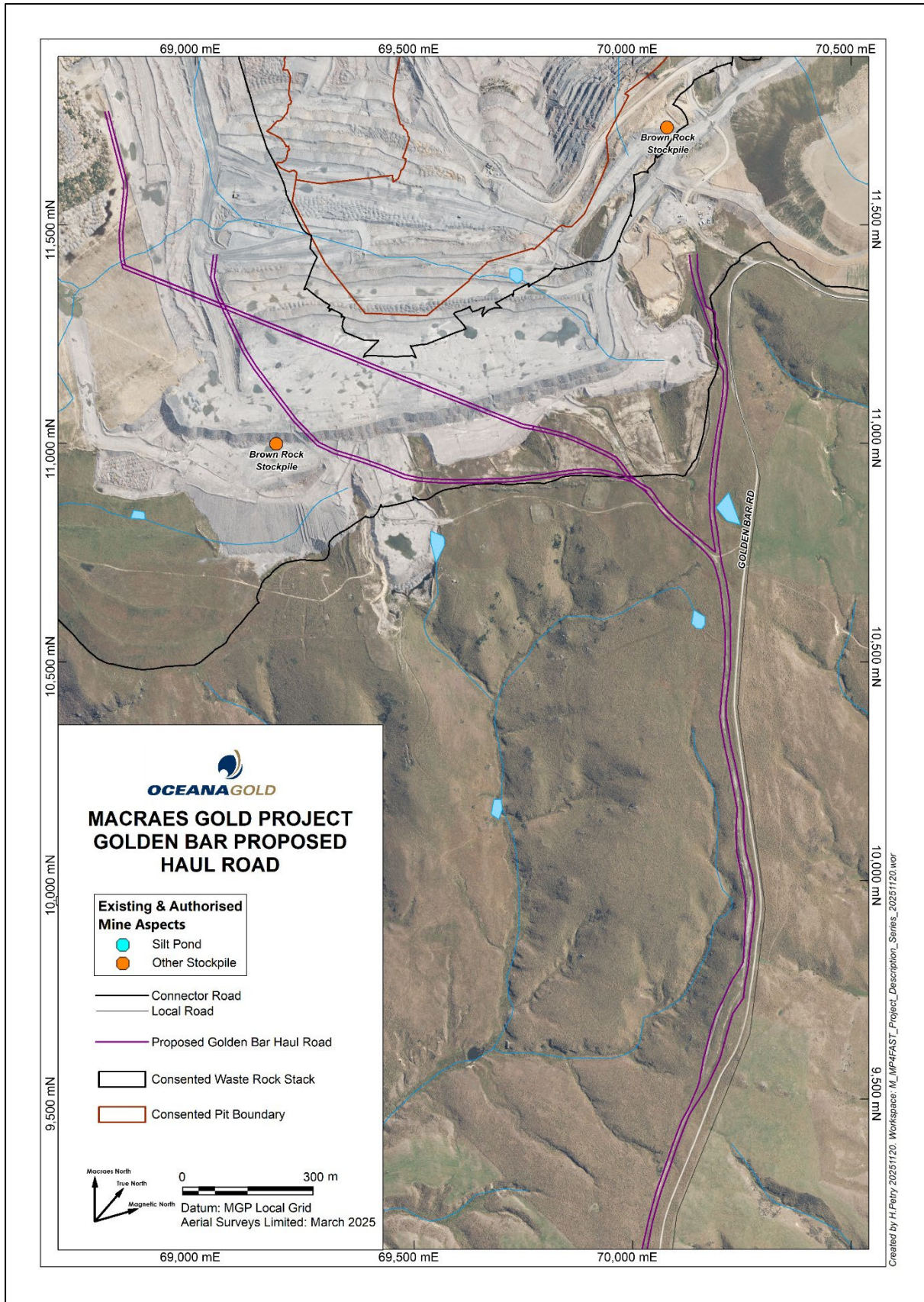


Figure 127. Golden Bar Haul Road, northern extents.²⁰⁸

²⁰⁸ OceanaGold.

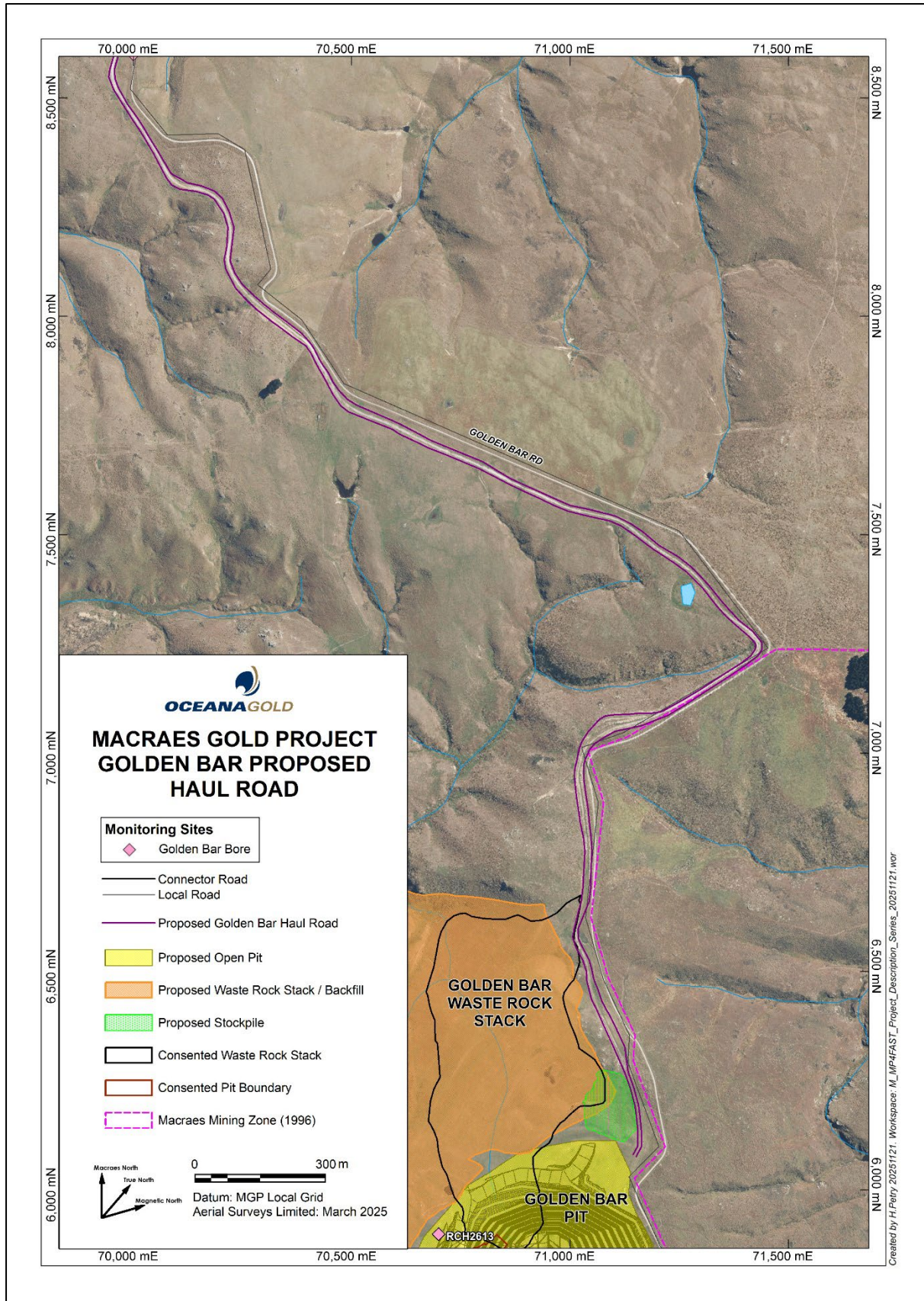


Figure 128. Golden Bar Haul Road, southern extents.²⁰⁹

²⁰⁹ OceanaGold.



Figure 129. Golden Bar Road, proposed haul road project area, Trig D, and adjacent mining claims and occupation sites (2025 OGNZL aerial photography).

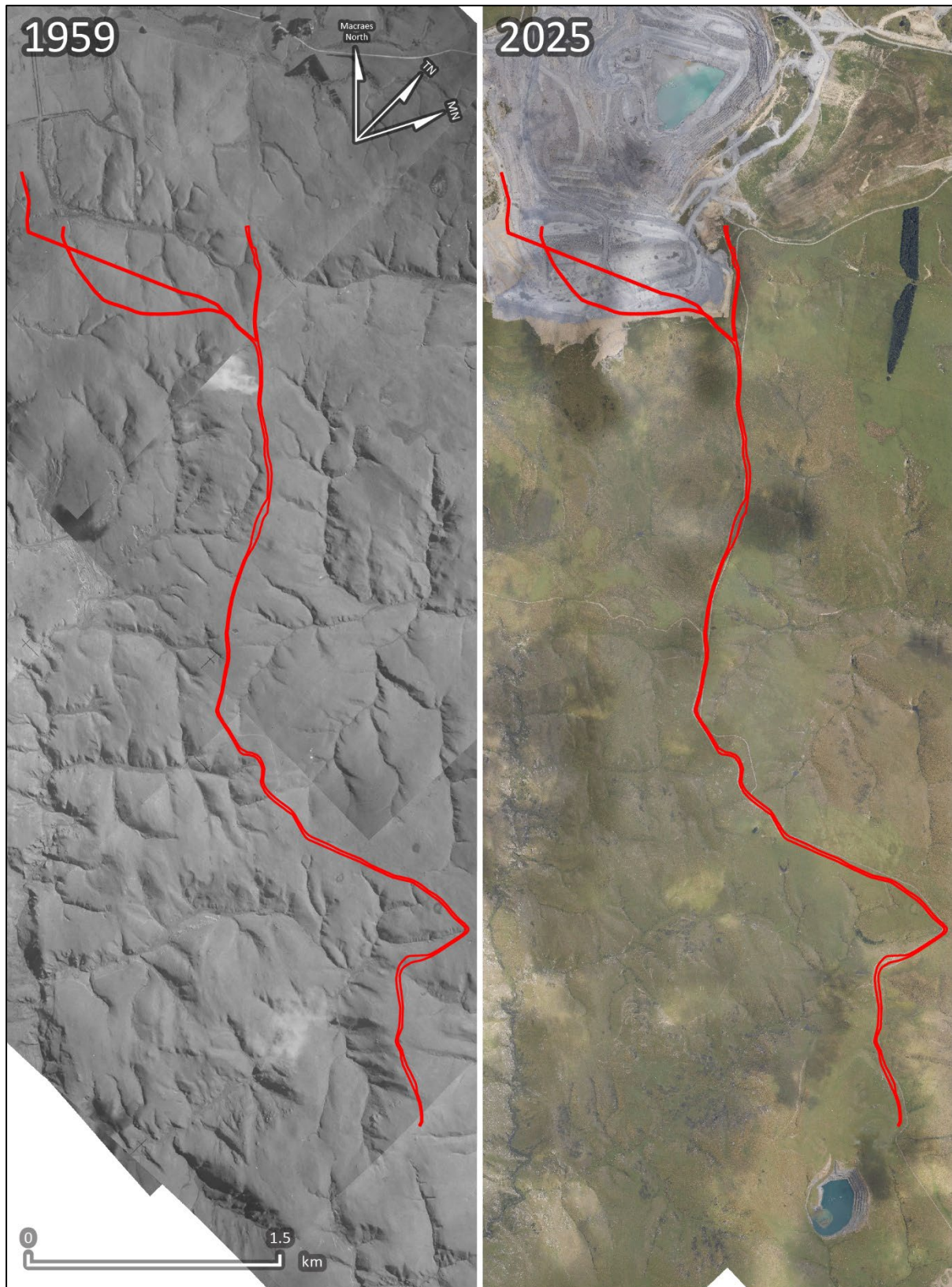


Figure 130. Aerial photographs showing the project area over time.²¹⁰

²¹⁰ Retrolens.



Figure 131. Locations of recorded archaeological sites in and around the project area (2025 OGNZL aerial photography).

9.3 Survey

A survey of the project area was undertaken by Jeremy Moyle and Chris Jennings on 24 November 2025 with a return visit to I42/33 by Jeremy Moyle on 2 March 2026.²¹¹ Figure 132 shows the general areas that were visited based on the identification of archaeological features or areas with archaeological potential during the desktop review. The area around the haul road route consists of vacant pastureland along the ridgeline between Tipperary/McCormicks Creek and Murphys Creek. The haul road project area runs immediately adjacent to Golden Bar Road. Given the history of this road, the potential for historic stone culverts was anticipated in the targeted survey, but none were identified on the ground. The length of Golden Bar Road was driven in addition to the targeted survey areas. No additional archaeological sites were identified beyond the two previously recorded sites discussed below. On site it was evident that almost all the Haul Road project area has already been significantly disturbed by past road formation (Figure 133).

9.3.1 I42/33

Hamel described this site as a:

... pond which has been partially dug out. These ponds tend to form in sink hollows along the line of the lode and either someone has tested it for 'pay dirt' or a famer has deepened it for stock water.²¹²

Her diagram of the site indicates a spoil heap adjacent to the deepened pit (Figure 134). At the time of the site visit there was no clear evidence of the excavated area or spoil heap, though a patch of greener grass may indicate the former (Figure 136). A kidney-shaped depression is indicated on Hamel's site record, though it appears she did not interpret this as archaeological. It is now surrounded by earthworks associated with modern mining activities (Figure 135 and Figure 137). A road passes between this depression and the dug-out pit.

9.3.2 I42/41 - Trig D

The historic Trig D survey mark consists of an approximately 200mm high circular plinth, walled with schist boulders, surmounted with an iron 'bayonet' type marker (Figure 138-Figure 139).²¹³ The item is overgrown with grass. Hamel²¹⁴ interpreted this as a 19th century feature, and it possibly dates to the establishment of the mark at some point prior to 1867.²¹⁵

9.4 Heritage Values

No heritage values are assessed as no heritage items were identified in the project area. The likelihood of additional sites being present is negligible.

9.5 Effects of the Proposed Works

The proposed works will not affect historic heritage.

9.6 Alternative Options

No alternative options have been considered as the proposed works will not affect historic heritage.

²¹¹ This site was not able to be located during the initial site visit.

²¹² Hamel, *Changes in Gold Mining at Macraes*, 13.

²¹³ Pers. comm., Richard Hemi (University of Otago School of Surveying).

²¹⁴ Hamel, *Changes in Gold Mining at Macraes*.

²¹⁵ SO 4535.

9.7 Recommendations

- Site I42/33 (prospecting pit) is flanked by two branches of the proposed haul road; a post and wire fence should be erected around this site – at least while the haul road is in use – to make its location apparent and protect it from any accidental damage.



Figure 132. Areas identified for survey based on desktop review. (2025 OGNZL aerial photography).



Figure 133. Example of the existing haul road formation, with Golden Bar Road in the foreground.

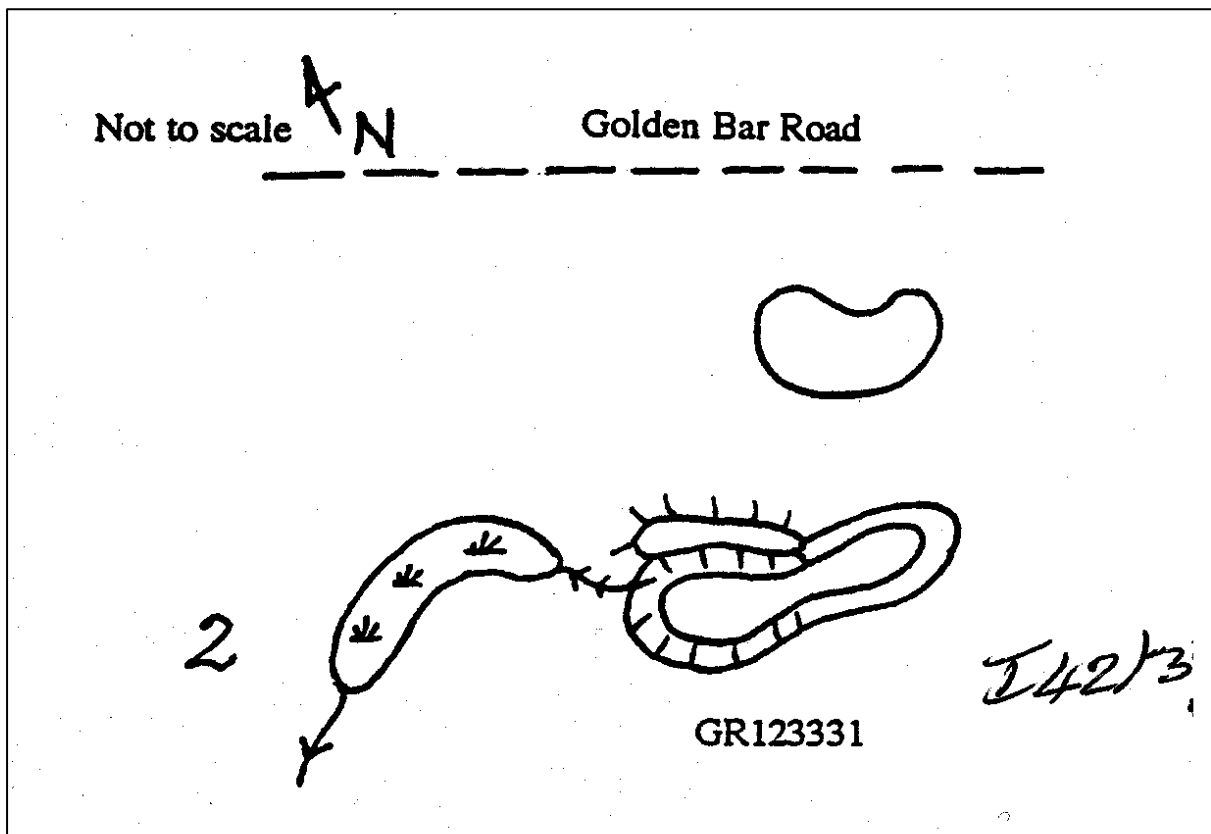


Figure 134. Diagram of I42/33.²¹⁶

²¹⁶ Hamel, *Changes in Gold Mining at Macraes*.

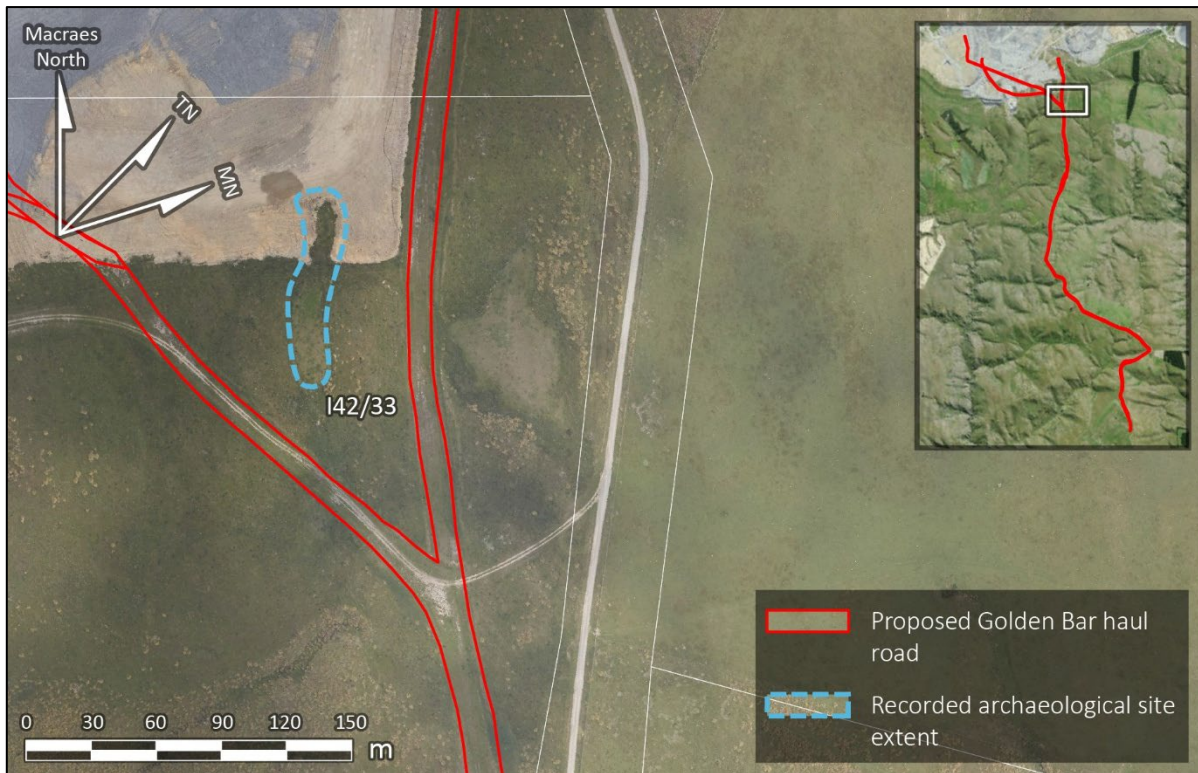


Figure 135. I42/33 sitting between the proposed branches of the haul road (2025 OGNZL aerial photography).



Figure 136. I42/33, looking south-east.



Figure 137. I44/33, looking north-west.



Figure 138. I42/41 (Trig D), looking north-east towards a truck on Golden Bar Road in the background.



Figure 139. Bayonet type survey marker at Trig D.

10 Murphys Ecological Enhancement Area

10.1 Proposed Works and Project Area

10.1.1 Murphys Ecological Enhancement Area

The Murphys Ecological Enhancement Area (MEEA) is intended to offset adverse effects on terrestrial and aquatic ecology that will happen as a result of the MP4 project. The establishment of this area will involve various works:

- An all-weather access track from the public roading network.
- Construction of a predator proof fence around the perimeter of the area.
- Construction of post and wire fences.
- Fence maintenance tracks and culverts at the points where the predator fence crosses major gullies.
- Construction of a site office, equipment sheds and park up area.
- Vegetation planting.
- Movement of rocks to create lizard habitat.

The exact location of these activities has not been confirmed at this stage; however, the fenceline will consist of a 9-10 km long, full-height (1.8-2.2m high) pest exclusion fence intended to enclose a minimum area of 250 ha. A buried skirt (300mm to 600mm deep) will require earthworks to install subsurface protection from burrowing pests. Lastly, the installation of 11 inflow culverts (4 small, 3 medium, 4 large) will be required for the fence to allow drainage where the fence crosses waterways.

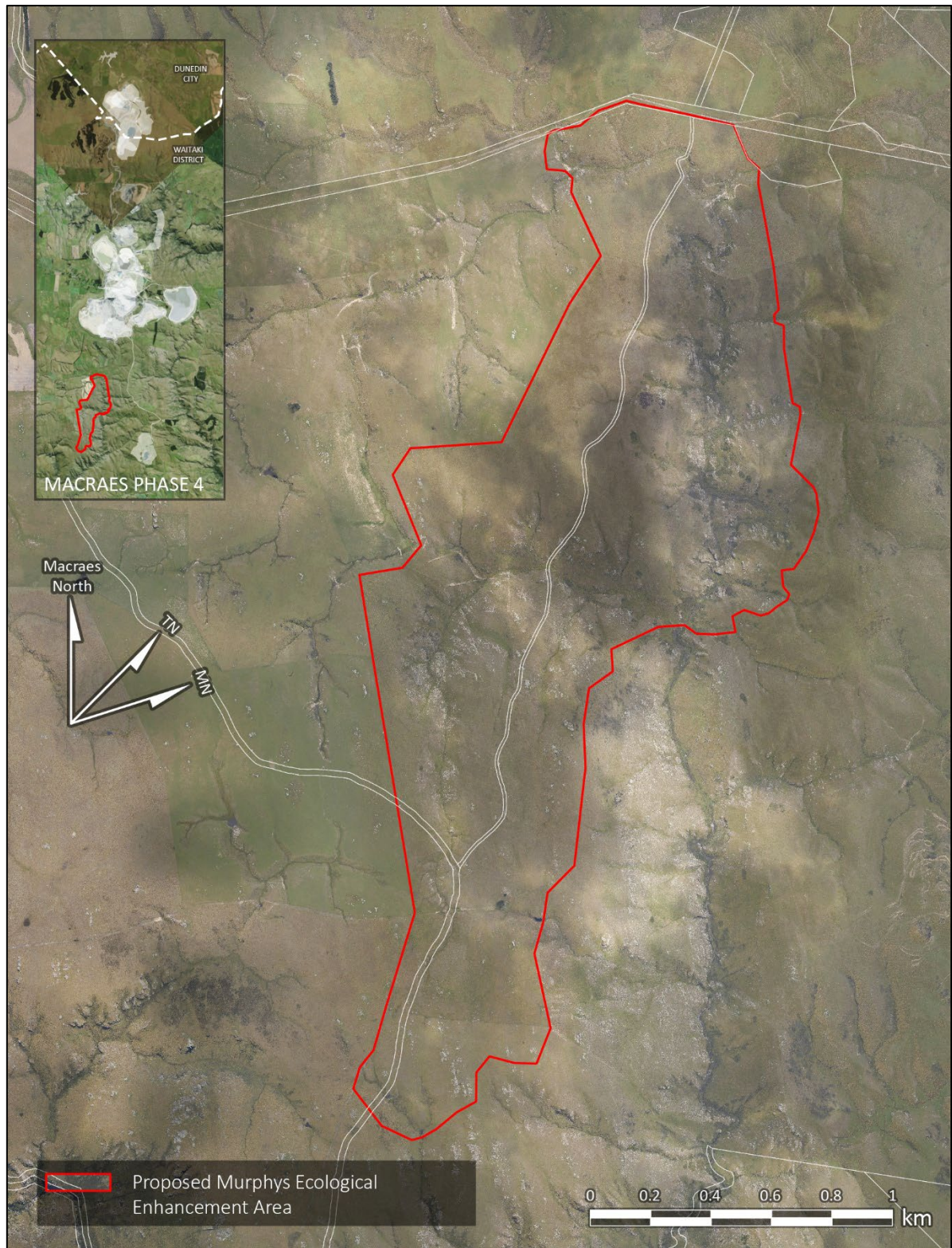


Figure 140. Location of Murphys Ecological Enhancement Area in relation to MP4 (2025 OGNZL aerial photography).

10.2 Research Results

10.2.1 Historic Record

Alluvial gold mining in Murphy's Flat and Muphy's Creek was possibly underway by 1862, and certainly by the late 1860s. Historical references to mining along the creek are imprecise, and surviving archaeological remnants

may date to anytime between the 1860s and 1930s.²¹⁷ Chinese dwellings are depicted on the 1891 SO 421 survey plan in the Murphy's Flat area, to the immediate north of the MEEA (Figure 141). It is unclear how far southward into Murphy's Creek their goldmining activities extended.

Alongside goldmining, the land encompassing the proposed MEEA was leased for pastoral farming for most of the 19th and 20th centuries. Following European settlement, it was part of Run 109 and later Rund 109b.²¹⁸ In the 1890s the land was broken up for closer settlement and the area around the MEEA was surveyed as Section 6, Block VIII, Dunback District.²¹⁹ A bridle track is noted on this survey running through the MEEA (Figure 141). After its creation, Section 6 was leased as a "Small Grazing Run" by David Ross into the mid-20th century.²²⁰ The 1897 valuation of the property notes the presence of house and storeroom, built *circa* 1890-1891. By 1899 this has been revised to a house and hut with the same construction date, and "yards" and a "concrete dip" are also recorded.²²¹

Historic aerial photographs show that the area was vacant throughout the latter half of the 20th century and into the 21st century (Figure 142).

10.2.2 Previous Historic Heritage Assessment

Archaeological survey has been the principal means of identifying historical heritage in the area. ArchSite records no previously recorded sites within the project area. A suite of features associated with gold mining along Murphy's Creek (pits, tailings heaps, water races, and hut sites) is recorded immediately to the east of the MEEA as site I43/89 (Figure 143 and Table 25). This site was recorded as part of a survey by Peter Petchey in 1995 (Figure 144) and it appears that it was intended to record the totality of archaeological features along Murphy's Creek within grid I43. Notably an area of alluvial workings (the stippled area) and two hut sites are recorded at the junction of Murphy's Creek and the unnamed creek running through the MEEA (Figure 144, see the area annotated '3,4'). The hut sites were described as:

- Hut 3 Possible hut site close to area of alluvial workings
- Hut 4 Similar to Hut 3. At base of schist outcrop.²²²

At the northern extent of the MEEA, above the upper reaches of Murphy's Creek, Petchey recorded the Murphy's Flat site complex. This is a major area of gold workings (around 1000 x 600m) consisting of sluicing, water races, tailings, and reservoirs. Based on Petchey's description of I42/63 as the workings running "for most of length of Murphy's Creek downstream of Murphy's Flat" and the two sites can be considered to be essentially contiguous.

Table 25. Details of recorded archaeological sites within or relevant to the project areas.

Site Number	Site Name	Site Type	Details	Archaeological Authorities	Site Condition
I42/40 ²²³	Murphy's Flat	Mining – gold	GOLDMINING	N/A	Fair

²¹⁷ Petchey, *Home Reef Resource Consent Area, Macraes Gold Project: Archaeological Survey*; Peter Petchey, *Murphy's Flat: The History of the Murphy's Flat Diggings, Macraes* (Unpublished report for Macraes Mining Company, 1996).

²¹⁸ Archives New Zealand, R10302729.

²¹⁹ SO 421.

²²⁰ OT100/70, OT259/238, and OT386/118.

²²¹ Archives New Zealand, R21088143.

²²² Petchey, *Home Reef Resource Consent Area, Macraes Gold Project: Archaeological Survey*, 14.

²²³ P. G. Petchey, *Murphy's Flat to Stoneburn Preliminary Archaeological Survey* (Unpublished report for Macraes Mining Company, 1995).

Site Number	Site Name	Site Type	Details	Archaeological Authorities	Site Condition
I42/63 ²²⁴	Murphy's Creek	Mining – gold	GOLDMINING	N/A	Fair
I43/89 ²²⁵	Murphy's Creek	Mining – gold	GOLDMINING	N/A	Fair

²²⁴ Petchey, *Home Reef Resource Consent Area, Macraes Gold Project: Archaeological Survey*.

²²⁵ Petchey, *Home Reef Resource Consent Area, Macraes Gold Project: Archaeological Survey*.

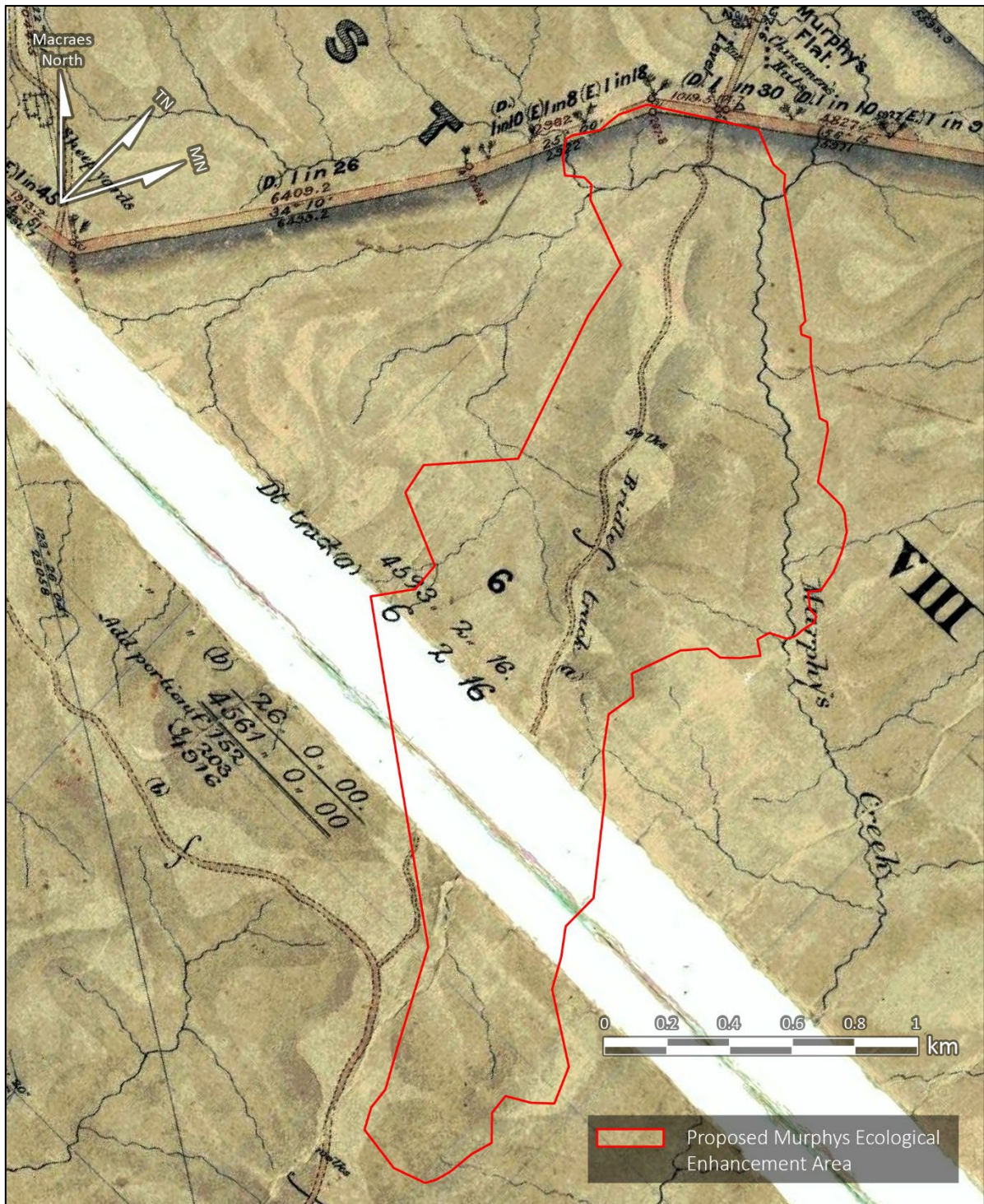


Figure 141. The 1891 survey of the area for closer settlement (SO 421) overlaid with the extent of the MEEA.

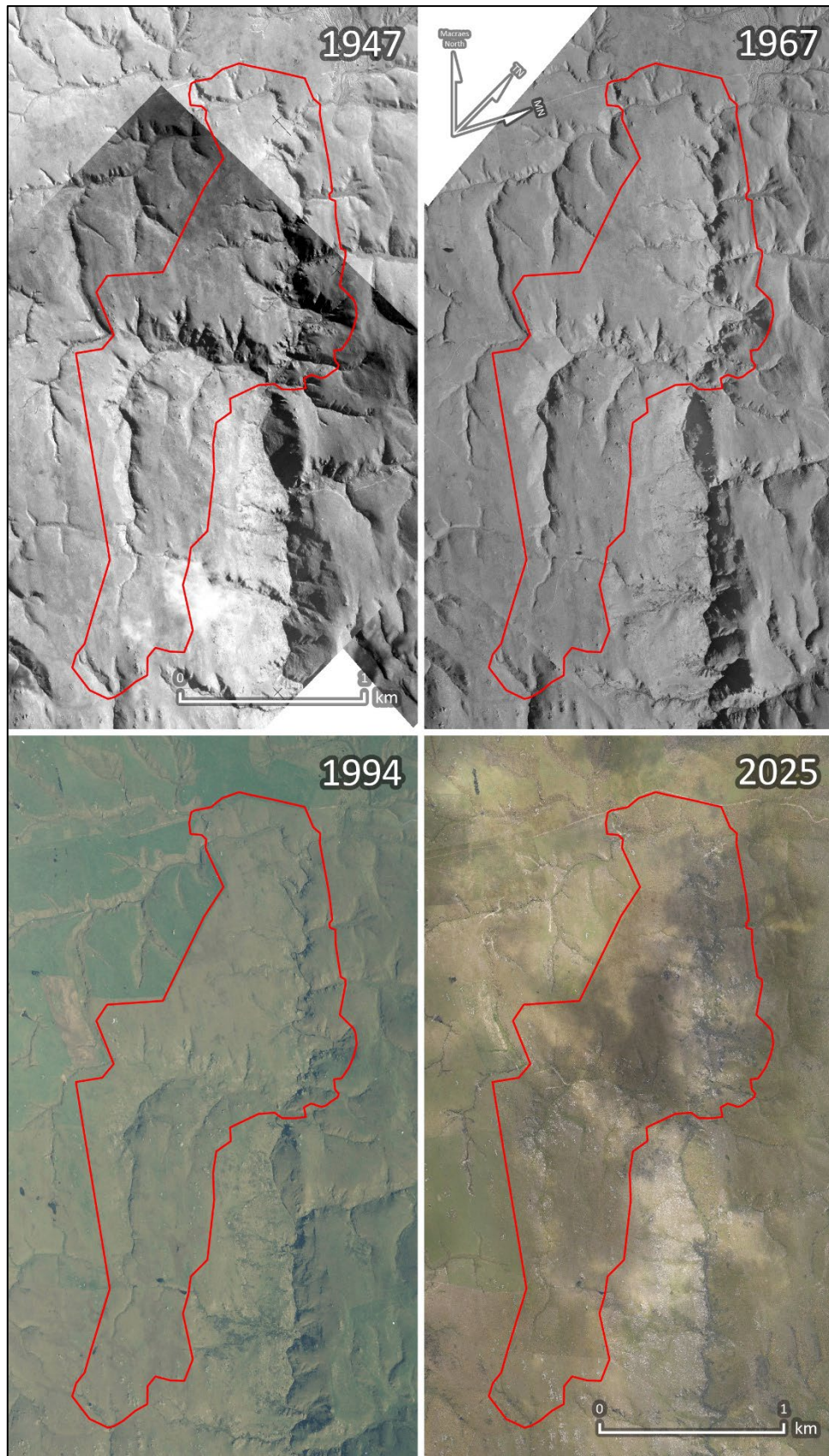


Figure 142. Historic aerial photographs showing the project area over time.²²⁶

²²⁶ Retolens and LINZ Data Service.

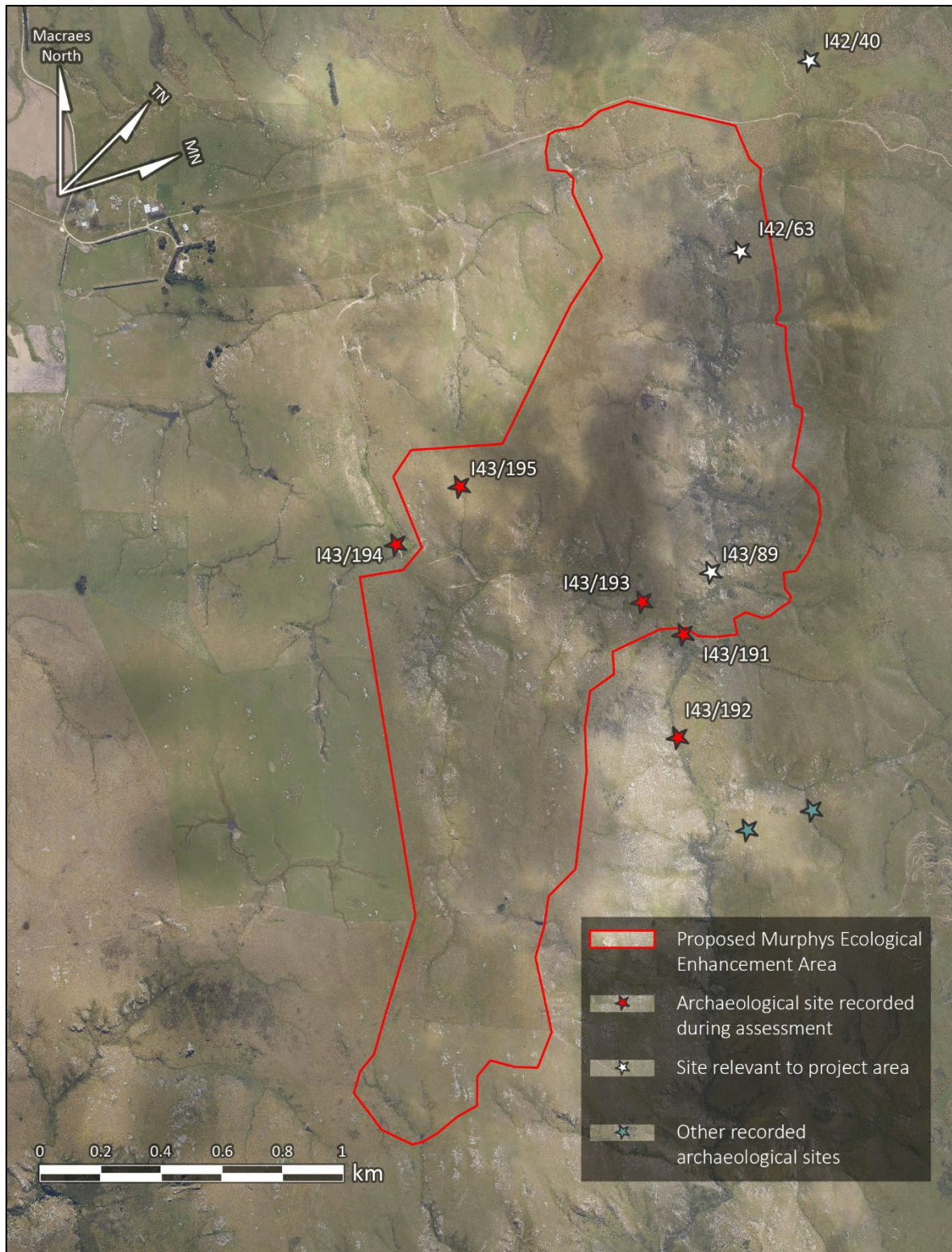


Figure 143. Locations of recorded archaeological sites in and around the project area (2025 OGNZL aerial photography).

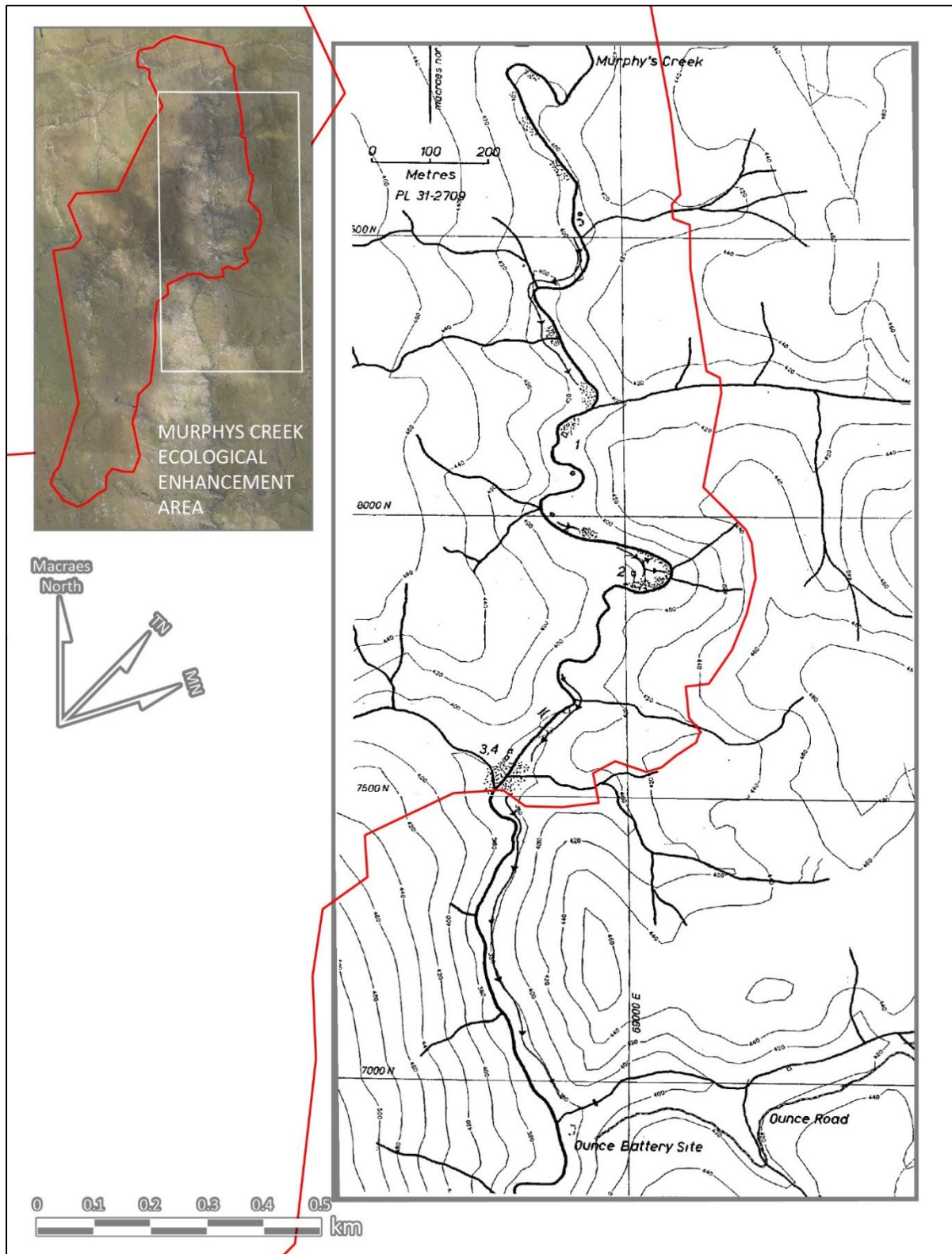


Figure 144. Detail of map of features from Petchey's 1995 survey of Murphy's Creek.²²⁷

²²⁷ Petchey, *Home Reef Resource Consent Area, Macraes Gold Project: Archaeological Survey*, Figure 5.

10.3 Survey

A survey of the project area was undertaken by Jeremy Moyle and Renée Sadlier on 2 March 2026. An additional survey was undertaken on 30 July 2026 by Chris Jennings in response to an expansion of the MEEA boundaries. The general areas where archaeological features, or areas with archaeological potential, were identified in the desktop review and visited for survey are shown in Figure 145. The upper reaches of the creek running through the MEEA were not surveyed as, aside from a single prospecting pit, no mining features were identified downstream. This indicated that the gold source was upstream on Murphy's Creek, and based on this an on-site assessment determined that additional features would not be present on its tributaries (at least not downstream of Murphy's Flat).

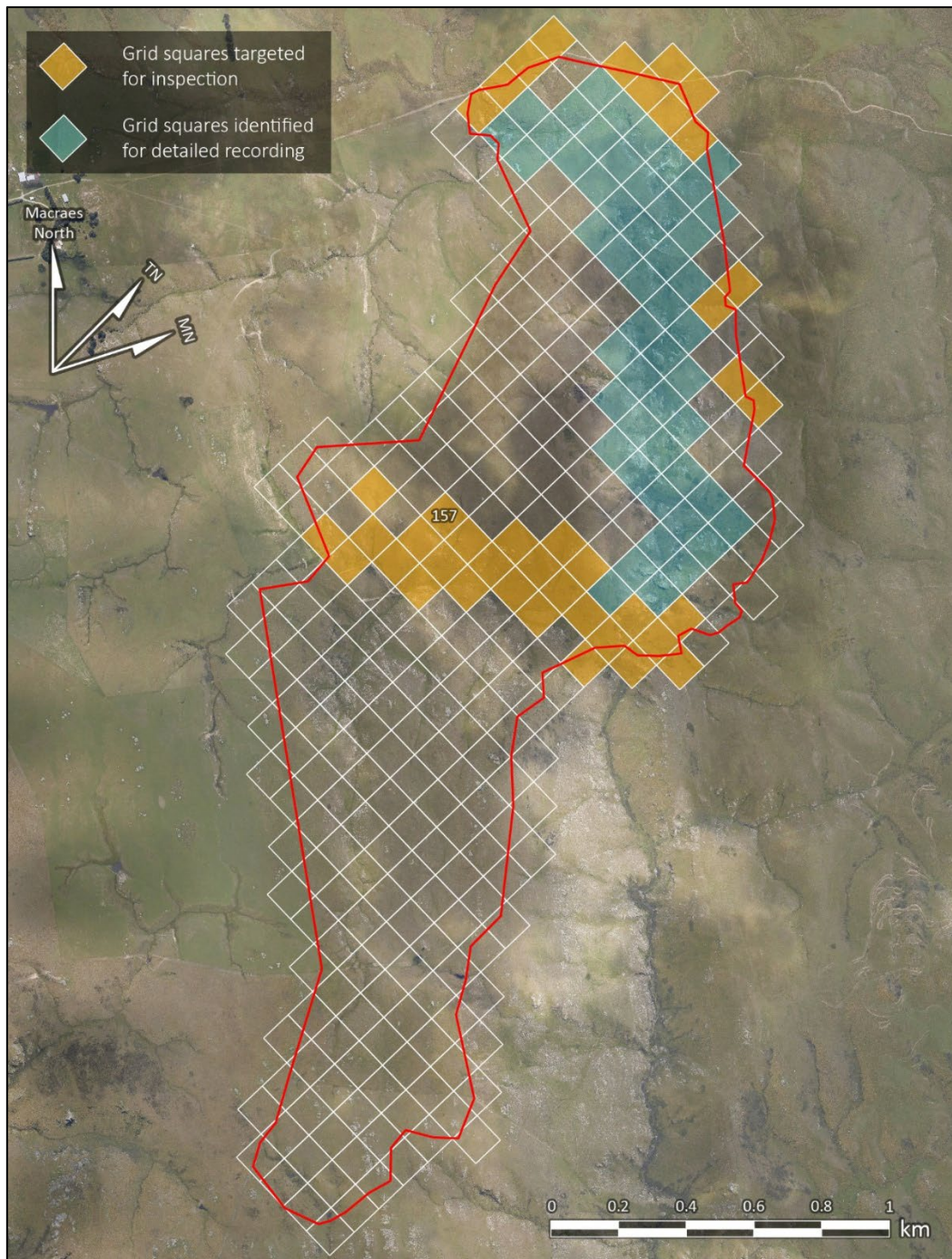


Figure 145. Areas in and around the project area targeted for survey based on historic survey plans, aerial images, and on-site assessment (2025 OGNZL aerial photography).

10.3.1 Murphy's Creek

Petchey's previous recording of sites in Murphy's Flat (I42/40) and Murphy's Creek (I42/63 and I42/89) represent an archaeological landscape, with features recorded throughout the main gully system of the creek. The northernmost gully crossing proposed for the boundary was inspected, where the fenceline borders the Murphys Flat Historic Reserve (Figure 146), and it was observed that the existing fenceline was subject to earthworks prior to its installation (Figure 147). No archaeological features were observed in the base of the gully itself, where the installation of a culvert will be required for the fenceline to cross at this location.

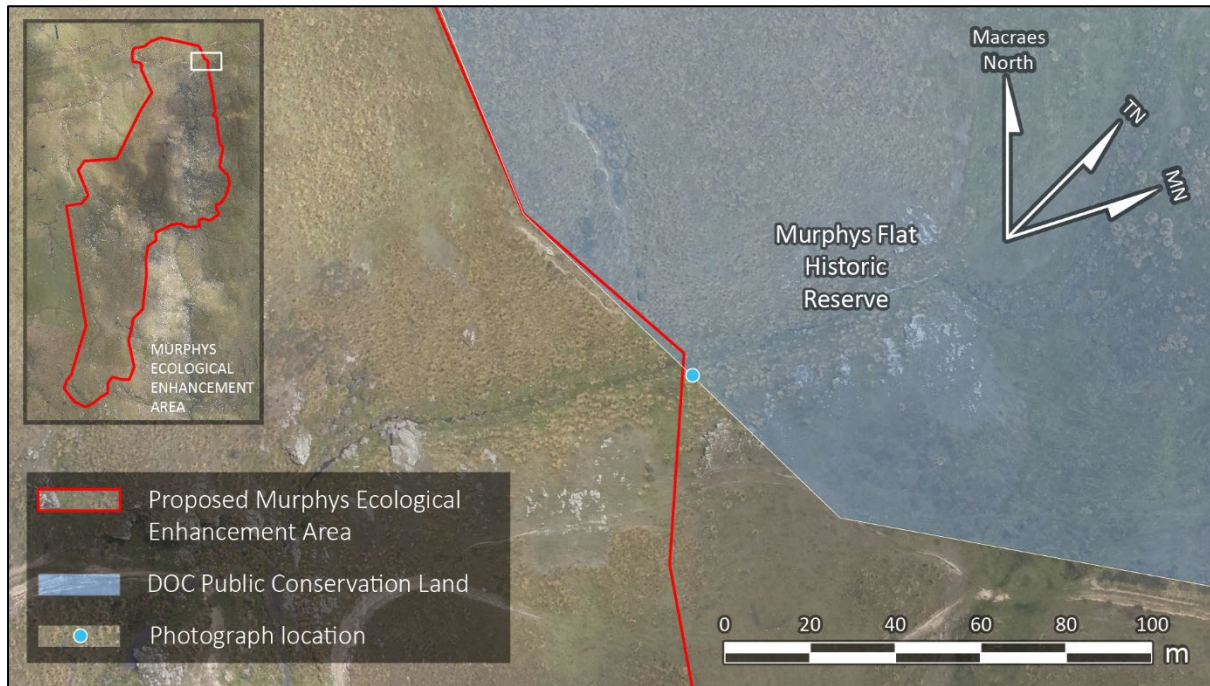


Figure 146. Northern area of MEEA in relation to Murphys Flat Historic Reserve. Note that MEEA boundary is indicative, and that the fenceline will not actually intrude into the DOC land parcel.



Figure 147. View of existing fenceline where MEEA predator proof fence will run taken from location marked in previous figure, facing true East. To right of fence is Murphys Flat Historic Reserve.

Table 26. Surveyed items near the junction of Murphy's Creek and MEEA Creek.

Ref	Item	Site	Details
A	Prospecting pit	I43/193	Heavily overgrown pit adjacent to MEEA Creek, approximately 160m upstream of the junction with Murphy's Creek, within the MEEA (Figure 149).
B	Possible dam/tailings mounds	I43/191	Earthen embankments adjacent to Murphy's Creek (Figure 150). May be either a dam or overgrown tailings piles.
C	Tailings and sluiced ground	I43/191	Exposed tailings piles within sluicing scar adjacent to Murphy's Creek (Figure 151).
D	Prospecting pit	I43/191	Overgrown pit adjacent to sluiced area (Figure 152).
E	Timber door	I43/191	Remains of a panelled timber door (Figure 153).
F	Hut sites	I43/191	Approximate location of hut sites based on site I43/89 record (Figure 154). This location was overgrown with gorse and not accessible.
G	Ounce Battery water race	I43/192	Water race supported by vertical stone revetment (Figure 155-Figure 156). Part of a longer water race feeding the Ounce Battery (I43/90) downstream.

An area of broken ground close to the prospecting pit in the MEEA was inspected as potential workings (Figure 157). This was interpreted as natural land slumping. No other archaeological evidence was identified along MEEA Creek (Figure 158).

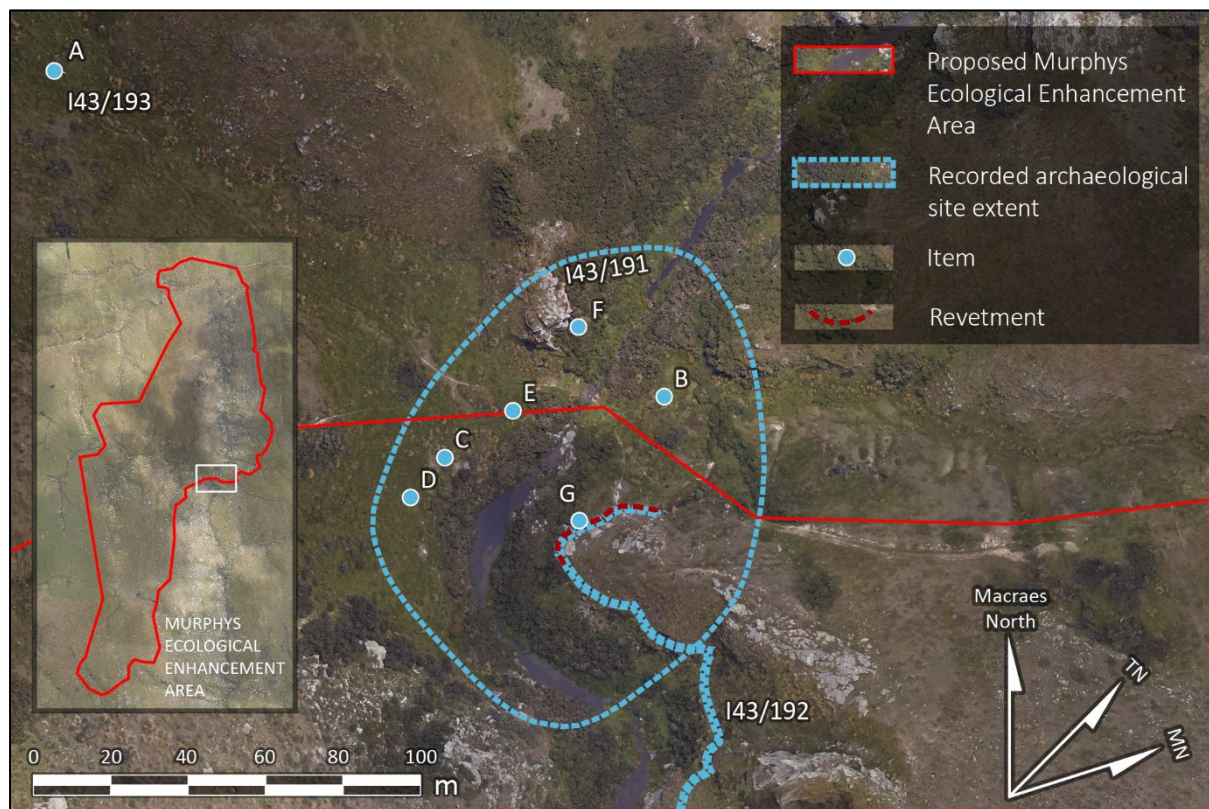


Figure 148. Surveyed items near the junction of Murphy's Creek and MEEA Creek (2025 OGNZL aerial photography).



Figure 149. Prospecting pit (A), looking west.



Figure 150. Possible dam/tailings mounds (B), looking north.



Figure 151. Tailings and sluiced ground (C), looking north-east. The waratah marks an ecological monitoring site.



Figure 152. Prospecting pit (D), looking north.



Figure 153. Timber door (E), looking east.



Figure 154. Location of hut sites (F), looking west. The huts sit within the area covered by gorse to the right of the rock outcrop.



Figure 155. Ounce Battery water race (G), looking south.



Figure 156. Stone revetment supporting the Ounce Battery water race (G) around the spur, looking south-east.



Figure 157. Broken ground interpreted as natural land slumping in Grid 157, looking north.



Figure 158. Oblique aerial view along MEEA creek from its junction with Murphy's Creek, looking west.

10.3.2 Ross's Sheep Dip (I43/194)

A historic sheep dip was identified near the south-eastern boundary of the MEEA, on an unnamed tributary²²⁸ of Murphy's Creek. This is interpreted as the circa 1897-1899 'concrete dip' recorded on the historic property valuation (see Historic Record above) that was built during the tenancy of David Ross.²²⁹ This site consisted of a masonry dip structure, an associated dam and reservoir, and the remains of sheep yards (Table 27 and Figure 159). The site has been recorded on ArchSite as I43/194.

Table 27. Surveyed items making up Ross's Sheep Dip (I43/194).

Ref	Item	Details
A	Dip	Primarily constructed of mortared schist stone, with a top course of bricks along most of its length. This structure was rendered with cement to create a channel that would hold water. Two drains run to the adjacent creek, one from either end of the structure. The south-east end was interpreted as the inlet as it was closest to the water source. Reels of wire have been dumped into the dip (Figure 159-Figure 162).
B	Dam	Earth dam still holding water. A stone-lined outlet feeds a race running to the dip (Figure 163-Figure 164).
C	Yards	Remnants of sheep yards adjacent to the dip (Figure 165). These are defined by a mixture of flat iron standards and rectangular posts. Patches of cement paving are also evident adjacent to the dip inlet and outlet. The large yard to the west of the dip is visible on aerial photographs and was not identified during the site visit.

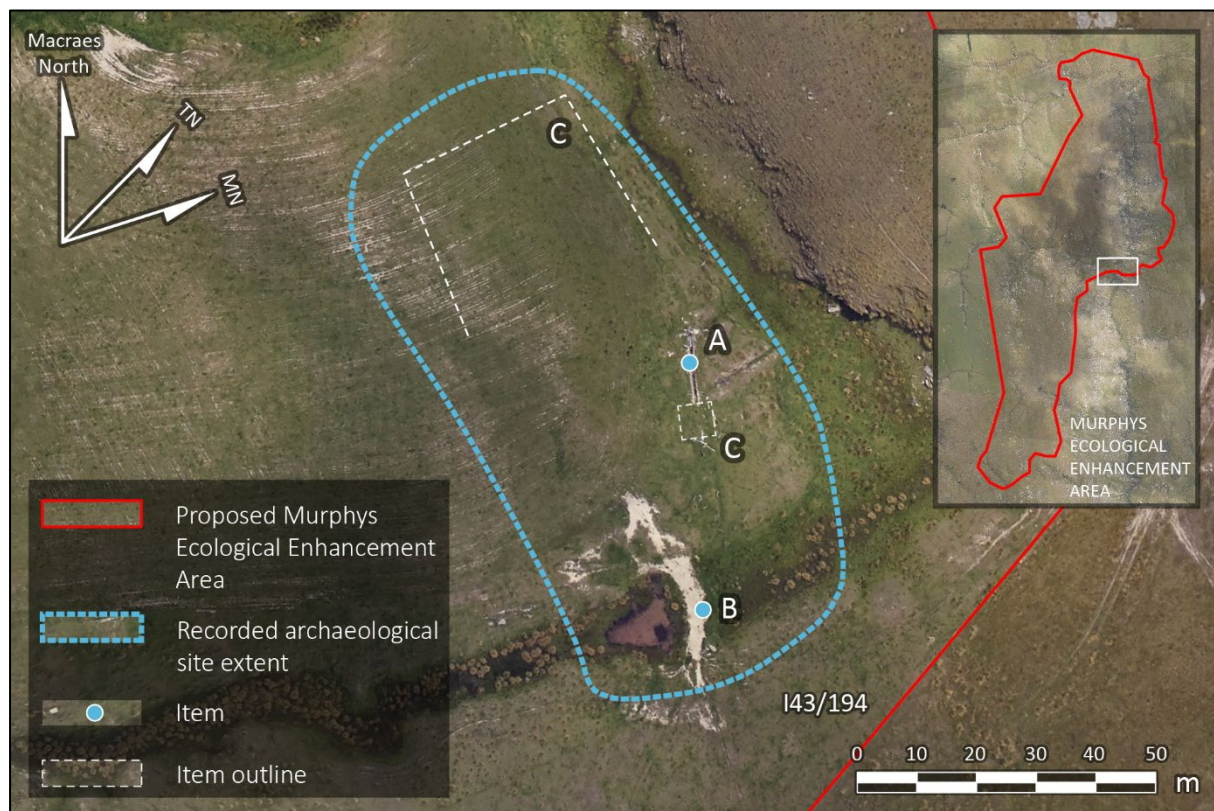


Figure 159. Surveyed items making up Ross's Sheep Dip (I43/194) (2025 OGNZL aerial photography).

²²⁸ This is a different water course to 'MEEA Creek.'

²²⁹ Archives New Zealand, R21088143.



Figure 160. Sheep dip, looking east.



Figure 161. Sheep dip, looking south-east. Note exposed areas of paving at the lower right of the image.



Figure 162. Detail of sheep dip showing mortared stone construction and brick top course.



Figure 163. Dam, looking south-east.



Figure 164. Stone-lined dam outlet, looking north-east.



Figure 165. Remnant fenceposts from yards at dip inlet, looking south-east.

10.3.3 Possible Prospecting Site (I43/195)

An area of disturbed ground was identified within the MEEA towards the north-west corner of its extent. This consisted of three aligned depressions in the ground. Several quartz cobbles and boulders were scattered in and around the depressions. The provenance of these features is not clear, but they are visible in the 1947 aerials, and the presence of quartz cobbles and boulders suggests they may be the remains of hard-rock gold prospecting. The site has been recorded on ArchSite as I43/195.

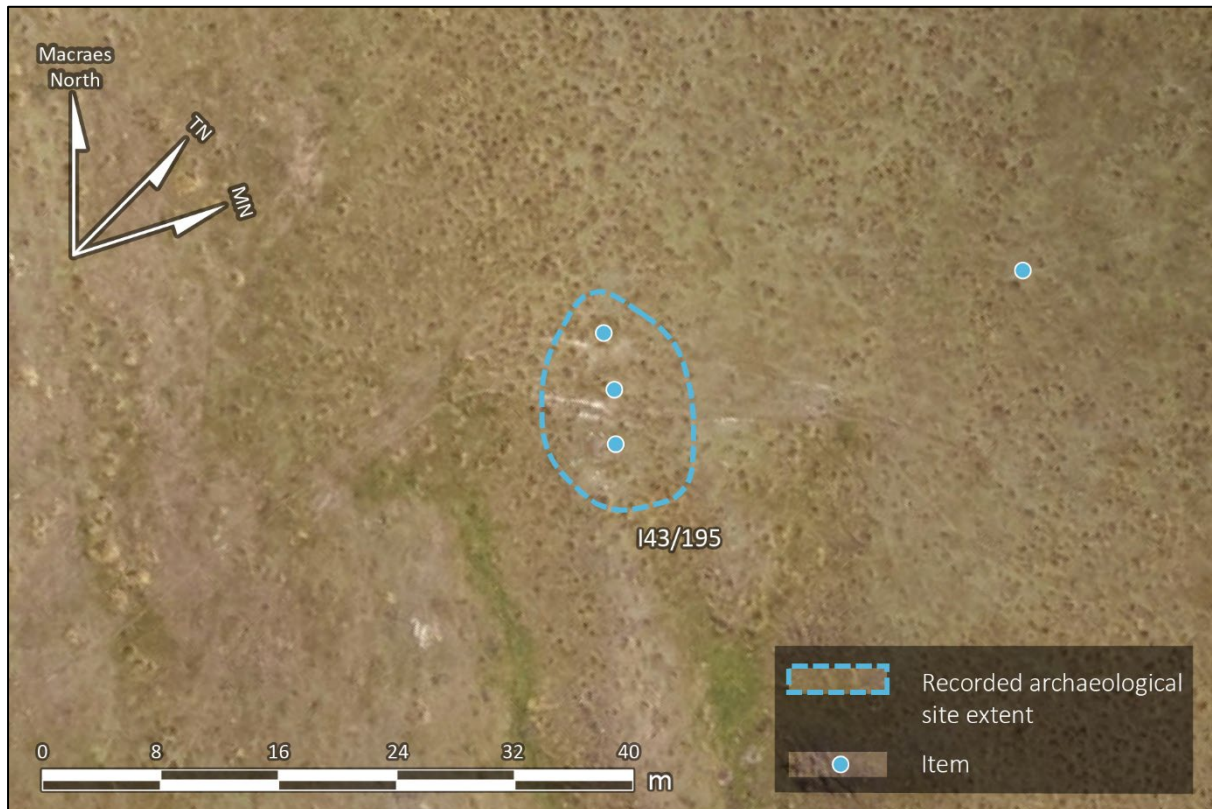


Figure 166. Possible prospecting site (I43/195) (2025 OGNZL aerial photography).



Figure 167. One of the depressions identified, looking north-east. Quartz cobbles and boulders are evident in the lower left of the image.



Figure 168. Scattered quartz cobbles and boulders in the vicinity of the depressions.

10.3.4 Stone Culvert (I42/256)

The site consists of a culvert of dry-laid schist slabs passing approximately 2-3 metres under the surface of a road embankment (Figure 169). The culvert is approximately 14.5 metres in length, with a channel 60-70 cm wide, and a height of 140-160 cm high from the base of the streambed to the culvert crown. The channel is a vertical rectangular passage, formed by stacking large slabs across the stacked walls of the culvert.

The eastern outlet of the culvert is asymmetrical (Figure 170), with its northern side protruding further out of the road embankment. No indication of collapse was observed on its southern side. The roof of the culvert on this side was unable to be properly observed as it was obscured by scrub, which made measurement difficult.

The western intake of the culvert was capped by an exposed schist slab approximately 1.85 m long by 60 cm wide (Figure 171). The site has been recorded on ArchSite as I42/256.



Figure 169. Aerial view showing location of Stone Culvert I42/256 (2025 OGNZL aerial photograph).



Figure 170. View of culvert outlet.



Figure 171. View of Culvert intake.

10.3.5 Fence Line (I42/257)

A fenceline runs along the southern side of the farm road that passes over Culvert I42/256 for a length of approximately 507 metres (Figure 172). The fenceline is consistent with the edge of the road reserve as shown on the 1891 SO 421 and is likely to be pre-1900 in origin. The site consists of a No. 8 wire fence with 5 wires, a barbed top-wire and deteriorating wooden posts. It runs alongside a road reserve, although mostly offset from the surveyed boundary. Most of the posts are flat triangular in cross section, potentially to make the number of posts go further. The remaining posts consist of metal standards. Several of the posts are still in embedded in

the ground, some are detached and some remain only as fragments of some posts remain dangling from the wire (Figure 173). A few other posts appear to be opportunistically made from local wood (Figure 174).

The holes for the wire are approximately 3 cm wide by 4 cm long and have most likely been enlarged by the wire rubbing against them.

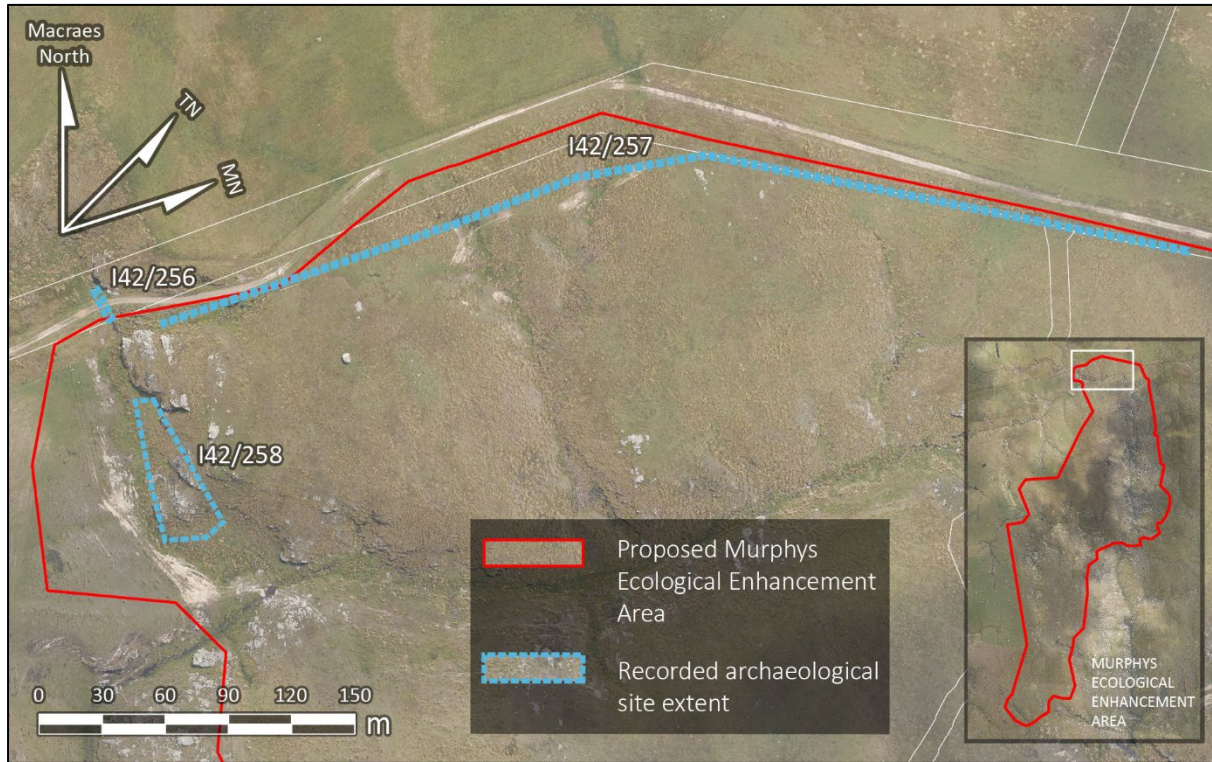


Figure 172. Aerial view showing location of Fence Line I42/257 in relation to nearby sites (2025 OGNZL aerial photograph).



Figure 173. Different states of fence posts along fence line I42/257.



Figure 174. Detached opportunistic post. Tape length = 100cm.

10.3.6 Prospecting Area (I42/258)

Inside the MEEA boundary, southeast of the stone culvert I42/256, was a small goldmining area including partially revetted benched track, a prospecting pit, and potential tailings (Figure 175). The area was heavily covered in tussock and thick grass, obscuring many of the features. The track appears to be formed in two parts. One, is a flattened path between two large schist outcrops (Figure 176); the second part of the track is a revetted section that carried on approximately 14m before it either terminated or deteriorated (Figure 177).

South of the revetted section were partially buried schist rocks that were likely indicated of tailings (Figure 178). As much of the site area was obscured by tussock, and the rocks were only partially exposed, it was difficult to determine the extent of the feature. Downslope to the south of the flattened path section was a prospecting pit, approximately 180cm long, 140cm wide, and 40m deep (Figure 179).

Although further features may be identified with clearance of the tussock grass of the site, those recorded during the inspection indicate an area representing a minor gold working or prospecting operation.

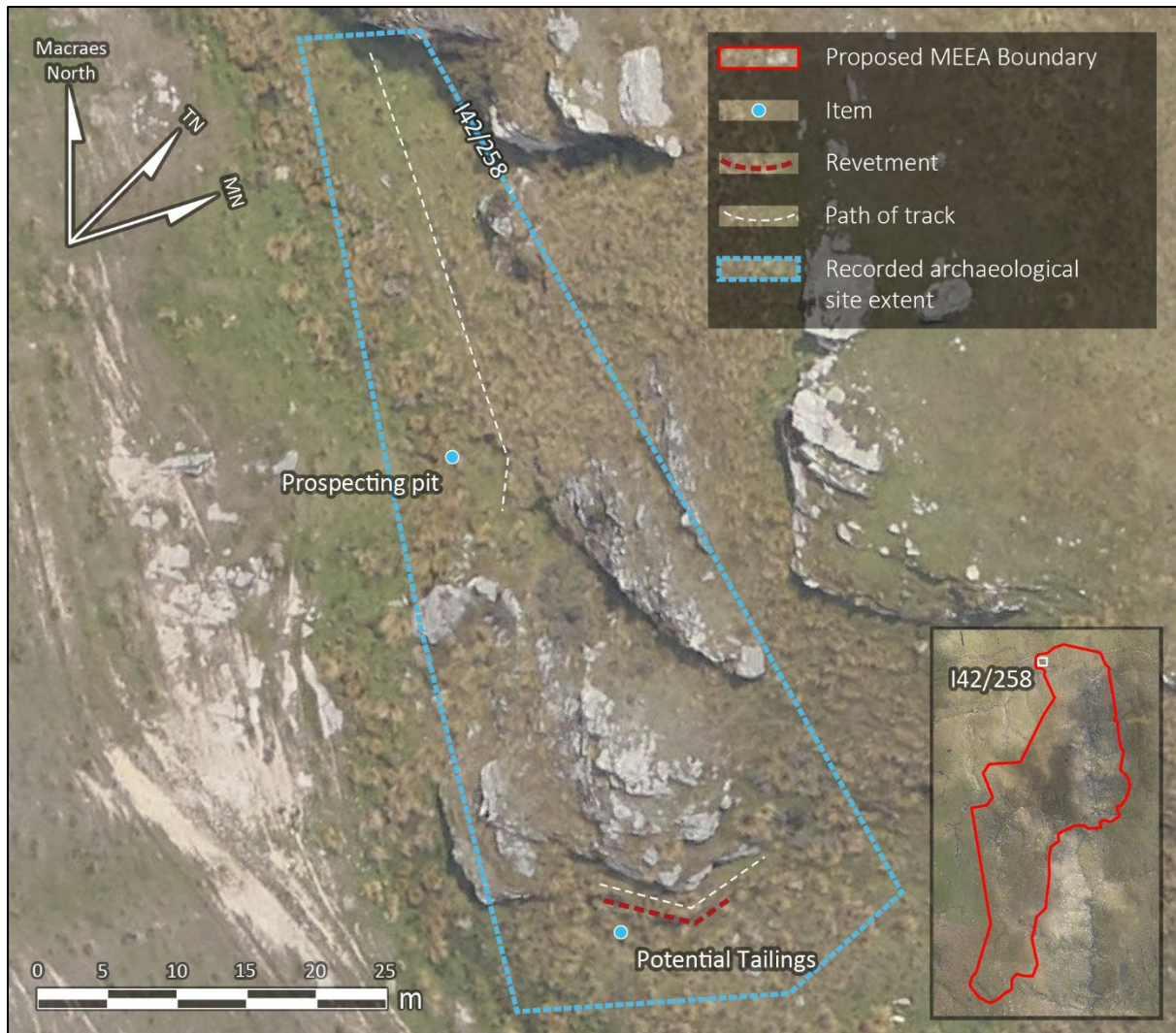


Figure 175. Aerial view showing location of prospecting area I42/258 (2025 OGNZL aerial photograph).



Figure 176. View of I42/258 track (indicated by white dashed lines) towards northeast rock outcrop.



Figure 177. Left: View of revetting on section of I42/258 south of second outcrop (facing north). Right: View to west of track above revetting.



Figure 178. View of probable tailings south of revetted section of I42/258) path. Tape extended to 100cm.



Figure 179. View of prospecting pit downslope of track, facing north.

10.4 Heritage Values

The heritage values of the historic heritage items in the project area are assessed in the tables below.²³⁰

Table 28. Otago RPS heritage values of Murphy's Creek alluvial workings I43/191.

Site	Value	Assessment
Murphy's Creek alluvial workings (I43/191)	Archaeological	The features recorded as I43/191 represent a portion of a wider archaeological landscape of features throughout Murphy's Creek. prospecting pit, tailings piles and sluiced ground, a possible dam, a timber door, and two possible hut sites. The information potential of these features is low as the archaeological patterns of 19 th century alluvial mining are well understood. Assessment – Low
	Architectural	Negligible
	Cultural	Negligible
	Historic	The Murphys Creek alluvial workings are representative of 19 th century alluvial mining in Otago and Macraes, a notable part of region's history. Assessment - Low
	Scientific	Negligible
	Social	Negligible
	Spiritual	Negligible
	Technological	Negligible
	Traditional	Negligible

²³⁰ See Section 3.3 for an outline of the assessment method.

Table 29. Waitaki District Plan heritage values of Murphy's Creek alluvial workings I43/191.

Site	Value	Assessment
Murphy's Creek alluvial workings (I43/191)	Historical and social	The Murphys Creek alluvial workings are representative of 19 th century alluvial mining in Otago and Macraes, a notable part of region's history. Assessment - Low
	Cultural and spiritual significance to takata whenua	Negligible
	Architectural	Negligible
	Technological	Negligible
	Group	Negligible
	Landmark	Negligible

Table 30. Otago RPS heritage values of stone culvert I42/256.

Site	Value	Assessment
Stone Culvert (ArchSite I42/256)	Archaeological	The stone culvert I42/256 is in excellent condition, and there are few comparable examples recorded in the Waitaki District. Investigation of the site may provide further information for addressing local challenges related early road construction and water control. Assessment – Low
	Architectural	Negligible
	Cultural	Negligible
	Historic	Negligible
	Scientific	Negligible
	Social	Negligible
	Spiritual	Negligible
	Technological	Negligible
	Traditional	Negligible

Table 31. Waitaki District Plan heritage values of stone culvert I42/256.

Site	Value	Assessment
Stone Culvert (ArchSite I42/256)	Historical and social	Negligible
	Cultural and spiritual significance to takata whenua	Negligible
	Architectural	Negligible

Site	Value	Assessment
	Technological	Negligible
	Group	Negligible
	Landmark	Negligible

Table 32. Otago RPS heritage values of fence line I42/257.

Site	Value	Assessment
Fence line (ArchSite I42/257)	Archaeological	Negligible
	Architectural	Negligible
	Cultural	Negligible
	Historic	Negligible
	Scientific	Negligible
	Social	Negligible
	Spiritual	Negligible
	Technological	Negligible
	Traditional	Negligible

Table 33. Waitaki District Plan heritage values of stone culvert I42/256.

Site	Value	Assessment
Fence line (ArchSite I42/257)	Historical and social	Negligible
	Cultural and spiritual significance to takata whenua	Negligible
	Architectural	Negligible
	Technological	Negligible
	Group	Negligible
	Landmark	Negligible

10.5 Effects of the Proposed Works

Following the adoption of alternative options (where relevant), and the above recommendations, the effects of the project component on the heritage items/points of interest identified are presented in Table 34.

Table 34. Effects of MEEA fence and culvert installation²³¹

Item	Heritage Value	Scale of Change	Effect	Comment
Murphy's Creek alluvial workings (I43/191)	Low	Minor	Nil/Less than minor adverse	The effects of the crossing through site I43/191 may modify features associated with the site, subject to the final design of the culvert crossing and fence. The site setting will be modified, but this is considered as being a minor change from the current situation.
Stone Culvert (ArchSite I42/256)	Low	Major	Less than minor adverse	The removal of the road embankment and culvert will destroy the 19 th century stone culvert.
Fence line (ArchSite I42/257)	Negligible	Moderate	Less than minor adverse	Part of the fence line will be destroyed.

10.6 Alternative Options

The placement of the predator fence in the location of stone culvert I42/256 presents a logistical challenge due to the topography of the area. Movement of the fence further from the culvert would provide pests with the opportunity to jump from a higher elevation into the protected area, and therefore the road embankment must be removed, and the fenceline cannot be redesigned. For the same reason, parts of the fenceline I42/257 will also need to be modified.

10.7 Recommendations

- An Archaeological Authority is required for the proposed works. The authority should provide for the modification of sites I43/194 and I42/257 and the destruction of stone culvert site I42/256.
- Monitoring of deconstruction of the road embankment and removal of the culvert by an archaeologist.
- Archaeological recording of Culvert site I42/256 to a Level III standard according to AGS 1²³² during its deconstruction.
- To provide some offset to the destruction and modification of these sites detailed archaeological recording should be undertaken for site complexes in Murphy's Creek (I43/63, I43/89) within the MEEA Boundary,
- An archaeological management plan prepared to support this authority should specify:
- To ensure contractors undertaking MEEA works avoid historic heritage:
 - The locations of any activities that include earthworks (e.g., road/track formation or predator proof fence construction) must be assessed by an archaeologist on the ground prior to work commencing to ensure that no archaeological sites are affected.
 - Where historic heritage items are identified they must be avoided and:
 - Illustrated on any relevant construction drawings.
 - Physically isolated from access tracks and work areas with wire fencing.

²³¹ See Section 3.4 for the assessment rubric.

²³² Heritage New Zealand Pouhere Taonga, *Archaeological Guidelines Series No. 1: Investigation and Recording of Buildings and Standing Structures* (Heritage New Zealand Pouhere Taonga, 2018).

11 Blasting and Management of Potential Heritage Effects

Heritage features located in proximity to proposed blasting activities were considered during the preparation of both this Heritage Assessment and the Air Blast and Vibration Assessment. Heritage input informed the identification of sensitive heritage receptors and consideration of their relative vulnerability to blasting effects.

Heritage receptors assessed in the Air Blast and Vibration Assessment include Gay Tan's Cottage and several buildings within the Golden Point Reserve (Callery's Battery, Building 1, Building 2, Building 3 and Building 4; Figure 180). The technical assessment of potential airblast and ground vibration effects on these heritage features, including consideration of building construction, vulnerability and setback distances from blasting activities, is provided in the Air Blast and Vibration Assessment.²³³

The Air Blast and Vibration Assessment was developed in consultation with the authors of this report. The Air Blast and Vibration Assessment sets out the proposed framework for managing potential blasting effects on heritage features, including blast design controls, vibration criteria, baseline condition surveys, monitoring requirements, adaptive management measures and follow-up inspection procedures. These measures form part of the overall approach for avoiding, managing and remedying potential effects on historic heritage values.



Figure 180. Golden Point Reserve buildings.

²³³ Elith, *MP4 Project Fast Track Blasting Vibration and Airblast Effects Assessment OGNZL Macraes New Zealand*.

12 Overall Effects

The overall effects of each project component and the overall project, following the adoption of alternative options (where relevant) and relevant recommendations, are summarised in Table 35. As per the assessment methodology, the overall impact is the highest identified. See the relevant project component sections above for the detail informing these effects assessments.

Table 35. Summary of overall effects.

Project Component	Heritage Item	Heritage Value	Scale of Change	Effect
Innes Mills Pit and Macraes Road Realignment	Innes Farm	Low	Major	Less than minor adverse.
	Macraes Chinese Camp	Moderate	Minor	Less than minor adverse.
	Gay Tan's Cottage	Moderate	Negligible	Less than minor adverse.
	Post and Wire Remains (IM2)	Negligible	Major	Less than minor adverse.
	Other potential buried remains in the upper township area	Negligible	Major	Less than minor adverse.
	Overall project component effect			<u>Less than minor adverse</u>
Coronation Pit and Trimbells Waste Rock Stack	Fenceline	Negligible	Major	Less than minor adverse.
	Overall project component effect			<u>Less than minor adverse</u>
Golden Bar Pit and Waste Rock Stack	Golden Bar Mine and Battery	Moderate	Negligible	Less than minor adverse.
	Sluicing	Low	Major	Less than minor adverse.
	Overall project component effect			<u>Less than minor adverse</u>
Golden Bar Haul Road				Nil effect on heritage
	Overall project component effect			<u>Nil</u>

Project Component	Heritage Item	Heritage Value	Scale of Change	Effect
MEEA	Alluvial workings	Low	Minor	Nil/Less than minor adverse
	Stone culvert	Low	Major	Less than minor adverse
	Fence Line	Negligible	Moderate	Less than minor adverse
	Overall project component effect			<u>Less than minor adverse</u>
Overall MP4 project effect on historic heritage: <u>Less than minor adverse</u>				

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