
CATHERINE BATTERY

Location

FARNSWORTH STREET EAGLEHAWK, GREATER BENDIGO CITY

Municipality

GREATER BENDIGO CITY

Level of significance

Heritage Inventory Site

Heritage Inventory (HI) Number

H7724-0188

Heritage Listing

Victorian Heritage Inventory

Statement of Significance

Last updated on -

The Catherine Reef United Company Gold Mine remains consist of sets of engine and battery foundations. These are remnants of quartz mining carried on at the site between 1861 and 1913. In its early period this mine was considered the second most important in Victoria behind the Port Phillip Company at Clunes. The engines and battery were intimately connected with the technology of quartz mining which required steam power to pound the quartz to sand in order to extract the gold.

The Catherine Reef United Company Gold Mine is of historical, archaeological and scientific importance to the State of Victoria.

The Catherine Reef United Company Gold Mine is historically and scientifically important as a characteristic example of an important form of gold mining. Gold mining sites are of crucial importance for the pivotal role they have played since 1851 in the development of Victoria. As well as being a significant producer of Victoria's nineteenth century wealth, quartz mining, with its intensive use of machinery, played an important role in the development of Victorian manufacturing industry. The Catherine Reef United Company Gold Mine is important for its manifestation of this facet of gold mining.

The Catherine Reef United Company Gold Mine is archaeologically important for its potential to yield artefacts and evidence which will be able to provide significant information about the technological history of gold mining.

[Source: Victorian Heritage Register.]

Hermes Number 12103

Property Number

History

Heritage Inventory History of Site:

Sept 1855: Cook's claim (Catherine Reef) - 90 ounces of gold were obtained from two buckets of quartz. The same party presently crushed ten tons of quartz which yielded a little over 200 ounces.

Sept 1856: Catherine Reef (Pegleg Gully) - In this reef a vein of slate runs down parallel with the quartz, which is highly charged with gold as much as 50 to 60 ounces to the bucket has been got.

Oct 1856: Messrs Cook - 16 tons of quartz have been crushed which yielded the handsome return of 256 ounces.

Jan 1858: Catherine Reef - Charlton, Beattie and Co.'s claim - Winter, Moose and Co. are still sinking, present depth about 150 feet; a crushing of three tons of the top stone about three weeks ago only yielded a half ounce to the ton. The Danes claim is about the same depth as the former one; several kilns have been got out lately.

July 1858: Messrs Helm and Co. have struck, at a depth of 80 feet, a spur which promises exceedingly well. Their claim has been registered for some time having reached a depth of 150 feet. There are six men in the company, and they can raise from 18 to 20 tons of quartz a week. The stack of quartz on the kilns is estimated at 120 tons.

Nov 1858: Brams and C. (Catherine Reef) - a cake of gold has been obtained from this company weighing 230 ounces.

March 1859: Catherine Reef - This line is still being worked, but most of the claims where it is supposed that good stone will be met with, are so drowned so as to prevent their being worked with effect. At present most of the claimholders are contenting themselves with getting out top stuff - until some arrangement can be come to as to draining the reefs.

1860: Whipstick - Towards the close of July 1860, 3 men prospecting the north-eastern slopes of Adelaide Hill struck payable gold at the shallow depth of 4 feet. By the 2 of August, some hundred claims were pegged - the lead was traced northwards where the sinking increased from 20 to 30 feet and over. It was estimated that by 13 August, between 250 and 300 men were on the site - Scarcely a week later the lead had been followed into private property, several paddocks owned by Mr Matchett, a Sandhurst business man [land owner set terms, usual strife] - 26 of August it was reported that although 1,000 claims were pegged out shepherding. Towards the end of September much of Mr Matchett's land was deserted and many miners had left the rush. As the lead was followed northwards, the shafts were over 70 feet deep. Most claims were poor, and also there were carting/crushing costs. One party were carting 4-1/2 miles to Catherine Reef Battery.

Feb 1860: Eaglehawk Division [G W Hart]. The Catherine Reef Claimholders Pumping Company have also made considerable advancement having just finished their chimney, and will soon be ready to pump the water from the reef more effectually than they are now doing by means of a whim.

June 1860: Eaglehawk Division: Some of the pumping engines lately erected are now at work, and doing good service in draining the reefs. Among those now pumping are the North Bendigo's engine, on Jackass Reef (in a few days the lately and long-flooded workings will be free of water) and the Specimen Hill Company's (McNair and Co.) engine, which is constantly drawing up a large body of water. The pumping engine of the Claimholder's Company on the Catherine, which is expected to drain the whole of the important reef, has not yet commenced: this company are still at work with their whim.

Sept 1861: Catherine Reef United Claimholders Gold Mining Company

The reports and money statements were adopted, and now that an additional battery of stampers and other expensive works have been paid for, and the Company's entire plant is in full profit, a resumption of monthly dividends may soon be expected.

Committee's report - Your committee, being fully impressed that one of the main objects in view was to work your mine with the strictest economy, and finding on enquiry, that the company stood almost alone in paying a high rate of wages, we resolved to effect a slight reduction and accordingly gave our miners a fortnight's notice of the intention, but the men took the movement in a wrong spirit, and some disagreeable scenes occurred, besides causing delays in the workings until fresh hands were taken on - The committee would also report that to supersede the great expenditure in horse labor, and meet the increased depth at which the main shaft has now reached, they considered it advisable to erect winding gear, to be worked off the pumping engine. Tenders were called for the iron work, and that of Messrs Gripe Brothers accepted the sum of £598 10s -

Manager's report - Mining has been proceeded with energetically, and with strict regard to economy, and again a large expenditure has been carried over to permanent works that will facilitate the opening of the mines.

The progress made in sinking the main shaft has been satisfactory, 90 feet having been sunk since my last report, making a total depth of 236 feet. The water has increased considerably the last 20 feet. The current contract will be the last that we shall be able to sink by horse-power for drawing water.

Anticipating the erection of an engine and winding gear on the southern ground, No's 1 and 3 shafts have been sunk and permanently timbered, the former to 220 feet, the latter to 284 feet.

The pumps have been taken out of the old shaft, and the shaft stripped, and the bob, etc. removed to the main shaft. A commencement has been made to put the pumps in the new shaft.

The greater part of the timber for the erection of the poppet heads and winding gear has been delivered, and the contract for the necessary ironwork for the winding gear, and the ironwork for the connections of the flat rods, has been taken by Messrs Gripe and Co. for £598 10s. An additional battery of six stamps has been connected to the crushing engine - 250 or 260 tons will now be crushed weekly. Blanket tables have been attached to the ripple tables. A capacious dam and extra sludge pits have been added to the permanent works within the past month.

Nov 1861: Catherine Reef United Claimholders Gold Mining Company

Area and Title - The extent of ground occupied by this company is 501 yards 1 foot and 9 inches. from north to south, or 25 acres. It comprises the claims formerly known as (beginning from north, next to the Catherine Keith Company) Kinder and Co., Ellis and Co., Wills and Co., Claimholders Association (late Wilson's), Stahl and Co., McGregor and Co., Brahn and Co., Moore and Co., Burgoine and Co., Tamsworth and Co., Bendigo and Ballarat Co., and Claimholders' Association (late Murray and Co.)

Machinery - This company is in possession of two powerful engines, of 30 horse power each, made by P.N. Russell and Co. One driving head of stamps and the other working the pumps and the winding gear.

Amalgamation - The system of amalgamation employed, ripples, wells and blanket tables. One battery of six stamps has a small Chilian mill.

Building - The engine house is of stone, both engines being enclosed in the same building. The stamps-house is of weatherboard; the offices are of brick. There are also a smithy and workshop of wood.

Remarks - Since the first starting of this company on the 16th March last, dividends have been declared amounting in all to 7-1/2 per cent. The returns of gold have averaged from the first from 170 to 180 ounces per week. But very extensive permanent works have been carried on. The ground has been opened out, main shaft put down. Winding gear of a very complete character and an additional battery of stamps erected. Offices and workshops have also been built. This has all been accomplished out of profits of the mine, besides setting apart a reserve fund of £2,000. In addition to this there is a balance in the bank. With a line of reef nearly a third of a mile in extent, gold being obtained from both extremities of the mine as well as in the very centre, and with machinery of very efficient and complete character, the prospects of this company are certainly very encouraging. This mine is the most extensively opened out of any in Bendigo. This company has acted very prudently, we think, in opening out the mine and preparing for systematic mining, instead of declaring a dividend immediately funds were in hand. This has been altogether a mistake with the numerous mining companies, that most of them have found out to their cost, we mean the haste to declare dividends.

March 1862: Catherine Reef United Claimholders Gold Mining Company - A substantial house over the winding gear, the tramway from the shaft to the stamps, and the tramway for conveying the timber and slabs to the main shaft, are amongst the permanent works connected with mining which have been constructed since my last report. The work in connection with the cages, trucks, etc. for the main shaft is in preparation. With exception of the barrel and shacking table for separating the gold saved by the blankets, there has been no addition to the stamping and amalgamating machinery during the past quarter.

Oct 1862: Bendigo and its Resources - During my stay at Bendigo an opportunity was afforded to go through the

Catherine Reef United Claimholders Gold Mining Company's mine, and little did I think, err I descended the shaft, that any company in Australia could boast of such well conducted works. No mine can be worked more economically. The arrangements and appliances are of such an admirable character that all unnecessary labor is prevented, whilst the work is so performed that a small yield of gold per ton will be found to remunerate the shareholders handsomely as their subterraneous workings become more extended. It is workings such as these that Bendigo requires to be resorted to, to make her yield up her immense treasure, and not the mode adopted by some many quartz diggers, which, unfortunately for the district, impoverishes the ground without giving any beneficial results. It is high time that this dog-in-the-manger system should be abandoned. It prevents hundreds of persons from obtaining profitable employment. Scores of thousands of pounds have been expended to no purpose in sinking useless shafts. There is scarcely a vein that has been worked on to any extent that you will not find that ten shafts have been sunk where one would have answered equally well; but this is not all - there is the labor thrown away in the raising of the stuff, and the frequent handling it over, as well as the expense incurred in carting it to the public crushing mill. All this adds to the cost of production, and only admits of ground being worked that will yield an ounce to the ton; whilst a great deal of valuable ground is in the hands of the digger, who is not in the position to work it himself, neither will he allow others. It is not to be wondered at that the escort returns show such a decrease. The sooner these things are remedied, the better it will be for the district. Such fields as Ballarat and Clunes would have been deserted long ago had they resorted to such a crude and contracted method.

Dec 1862: Catherine Reef United Claimholders Gold Mining Company - The experiments which have been made for the saving of the fine gold, hitherto lost, are not yet sufficiently complete for us to report on, as through unexpected difficulties Mr. Carpenter has only very lately succeeded in getting his rotating blanket to work steadily. An iron amalgamating cylinder has been added to the machinery, and a reverberatory furnace has been erected for roasting the mundic previous to amalgamation.

June 1863: Catherine Reef United Claimholders Gold Mining Company .

Your committee, with the view to reduce the cost of management of the company, brought before the special meeting of shareholders, held last week, two propositions, one of which was to reduce the number of committeemen from five to four, and the other to reduce the remuneration to one-half. The first reduction was not agreed to, but the second one was carried, thus fixing the rate of remuneration at £125 per annum. Manager's report - In the crushing department, the expenditure last quarter has been unusually heavy, consequent on the providing and fixing the four new stamper boxes. The old ones wore two years; these I expect to last three.

March 1864. Eaglehawk Subdivision [G W Hart]. In quartz mining a decided improvement has, of late, taken place, many of the principal reefs giving yields which have not hitherto been surpassed. The Catherine Reef, The Prince of Wales, and the St. Mungo Companies have been especially fortunate and not withstanding the increasing depths to which the reefs are sunk, the quartz continues equally rich.

June 1864: Eaglehawk Subdivision - Among the various companies none stand more conspicuous for their success than the Catherine Reef United; the crushings from this company's mine, for the last three months, have been upwards of five thousand tons of quartz, yielding, on an average, eight and a half pennyweights per ton, and, as the company have a large body of stone which will pay by the quantity crushed, they are about to erect another engine of fifty horse-power, and to render their works yet more extensive than they have been.

Sept 1864: Your committee have taken the necessary steps for the erection of twenty additional stampers, by completing for purchase of an engine, letting contracts for erecting machinery, etc. Messrs Irving and Co. were successful tenderers for the ironwork, for the sum of £978; Mr Butterworth for the stonework foundation for the engine, for the amount of £174; and Messrs Gripe and Co. for making a tailings-pump and two waterpumps of the same size, for the sum of £265. The engine was purchased from Mr MacPherson for sum of £380. The difficulty of getting the heavy logs from the bush, and granite from the quarries during the late wet weather, has greatly retarded the work in connection with the new machinery. The engine-bed will be finished today, and the sole-plate of the engine fixed. The contractor for the ironwork is making good progress, and the carpenters are at work on the horses for the stampers.

The only permanent work of any consequence carried out since the last meeting is the flume and race to take the water from the Pegleg Gully watershed to the dam in Snob's Gully, the lower dam being so full of tailings that there was no room for the storage of water from this watershed.

Dec 1864: Owing to the extreme difficulty of procuring large and solid enough logs for the foundations, and also the dilatoriness in supply of ironwork the new batteries have not been erected so soon as expected. In a few weeks

it is anticipated they will be ready for work. Foundations will be laid for thirty stamps instead of twenty as at first intended. A sum of £1200 has already been spent on the new machinery. A tunnel is being put into the western side of the hill, in order to get plenty of quartz for the stampers.

March 1865. Eaglehawk Subdivision [G W Hart]. The Eagle and the Catherine Reef United Companies are taking advantage of their forced idleness to make additions to their machinery.

April 1865: Catherine Reef United Claimholders - The new and extensive machinery erecting for this company is rapidly nearing completion. The stamps will be self feeding, although provision will be made in connection with the old batteries, which have been re-erected to allow hand feeding in event of those batteries being employed on public crushing. The tunnel going into the hill is nearly complete, and has an iron tramway laid down its entire length. The stamp house is very roomy, and well boarded throughout, so that it may be washed down daily.

May 1865: Progress - The very extensive alterations and additions to the plant of this company have been completed, and the starting of the new works - was made the occasion for a public opening. The works of the Catherine Reef United Company are the most extensive in the colony on that side of Clunes

Plant - New engine 24-inch cylinder, 4-feet stroke; winding and pumping engine, 18-inch cylinder, 3-foot stroke; two boilers, 25 feet by 6 feet. It is proposed to erect a third boiler.

Stamps - The four original batteries of 6 heads, each have been overhauled - diameter of head, 9 inches; weight of stamps, 4-1/2cwt; fall, 10 inches. The four new batteries, of 5 heads each - diameter of head, 10 inches; weight 8cwt; fall 9 inches.

Amalgamation - Blanket tables, 22 feet in length; ripple tables, 7 feet - 29 feet altogether; 3 wells and 2 ripples; false bottoms in stamper beds. Size of driving wheel, 9 feet 6 inches, and pinion, 8 feet 6 inches - about 5 tons altogether. The castings, founded by Messrs Irving, Espie and Co. give every satisfaction. The stamp house is 113 feet long, 54 feet wide, with 27 feet walls; double roof, 26 feet and 28 feet span; the floor in front of the stamps is a boarded one, with water and hose laid on.

Surface Pumps - For 11-inch plunger pumps, 3 feet stroke; two of them are used for water and two for tailings. The water tank is 20 feet long, fixed on top of horses 18 feet from ground to supply machinery, etc. The tailings are lifted to a height of 40 feet and conveyed about 500 feet to dam. The water is conveyed by level from dam into pump-well outside, in front of the stamp house.

Mine - The tunnel, in 300 feet, the miners having just commenced to open cut. It will be connected with the stamp-passes by tramway. The height of the tunnel is 7 feet, to admit horse being used. The greater part of the crushing stuff is being got at present from the open cutting.

A double line of rails has been laid from the brace to the extreme end of the battery. The logs have been laid and the house prepared, ready for two other batteries of 5 heads each, which will make up the full complement of 54 heads.

June 1865: Catherine Reef United Claimholders Company

Director's report - The object of the meeting was to consider an offer made by the South Star Company to dispose of their ground for 3000 of the reserved shares.

The cutting is now being worked north of the course of stone first wrought, and south on the eastern run. The carting of the crushing stuff to the machine is now done away with, the whole being raised through the main shaft. Both faces will now be worked from the lower stope. The tunnel has been driven through the eastern spurs, and men are now engaged laying the permanent tramway from it to the stamps.

Sept 1865. Eaglehawk Subdivision. [G W Hart]. The United Claimholders Company on the Catherine Reef - has again come onto payable quartz

Sept 1865: The machinery in connection with the winding machinery shaft has all been repaired ... The two new batteries will be in all probability be completed within a fortnight.

Sept 1865: A permanent tramway has been laid from the tunnel to the stamps, so that all the broken stuff from this ground can be filled into the trucks and taken direct to the stamps by horse-power, thus effecting a great saving in the cost.

Messrs Gripe and Co.'s tender to supply and erect the ironwork of ten additional stamps for £400 9s 6d was accepted, the company supplying and fixing the ripples and blanket tables, and self feeding shoots. The foundations and the horses, it will be remembered, were put up, and the house room provided, when the other twenty stamps were erected.

Oct 1865: Mine force and wages - Seventy men in all, 49 miners, 12 at mill, and 9 on general.

1865-late 1860s: Despite the Whipstick rushes, slightly more than 60 per cent. of the gold produced by the Bendigo Field in the late sixties was derived from quartz mining. But for indifferent management and often quite inefficient organization, probably the percentage would have been higher. However, No single factor so retarded the growth of quartz mining as the inadequate size of claims and the general reluctance of claim-holders to consider amalgamation, although by the mid sixties there were signs of change.

Capital began trickling back into the Sandhurst mines and attention was being given to finding and opening up new reefs. New mining companies made their appearance and old-established companies, such as the Catherine and Latham and Watson's were installing new and more adequate machinery. In April 1865 Koch installed a 50hp engine and battery of 44 stampers.

Dec 1866: Catherine Reef United Claimholders:

It is impossible to regard the progress of the large quartz mining companies of the colony - such, for example, as the Catherine Reef United - without being impressed with the great change for the better which has been gradually creeping over the older goldfields. It is unnecessary to harp again upon the exploded idea that reefs would only be found to pay near the surface, for that fallacy has been already sufficiently exposed. It still remained to be proved, however, whether large associated companies having extensive areas of ground could be worked to advantage. The solitary instance of the Clunes mine, with its well-defined lodes, might be regarded only as an exception to a rule, and in that way would prove nothing, being exceptional ... We have said it is till remained to be proved whether quartz mining companies could be worked successfully in Victoria on an extensive scale for any length of time. The Catherine Reef United Claimholders Gold Mining Company was perhaps the first undertaking of the kind to take the matter fairly in hand.

Workings - The total length of levels and crosscuts measures nearly two miles.

Machinery - The crushing plant is the most extensive in Bendigo

This undertaking is one of the most enterprising quartz mining companies in Victoria.

June 1867. Sandhurst Division. [N G Stephens]: The Catherine Reef Company are down 440feet; the Comet Company, on the Redan, 450 feet; the Johnson's Reef Gold Mining Company, 475 feet, all with good prospects. The North Johnson's Reef Company struck a new and promising reef, at a depth of 270 feet.

September 1868: Sandhurst Division - The Catherine Reef Company have recently cut a great quantity of water at the 416 feet level. The influx of water is looked upon as a favorable indication of the proximity of large bodies of quartz.

June 1870: Scarcely a day has passed without the discovery of good stone in some claim, and the share market has been in a continual state of excitement, which it is feared will occasion too much speculation.

At Eaglehawk there is a considerable improvement. The South Catherine Company are exhibiting a magnificent lot of specimens; and the Golden Pyke Company, on the Comet Reef, have, during the past week, obtained 58 ozs of loose gold from two nail cans of rubble.

March 1875: South Catherine Reef, St Mungo Reef - 18hp winding engine erected.

June 1875. Sandhurst Division [N G Stephens]. Deep sinking in the quartz mines have received considerable attention and the results are very encouraging ... the richest quartz and pyrites have come from the Catherine and St. Mungo Reefs at Eaglehawk, but the Pandora Co., on the Garden Gully Reef, have a very large body of stone averaging nearly 1 1/2ozs. to ton.

June 1877: Sandhurst Division [N G Stephens]. The Catherine Reef U. Company also found rich stone at their 740-foot level.

June 1883: Eaglehawk Subdivision (F.R. Ellis) - The prospects in the Catherine United Company's mine have considerably improved.

September 1883: Eaglehawk Subdivision (FR Ellis) - The St Mungo Company are using the electric light, and the Catherine Company are making arrangements for lighting up their crushing plant by the same means.

September 1884: North Sandhurst Division (FR Ellis) - The Catherine Reef United Company are sinking their main shaft, which is now down 1,027 feet from surface.

March 1885: Eaglehawk Division - Catherine Reef Company - water heavy, 47 men employed.

May 1887: Sandhurst Division - Catherine United have been crushing somewhat extensively from several levels

1892: Cyanide and tailings. [to the editor of the Advertiser] Dear Sir, I read the letter in your issue of the 12th on the above subject with interest, as it is one in which I have been concerned since 1892. In that year I induced three gentlemen to inspect the tailings heaps in Bendigo, and as a practical earnest of their desire to do business, sample of the tailings from the Fortuna and old heaps adjacent, Catherine, Clark'e, and Virginia (old and new heaps) were sent to Swansea, and New York for assay. The results therefrom were fairly good, ranging from 1 1/2 to 3 1/2dwts per ton, and this led to the despatch of of several tons a few months later. Afterwards, in 1893, I consigned six tons to Melbourne, but the practical results from both lots were unsatisfactory, though it did not close the experiment for another larger parcel was treated with no better encouragement, and even after that a series of bores were put through the larger heaps at all angles from top to bottom to obtain a fair average sample without, unfortunately, results good enough to justify the erection of plant. Apart from the poorness of the tailings, however, there is another drawback, viz. the difficulty of storage, as it was a condition insisted on by the companies that the debris should be removed from the existing area. With the exception of the Fortuna heap, there is no convenient spot where the tailings may restacked, and there is an endless view of litigation for any company taking this matter in hand. Mr Denovan's suggestion that the alluvial gullies may be profitably treated is, I think, impracticable. The material, from its clayey nature, sets so compactly that the cyanide solution could not take effect quickly enough, and loss of time in treatment of poor stuff means diminution of profits, as these are dependent on large quantities being dealt with in a short time. The one place I know of about in Bendigo, where cyanide might be profitably employed, is the Slate Reef. There the gold is so fine and the material so easily crushed that a large quantities could be dealt with, as is done in Africa, where the gold is much the same character. It will never pay as at present worked, if from no other cause than from want of large quantities of clear water. The water must become thick and carry off much of the very fine gold, and I think this view is borne out by recent crushings. When treated at Eaglehawk the yields were 7dwt per ton, now they are about 3dwts, and the directors would do well to have the tailings assayed after passing the plates. Assays, rightly enough, are not believed in in Bendigo, but the Slate Reef is so different from anything else in the district that they are warranted, and inedited, necessary. The cyanide process commonly in use at the African mines provide for zinc shavings and plates, whereon the gold is deposited after having been in the solution. At Tarnugulla charcoal is employed instead, and I understand the methos is otherwise slightly different and known only to those working it. Tarnagulla was chosen in preference to Bendigo, after all the experiments that I have named, which were carried out by the same people, and who were perfectly satisfied with the royalty to be paid. The two difficulies were the low grade material and the difficulty of storage. I hope I have not trespassed too freely on your valuable space; the subject is one of importance to Bendigo, and public corresspondence is a means to its solution - Yours etc. Cyanide.

1897, Annual Report: list of mines from which ore has been treated and dividends paid during 1897, some of the smaller companies have been omitted :-

Great Souther; Victoria Quartz; New Red, White and Blue; St. Mungo; New Chum Railway; Koch's Pioneer; United Hustler's and Redan; Catherine Reef; New Prince of Wales; New Argus; Windmill Hill; Ironbark; South New Moon; South St. Mungo; Stewart's United; Lady Barkly; Virginia Tribute; Great Comet; Slate Reef; Stewart's Extended.-

June 1899: Catherine Reef United - possesses a battery of 64 stampers. The company's record is - gold won, 158,304ozs, dividends £71,410, calls £87,880 Ground first worked in the early fifties.

1912, June 10. Bendigo's rich goldfield. The present prosperous condition of the gold mining industry in this district is a thorough vindication of the 'shallow ground' policy, so consistently advocated by this journal for years past. In most every, if not every, gold mining area in the world the experience is that as considerable depths are attained, the gold is scarcer. Bendigo investors and speculators know from bitter experience [this fact] No doubt some reefs in the deep ground will pay to work with adequate appliances and good and economical management, but science and invention apparently have not progressed yet far enough to enable the mines generally in this district, to explore the unknown depths with reasonable costs, and under conditions which will not injuriously affect the health of the miners. As there is, however, an almost unlimited area of shallow ground, only partly prospected or wholly neglected on this field, the work of exploring the deep ground may be very well left to a future generation, which with improved appliances will be better able to undertake the work. The sound and not difficult policy of systematically exploring the shallow ground is thus before us today.

It is interesting to note the levels from which the most prominent mines at present are procurring their gold. The United Hustler's and Redan Co. is operating at 365 feet, the Central Red, White and Blue at 318 feet, the Golden Pyke at 447 feet, the New Price of Wales at 690 feet, the Johnson's, on the Derby line, at 1150 feet, the Ironbark at 480 feet, the Catherine Reef United at 2300 feet, and the South New Moon at from 580 feet to 1140 feet. It will

be noticed that most of these prosperous mines are obtaining their good results from comparatively shallow levels, and the best stone, namely, that from the United Hustler's and Redan mine, is coming from the shallowest zone of all. Furthermore, the companies named are winning their gold on six distinct lines of reef, on some of which comparatively little work has been done.

1905: Catherine Reef United - The new Battery. The old mill, which has done service since the early sixties, has been replaced by a 30-head battery of modern design. The management, alive with the importance of economising in working and treatment, has made substantial improvements in the surface equipment. Since the discovery of the massive reef in 1905 the company has erected a powerful winding plant and a set of poppet legs. Last year a fine air compressor service was erected at a cost of £2500, and now a splendid mill, equipped with the latest appliances, has been installed. The cost of the battery will be about £7500 .

14 Jan 1910: Some idea of the resourcefulness of the massive formation discovered in 1905 at 2200ft - operated on since then almost continuously. Altogether the company has milled 97,281 tons/36,568oz/7-1/2dwt per ton/Dividend £46,448. As a result the company has liquidated a big overdraft, and in the past 5 years upwards of £10,000 has been expended in machinery plant.

1911: Catherine Reef United - a fine air compressor service was erected at a cost of £2500.

1912, 17 July: Catherine Reef United - The new Battery. The old mill, which has done service since the early sixties, has been replaced by a 30-head battery of modern design. The cost of the battery will be about £7500 - since the discovery in early March 1905 - the company milled 168,342 tons for a gold yield of 57,533ozs., averaging a fraction over 6dwt. per ton.

Erected on the northern slope of Snob's Hill the mill of 30 heads occupies a commanding position. The stamps are 1250lb. weight, and the mill has a capacity of 900 tons per week. There is 72 cubic feet of copper plate surface provided for each box, and Phoenix-Weir concentrating tables are installed for each set of stamps. An innovation in Bendigo is the introduction of woven steel screenings, which are to serve the purpose of the punched gratings manufactured locally. The woven screenings are 350 holes to the square inch, and they have been used extensively in Western Australia and South Africa.

The ore is first passed through rock breakers, and after going through the grading process, is transmitted by conveyor belts to the ore bins, and is automatically fed into the boxes. The tailings are raised by a triple plunger pump to a height of 56 feet, and pass over blanket tables before being finally deposited on the sand dump.

The power is supplied by a Corliss compound tandem engine, with surface condenser. The engine and battery was purchased from the New Yorkshire Company, Tarnagulla. It is practically a new plant having done very little work before its removal.

The company will cater for public crushing. A specially constructed ore bin is being provided, and the material is to be raised by elevator belt for transmission to the mill.

1917: Eaglehawk District - No development of general benefit to the field has taken place. Gold yields have been small, and, together with the high cost of mining material, have, in some instances, mitigated against the general animated mining activity common to this district.

Most of the mining companies in the Eaglehawk portion of the Bendigo mining district amalgamated their interests, and now carry on under the title of the Bendigo Amalgamated Gold-fields Company. Greater economy in management is anticipated.

The work carried on by the company in the shafts on the several lines of reef is as follows:-

Garden Gully Line of Reef - At the Koch's shaft, Windmill Hill shaft, Johnson's No. 2 shaft, Golden Age shaft.

Pyke and Moon Lines of Reef - Constellation shaft, Great Northern shaft, Virginia shaft, Specimen shaft, New Argus shaft. Clarence and North Argus shafts - Work suspended.

New Chum Line of Reef - Catherine shaft

Derby Line of Reef - Johnson's No. 3 shaft

Paddy's Gully Line of Reef - Clark shaft: It is the intention of the company to sink the shaft and do prospecting work.

South New Moon and North New Moon

1918, 3 June: Amalgamated Goldfields Policy - The Bendigo Amalgamated Goldfields Company on Saturday made available [a] statement dealing with its policy.

It is proposed to maintain sufficient mills to treat approximately 8500 tons per fortnight. These mills are the Virginia, Johnson's No. 2, Nelson, Koch's Pioneer, Carlisle, Consols and Garden Gully. It is possible that the Catherine mill may be used to replace one or other of these. The Virginia mill is now equipped with very efficient steam power, and the Koch's mill with suction gas. For the remainder, suction gas plants with good producers

have been purchased, and these are being installed together with the replacement of the old geared drives by belt drives. The Carlisle mill is now undergoing this reconstruction.

1918, 2 Aug. Mining Questions. The opinion having been expressed that if the Snob's Hill group of mines could be re-opened much gold would be won. Messrs Dyason and ? of the Bendigo Amalgamated goldfields, waited on the Eaglehawk Council last evening in order to make a statement in regard to their activities and policy in that area. Regarding the winding plants at the mines, Mr Dyason said the compressor and mill at the Catherine mine would be of use in Eaglehawk. With regard to the mill, the present proposals are to shift it to amore central position somewaht south of the Constellation mine, nut the proposals could not be carried out at present owing to the machine shop going full time. Mr Dyason, explained that the opening of the Koch's Pioneer air station would take place shortly. It was far the largest present air station yet erected in Victoria, and capable of supplying a very large number of drills. It was proposed to shift the Catherine air station to the Virginia air station. They would be prepared to supply air to any purchasers that might come along at the running cost, plus 15% for running charges.

1919, 30 January: Bendigo A1 Company - The New Moon shaft will be deepened 200 ft to intersect the Clarence reef. The plant at the Collmann and Tacchi and the poppet heads at the N. Catherine mines will be removed and re-erected at the Neangar shaft (Derby line), which will be sunk a further 200 ft. The N. Argus shaft will be reopened. The amount of expenditure at the different properties were:- New Moon, £2808/2/; Clark shaft (Paddy's Gully line), £1259/19/4; Neangar shaft (Derby line), £717/17/8; N. Argus, £98/4/6.

22 June 1925: - Completed removal of the battery material from the Catherine Reef mine and good progress is being made with the erection of the same on our mine.

1936: Catherine Reef United - This company worked from two shafts - a main shaft to 2,316 feet, and a south shaft sunk to 1,000 feet. In the main shaft a reef between 2,200 feet and 2,300 feet gave 56,521 oz. of gold, and in the south shaft auriferous west dipping spurs were worked to 355 feet, and at 520 feet a run of spurs gave over 1oz. per ton. The gold estimated to have been obtained until 1861 by private parties totalled 120,000 oz., while this company obtained 245,260 oz., and paid £136,579 in dividends.

1936 (Summary): Cyanide Yield - Further Increase - One of the most valuable adjuncts to the mining industry on this field is the cyaniding treatment plants, which this year produced close on 10,000 oz of gold and gave employment to about 300 men. It is only in the past three years that this industry has boomed, and on present results it is apparent that there remains several years of work for many parties. Little cyaniding treatment of battery tailings was undertaken in years gone by owing to the low price ruling for gold, but at present values the small gold content, which varies on this field from 8 grs to 18grs gives a good profit, but the organisation behind the plant must be most exacting. Only two companies are operating the dumps in a big way, namely Devonshire Sands (Bendigo) Ltd and New Red White and Blue Consolidated Company. The first named company which is an Adelaide-capitalised venture, paid £3700 in dividends last year, and followed this with the payment of £1826 to shareholders. This company treated 94,286 tons for a return of 2562 oz of gold, while New Blue Consolidated treated 44,950 tons for 825-1/2 oz of gold. The latter company has only been in operation a year and recent returns show a considerable increase. In addition to the two main companies there are about 18 private parties treating sands on various parts of the field.

The following table, supplied by the Mines Department, Bendigo, shows the amount of gold won for the year ending December 16, 1936.

:Ozs:dwts

Anderson and Party, Abe Lincoln: 125: 0

W. Bussey, Victoria Heap: 420: 0

W. Bussey, Ironbark Heap: 480: 0

Devonshire Sands -

Devonshire, 10,308 tons: 249: 0

Johnson No. 3, 16,550 tons: 448: 12

Johnsons No. 1, 9348 tons: 251: 0

Kochs, 58,080 tons: 1583: 9

Slag: 30: 0

Deeble and Party : 245: 0

Hamley and Harris, Garden Gully United: 325: 0

J. Stanley, G.G. Heap: 94: 0

J. Stanley, Hibernia: 189: 10

Mr May, New Chum Railway: 100: 0

*New Red, White and Blue Big Blue Heap: 825: 11
Mr O'Halloran, Catherine: 512: 10
Mr O'Halloran, New Moon and Virginia: 1000: 0
Ruedin and Party, Lansell's 222: 305: 0
Ruedin and Party, Hustlers' Reef: 364: 0
Valli and Party, Shenandoah: 100: 0
Woods and Lawrence, Hustler's Cons: 300: 0
C. & M. Woods, Great Extended Hustler: 430: 0
W. Wood and Sons, Great Extended Hustler: 540: 0
Total: 9037: 15

*-Note New Red White and Blue treated 44,950 tons of tailings

1937? summary [Bendigo advertiser ?/?/1937] Cyaniding production. Returns doubled during the year. Many thousands of tons of battery tailings were treated by cyanide parties during the year, and this important branch of the mining industry has become one of the stable influences for the gold production of the field. For these these heaps dotted around Bendigo had been considered worthless, but with the increase in the price of gold they immediately became areas of wealth, and the present activity is the greatest that has ever occurred in cyaniding in Victoria. There are now nearly 30 plants in operation on the field, and even at the present rate of treatment there is ample sand available for a few years more work. Attention has been directed principally to the older dumps raised by batteries which were not so efficient as the stamp mills of a later day. This new industry has been of great assistance in relieving unemployment, as each plant requires a fair staffing. Many of the parties who entered into the treatment of the heaps had little previous experience, but they have profited by their work, and the results being obtained today are satisfactory.

Devonshire Sands (Bendigo Ltd) is the only cyaniding company tackling the heap treatment in a big way, and the results during the past year speak for themselves. The company treated 100,498 tons for a return of 3253oz. This company, financed largely by Adelaide investors, have been operating for more than two years, and this was its most successful year. The company has paid two 3d dividends, absorbing £3700. Biggest production was obtained from Koch's Pioneer heap which treated 58,138 tons for 1927oz. The Johnsons plant treated 23,050 tons for a return of 721oz, while at the Devonshire plant 19,310 tons were treated for 603oz.

The profitable returns being obtained by private parties induced the New Blue Consolidated Company to install a plant on its own dumps, capable of treating 1000 tons per week. O'Halloran Brothers, who have commenced cyaniding at the New Moon dump about four years ago, were the first to realise the value of the heaps and their returns from the same dump continue to be profitable. The party is now operating the Moon dump and Clarke's dump, and last year recovered 840oz. The Great Extended Hustler's dump is returning splendid returns to the members of the Woods family, who have considerably increased their plant in the last 18 months. Following table shows principal heaps - Devonshire Sands Ltd; Deeble and party (Rae's dump); F. Goldsmith (Virginia dump); Hibernia dump; H. May (New Chum Railway); O'Halloran & party (New Moon); O'Halloran and Hicks (Catherine); Ruedin & Timewell (Hustler's and Redaan); J. Stanley (G.G. heap); W. Bussey (Victoria Consol); W. Woods (Great Extended Hustler's); C & M Woods: Woods and party (Hustlers Reef); A. Andersen and Kennedy (Abe Lincoln); New Red White and Blue.

This place/object may be included in the Victorian Heritage Register pursuant to the Heritage Act 2017. Check the Victorian Heritage Database, selecting 'Heritage Victoria' as the place source.

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