

**Back - Tracks
Heritage Consultants**

**Archaeological reconnaissance of Storeys Creek and Aberfoyle mines
Rossarden, Tasmania**

Mine site rehabilitation: phase 1



**Report to Industry Safety and Mines Division,
Tasmania Development and Resources**

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MINERAL RESOURCES TASMANIA



**Archaeological Survey
Report 1995/01**

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Contents	Page
1.0 Introduction	2
1.1 Project brief	3
1.2 Objectives	3
2.0 Brief Historical background	
2.1 Storeys Creek	4
2.2 Rossarden	4
3.0 Sites inspected	
3.1 Storeys Creek mine	
3.11 Machinery site	5
3.12 Storeys Creek	7
3.13 Side Creek	10
3.2 Rossarden	
3.21 Mill site and loading ramp	13
3.22 Number 4 slimes dam	15
4.0 Conclusion	17
5.0 Bibliography	17
6.0 Appendix	18

List of Figures

Figure 1: Map of North-East Tasmania	2
Figure 2: Ingersoll-Rand Duplex, Steam-driven Compressor	6
Figure 3: Duplex compressor encased in mine tailings, Storeys Creek mine	7
Figure 4: Trolley car frame in Storeys Creek	9
Figure 5: Machinery site and jig tailings dump, Storeys Creek mine	9
Figure 6: Square ore bucket, Side Creek	11
Figure 7: Plan of Storeys Creek	12
Figure 8: Collapsed ore bin in front of loading bay, Aberfoyle mine, Rossarden	14
Figure 9: Tea tree reinforcing in south face of No.4 slimes dam, Aberfoyle mine	15

1.0 Introduction

Over the decade following the cessation of major mining activity at Rossarden and Storeys Creek, a number of concerns have arisen relating to contamination of the local environment through mobilisation of heavy metals from the mine tailings. A rehabilitation plan for the mine sites at Storeys Creek and Aberfoyle, Rossarden, drawn up by Thompson & Brett Pty. Ltd., consulting engineers, outlines a number of measures to be taken over the next six years to control the erosion and dispersal of slimes and tailings and thereby inhibit the current unacceptable rate of contamination of Storeys and Aberfoyle creeks and areas surrounding the mine sites (Thompson and Brett 1994). Some of the rehabilitation measures proposed have the potential to impact upon the cultural heritage values of the mine sites themselves.

Preliminary rehabilitation works at Storeys Creek and Rossarden carried out during 1992, unrelated to the schedule given in Thompson and Brett, were preceded by an archaeological inspection and report by consulting archaeologist Denise Gaughwin (Gaughwin 1992). The first stage of the works proposed in the six year rehabilitation plan has been preceded by a brief reconnaissance of the affected sites by Greg Jackman and Michael Jones of Back-Tracks Heritage Consultants, assisted by David Gatehouse representing Industry Safety and Mines Division. This report details the findings of a site inspection of Storeys Creek and Aberfoyle mines carried out on 14th October 1994. The project was commissioned by Industry safety and Mines Division of Tasmania Development and Resources. The sites inspected are located on State forest.

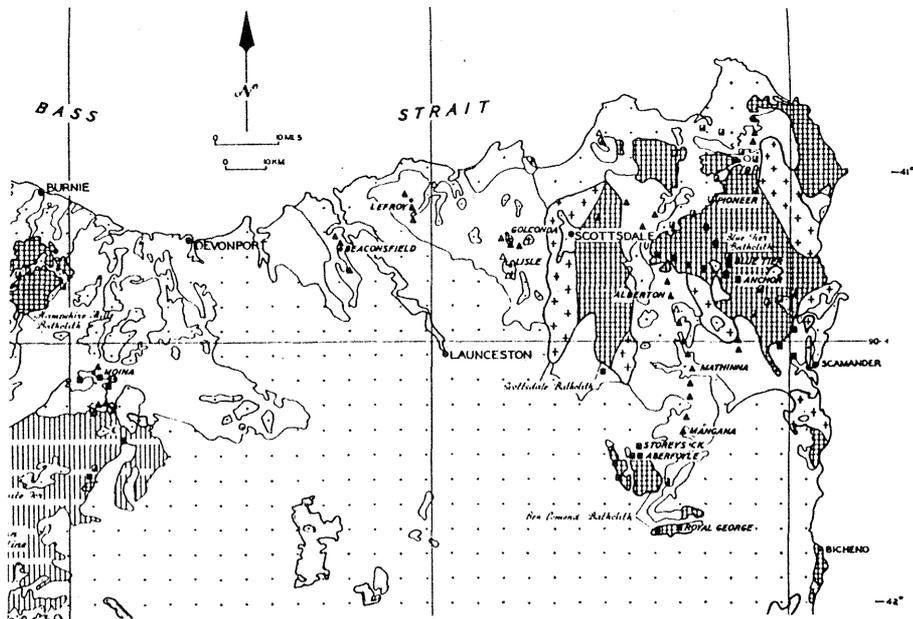


Figure 1: Map of North-East Tasmania indicating location of Storeys Creek & Rossarden

1.1 Project brief

The environmental rehabilitation works scheduled for 1994/1995 given in Thompson and Brett (1994) necessitates disturbance and alteration of several mine features at Storeys Creek and Rossarden. In consequence Industry Safety and Mines have short listed a number of areas as requiring assessment in order to establish their heritage and/or interpretive value prior to the commencement of site stabilisation.

Specific proposals for remediation at Storeys Creek to be undertaken over the current 1994/1995 financial year include:

- * Realigning the flow channel of Storeys Creek from its present position, where it undercuts the exiting creek bank and jig tailings dump, to a new position on the east side of the creek bed, in-filling of the existing channel and stabilisation of the toe of the tailings dump.
- * Installation of a drain around the perimeter of the tailings dump to intercept contaminated surface run-off and sub-surface drainage and prevent it entering the creek.
- * Establishment of wetlands at the mouths of Side Creek and the Eastern Hill workings in an attempt to decrease the amount of heavy metal contaminants entering Storeys Creek.
- * Removal of tailings piled against an old compressor at the mill site in order to make the machinery more visible and to arrest the current rate of corrosion.

Proposals for the Aberfoyle mine site, Rossarden include:

- * Battering, stabilising and re-vegetating the number 4 slimes dam in order to retard erosion.
- * Spreading of soil over the mill footings prior to re-seeding.
- * Infilling of the ore reclaim bay, west of the mill site, and removal of the collapsed ore bin.

1.2 Objectives

The purpose of the archaeological site inspection at Storeys Creek was:

- * To assess the likely impact on the cultural significance of the mine site of the proposed creek realignment and of the need or desirability of relocating historic artefacts scattered along the creek bed to the creek bank. Recording of features was to be undertaken where considered necessary.

- * To comment on the proposal to remove encasing tailings from the mill site compressor.

In relation to the Aberfoyle mine site at Rossarden the principal aim was:

- * To examine and record the tea tree reinforced wall of number 4 slimes dam and to comment on the significance of the feature and suggest any necessary mitigation action.
- * To comment on the proposals to stabilise the ore loading structure and for allowing access to the feature.

2.0 Brief historical background

2.1 Storeys Creek Area

Alluvial tin was first found in the Avoca/Ben Lomond district at Gipps Creek in 1871. Alluvial cassiterite was discovered shortly afterwards in Storeys Creek although it was not until 1891 that lode mining commenced. Tin and tungsten bearing quartz veins within Mathinna group greywackes were attacked via short adits on Side Creek, however the wolfram, for which the mine was to become best known, was not saleable until 1900. Mining of cassiterite and wolfram was carried out intermittently from 1901 to 1937 when the Storeys Creek Tin Mining Company No Liability took over and major production commenced. During the early years of the mine's operations tailings and mine water were discharged into the flowing creek, but by the late 1950's a new processing plant was installed in order to further boost production and tailings began to be dumped along the creek banks. In 1971 with the mine now owned by the Aberfoyle Company, the ore processing plant at Storeys Creek was closed and the ore transported to the Rossarden mill for treatment. Mining continued at Storeys Creek until 1982.

2.2 Rossarden

Tin bearing quartz fissure veins in folded Mathinna group sediments were first discovered at the mine site above Aberfoyle Creek in 1916. Production of tin at the Aberfoyle mine began in 1931 and increased steadily over the following years, the mine becoming the State's largest producer of tin and tungsten ores by 1960. By the end of 1972, 20 168 tons of tin concentrate had been processed. The tailings were initially deposited around the mill complex, but eventually a number of terraced slimes ponds were constructed to the north. As with the mine at Storeys Creek, ore production at the Rossarden mine ceased in 1982.

3.0 Sites inspected

3.1 Storeys Creek mine

3.11 Machinery site

The machinery site lying to the north of the tailings dump retains a number of features which relate to the period of mine operations between 1937 and 1971. One of the principal features is a steam driven duplex compressor, partially buried by mine tailings and obscured by weeds although the twin horizontal pistons and large central flywheel are still visible. The remains of what appears to be a vertical wood gas producer for the compressor protrudes from the tailings several metres to the south-west. A number of iron pipe and vessel fragments, possibly associated with the compressor and power plant, lie partially concealed between the two in situ features. (See figure 2 for an example of a duplex compressor).

The compressor and gas producer are incomplete but, where exposed, appear to be in a reasonable state of preservation. Where the mine tailings are in contact with the relics corrosion is fairly advanced resulting in blistering and fretting of the metal surfaces.

Located 23 metres to the north of the compressor is a stringer and slab bridge across Storeys Creek. The stringers have given way in the centre and the structure has collapsed into the creek bed.

A small timber and galvanised iron shed is situated on the south bank of the creek 35 metres to the north-east of the compressor. The shed, measuring 3 x 2 metres is in fair order and would appear to be less than 25 years old.

The remains of a narrow gauge single line tramway runs from the sealed shaft openings south-east of the compressor, a short distance around the bank of Storeys Creek below the jig tailings

Effect of proposed works

The proposal to remove the tailings which have accumulated around the compressor will involve crossing Storeys Creek to gain access to the site, excavation of the tailings from around the machinery, and deposition of the sediment at another location. As several tons of gravel and sand need to be removed excavation by mechanical means will be necessary. The means of access to the site has not been addressed in the proposal and therefore its effect cannot be evaluated. Clearly the bridge is no longer passable and so another point of entry to the site must be found.

Excavating the accumulated tailings from around the machinery will remove the principal cause of metal corrosion, although it will expose the pitted metal surface to the elements.

Significance

Precise information regarding the role of the various site features in the life of the mine is lacking. Nonetheless the individual features illustrate a number of different processes relating to the extraction and treatment of the ore at the mine. The compressor is an evocative and easily interpreted historic mining relic and care should be exercised when removing the encasing sediments in order to avoid compromising its interpretive potential. This potential will become clearer as removal of the tailings progresses.

Recommendations

- * The Tailings and weeds enclosing the compressor and associated machinery should be removed.
- * An archaeologist should be on site during the removal of the tailings in order to prevent damage to the plant or any associated features. The archaeologist should be able to assess the physical condition of the features and determine if further conservation action is required following the exposure of the plant.
- * The advice of Conservators from The Queen Victoria Museum in Launceston should be sought, where necessary, regarding the use of surface treatments for retarding the decay of exposed features.

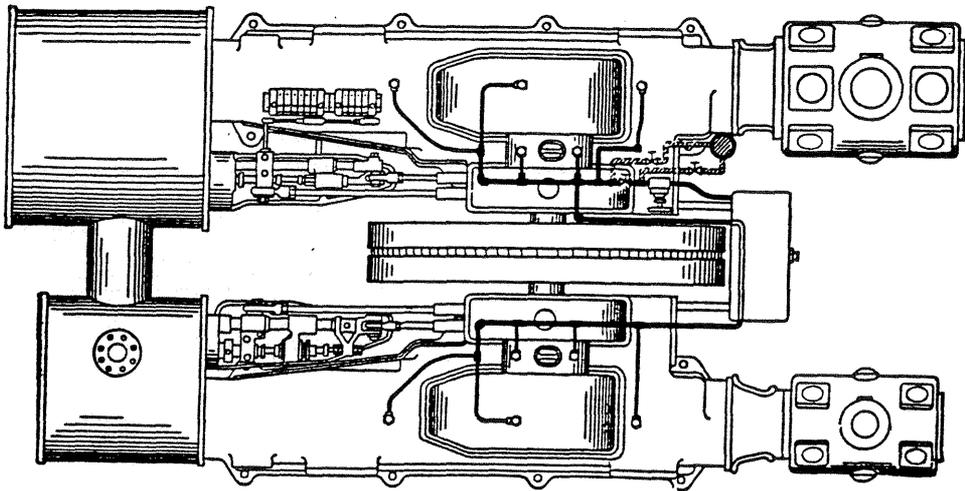


Figure 2: Ingersoll-Rand Duplex, Steam-driven Compressor (Peele 1945:p.14)

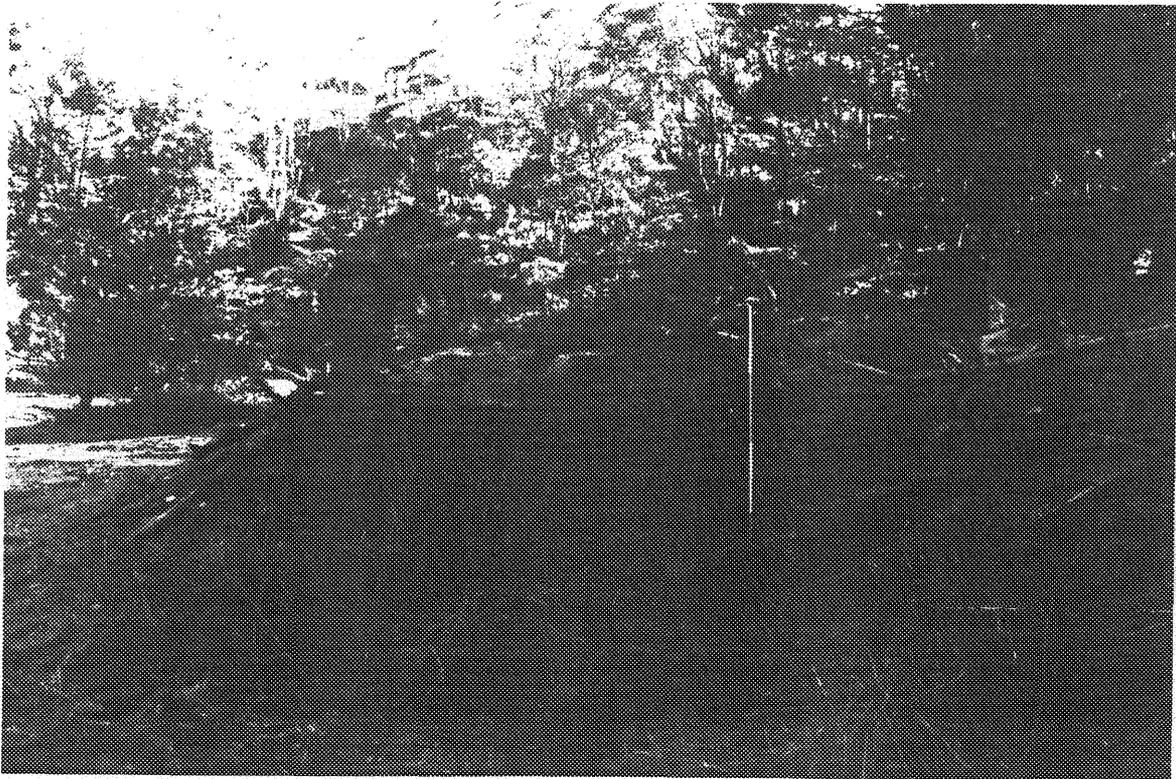


Figure 3: Duplex compressor encased in mine tailings, Storeys Creek mine

3.12 Storeys Creek

At the time of inspection the flow in Storeys Creek was limited to a narrow channel meandering across the floor of a larger stream bed measuring from 20 to 50 metres in total width. The current channel has cut back the west creek bank to a height of up to 3 metres, and between 0.5 and 1.5 metres of distal jig tailings are being eroded along the entire creek frontage. Numerous metal and timber objects lie strewn about the creek bed as far down as Side Creek. Many can be related to particular mining processes, including segments of tram rail, gear and shaft fragments, trolley car remains etc. The majority of items, including lengths of water pipe, cast iron sleeves etc. are unidentifiable to specific function.

The remains of several mine openings and a machinery site, partially buried in tailings, are situated 20 to 30 metres above the level of the creek near the southern end of the tailings dump. Among the in situ features are concrete machine footings, shaft and flywheel combinations, a second standing gas producer and a large concrete water tank, laid, according to an inscription cut into the lip, in 1938. An extensive scatter of discarded machinery items including ore buckets and pipe and rail segments covers the hillside below. The precise function of the site was not determined at the time of inspection.

Effect of proposed works

The relocation of the creek channel from its present path to the east side of the creek bed, away from the jig dump, and strengthening of the west bank with boulder fill will result in the disturbance of mining related objects in the creek bed. With only a few exceptions this will not result in the loss of significant archaeological information. In addition it is also proposed that an attempt be made to intercept and redirect surface and sub-surface drainage from the dump to the side creek wetlands. This nature of the works involved is not described in any detail within the rehabilitation plan and therefore its effect on the physical and historic fabric of the mine site is difficult to evaluate.

Significance

The artefacts scattered along the creek bed below the tailings dump are derived from the plant, structures and services that were utilised and discarded around the mine site, typically over the later years of milling and mining operations. In theory at least, these objects have the intrinsic potential to illustrate, in part, the large range of equipment used over the life of the mine. In reality however, the majority of the artefact types cannot easily be identified to specific function and/or are also represented in other areas of the site not likely to be affected by the proposed rehabilitation works. The sole exceptions to this rule are the remains of two ore trolley frames, lying in the creek bed near the entrance of Side Creek.

With regards to the present location of the artefacts, Storeys Creek is a predominantly seasonal stream and the high energy winter water flow has deposited the numerous machinery and structural fragments distances of up to several hundred metres from their original environmental contexts of use and discard. Where the intrinsic significance of the artefacts is sufficiently high to warrant preservation, this significance will not be diminished through selective and sensible relocation of the artefacts away from the areas to be disturbed.

The mine openings, machinery site and associated artefact scatter, and tramline section around the northern perimeter of the tailings dump are all sensitive areas and warrant preservation. Further disturbance to the remaining tailings deposits on the west bank of Storeys Creek should be avoided in any creek bank stabilisation and drainage remediation attempts.

Recommendations

- * The remains of the two trolley cars in the bed of Storeys Creek should be relocated at a safe distance from the edge of the creek.
- * The tramway, machinery site remains and artefact scatter should be recorded in detail prior to the commencement of site remediation. Disturbance to these sites should be avoided in any drainage and bank stabilisation works.

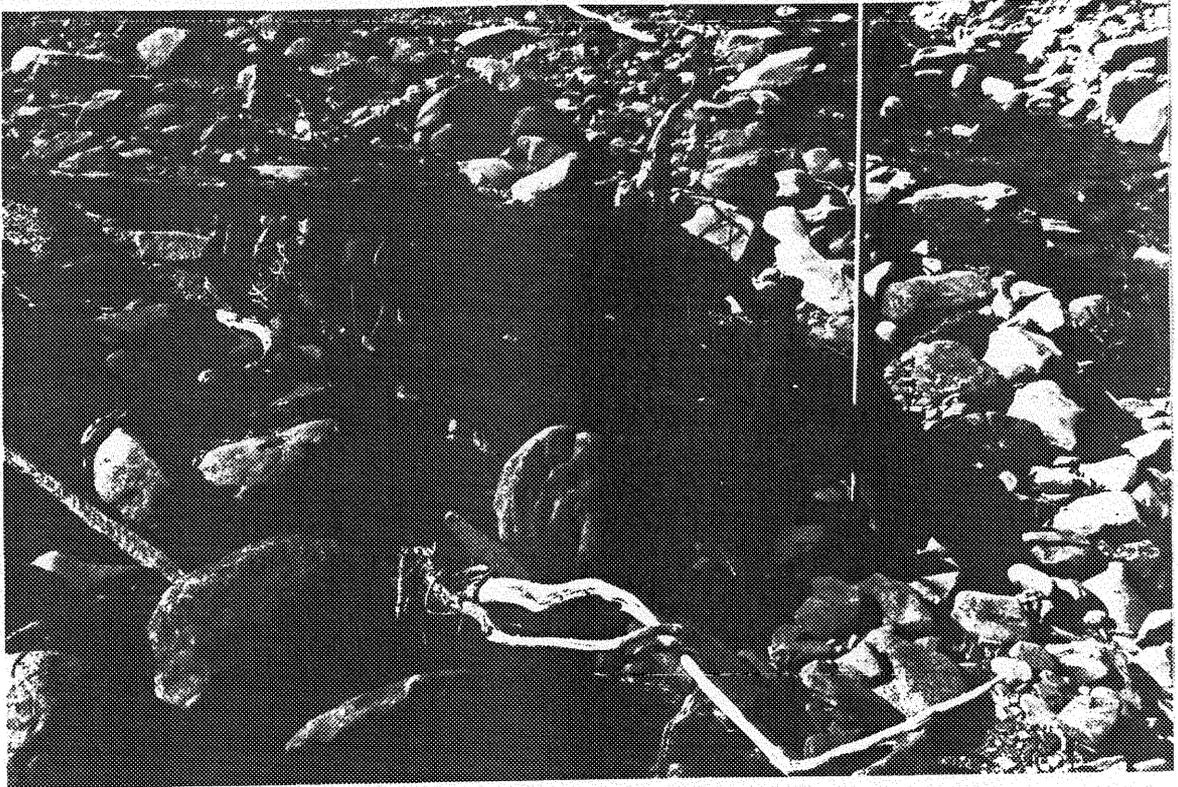


Figure 4: Trolley car frame in Storeys Creek



Figure 5: Machinery site and jig tailings dump, Storeys Creek mine

3.13 Side Creek

Side Creek is a small tributary of Storeys Creek, and intersects at an acute angle from the west approximately 180 metres downstream from the edge of the tailings heap. The creek bed is covered by a thick algal bloom which appears to be thriving on the mineral rich water draining from the mouths of two collapsed adits located 70 and 100 metres upstream. Side Creek exhibits a number of features relating to different phases of mining at the site, including the adits themselves dating from the earliest period of mine workings, mullock heaps, and various items of mining associated and domestic debris. Included are the collapsed remains of a small timber and galvanised iron shed, galvanised iron water tanks, oil drum firebox and a discarded stove. The corroded remains of a square trolley bucket lies in the creek gully below the mouth of the lowest adit.

Effect of proposed works

It is proposed that a wetland be established at the entrance of Side Creek to intercept the water draining from the two collapsed adits. This conceivably will involve the creation of earth terraces to impound the water and allow for the establishment of appropriate vegetation types in an attempt to decrease the amount of heavy metal contaminants entering Storeys Creek. Whether this will be an effective solution to the problem of waste dispersal, given the high rate of discharge from the adits, remains to be seen.

Significance

With the exception of the ore bucket, the moveable items possess little heritage significance or interpretive value and could feasibly be removed in a clean-up of the area. The ore bucket is of a different order of significance as it demonstrates a link with the practice of moving ore, mullock and tailings around the mine site. The bucket has evidently been washed into its present position, and its significance will not be reduced through appropriate relocation.

Areas of observable historic mining adjacent to Side Creek lie outside the area proposed for wetland redevelopment and therefore should be unaffected by site rehabilitation.

Recommendation

- * The ore bucket should be relocated to a position of safety at the side of the gully prior to site rehabilitation works being undertaken.

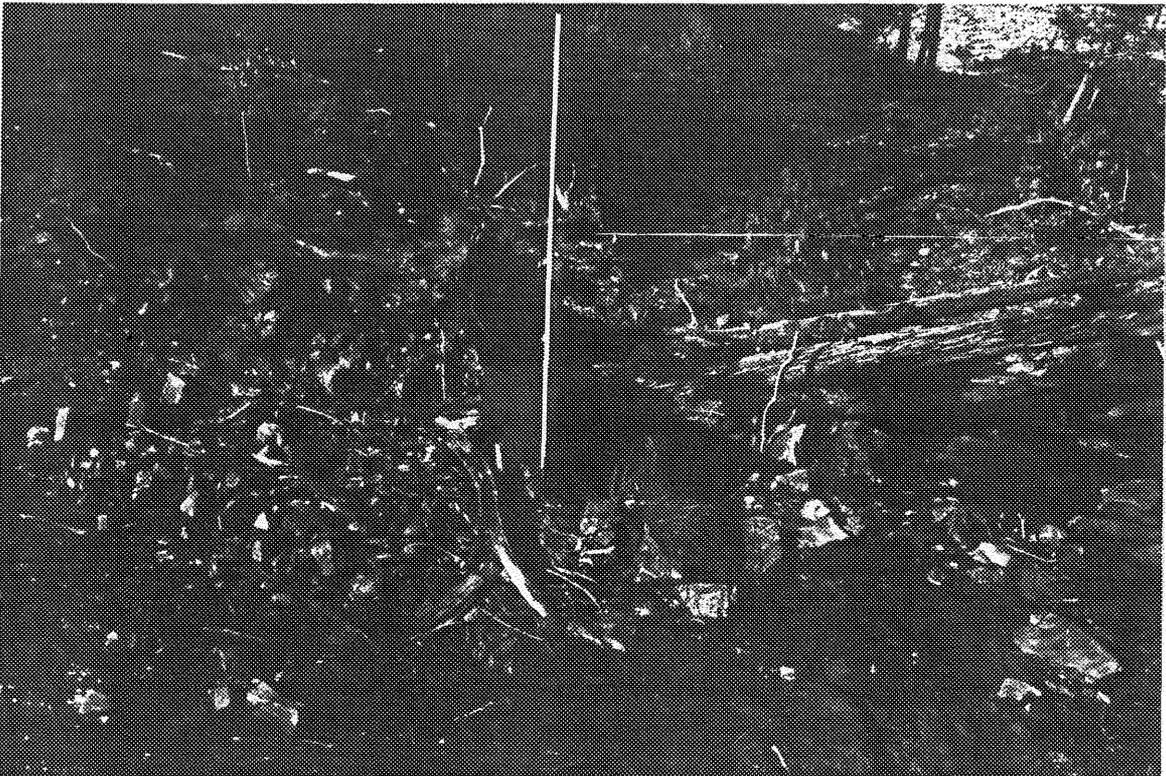


Figure 6: Square ore bucket, Side Creek

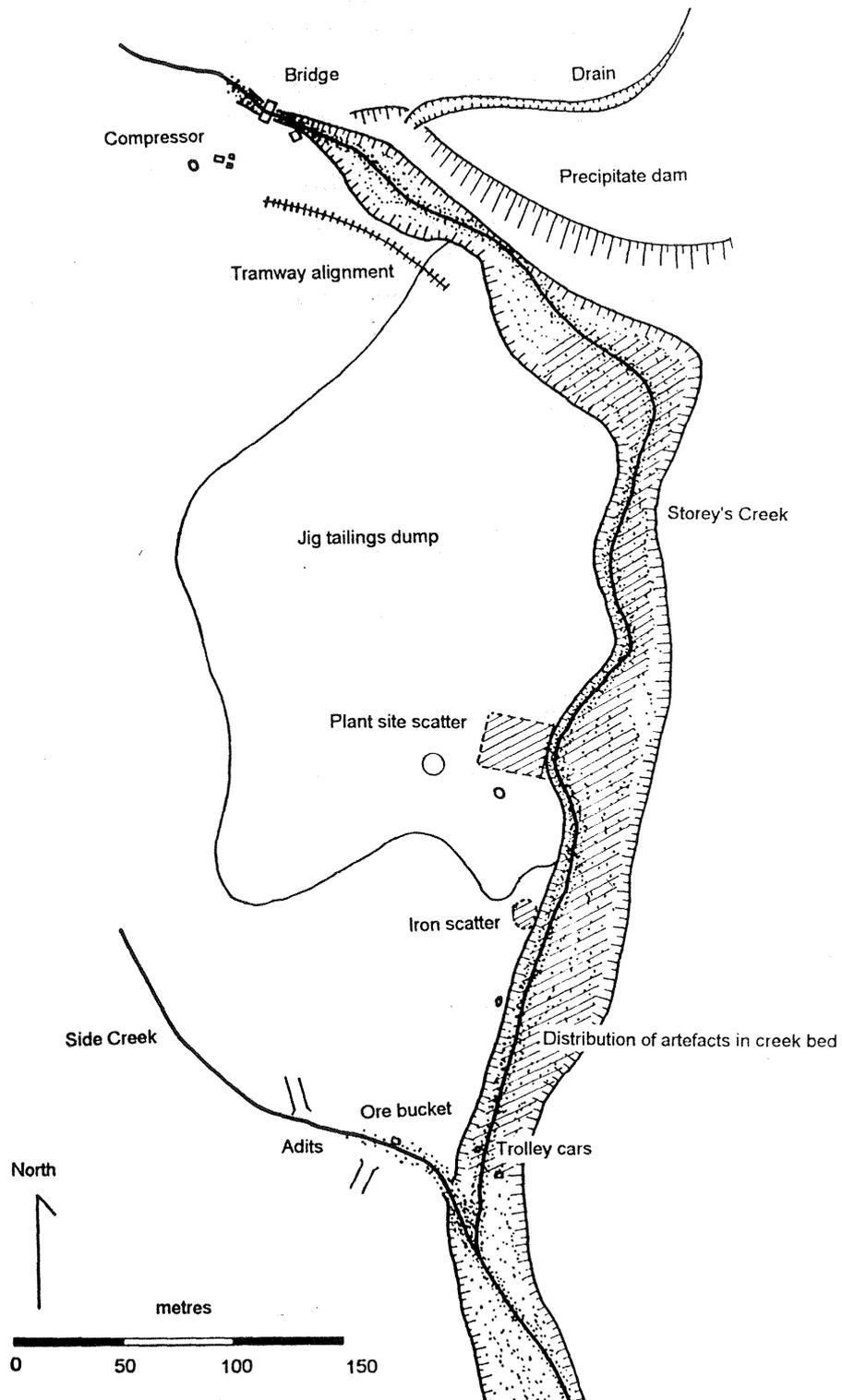


Figure 7: Plan of Storeys Creek showing location of items referred to in text (Plan modified from Thompson & Brett, 1994)

3.2 Rossarden

3.21 Mill site and ore loading ramp

With the exception of the ore loading ramp and reclaim tunnel, all major structures associated with the extraction and treatment of ore at the Aberfoyle mine have been removed or levelled. An asbestos dump on the site of the demolished mill building has been covered over with coarse tailings, and tailings are spread around the loading station. The loading ramp is constructed of cemented rubble and the entrance to the reclaim tunnel faced with a high concrete wall. The tunnel itself contains the remains of a series of ore chutes, with cones of pulverised stone in place beneath the chutes. Several fastenings have been removed from the chute assembly. Access to the bay is partially restricted by a pile of coarse tailings dumped at the entrance and by a large ore hopper which lies collapsed at the main entrance. Permission to salvage loose steelwork, including the ore bin, has been granted by Industry safety and Mines Division to a local resident.

Effect of proposed works

It is proposed that the mill site be covered with 5 000 cubic metres of soil in order to assist in revegetating the area. This will result in covering what little structural evidence currently remains to be seen which relates to the processing of ore at the mine.

There have been a number of proposals put forward for controlling access to the loading structure. One attempt to backfill the reclaim tunnel has already been made and apparently abandoned. The current plan is believed to involve repairing the tunnel steelwork and clearing out the gravel piles in order to permit unrestricted access to the loading bay. The ore bin would likely be removed and scrapped as per agreement. In addition it has been suggested that some protective device, ie. railing, may be installed at the top of the loading ramp as a hazard reduction measure.

Significance

The loading bay and mill site represent the principal remaining structural evidence relating to the processing of ore at the mine site. The mill building itself has been demolished and its significance is not likely to be further reduced through attempted revegetation. Information on the mill layout and ore processing methods should be more readily reconstructed from historical documents or through local informants than from studying the few remains on site.

The mill loading bay is a highly visible and easily interpreted structure, and retains features of interest in terms of the ore handling process. This remaining construction should be preserved if it is safe to do so. Safety should be of paramount importance in any scheme designed to enable access to or provide interpretation for the mill area.

To this end the collapsed ore bin requires consideration. Whilst the structure is of significance in that it further illustrates part of the ore storage and handling process, in its current state it represents something of a hazard. The stability of the feature is not likely to improve with time.

Recommendations

- * The loading ramp should be retained.
- * The chute steelwork in the reclaim tunnel should be repaired and made secure.
- * The excess tailings piled at the entrance to the reclaim tunnel should be removed and protective mesh fencing place at the tunnel openings to prevent access.
- * The gravel piles beneath the ore chutes should be left in their current form.
- * Protective fencing may be installed at the top of the loading ramp.
- * The collapsed ore bin may be removed.

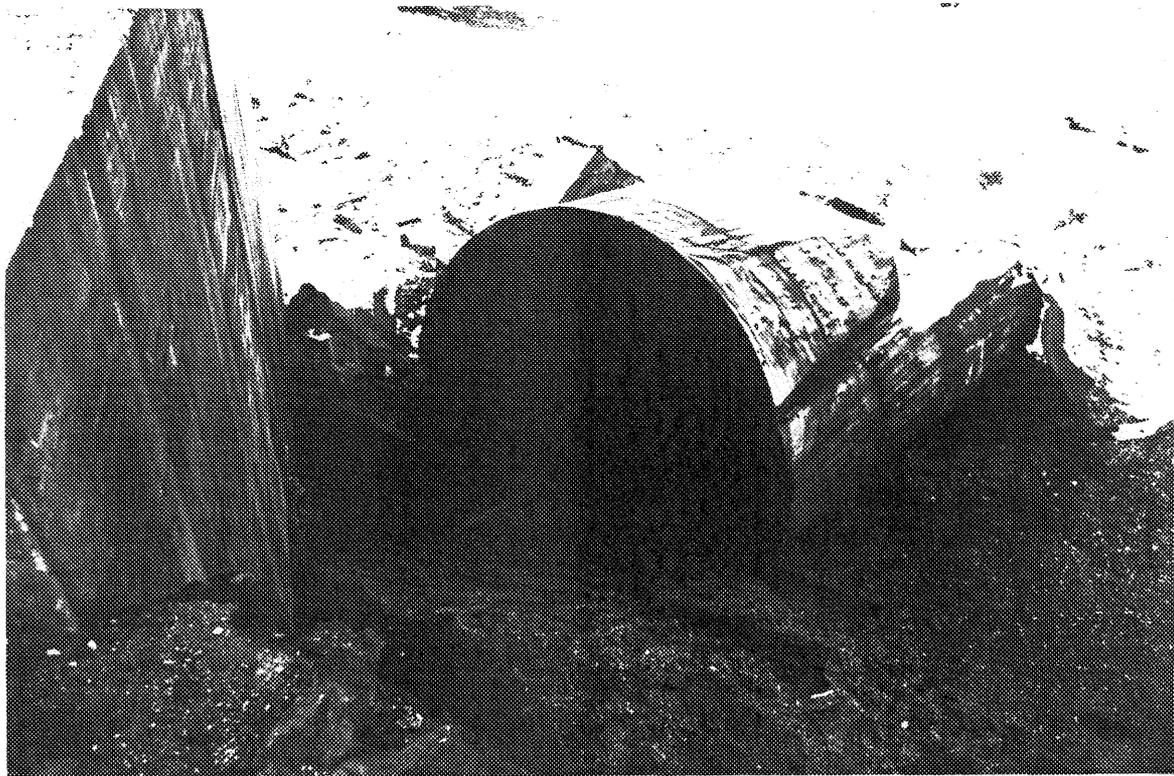


Figure 8: Collapsed ore bin in front of loading bay, Aberfoyle mine, Rossarden

3.22 Number 4 slimes dam

The dam is an extensive elongate area of impounded tailings, built around the contour of a steep gully above Aberfoyle Creek, and consists of at least two separate ponds of different age. The older southern pond, covering 1 ha, is constructed with a tea tree reinforced earth bund. The south, east and north walls have been formed from earth and clay, reinforced every half metre or so with mats of cut tea tree saplings. The wall is eroding badly with the loss of large amounts of tailings to the creek below. A drain has been installed running around the south and east sides however this is only a temporary measure and largely ineffectual in limiting slimes dispersal. Immediately to the west of the slimes pond, adjacent to the drain lie several sections of bucket conveyor, partially concealed by slimes. Most of the other moveable objects relating to mine operations have been collected up and deposited in scrap piles around the mine site.

Effect of works

In order to reduce the rate of slimes erosion into Aberfoyle creek it is proposed to batter down the eastern side of the number 4 pond to 1:5 batter, and to stabilise the toe with rock fill. The angle of reduction will almost totally remove the evidence of the tea tree reinforced bund. Soil cover will be added and revegetation attempted subsequent to the pond being re-contoured. The excavated slimes will be removed to the number 9 slimes dam. It is proposed that the soil cover will eventually be extended to cover the number 4 dam as far as the mill site, concealing any objects not already removed, including the bucket conveyor.

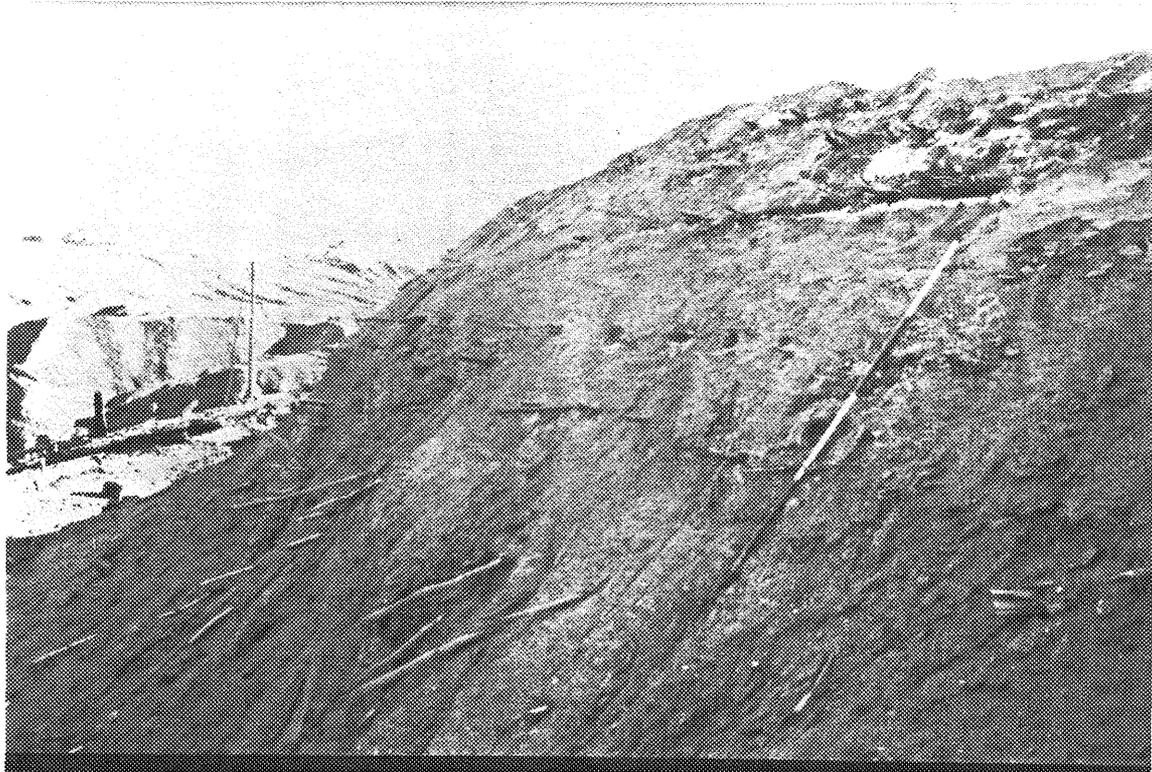


Figure 9: Tea tree reinforcing in south face of No.4 slimes dam, Aberfoyle mine

Significance

The slime dams at Aberfoyle, arguably dating to the 1930s, illustrate the final stages of ore processing and waste disposal and are able to provide information not only about the technology applied in their construction but also the nature of the process of waste disposal around the site. Although the construction method may appear curious it is by no means unique. The technique of terra forming using alternate layers of earth and vegetation has great antiquity. Notably, examples from the same time period in a better state of preservation, and less hazardous to the environment, exist elsewhere in Tasmania (ie. Georges Bay mine, St Helens). The heritage value of the number 4 slimes dam is offset by several important factors:

- Slimes dams are a common feature on mining fields.
- The dam in question is a significant source of environmental pollution, both as a result of leaching toxins into the local waterways and through covering nearby vegetation by wind blown fines.
- Due to the low shear strength of slimes when wet, slimes deposits are extremely unstable features which have been known to collapse with tragic consequences.

For these reasons, and despite the nominal heritage value of the site, it is considered inappropriate to leave the dam in its current condition.

The bucket conveyor is associated with the transference of ore products during the milling process, however it has no greater level of significance than many of the other items of machinery lying in piles around the site. Nonetheless it is an instantly recognisable device and one which would not look out of place as a feature on the rehabilitated landscape.

Recommendations

- * Stabilisation of the number 4 slimes dam may proceed as proposed.
- * The bucket conveyor may be extracted from its current position and replaced at an appropriate location subsequent to site rehabilitation.

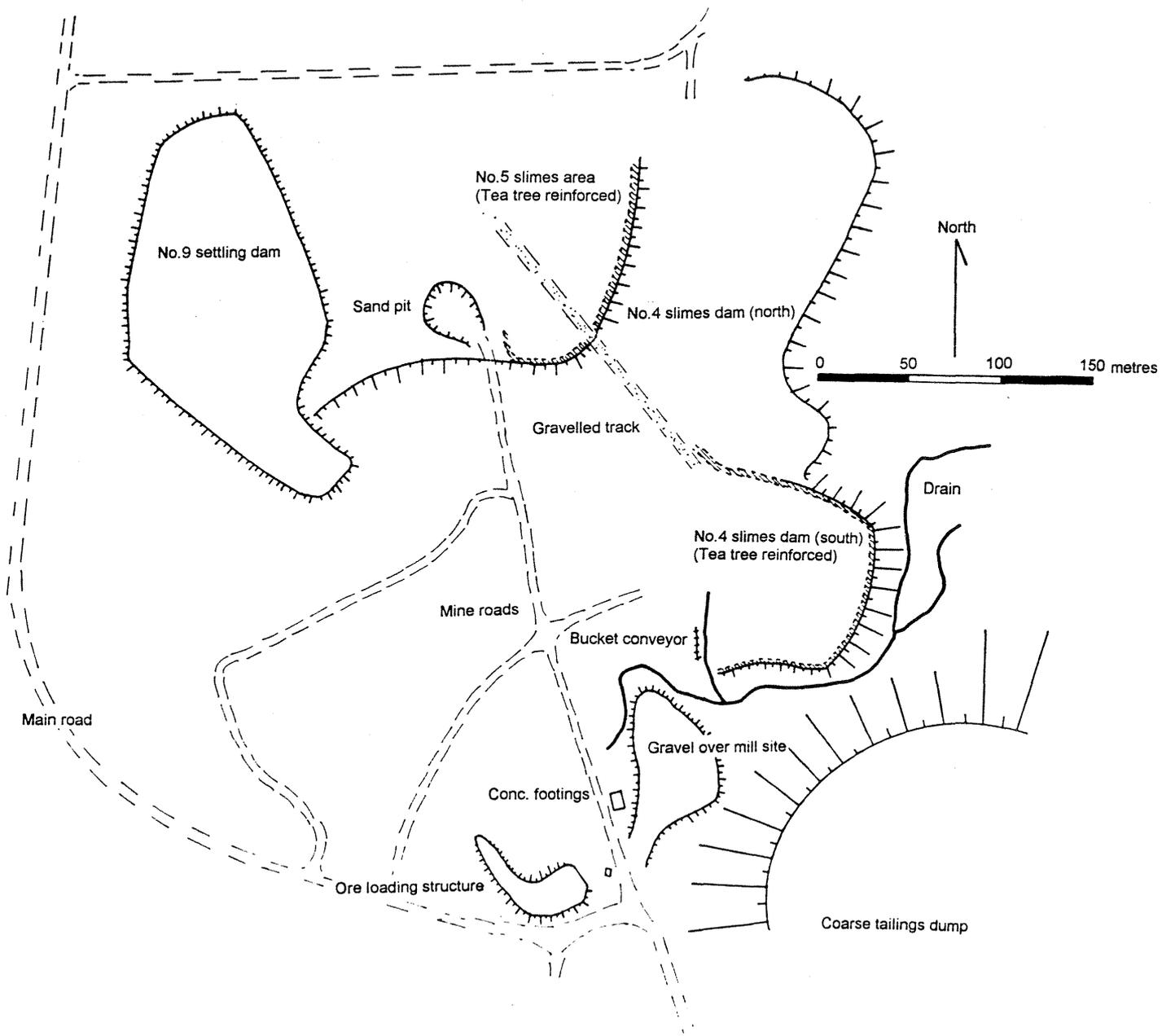


Figure 10: Plan of Aberfoyle mine site showing location of items referred to in text (Plan modified from Thompson & Brett, 1994)

4.0 Conclusion

This report addresses only those areas of Storeys Creek and Rossarden mine sites which are subject to the rehabilitation proposals scheduled for the 1994/1995 financial year. Several points of concern, relating to other mine areas likely to be affected by later works outlined in the rehabilitation plan, were noted at the time of inspection but have not been dealt with in this document.

The first stage of rehabilitation works so far as has been proposed is unlikely to adversely affect the historically significant fabric of the mine sites. Several objects which are deemed to have heritage and interpretive value may be relocated away from the areas to be disturbed without the significance of the site or objects being compromised.

The ability to objectively ascribe significance to site features has been limited through want of detailed historical plans and information regarding the former configuration and use of particular features. Much of the significance of individual items therefore have to be based on generalisations and assumptions as to their age and role in the mining process. The provision of more detailed historical information relating to the layout and operations at particular mine site would help in making heritage significance determinations on future rehabilitation projects.

5.0 Bibliography

Gaughwin D. 1992 *Report on an archaeological reconnaissance of parts of Rossarden and Storeys Creek, Tasmania*. Unpublished report to Division of Mines and mineral Resources, Dept. Resources and Energy, Tasmania

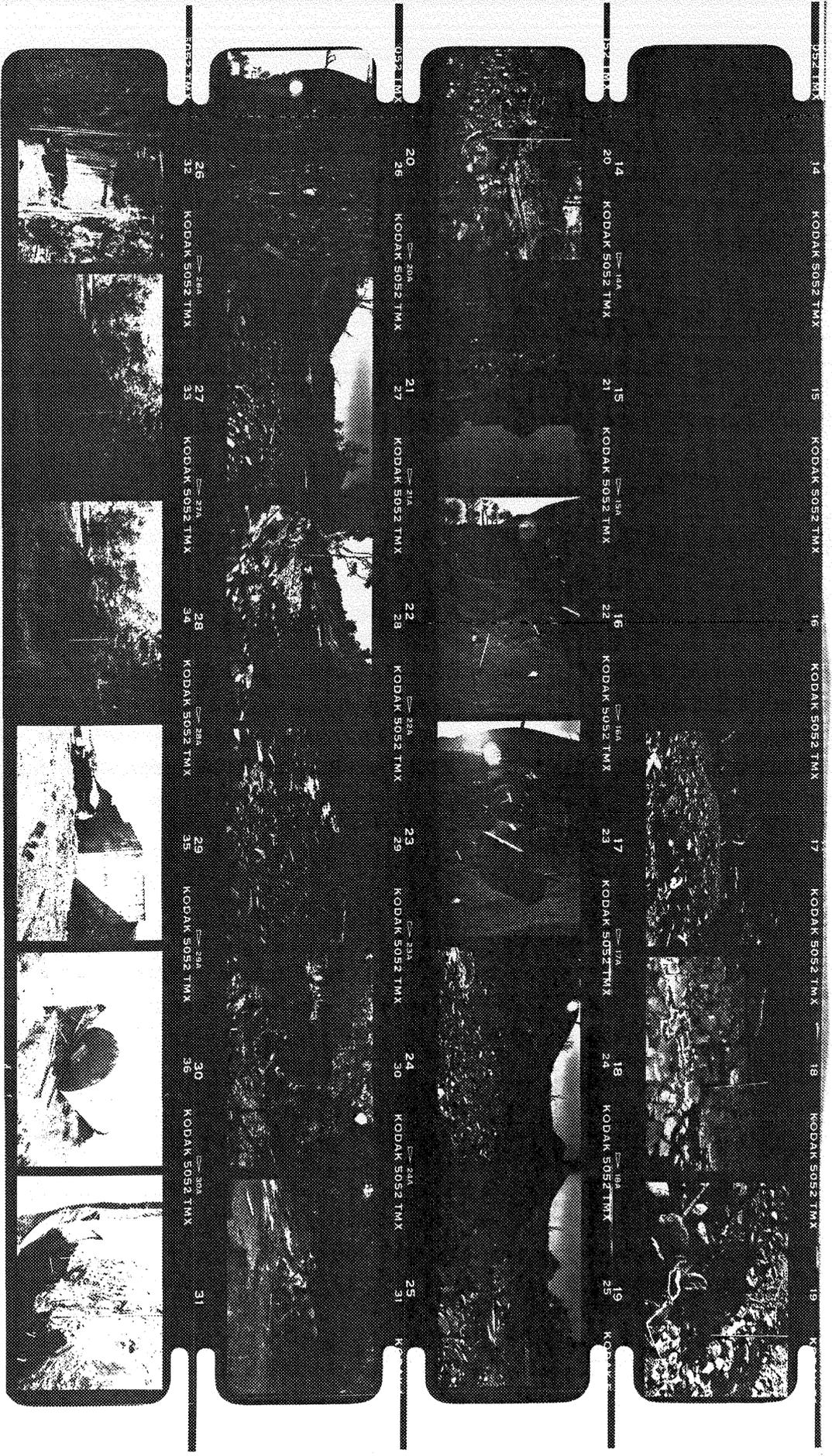
Peele, R. 1945, *Mining Engineers' Handbook*. John Wiley & Sons, United States of America

Thompson and Brett 1994 *Rossarden / Storeys Creek mine sites rehabilitation plan*. Unpublished report to Tasmania Development and Resources.

6.0 Appendix: Photographic Records

Black & white
Film Number 1:

Exp. #	Facing	Description
17	NW	Side Creek entering Storeys Creek
18	SE	Trolley cart base in Storeys Creek
19	N	Well preserved trolley cart base in Storeys Creek
20	NE	Ore skip at edge of Side Creek.
21	N	Erosion of tailings along Storeys Creek.
22	W	Machinery site on slope of tailings dump
23	W	Machinery site on slope of tailings dump
24	NW	Erosion of tailings along Storeys Creek
25	N	Erosion of tailings along Storeys Creek
26	W	Erosion of tailings along Storeys Creek view towards plant site
27	NW	Erosion of tailings along Storeys Creek
28	S	Erosion of tailings along Storeys Creek, view down stream
29	W	Erosion of tailings along Storeys Creek, view up stream
30	SW	Corrugated iron and timber storage shed
31	W	Buried compressor
32	N	Collapsed bridge near compressor site
33	S	Compressor
34	S	Compressor
35	S	Aberfoyle mine loading bay, Rossarden
36	NW	Collapsed hopper from top of loading ramp
37	S	Tea tree terra-form in No.4 slimes dam



Colour Transparency

Film Number 1:

Exp. #	Facing	Description
1	NW	Side Creek entering Storeys Creek
2	SE	Trolley cart base in Storeys Creek
3	N	Well preserved trolley cart base in Storeys Creek
4	NE	Ore skip at edge of Side Creek.
5	N	Erosion of tailings along Storeys Creek
6	W	Machinery site on slope of tailings dump
7	W	Machinery site on slope of tailings dump
8	NW	Erosion of tailings along Storeys Creek
9	N	Erosion of tailings along Storeys Creek
10	W	Erosion of tailings along Storeys Creek, view towards plant site
11	W	Erosion of tailings along Storeys Creek, view towards plant site
12	NW	Erosion of tailings along Storeys Creek
13	NW	Erosion of tailings along Storeys Creek
14	NW	Erosion of tailings along Storeys Creek
15	S	Erosion of tailings along Storeys Creek, view down stream
16	W	Erosion of tailings along Storeys Creek, view up stream
17	SW	Corrugated iron and timber storage shed
18	N	Collapsed bridge near compressor site
19	S	Aberfoyle mine loading bay, Rossarden
20	NW	Mill area from top of loading area
21	S	Tea tree terra-form in No.4 slimes dam
22	N	Tea tree bund, No 4 slimes dam
23	S	Tea tree bund, No.4 slimes dam
24	N	General shot of eroded slimes dams, Aberfoyle mine