

Native Youth Gold Mine Site Heritage Assessment, Lefroy, Tasmania.



**June 2006
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**Report for
Lefroy Resources Limited.**

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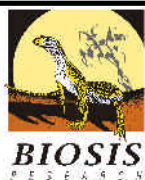
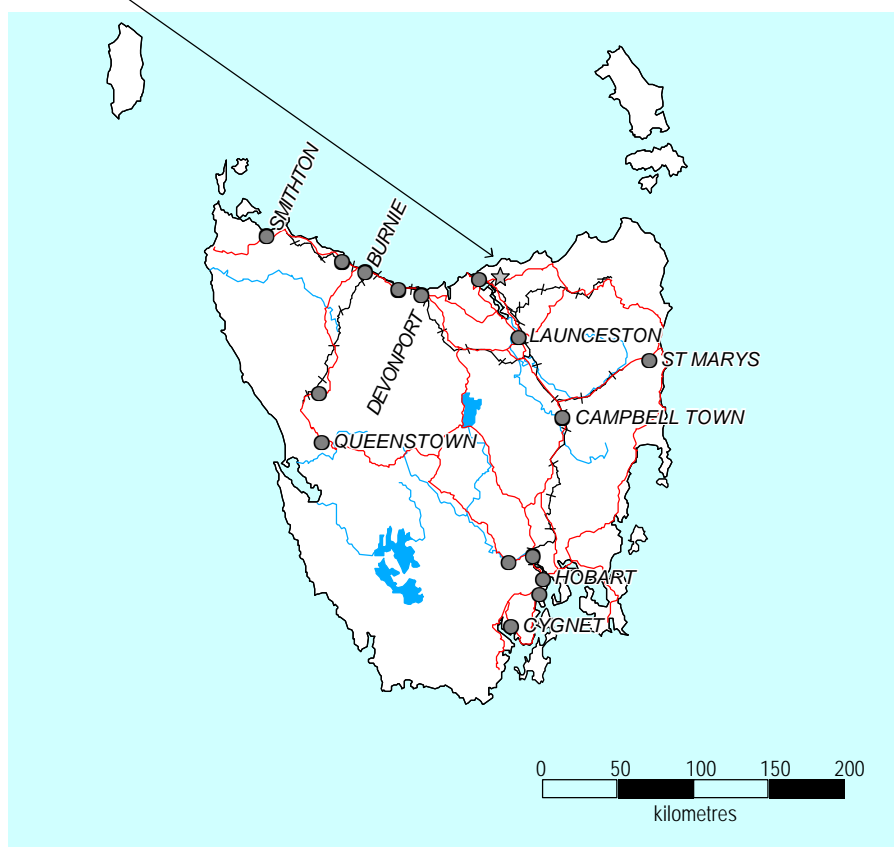
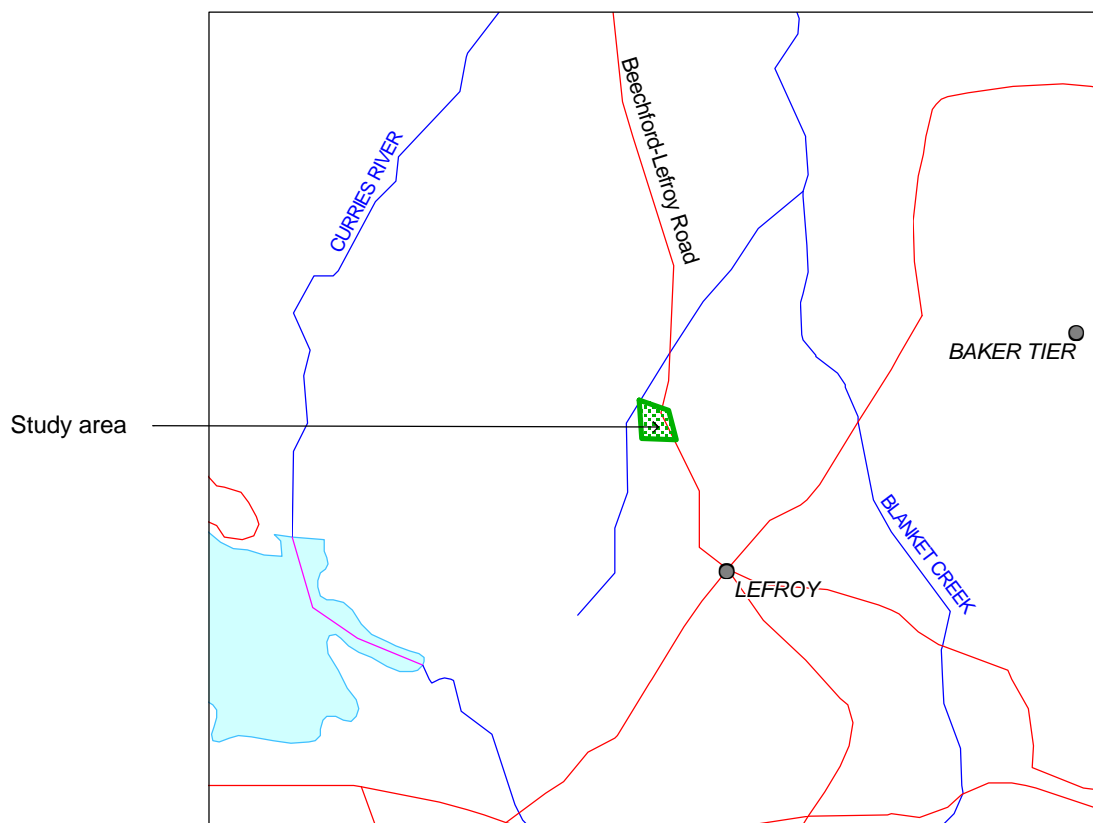
1.0 INTRODUCTION

This assessment has been commissioned by Lefroy Resources Limited to determine the heritage values of sites for proposed exploratory drilling and possible tailings reprocessing in the vicinity of the former Native Youth, Excelsior, and Gold Mine, Lefroy, northern Tasmania. The report outlines a brief history of the site, describes the result of archaeological survey, assesses the potential heritage significance of archaeological features and makes recommendations for their management.

Gary Vines carried out the site inspection, report writing and project management. Cheryl Kift undertook additional background research and assisted with production of the report. Bretan Clifford prepared mapping figures.

1.1 Study Area

The Lefroy Goldfield extends for at least 5 kilometres through the old gold-rush town of Lefroy, 45 kilometres north of Launceston, east of the Tamar River and about 16 km east of Georgetown. While there are numerous mine sites in the vicinity, the current assessment is confined to the area of proposed exploratory drilling at the site of the former Native Youth line of reef and associated mines immediately north of the township of Lefroy. The location of the study area is shown in Figure 1.



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Figure 1: Location of the study area, Lefroy

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2.0 BACKGROUND HISTORY

(N.B. Much of this section has been sourced from the Lefroy Resources *Lefroy Project Area Exploration Potential Report*, 2005 and Webster, 1998).

The first documented knowledge of gold mining in the Lefroy area began around 1864 (Gould, 1864). Mining is likely to have commenced much earlier, based on a report of a gold discovery at Nine Mile Springs (later renamed Lefroy after the colonial Governor) in 1853 (McClenaghan, 1994). Initially alluvial mining predominated, with both surface and deep leads worked.

Reef gold was discovered in 1867 (according to van Moort & Russell 2003:1) or 1869 (according to Webster 1998:1, citing Broadhurst 1935), initially at Specimen Hill, 1.5 km southeast of Lefroy. This was by the party led by Samuel Richards. Production was mainly restricted to the Native Youth, Chum, Volunteer and New Pinafore Reefs. By 1870, the population of Nine Mile Springs (as Lefroy was then known) had grown to about 200.

The Lefroy Goldfield historically experienced two major mining booms, 1880 – 1885 and 1895 – 1898. The initial phase of quartz mining development from 1869-73 occurred at Specimen Hill with The Shamrock Company introducing a 15 head battery and other mining equipment brought from the Union Foundry in Ballarat (Morris-Nunn and Tassell 1984).

The three reefs in closest proximity to the current survey area were: from north to south, the Morning Star, Nugget, and New Native reefs, each running in a roughly east west direction. Among the mines operating on these reefs were the Bendigo and Morning Star shafts on the Morning Star Reef, the /Nugget Mine on the Nugget Reef, and the New Native Youth, City of Launceston, Excelsior, on the Native Youth reef. There were also other shafts and mining companies on these reefs, but these are not well documented.

2.1 Native Youth mine

The Native Youth mine and battery were established in about 1872 (and possibly as early as 1869) and while Thureau (1882) suggests this was “about the oldest quartz load that has ever been opened in Tasmania”, Webster thinks this is a difficult claim to justify on the basis that reefs had already been developed at Mangana by this time.

The first ore crushed from the reef was in 1872 and produced 27 oz, 12 hwt. The mine subsequently produced at an average of 19 hwt to the ton. (Morris-Nunn and Tassell 1984). However, despite this early achievement, by June 1873 all mining had ceased and the Native Youth Company was defunct. A new company was formed in 1874, presumably with new capital, known as the New Native Youth Gold Mining Company. It went on to become one of the most

successful mines in the field. A new ten-head battery was ordered from Melbourne, which arrived in January 1874 (Morris-Nunn and Tassell 1984; Webster 1998:3-6).

By April 1874, 524 tons of quartz was crushed and 792 oz of retorted gold had been recovered along with 60 oz of silver. Between November 1874 and October 1876, the original mill and concentration plant recovered 8813 oz of gold from 5474 tons of quartz, with production peaking in 1876 (Morris-Nunn and Tassell 1984).

A brief rush of prospectors was spurred on by the success of the mine, but it was short lived so that by 1875, the New Native Youth was the only mine in operation on the Nine Mile Spring gold field.

In 1875 the New Native Youth Company amalgamated with the Native Point Company and undertook considerable expansion with a new main shaft reaching 208 feet by November, and water pumps purchased from the Mersey Coal Co, to deal with the increased inflow. Expansion of the battery was also needed to cope with the increased ore production, as well as the custom milling being done for other companies. In October 1876, a second 10 head battery was bought from the Caledonia Company of Black Boy (Mathinna) which was reported to have been one of the oldest batteries in Tasmania, having previously been installed at the Sovereign Mine of the Union Company at Magana (Morris-Nunn and Tassell 1984).

This was only a stop gap, and a new 40 head battery was ordered from W Middleton's Foundry in Castlemaine Victoria in December 1876, but a fire in the foundry delayed delivery until 1877. Descriptions of this battery indicate the 40 heads were arranged in groups of five, with 10 heads per crank, on foundations logs bedded on concrete, and the two ton boxes bolted down. Two new boilers and a more powerful steam engine were also imported to drive the new stampers.

Water supply was not always reliable, and various measures were put in place to deal with this. The present dam is believed to have been constructed as the Native Youth Mine supply, but later became the township reservoir. A tailings and water recycling dam was constructed, so that run-off from the battery tailings could be reused. The tailings in this dam – presumably located on the creek flats below the mine, were eventually retreated between 1897 and 1904 by the New Pinafore Company. A 3500 gallon water tank was installed at the battery for its supply, and Oregon pine fluming built on 30 ft high trestles to take the tailings about 100 metres to the dam (Morris-Nunn and Tassell 1984; Webster 1998:4).

While it is not known how much use the mine had in the later 1870s and early 1880s, it appears to have been kept in a serviceable order and was ready when

the next major reef (the Chum Reef) was discovered on the field in 1881 (Webster 1998:4).

The new Native Youth Mine was the only mine from the early period of Lefroy's development that continued in operation in the second phase, between 1881, with the discovery of the Chum line of reef, and 1884 when the new find itself began to run out. In 1882, a one kilometre long tramway was constructed to bring ore from the Chum Mine. However, despite a yield of 23,350 oz of gold and dividends of 24,000 Pounds prior to 1883, the mine appears to have floundered in its later years (Morris-Nunn and Tassell 1984; Thureau 1882; Webster 1998).

In 1882 a three compartment main shaft has reached 600 ft, but bottom levels were not being worked when Thureau visited the field in 1882. When he revisited the mine the following year the main shaft had reached 812 ft, making this the deepest mine in Tasmania at that time (Thureau 1882; 1883; Broadhurst 1932; Webster 1998:5).

After a period of dormancy of several years, work at the mine resumed in 1887-8, but not by the New Native Youth company, but by a tribute miner, W. H. Stubs' party, which continued to 1889. They are recorded as having produced 2390 tons of quarts for a yield of 710 oz from the No 3 Main Reef in 1888. However, this appears to have been the last time the mine worked (Montgomery 1898).

In 1897 the Section 133-83, on which the mine and battery were located, was owned by the New Pinafore Company, but the shafts were full of water (Montgomery 1898). As part of this purchase the new company also acquired the sites of the Excelsior and City of Launceston mines. The battery, however, appears to have still been operational and was probably the main reason the New Pinafore company took over the Native Youth Mine, and the focus of the Pinafore company's crushing and tailing re-treatment operations. Some prospecting took place on the former Native Youth lease in 1901-2, but little came of it and by 1935 most of the old shafts and trenches had been filled. A further shaft to the west, the West Native Youth Mine, was sunk sometime in the 1880s or 90s, but this did not cut the reef at all (Broadhurst 1935; Webster 1998:5; Montgomery 1898).

Because the Native Youth mine was the only one to keep operating through the slump of the 1870s, it became the centre of habitation and the focus of the township of nine Mile Springs. By 1876 the new settlement had a Joss House and gambling saloon for the substantial Chinese populations, a school under construction with 30 or so children enrolled, but no church.

In 1880, the township on the Native Youth reef officially became Lefroy when it was named for the then Colonial Governor. The original Nine Mile Springs

Settlement to the south eventually died out with only a caretaker on site to maintain the government buildings.

The second phase of quartz mining was concentrated on the Chum reef in the early 1880s, while the Native Youth battery benefited from processing ore from these other mines (Webster 1998; (Morris-Nunn and Tassell 1984).

The final phase of mining in the 1890s and up to about 1904, was focussed on the Pinafore reef to the north of Lefroy, and the Volunteer mine some kilometres to the south.

The Pinafore Reef was discovered in late 1890 (or possibly 1992 depending on which sources are consulted), by S T Stubs, prospecting and working alluvial sediment south of the New Chum Mine. The name of the reef was taken from the small Pinafore Mine that had been operating in the area for some time. The discovery reinvigorated the gold field following the decline of the Native Youth and Chum mines.

By 1897, work on the Pinafore Reef was suspended and the company was putting its efforts into the golden Point and Golden Crown claims that were adjacent to the Native Youth Mine and battery.

While this reinvigorated the township and saw the Native Youth battery put into service under the Pinafore company, the Native Youth reef remained dormant. A large quantity of machinery was erected, including electric lighting. The battery and processing plant were improved by the addition of a concentrating plant, and from 1897 a chlorination plant. Stubs describes the operation at this time in detail (Stubs 1899). A cyanidation plant superseded the chlorination plant as the former was not successful. Concentrates were roasted in a long reverberatory furnace prior to chlorination. The cyaniding plant consisted of three 16 foot diameter steel vats, 4 ft deep, and one wooden vat 20 ft by 5 ft, and two wooden vats 18 ft by 4 ft and 15 ft by 5 ft respectively. The two larger vats were used for agitation, but were converted to leaching vats. In 1899 the chlorination plant consisted of two solution vats made from condemned boilers from the battery, a centrifugal pump, two steam injectors, a large trommel and 33 charcoal filters. Crushers reduced the charcoal before it was burnt to ash in a reverberatory furnace. There were also two smelting furnaces and a well-equipped assay office. Thirty ton capacity wash boxes were located near the stamp heads (Stubs 1900; Webster 1998:9).

The gold production on the field was considerably greater during this period with 42,212 oz produced up to 1896, and up to its closure in 1904, over 50,000 oz (Broadhurst 1935).

Early reports suggest that as mining in the old goldfield progressed to depth, the ore became sulphidic and without the benefit of appropriate metallurgical technology many mines were closed as mill recoveries decreased. This factor combined with water infiltration and increasing mining costs forced the eventual closure of the field. The Lefroy Goldfield contains many historic workings and shafts located on approximately 30 gold lodes, which were mined and subsequently abandoned in and early 1900's. Mining ceased in 1911 (van Moort & Russell 2003).

The battery and treatment site processed material from a number of mines, including re-treatment of tailings in the last period of operation. This suggests considerable reworking may have occurred of the mullock heaps and other above ground features at the mines. In the 1890s mining revival, several new processes were introduced including smelting furnaces, concentration plant with a chlorination works, reverberatory furnaces for roasting ores, and later a cyanide plant (Webster 1998:9).

2.2 Excelsior mine

The original Native Youth Mine was one of three significant mines developed on the Native Youth Reef. The other two were the City of Launceston to the east, and within the township boundaries, and the Excelsior mine to the west across Sludge Creek. The Native Youth may have been undercapitalised up to 1874 as it is recorded as operating without its own battery and taking its quartz to the "old" Excelsior battery for crushing. By this time the Excelsior mine was owned by the Golden Point Gold Mining Company.

2.3 City of Launceston mine

This mine was operating by the 1880s, although little is known of its early history. It appears to have been managed in conjunction with the Native Youth and Excelsior mines for some of its life. The total value of gold from the City of Launceston Mine was 10,000 pounds up to the end of the century. The City of Launceston mine was purchased along with the New Native Youth, by the New Pinafore Company, some time prior to 1897 (Montgomery 1897:28).

2.4 Bendigo mine

The Bendigo Shaft, located at the western end of the Morning Star Reef, was opened by the Reliance Company around 1876. The Young Bendigo Company then sank a shaft a further 70 feet, and then the New Bendigo Company sank the same shaft a further 60 ft. In 1885 Stubs and Keys found a small rich leader and sank a 40 ft shaft, and further shafts were sunk to 70ft and 100 feet (Broadhurst

1935:39). Montgomery (1897) referred to “several old fallen in shafts, some shallow alluvial digging below the line of reef and a main shaft full of water”. It is assumed that all of this work was done on or near the Bendigo Mine head, which still retains substantial mullock heaps and features to the north west of the Lefroy Resources compound.

2.5 Morning Star mine

The Morning Star reef was traced across Back Creek Road, Demijohn Flat and Sludge Creek, with the Morning Star Mine erected on the hilltop north of Lefroy Township (immediately east of the Lefroy Resources compound). The mine was operating before 1891 According to Montgomery, and appears to have had a considerable life span compared to the average for the Lefroy mines. It was then let on tribute but soon closed down. It was unwatered in 1896 by the Amalgamated Morning Star Gold Mining Co, but was closed again almost immediately (Broadhurst 1935:39; Montgomery 1897).

2.6 Nugget mine

While this mine is outside the present study area (near the cemetery to the east) the Nugget Reef runs close to Sludge Creek, and shafts are believed to have been sunk at the western end of the reef. The Nugget mine shaft was sunk to 150 ft. but the reef here proved unpayable. As the reef runs under the township blocks, shafts were sunk off the line and drives pushed through to the load. Lefroy Resources has identified the New Golden Heart on this reef, but Montgomery 1896:21) puts this mine to the north. A plan in Groves (1976:77) shows the Indian Runner Mine at the western extreme of the nugget reef on the bend of the Beechford Road.

2.7 Hit or Miss mine

Another mine, the Hit or Miss Gold Mining Company, on the Hit or Miss reef, operated a shaft within the Lefroy township on the south side of the Launceston Road. The reef was not large and only this one mine appears to have intersected it. This mine was also worked by the New Pinafore Company, but closed in 1896 (Montgomery 1897 Broadhurst 1935:41).

2.8 Conclusion

In all, some 50 shafts operated in the Lefroy area, mostly shallow workings (McClenaghan, 1994). Although mining was conducted in earnest from 1870, no government production records were produced until 1886, with most of those values obtained before 1900. Overall there is an uncertainty regarding the exact

quantity of gold extracted from the field, but the values presented are at best a minimum. Actual production from the goldfield is generally regarded to be greater than 200,000 oz. The Launceston Examiner and Tasmanian Mail (newspapers) historically published weekly Mine Manager's reports on the progress of the mines and the ore crushed and gold "won".

It is likely that periodic exploration and prospecting has been conducted in the Lefroy goldfield during the later twentieth century. The field remained largely dormant from the time historical mining ceased (1914) until the late 1930's when the Tasmanian Department of Minerals and Energy completed a survey of the field and conducted some drilling. Most of the above ground infrastructure had been removed or destroyed in this period.

Further explorations are known to have occurred in the 1980's and 90's using soil-sampling programs with around 500 pits and costeans dug along drainage systems. From 1995 to 2002 Lefroy Gold Mines undertook exploration and sampling using trenching and drilling.

As a consequence of this activity, the gold field has been extensively altered and disturbed, with many layers of earth features obscuring the evidence of the historical mining period.

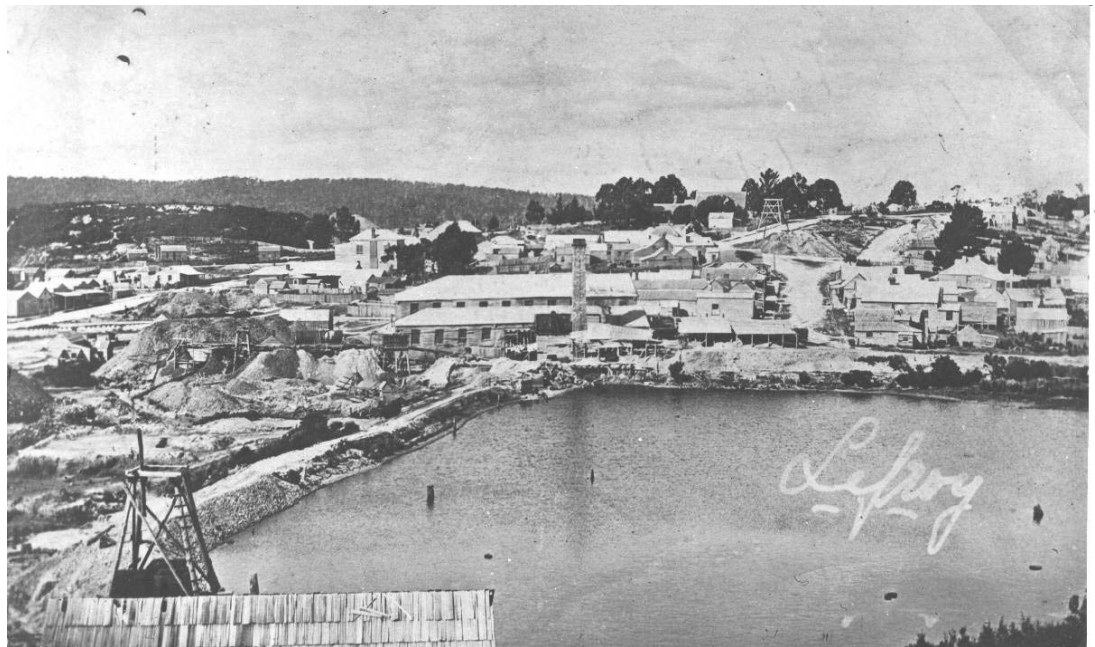


Plate 2: View from Excelsior Mine across dam wall to Native Youth Mine and Lefroy Township.

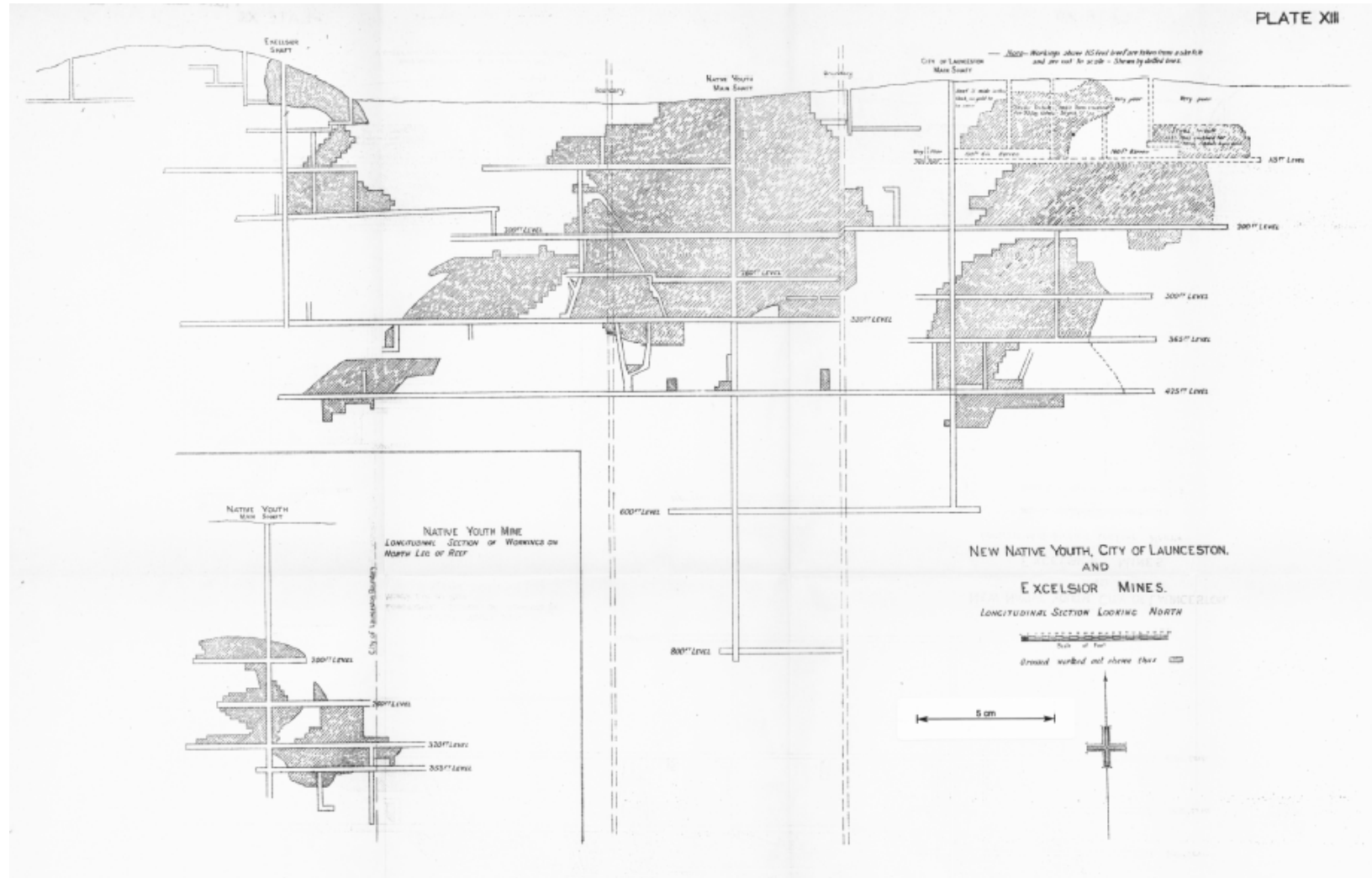
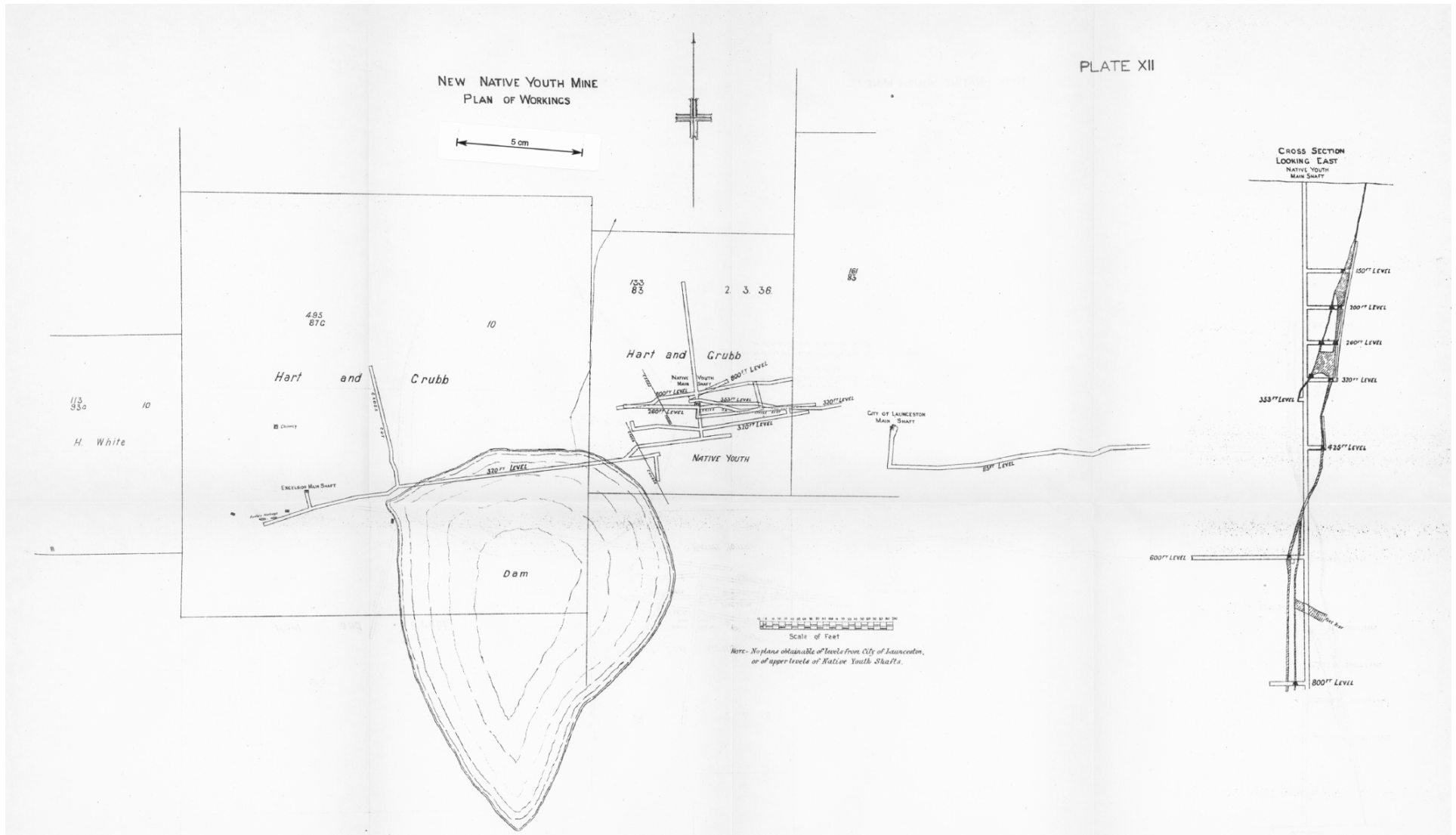
Plate 3: Historic Long Section of Native Youth Mine (1897)

Plate 4: Plan of Native Youth Mine (Broadhurst 1935).



3.0 DESCRIPTION

Site survey involved inspection of feature in the vicinity of the Native Youth mine, and adjacent Excelsior, and City of Launceston on the Native Youth reef, the Bendigo and Morning Star mines on the Morning Star reef and the New Golden Heart on the Nugget reef by Biosis Research PL archaeologist Gary Vines, in the company of Lefroy Resources geologist Kate ... on ... 2006.

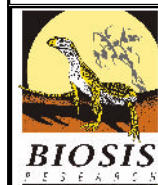
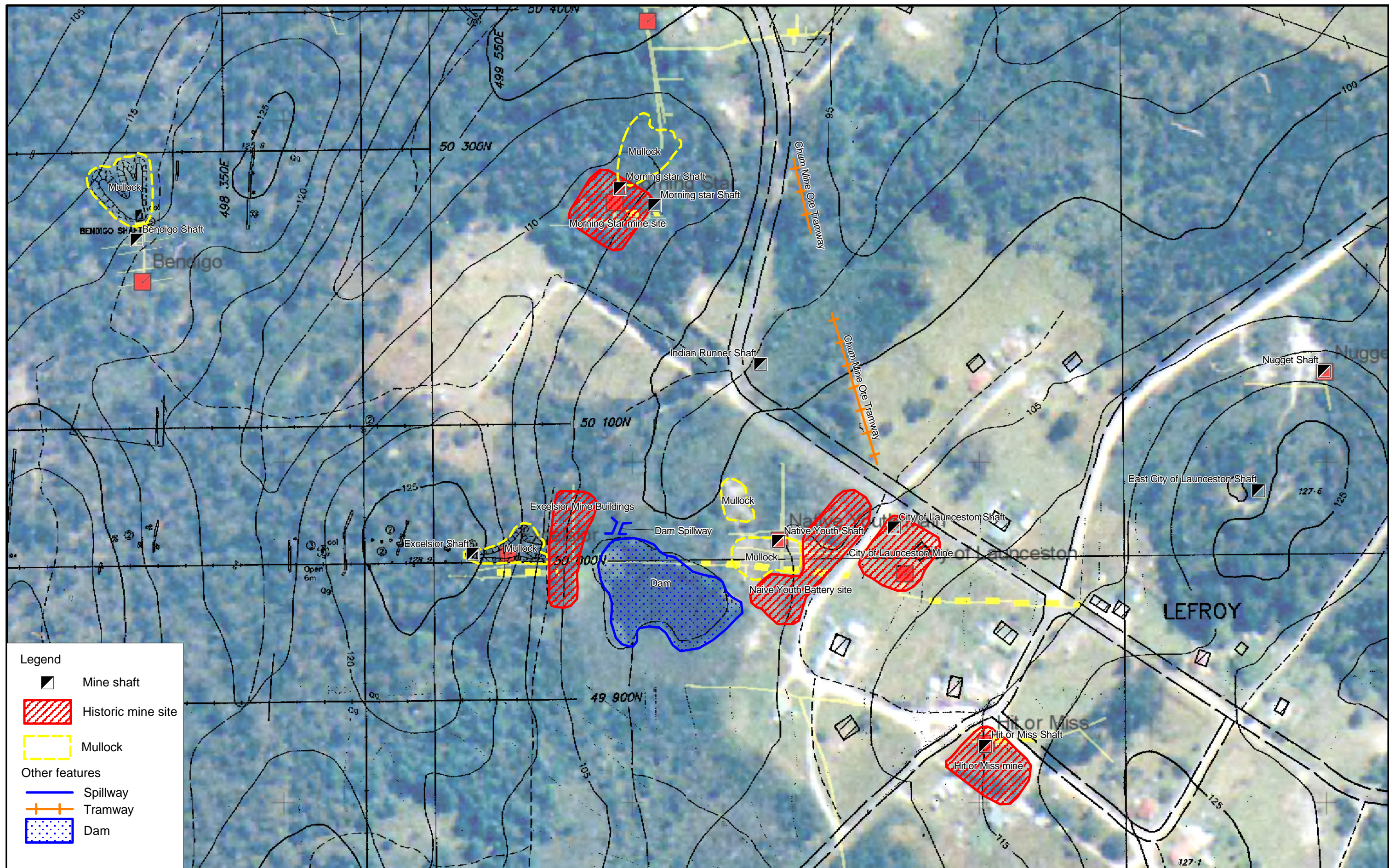
While the scrub makes identification of features difficult, it was possible to identify a number of features relating to the Native Youth and other mines. The most obvious are the shafts and remains of mullock heaps. However, there are also remains of the processing building at the Native Youth, and other evidence of machinery at various sites.

Nineteenth century mine infrastructure at Lefroy was generally rudimentary, using locally available materials as much as possible, such as raw timber trunks for head frames, trestles and building frames. Processing buildings also were constructed mostly of locally milled timber, with stone and brickwork only being employed where it was necessary, such as for machinery bases or chimneys. As a result the archaeological remains of mining at Lefroy are generally confined to earth features, occasional foundations work, and scattered metal artefacts. The last are difficult to identify among the ubiquitous rubbish dumping that seems to have been carried out continuously for the last 100 years around Lefroy.

Locations of identified historical features are shown in Figure 2.

3.1 Dam

Sludge Creek, a tributary of Brankeet Creek runs in a south west to north east direction past the northern edge of the Lefroy Township. Near the site of the Native Youth Mine, the creek forms a wide flat, known as Excelsior Flat, and here, an earth dam about 100m long has been constructed (probably in the 1870s, to provide a reliable water supply for the mine. The dam wall is about 8 m high at its greatest point. A spillway has been constructed at the northern end, with a stone lined channel diverting overflow back into the creek. There appears to be extensive siltation within the dam, with as much as half its capacity lost, while below the spillway further silt accumulation is noticeable. A small timber platform on the dam wall may be a former site for a pump, while a more recent pump has been installed on the south edge of the dam.



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Figure 2: Location of historic features

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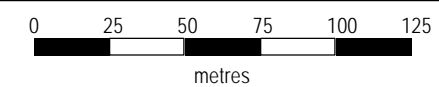


Figure 2: Location of historic features



3.2 Native Youth mine mullock and shaft.

The features of the New Native Youth Mine were not recorded by Purvis' when he mapped much of the historic features in the field in 1999. It would appear that Purvis chose not to record these or they were more obscured by vegetation. It is understood that Purvis' survey was carried out immediately after a bush fire, which made visibility much better than normal over much of the gold field.

The mullock deposits comprise a roughly linear, steep-sided group of mounds extending for about 120 metres north west from near the roadway. The mounds are about 10 metres wide at the base, but a lower level platform of mullock along the south west flank suggests a more extensive deposit, that may have been removed in the past.

The mullock are about 15 metres high at their greatest point, although it is unclear if some of the height has been lost as materials have been excavated from the sides. The mullock heaps are in two groups, with a deep flooded shaft between them. This has some evidence of timbering still intact, and in the foot of the mullock slope some vertical timbers are evident, possible remains of structures such as a poppet head.



Plate 6: Flooded shaft hidden beneath undergrowth presumed to be Native Youth Main shaft.

Interestingly, a three compartment shaft (which is a generally rare type of shaft) is recorded as having been sunk in 1882 as the Main Shaft for the New Native Youth mine to a depth of over 800 feet (Webster 1998:5, citing Thureau 1882: 1883 & Broadhurst 1935).

The shaft between the mullock heaps is most likely this one, and may in fact be the same as that first opened by 1872. Weathering of the mullock slopes, and regeneration of vegetation around the shaft suggest this area has not been disturbed since the mine was abandoned and all machinery removed.

Three areas of excavation and removal of mullock are noticeable. All along the south west side of the mullock, a bulldozed level area indicates either removal of mullock, reworking, or both. A platform has resulted about 8-12 m wide, with at least two tracks evident, one along the south west base of the main mullock pile. At the south east end of the mullock, just a short distance from the road, a recent excavation has been made, as part of sampling.

Midway along the northern section of the mullock heap, a cut has been made deeply into the mound, also evidently for sampling, but this is some years older than the southern cut.

Other smaller mounds of rock and gravels were also noted to the north east of the main mullock mounds, but these are likely to be the results of modern reworking of material and dumping of material brought to the site from elsewhere.



Plate 7: Mullock Heap at Native Youth Mine looking

The surviving mullock heaps are not readily resolved against historical photographs (see Plates 1 and 2) which show bot larger and more dispersed

mullock. This is not surprising considering the regular reworking and removal of such material. As well as reprocessing in the historical period, tailings, mullock, stamp sands were removed for reprocessing in more recent decades, and have also been mined for use as road base, land fill, and in some cases building materials such as brickies sand.

3.3 Native Youth processing plant sites

This site is an extensive area of earth features and structural remains located immediately west of the Lefroy – Beechford Road, about 1km north of Lefroy.

The most prominent evidence of the Native Youth Battery and processing plant is along the edge of the slope running down from the gravel road at the south east edge of the Excelsior Flat.

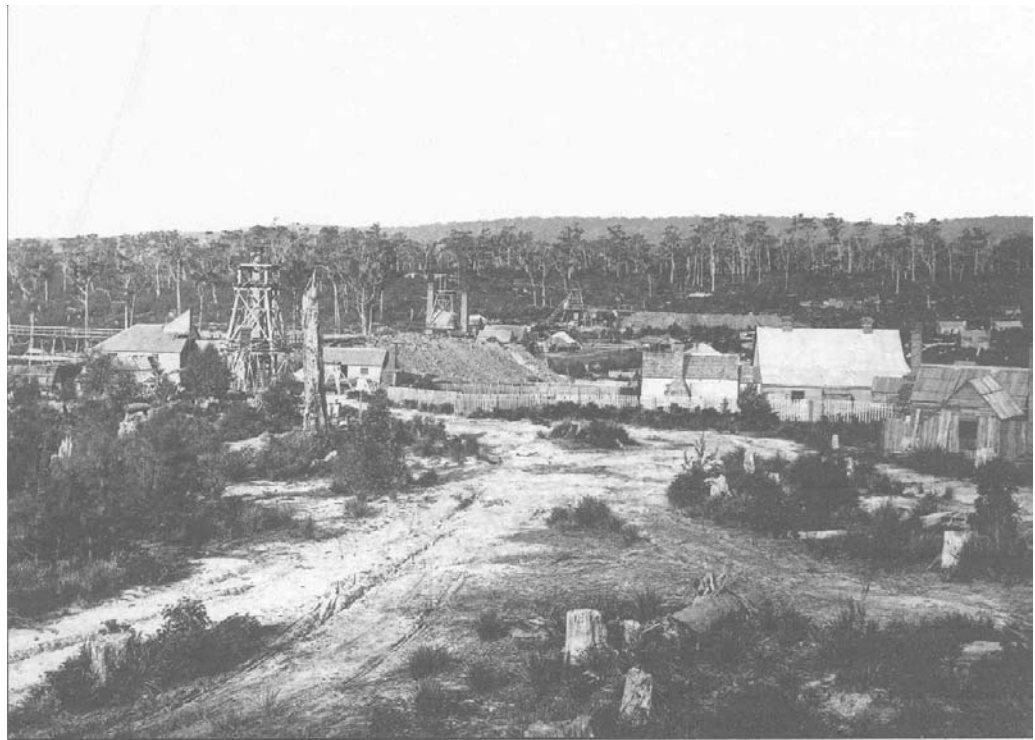


Plate 8: View of Lefroy to Native youth mine ? (Excelsior mine in background)

Stonework up to 2 metres high is evident, with walls constructed of random rubble siltstone (probably extracted from the mines) with a mud or lime mortar. Grey hard rendering is evident on part of the walls, with the render appearing to comprise hydraulic lime or Portland cement. This would suggest it is of the later period of operation of the mine, but could be original to the 1870s period also.

The walls are only evident in an area of about 10 x 8 metres. Fill from the road construction may have buried part of the site to the south east. A pit lies against

the rendered part of the wall measuring about 2 x 3 m, and is at least 1 m deep, although it is partly filled by rubble (see Plate 9).

Two gravel dumps are located to the north of the structure. These appear to be introduced material.

To the north east of this site, the steeply sloping bank below the road appears to have other stone features, possibly part of the processing building or retaining wall. However, this area was not accessible and is obscured by vegetation.

Webster (1998:10) refers to:

“extensive brick and concrete machinery footings and foundations at the battery site located between the main dumps and the bitumen road” and
 “The greatest density of brick and concrete foundations lies at the eastern end of the site adjacent to the bitumen road.”

These features were not apparent during the current site inspection.

A bulldozed path had been made from the north to the south east end of the mullock dump, with a fairly large area cleared of vegetation. It is possible that the features described by Webster were in this area., or they are further north east and obscured by vegetation and fill. Webster describes the features as “heavily overgrown or lie buried under rubble that has been placed there to build up the bitumen road”. This seems contradictory as it implies that these features were not visible in their entirety.



Plate 9: Cement rendered stonework in south west corner of site.

Webster also identified

“some brick foundations and a house platform(?) ... adjacent to the access track at the eastern end of the site. The footings can just be discerned through a thin soil cover and are mostly sub-surface.” (Webster 1998:10)

Again, these could not be relocated during the survey, and it might be assumed that they have either been further under disturbed soil, become more overgrown, or have been removed through bulldozing since Webster’s inspection.

Finally, Webster also identified

“a single wooden mortar box bed...immediately south of the low retaining wall...made up of four logs bedded vertically into the ground. A fragment of boiler end plate lies to the west of the mortar box bed.”

While some timbers embedded in the earth were evident near the stone structure identified above, they appear to be further disturbed and obscured since Webster’s investigation. No boiler plate was found in the current survey.

3.4 City of Launceston Mine

The City of Launceston Mine is located in a grassed and fenced township block in the corner of the Lefroy - Beechford Road and an unsealed road at north west the edge of the Lefroy township. No remains of this mine are visible apart from a low mound that it is assumed caps the mine shaft. The historic view of this area (see Plate 2) shows only a mullock heap with no structures. It can be assumed that the mullock was carted away for reprocessing or use as fill.

3.5 Excelsior Mine

The Excelsior mine site is cut by a gravel road on the north west side of the town dam. Between the road and the dam there is a complex of building platforms with stone and brick retaining walls evident in the undergrowth. The features extend for about 40 metres along the road edge, and 10 metres from the road. The historic photos of Lefroy show a long timber building with a simple timber pole headframe between the building and the dam.

On the north side of the road are the mine shafts, and mullock heaps. Several fingers of mullock extend from the mine platform down the slope to the edge of the road. There is some evidence that part of this mullock has been excavated and carted away. Although it is generally vegetated and so most has probably not been disturbed since mining operations ceased.

3.6 Other Features

Scattered widely over the study area are various forms of trenches, small earth and gravel mounds, tracks and ridges. These may be interpreted variously as old prospecting trenches and pits, “Costeans”, remnants of tailings and mullock, and the result of excavation and removal of larger tailings. The uneven ground is also a consequence of modern exploration, site clearance, bulldozing and other disturbance. As a result, any historical significance of the landscape in such areas has been seriously compromised or destroyed. A few minor features survive that can be interpreted such as a concrete channel to the south west of the study area, possibly related to a similar feature near the mine dam described above.

The site of the Hit or Miss Mine shows some evidence of the mine workings with a roughly level platform and mullock remains. The historical view of Lefroy shows a small mullock heap with a simple timber pole headframe on the north side, right on the corner of the road. It is likely that the mullock has been removed for reprocessing or use as fill, However, ground levels suggest archaeological remains may survive under the remaining mullock.

4.0 SIGNIFICANCE ASSESSMENT

A full assessment of the cultural significance of the Lefroy Gold Mines has not been carried out. However, Webster in his report on the North East Tasmanian goldfields for Minerals and Energy Tasmania (1998:11) has made a preliminary assessment which suggests that the more significant of the various Lefroy mine sites are the New Native Youth, Volunteer, New Pinafore and Specimen Hill sites.

Webster considered the New Native Youth/New Pinafore battery site to be of “State archaeological and historical significance”. He proposes the following statement of significance for the:

- It is the site of the Native Youth mine and battery which was the operation that established the Lefroy Goldfield as a long-term mining field.
- The mine and battery provided employment in the district when the initial shallow mines and alluvial gold declined and it therefore helped to maintain the population of the district when the field declined.
- The mine and battery site became a focus of the population and the township of Lefroy developed adjacent to the site. The original population centre of Nine Mile Springs was abandoned as a result.
- The Native Youth/New Pinafore battery was the only treatment plant to remain on the field after its first boom and was utilised by later prospecting operations and developing mines to crush their initial production. The battery therefore became a focus of the region's transport infrastructure.
- The battery dam was the water supply for Lefroy township for many years.
- Extensive foundations of the battery, cyanidation plants and ancillary buildings represent a major late 19th century industrial site and it has the potential to reveal significant archaeological information about the battery construction from the period from 1874 to 1904. No other site in north east Tasmania has such extensive remains of a treatment plant and battery dating from the 1870s.

The above makes no specific mention of the mullock heaps, but as the most visibly prominent of the features at the mine site, the mullock is clearly contributory to the significance of the site. However, the present form and extent of the mullock is not representative of the conditions during the mine's operation, but a result of various stages of reworking and removal. It would therefore be desirable to retain the mullock, or provide suitable identification of its former extent.

The Volunteer Gold Mine is identified on the Register of the National Estate (No. 103330) as "...a good and relatively intact example of a nineteenth century, deep lead gold mine, [with] a combination of mine-top machinery foundations, mullock tip and associated administrative/domestic areas. The mine is considered to be the best preserved in the Lefroy Field."

It is difficult without a more thorough regional survey and comparative assessment to be authoritative regarding the significance of the archaeological features at the Native Youth and surrounding mine sites. At present, however, there is a *prima facie* case for considering the New Native youth mine and battery site to be of state cultural significance.

4.1 Impacts and recommendations

Mineral Resources Tasmania guidelines for works at historic goldmines, recommends the avoidance of the more significant physical evidence of historical mining, such as large machinery and plant, footings and samples of the more important mullock and tailings heaps, while features such as shafts, adits and other minor structures are recommended for recording prior to disturbance (Bacon 1996).

Lefroy Resources is considering reprocessing the mullock and tailings at the New Native Youth mine, and other potential sites in the vicinity. Removal of the mullock would clearly have a considerable impact on the appearance of the mine site, and could potentially diminish its historical and archaeological significance. However, as the mullock and surrounding area has previously been disturbed and cannot be considered to represent, in its current form, the character of the mine during its operational period, then this may suggest that further change to the form of the mullock may not in itself severely diminish the site's significance. However, in any excavation or earthworks, there is the potential for disturbance of buried or obscured archaeological evidence.

The following recommendations aim to minimize impacts to the significant features of the mine, and suggest possible mitigation measures in the event that substantial change to the mullock heaps and surrounds are proposed.

1. Prior to clearance, the areas identified in Figure 2 as significant features (primarily the site of the Native Youth processing plant) should be marked on the ground with suitable identification such as flagging tape or para-webbing, to ensure they are not inadvertently disturbed. These areas should then be avoided during any vegetation clearance, track construction or drilling works.

2. Clearance of vegetation should be conducted prior to earth works and the area carefully surveyed by an archaeologist to identify and record any further archeological features. These additional features should be marked out and avoided as per above.
3. The site of the New Native Youth shaft should be marked, both during and subsequent to any removal of the mullock, with the intention that its location will be recognizable at the completion of any works.
4. Rehabilitation of the area following any earth works should avoid disturbance to the archaeological features.
5. While reconstruction of cultural heritage features is generally discouraged in conservation practice, there is an argument in the case of the Native Youth mine, that because of its prominent position, symbolic representation of gold mining in the Lefroy area, and low level of integrity, that reconstruction of the mullock in this area may be an appropriate form of commemoration and interpretation for this site. However, this should not be seen as an appropriate management procedure for other historic mullock heaps in the Lefroy region. Therefore, if operational circumstances permit, mullock, tailings or other crushed rock, gravel or suitable material could be returned to the site to reform a representative step-sided mullock heap as close to the original footprint as possible. This is considered desirable because of the visual prominence of the existing mullock heap as the major marker of historic gold mining near the Lefroy township.
6. Interpretation of the gold mining history and surviving archaeological and landscape features is also desirable, particularly in respect of the mine sites within and near the town. A suitable form of interpretation might be installation of marker signs on the various mine sites. More elaborate interpretive panels might also be considered in conjunction with regional tourism development. However, this would not be considered a justifiable cost as a stand-alone project.
7. The sites of the other mines in the area, including the Bendigo Shaft, Excelsior and Morning Star, each of which also retains extensive mullock heaps, should also be managed according to the above recommendations.

APPENDIX 1

Statutory Regulations

i) Tasmanian cultural heritage legislation

The *Historic Cultural Heritage Act 1995* forms part of the State's Resource Management and Planning System (RMPS). The Act, through the creation of the Tasmanian Heritage Council, the Tasmania Heritage Register, heritage areas, heritage agreements, stop-work orders and repair notices, seeks to promote the identification, assessment, protection and discussion of places with historic cultural heritage significance in Tasmania.

The Act defines 'historic cultural heritage significance' in relation to a place, as: 'significance to any group or community in relation to the archaeological, architectural, cultural, historical, scientific, social or technical value of the place', and a 'Heritage Area' as 'an area declared as such under Part 5' [i.e. on the Heritage Council's advice or after consulting with any relevant planning authority or any other body].

The Heritage Act 1995, regulates the protection and conservation of places of cultural heritage significance to the state of Tasmania. Heritage Tasmania administers both heritage places and precincts included on the Tasmania Heritage Register, while archaeological sites are also managed through the Parks and Wildlife Department's THASC (Tasmanian historical archaeological sites catalogue) forms.

The Tasmanian Heritage Council may enter a place of historic cultural heritage significance in the Heritage Register if, in its opinion, it meets one or more of the following criteria:

- (a) it is important in demonstrating the evolution or pattern of Tasmania's history;
- (b) it demonstrates rare, uncommon or endangered aspects of Tasmania's heritage;
- (c) it has potential to yield information that will contribute to an understanding of Tasmania's history;
- (d) it is important as a representative in demonstrating the characteristics of a broader class of cultural places;
- (e) it is important in demonstrating a high degree of creative or technical achievement;
- (f) it has strong or special meaning for any group or community because of social, cultural or spiritual associations;
- (g) it has a special association with the life or work of a person, a group or an organisation that was important in Tasmania's history.

In practice, the Act allows for the declaration of any area or item by the Tasmanian Heritage Council as an item of cultural heritage, given advice from a relevant body or qualified person. There are no heritage areas or sites listed on the Tasmanian Heritage Register within the study area.

The Tasmanian Parks and Wildlife service maintains the **Tasmanian Historic Places Index** (THPI) - formerly known as the Tasmanian historical archaeological sites catalogue (THASC).

While the **Tasmanian Historic Places Index** (THPI) does not have any legal status, the listing of a site on the THPI may be relevant to the extent that one of the objectives of the planning process established by the *Land Use Planning and Approvals Act 1993* (LUPAA) is to conserve those buildings, areas or other places which are of scientific, aesthetic, architectural or historical interest, or otherwise of special cultural value (LUPAA, Schedule 1, Part 2).

There are no THPI sites in the study area.

The *National Parks and Wildlife Act 1970* provides for the declaration of an area of land as a historic site if the land possesses the values of 'an area of land of significance for historic cultural heritage'; or adjoins an area of reserved land in the class of historic site possessing those values.

ii.) Commonwealth legislation

- ***Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)***

The Commonwealth Australian Heritage Commission Act was recently repealed and in its place amendments to the EPBC Act and the provision of an Australian Heritage Council have also been made in new legislation.

Under the EPBC Act Amendments (No 88, 2003) two mechanisms have been created for protection of heritage places of Commonwealth or National significance. Initially places in Commonwealth ownership may be placed on the Commonwealth list with similar protection measures as under the previous AHC act. In addition the National list provides protection to places of cultural significance to Australia. By law, no one can take any action that has, will have, or is likely to have, a significant impact on any places of national heritage value, without approval. Such actions must be referred to the Australian Government Minister for the Environment and Heritage.

REFERENCES

- Australia ICOMOS 1999, The Illustrated Burra Charter, The Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (the Burra Charter), revised edition.
- Bacon C A 1996, Mining Heritage Guidelines for use by MRT staff: Re-opening, reworking or exploring a previously worked deposit. Tasmania Geological Survey Record 1996/02.
- Broadhurst, E. 1935. Lefroy and Back Creek Goldfields, *Bulletin Geological Survey Tasmania* 42.
- Gould C 1864, Geological Surveyor's Report on part of County of Dorset, Tasmanian Legislative Council, Hobart.
- Groves, D., (1965). Geology of the Lefroy Goldfield. In: Economic and General Geology.
- John Canaris, Colwin Lloyd, Kate Bradley & John Baxter, 2005. *Lefroy Project Area Exploration Potential Report*. Lefroy Resources Limited.
- McClenaghan, M P 1994, A summary of the Beaconsfield, Lefroy, Back Creek and Gladstone Goldfields, report Mineral Resources Tasmania 1994/03
- Marquis-Kyle, P. and Walker, M. 1992 *The Illustrated Burra Charter: Making Good Decisions about the Care of Important Places*, Australia ICOMOS, Brisbane.
- Mining Heritage Places Assessment Manual* AHC.
- Montgomery, A., 1896. *Geological Survey of the Lefroy Goldfield, Progress Report*. Department of Mines, Tasmania, Hobart.
- Montgomery, A., 1897. *Lefroy Goldfield Tasmania, Report on the Geological Structure and Mining Development*. Department of Mines, Tasmania, Hobart.
- Morris-Nunn, M. Tassell, C, 1984, *Tamar Valley Industrial Heritage: A Survey*. Australian Heritage Commission and Queen Victoria Museum, Launceston.
- Pearson, M. and Sullivan, S. 1995, *Looking After Heritage Places*, Melbourne University Press.
- Purvis, J., 1999. Lefroy EL 1/95; *Annual Report 1998-99*. Allstate Explorations NL.
- Stubs, J. T. 1899. Description of the Treatment of Tailings by the New Pinafore Gold Mine. *Report Secretary for Mines Tasmania*, 1899-1900:99-104, Department of Mines, Tasmania, Hobart.
- Thureau, G. 1882, *Report on the mineral resources and permanency of the Lefroy gold field*, Tasmania. House of Assembly Paper Tasmania 1882/118.
- Thureau, G. 1883. *Report on the recently discovered gold field at Mt Victoria, county of Dorset*, Tasmania. House of Assembly Paper Tasmania 1883/50.
- Twelvetreets, W., (1899). *Volunteer Gold Mining Company, Report by the Government Geologist*. Mineral Resources Tasmania Hobart.
- Van Moort J C 7 Russell D W, 2003, *Lefroy and Beaconsfield Gold Mines*, Tamar Region Tasmania, University of Tasmania.
- Webster, A E, 1998, A preliminary cultural heritage assessment of the historic gold mines of North East Tasmanian, part 10 Lefroy Goldfield (Nine Mile Springs), Mineral Resources Tasmania report for Minerals and Energy Tasmania "Register Hard Copy Lefroy Sheet 8 (Pinafore)"