VICTORIAN GOLDFIELDS PROJECT

HISTORIC GOLD MINING SITES IN GIPPSLAND MINING DISTRICT

GAZETTEER: STATE & REGIONAL SIGNIFICANT SITES

Department Of Natural Resources & Environment

February 1998

PLACE NO. & NAME:	**55.0 JIRNKEE WATER RACE**
	Swifts Creek goldfield
HI No.	***H8423-0005***

LOCATION:	Wentworth River to Tongio West (partially within Cassilis Historic Area)
MUNICIPALITY:	East Gippsland Shire Council
LAND USE/STATUS:	Combination of freehold and Crown land (including Cassilis Historic Area)

EXISTING HERITAGE LISTING: Reported to National Estate—not yet listed.

SITE HISTORY:

Chinese miners opened up alluvial ground in Long Gully and its tributaries during the 1860s. By the mid-1880s, quartz reefing was on the ascendant and few alluvial miners remained in the locality. Prospecting activity in 1890-91 showed promise and led to new interest in the Long Gully alluvial. Between 1892-6, the Working Miners Co. (a group of six men) drove an adit some 1,000 ft in length and produced about 800 oz of gold.

In 1896, the Working Miners put forward a proposal to sluice the whole length of the Long Gully alluvial ground, with water supplied by a water race from the Wentworth River. A race of 26 miles (42 km) extent and costing £2,000 was originally envisaged. Two years later, the Jirnkee Hydraulic Sluicing GMC was formed in London, with a capital of £40,000. By the end of 1898, the company had mining leases totalling 185 acres, extending about 6 km from the Warden battery at Cassilis, downstream to Chinaman's Crossing, about 1½ miles below Tongio West.

The water race was constructed in 1899-1900, with an eventual length of 48 miles (77 km), costing approximately £14,000. It commenced at the head of Wentworth River, picked up water from New Rush Creek, crossed the dividing range twice, then came down Waterfall Gully just below Cassilis Gap to terminate just above Tongio West, on the western side of Gray's Creek.

Trial sluicing operations commenced at Tongio West in 1900, initially using a gravel pump, then a jet elevator. Both types of plant had trouble dealing with the presence of large obstacles (boulders and timbers). To make matters worse, the water supply was insufficient due to collapses in the banks of the water race. Repairs were made, and production began in September 1901. Soon after, the manager of the Jirnkee Co., Jonathan Lang, died after being struck by a jet of water from the hydraulic nozzle.

In 1902, the Jirnkee water race was extended to over 56 miles (90 km) in length, when a branch was cut to pick up additional water from the heads of the Wentworth. But the race continued to supply insufficient water to operate the plant at more than half its capacity. After the company's enormous initial outlay, running costs continued to far outstrip gold production. When operations ceased at the end of 1905, after four years' operation, the total yield stood at just over 750 oz of gold.

The leases, race, and plant were purchased for a small price by the Jirnkee Hydraulic Syndicate in 1907. Trials were carried out with and without the jet elevator used by the previous company, and it was found that conventional hydraulic sluicing yielded more than twice the gold won with the jet elevator. Even so, the gold obtained failed to pay running costs, and operations ceased for good at the end of 1909.

DESCRIPTION & INTERPRETATION OF FEATURES:

Intact sections of the Jirnkee water race now survive mainly on Crown land where the race runs around the heads of gullies. Sections on the lower reaches of the gullies and spurs—now grazed freehold land—have largely been ploughed in. Where still visible, the race is partially filled with silt, vegetation, and forest debris.

CONDITION OF FEATURES:	Intact sections of water race are mainly to be found at the heads of gullies on public land. Sections of the water race on freehold land have been eroded/destroyed by grazing and ploughing

CULTURAL SIGNIFICANCE:

The site has:

Historical significance—The Jirnkee Water Race is historically significant as a characteristic and well-preserved 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, with its intensive use of machinery, played an important role in the development of Victorian manufacturing industry. The Jirnkee Water Race was one of the longest privately owned water race constructed in Victoria.

SIGNIFICANCE RANKING: Site listed on Heritage Inventory

Assessed by: David Bannear *Date:* May 1995

PLACE NO. & NAME:	**56.0 WARDEN BATTERY & TREATMENT WORKS SITE**
	Swifts Creek goldfield
HI No.	***H8423-0006***

LOCATION:	On bank of Gray's Creek
MUNICIPALITY:	East Gippsland Shire Council
LAND USE/STATUS:	Cassilis Historic Area

EXISTING HERITAGE LISTING: Cassilis Historic Area

SITE HISTORY:

The Warden battery began its working life as the Hope battery, erected by the Rose of Australia Syndicate in 1889, when the Cassilis quartz reefs were first coming to life. In 1893, it was purchased by McCulloch and Eckberg, who operated it on the same site as a public treatment works, adding a chlorination plant. In 1894, the plant consisted of a 10-head battery, hydraulic separator, Frue vanners, and a large settling pit, and was described as "the best fitted plant to treat the sulphide ores ... and will probably shortly be furnished also with the necessary furnaces, apparatus, &c., to work them on metallurgical principles". A Cyanogen (cyanidation) plant was added soon after, to treat tailings from the settling pit.

As a public treatment works, the battery and plant were instrumental reviving the Cassilis reefs, many of which had been idle since 1890, when miners found it difficult to retrieve gold from the complex ore. Prospectors were able to prove the value of abandoned claims, by having ore tested at McCulloch and Eckberg's up-to-date works.

In 1896, the Warden GMC purchased the plant, which by then consisted of battery with boiler and steam engine, two Wilfley tables, five Frue & Triumph vanners, two Watson & Denny grinding pans, chlorination plant, 160-ton capacity cyanide plant, and 38 x 10 ft open-hearth roasting furnace with flue and chimney stack. The Warden Co. added an Otis rotary mill (ex Mt Hepburn Co.) and fitted their battery and mine with electric light.

The Warden mine was located on Mt Markey, about 1 mile east of Cassilis, with the battery at the mouth of a gully which headed on the opposite side of the ridge. Ore was sleighed uphill from the mine, then tipped down a chute to the head of the gully, and finally carted by drays to battery. The Warden battery crushed and treated ore for most mines on the Markey line of reef during the 1890s-1900s, and their treatment process consistently achieved a higher average yield than the far more expensive plants associated with the Mt Hepburn mine. The Warden mine was one of the main mines at Cassilis until 1905, after which it was tried with less success until 1913.

References: Department of Mines Annual Reports, 1903-8.
Fairweather (2), pp. 40, 79, 94-5, 103.
Rosales

DESCRIPTION & INTERPRETATION OF FEATURES:

Features of the Warden battery and treatment works site include the remains of a battery, cyanide vats, slum pond, furnace, and calcined sand heap.

Battery site—Partly collapsed timber uprights and framework for 10-head of stamps. The stampers and other machinery have been removed from the site. Only one set of mortar blocks survives.

Cyanide works—Near the battery are two uprooted and one *in situ* 16ft-diameter galvanised iron cyanide vats with concrete bases, and two full slum ponds. Above the battery, on the top side of the road, are several circular impressions containing jumbles of circular iron rings. These are the remains of decayed or burnt oregon cyanide vats.

Furnace—To the east of the cyanide vats is the stone base of a roasting furnace and an extensive scatter of red bricks. The furnace base measures 40 ft x 10 ft and is partly surrounded by a small pond of burnt (calcined) sand. Most of the furnace's brickwork has been demolished, but some *in situ* ironwork remains at the front end of the furnace.

Calcined sand—Apart from the slum pond near the furnace, there is a small, peaked dump of burnt sand above the road.

INTEGRITY/CONDITION: Machinery has been removed; only foundations and some fragile relics (battery framework and cyanide vats) remain.

CULTURAL SIGNIFICANCE:
The site has:

Scientific significance—The site contains a range of relics that document the gold mining operations that were undertaken on the site.

Archaeological significance—The site is archaeologically important for its potential to yield artefacts and evidence which will be able to provide significant information about the technological history of mining.

SIGNIFICANCE RANKING: Site listed on Heritage Inventory

Assessed by: David Bannear *Date:* May 1995

PLACE NO. & NAME: **57.0 MT HEPBURN CO. TREATMENT WORKS**
Swifts Creek (Cassilis) goldfield
HI No. ***H8423-0007***

LOCATION: Cassilis
MUNICIPALITY: East Gippsland Shire Council
LAND USE/STATUS: Cassilis Historic Area (3,620 ha)

EXISTING HERITAGE LISTING: Cassilis Historic Area

SITE HISTORY:

In 1858, William Power made the first reef discovery in Gippsland near the junction of Power's Gully and Swifts Creek. His claim, named the Morning Light, formed part of the later Mt Hepburn–King Cassilis leases.

The reefs in the vicinity of the later Mt Hepburn leases were first opened up in the late 1860s. A battery operated briefly, but was removed when the mines were abandoned in about 1870. The difficulty of retrieving gold from the complex, pyritic ore of the district was doubtless to blame for that early exodus.

Mining entrepreneurs Ball and Smart took out leases on the Mt Hepburn ground in 1888, and initially crushed stone from their mine at their Brave George battery at Swift's Creek. After the death of Smart in 1889, Ball continued the development of the mine. In 1893, his Mt Hepburn Co. installed an Otis ball mill (one of the first in Victoria) and short blanket tables, driven by 16-hp portable steam engine. The plant cost relatively little to run, but its lack of concentrating plant caused a substantial loss of gold in the tailings and operations were halted at the end of 1895. At that time, the Government Geologist, R.A.F. Murray, visited the mine and hailed it as the most remarkable on the field—at least, in terms of its *potential* yields. But he lamented that the company's inadequate treatment plant allowed at least half the gold to escape with the tailings.

In 1896, an English company, the Mt Hepburn Co. Ltd, was formed to take over the leases. The Otis mill was replaced by a traditional stamp battery made by Thompsons of Castlemaine. A 60-head battery was originally ordered, but was deemed excessive and only 20 heads were eventually delivered. A 90-horsepower boiler, intended to drive the 60-head battery, was also delivered but was never used. Also superfluous was a 60-ft high brick chimney stack, built on the hillside near the battery to serve the large boiler. Other works developed at this time included a water race from Upper Swifts Creek, water storage, and a new tramway from the Beehive level of the mine.

In 1897, the Mt Hepburn Co. contracted with the General Exploration Co. (GEC) that the GEC could treat all its tailings. In return, the GEC agreed to build a cyanide treatment plant and pay the Mt Hepburn Co. a royalty on gold retrieved. In 1898, GEC constructed a large cyanide plant, costing £7,000 and said to be one of the best in Australia at that time.

In September 1898, after just three months' continuous crushing with their new battery, the Mt Hepburn Co. ceased operations, due to negligible gold returns. The stamp battery had achieved poorer returns than the old Otis mill: only 207 oz from 2,893 tons of ore. Summarising the performance of the Mt Hepburn Co. Ltd., Griffiths (1978) wrote that it "was floated on the premise of huge ore reserves and simple metallurgy, neither of which were investigated properly at the time, and both of which were quickly found to be incorrect". Shareholders lost some £180,000. The crushing plant was sold to the Cassilis GMC in 1900.

The GEC's cyaniding plant had commenced work in mid-1898. It was soon found that the plant's operational capacity was only 720 tons per month, rather than the 3,000 tons anticipated. The complexities of the local ore resulted in low gold recovery, demanded a large consumption of lime, and lengthened the cyaniding process. Proving unprofitable, operations ceased in early 1900, and the cyanide plant was sold to the Allsop brothers (its former managers). At the same time, they acquired outbuildings, chimney stack, engine bases, and other structures from the defunct Mt Hepburn Co.

The Allsops constructed an integrated treatment works on the Mt Hepburn site. Recognising the need to treat the pyritic Cassilis ores in a furnace prior to cyanidation, they installed a large de-sulphurising roasting furnace, complete with condensing chamber and 360ft-long ground flue connected to the unused 60-ft chimney. The furnace occupied the GEC's former extraction house, between the southerly group of vat bases and the creek. It was one of the largest ore-roasting furnaces in Victoria, measuring 50 ft long and 10 ft high. In July 1901, J.L. Allsop, manager of the plant, died, aged just 34, as a result of inhaling the poisonous gases generated by the cyanide process.

The Allsops' plant treated tailings from local mines and from as far away as Sunnyside and Glen Wills. In fact, in 1901 most of the plant was moved to Sunnyside, to treat the huge volume of tailings on-site. Between 1900-03, it is estimated that the plant at Mt Hepburn treated 2,500 tons of concentrates and tailings for a yield of about 5,000 oz. The gold recovery process was said to have been nearly 95 per cent effective.

In 1902, the King Cassilis GMC was formed. From 1904, the company rented Allsop's treatment works, gradually modifying the plant to incorporate an economical Merton furnace, Dodge rock breaker, and a Niagara pulveriser (later replaced by a Krupp ball mill). The plant's small size and unsuitability for the hard local ore resulted in poor yields, and the mine closed down in 1906. Since 1888, the Mt Hepburn/King Cassilis mine had yielded 1,852 oz from 4,172 tons of ore.

In 1907, the remaining useful components of Allsop's treatment works were removed to sites at Glen Wills and Sunnyside, and over the ensuing few years operations at Mt Hepburn were confined to the cyaniding of tailings remaining on the site. Some small-scale prospecting and mining took place prior to World War One.

The King Cassilis leases were worked by the National Gold Mining and Milling Co. in the early 1930s. A small plant was installed, consisting of a 5-head battery with two concentrating tables, a small hand-charged reverberatory furnace, and cyanide plant. Only 220 tons of ore were treated, for a yield of 114 oz.

J.D. Avery took up the leases in the late 1940s and erected a small water-jacketed blast furnace, in which he smelted ore for many years.

References: Christie, pp. 43-9.
Department of Mines Annual Reports, 1903-13.
Fairweather (2), pp. 81, 87-8.
Griffiths, pp. 28-31, 121-83.
Murray
Rosales

DESCRIPTION & INTERPRETATION OF FEATURES:

Features of the Mt Hepburn treatment works site include the King Cassilis and other mine workings, and remains of the Mt Hepburn treatment works and Avery's treatment works.

Mine workings and associated features—The gully above the treatment works has three adit levels of the Mt Hepburn/King Cassilis mine: No. 2, King Cassilis and Beehive. The King Cassilis adit has a very large intact mullock heap. Also in the gully are several stone fireplaces, a concrete-lined dam (fed by water race), and an excavated powder magazine with stone-lined entrance.

MT HEPBURN TREATMENT WORKS

Vats and foundations—Three levels of foundations which are largely buried by battery sand and partly obscured by vegetation.

Upper level—Row of four stone vats, each has one internal dividing wall. The vats are 13 ft in diameter, stand 9 ft high and have 2ft-thick walls.

Middle level—200 to 300m-long tramway cutting (6 ft wide) with 2ft-thick stone wall which cuts through six 23ft-diameter vat footings. The tramway runs through a brick archway under the one of the vats. This vat is sealed by a stone floor with the remains of a 12ft-square brick chimney stack base. The tramway cutting continues on from the vat foundations and terminates near Avery's iron blast furnace.

Lower level—At least four 17ft-diameter vat foundations, largely buried by a large full slum pond. Also visible on the slum pond are the stone base of a roasting furnace (40 ft x 10 ft, most brickwork demolished) and another substantial structure with a floor and a row of three small vats. Near the furnace is another largely buried structure (stone footings) and a scatter of furnace ironwork.

These remains represent treatment works operated on the site by a succession of companies: Mt Hepburn Co. Ltd (brick chimney stack, water race—1896-1900); General Exploration Co. (cyanide vats and footings, tramways—1897-1900); Allsop brothers (1900-03); King Cassilis Co. (1904-6).

The stone walls and piers for the General Exploration Co.'s cyanide plant were constructed downhill from the Mt Hepburn battery in late 1897. The contractors brought skilled masons from Melbourne to build the walls of local schist. The vats themselves were made by Bowman and Bow, coopers of

Maldon. Griffiths (p. 155) provides the following description of the GEC works, to which operation most of the structural remains relate.

"Tailings were taken by tramway from their discharge at the battery plates to six collecting vats, each of 60-ton capacity. Each collecting vat was built over a tramway ... After draining in the collecting vats the sands were discharged into trucks underneath which were hauled up an inclined tramway by means of a steam winch, to the top level of the six treatment vats, each of which was 23 foot diameter, 8 foot high and had a capacity of 90 tons. These also had a tramway underneath and after discharge of the sand again by bottom discharge doors, it was transferred by truck to the sand dump and dam".

"Prior to discharge of the treated sand, the solution was run to four storage vats each 13 foot diameter, and thence through intermediate vats prior to its discharge into the electrolytic precipitation boxes which were 40 feet long and 6 feet 4 inches wide".

"In all there were 26 vats, the elevated vats being supported on circular walls or on semi-circular walls and the walls either side of the central discharge tramway".

AVERY'S MINING PLANT

The plant is surrounded by an extensive dump of modern processing equipment.

Crushing shed—Timber-framed, galvanised iron roof. The shed contains a range of plant including a jaw crusher (manufactured by Jacques Bros. Pty Ltd, Richmond, Melbourne), rod mill, diesel engine, and generator.

Furnace—Small iron blast furnace and slag dump. The blast furnace stands on the foundations of the earlier Mt Hepburn treatment works.

Avery's plant was installed in the late 1940s and was used over a long period (until as recently as 1978?).

CONDITION OF FEATURES: Good

CULTURAL SIGNIFICANCE:

The site has:

Historical significance—The Mt Hepburn/King Cassilis site is historically significant as a characteristic and well preserved 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, with its intensive use of machinery, played an important role in the development of Victorian manufacturing industry.

Scientific significance— The Mt Hepburn/King Cassilis site is scientifically significant because it has a large range of relics associated with a great variety of ore reduction and metallurgical treatment methods. It is doubtful if such a varied layout and assembly of basic remains related to complex ore treatment can be seen on any other single site elsewhere in Victoria.

Archaeological potential— The Mt Hepburn/King Cassilis site 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.

SIGNIFICANCE RANKING: Site listed on Heritage Inventory

Assessed by: David Bannear *Date:* May 1995

PLACE NO. & NAME:	**58.0 CASSILIS GMC TREATMENT WORKS** ***Swifts Creek (Cassilis) goldfield***
HI No.	***H8423-0008***

LOCATION:	Cassilis
MUNICIPALITY:	East Gippsland Shire Council
LAND USE/STATUS:	Cassilis Historic Area (3,620 ha)

EXISTING HERITAGE LISTING: Cassilis Historic Area

SITE HISTORY:

Cassilis Reef was discovered in 1890, the most westerly of seven reefs on a high ridge to the west of the Cassilis townships—it eventually became the main lode of the Cassilis GMC mine. Ore from the Cassilis Reef was heavily mineralised (containing no less than six minerals associated with the gold), and became increasingly so at depth, making gold retrieval virtually impossible using ordinary methods. In 1894, a small syndicate installed a five-head battery and small chlorination plant close to their tunnel. The chlorination plant proved inadequate and was replaced by a larger one in 1896, but still the ore proved too refractory.

The Cassilis GMC was formed in 1897, with a capital of £12,000 in 24,000 shares. Extensive exploratory works were carried out—shafts sunk, tunnels driven—and the chlorination plant was further enlarged and improved. Test parcels of the ore (solid arsenical pyrites) yielded 5 oz to the ton. In 1898, the Cassilis Co. purchased the leases of the neighbouring North Cassilis Co. where an incredibly rich reef was soon after opened up—this lode was called the Ceresa. Additional treatment plant was installed in 1899: a Halley table, Berdan pan, a hand-operated reverberatory furnace.

The Cassilis Co. had been having its ore crushed at the Warden battery, but in 1900 the company bought a 20-head battery from the Mt Hepburn Co. and installed it at the foot of the range, in Power's Gully. During 1900-01, further plant was installed at the new site: a Jacques rock-breaker, two Edwards mechanical furnaces, and a new chlorination plant operating on the Munktell process using seven 11-ton leaching vats, seven precipitating vats, and six other accessory vats. A gravity tramline ran between mine and plant. In 1902, a new compressor, additional furnace, new engine, offices, and workshop were added. The large compressor delivered compressed air over two miles uphill to the mine, to power ten rock drills; its engine had a very heavy fly-wheel, to maintain an even speed to ensure constant air pressure at the mine. The company increased the capacity of its dam in Power's Gully to 3 million gallons, and piped the water race from dam to battery. By 1903, the Cassilis Co.'s sprawling plant also included a dynamo to supply electric light, two large Berdan pans, amalgamating barrel, Kelly and Lewis vertical 150-hp engine, two large Cornish boilers (26 ft x 6 ft 6 in), two multi-tubular boilers (14 ft x 5 ft 6 in), and a cyanide plant of five 80-ton vats. Over 200 men were employed in the mine and treatment plant, with another hundred or so employed indirectly in carting, and supplying wood, charcoal, and lime.

Additions to the Cassilis Co. plant continued in 1905, when 130 men were employed and 13,450 tons of ore were treated for a yield of 12,032 oz gold. The gravity tramline between mine and battery was replaced; a Hornsby oil-engine was installed for driving furnaces, conveyors, elevators, machines in shop, dynamo, and blowers (cheaper and more efficient than coke); and a foundry was erected, complete with testing-room and cupola furnace, enabling the company to 'work up all the old iron and steel obtainable in the district, making a great saving in the manufacturing of numerous parts of the plant'. A telephone system was also installed. The company's works were described as "quite a model plant".

The shortage—and consequent high cost—of firewood threatened to undermine the company's "handsome profit", so it was decided to construct a hydro-electric scheme, operating from the Victoria River, to power the mine and treatment plant. The scheme was completed in 1907, and by 1909 all old engines at the Cassilis Co.'s works were replaced with electric motors. But the holding dam for the hydro-electric works was never finished, and the company's operations were crippled by power shortages during the drought years from 1910-14.

In 1909, a new electrically-powered rotary air compressor was added to the Cassilis Co.'s plant, which was hailed as "one of the most extensive and complete in the State". A new plant was installed in 1910 for treatment of the accumulated slimes by the vacuum filter process (replacing the chlorination plant), and the following year a tube mill was erected for re-treating residues from the roasting furnaces by the cyanide process. But output from the mine was falling—largely due to power shortages—and the ore from deeper levels was becoming increasingly difficult to treat. A grant from the Mines Department, enabled the company to prospect still deeper, in search of better ore—to no avail. Actual mining was confined to the Ceresa lode, which grew increasingly thin and poor in quality. By 1916, the Cassilis Co. was defeated and its mine and works closed.

Between 1898-1916, the Cassilis Co.'s workings—by adit and internal shaft—reached a maximum depth of 1,300 ft, and 124,607 tons of ore were treated for a yield of 93,572 oz, valued at £383,645. The Cassilis Co. mine was the largest and most successful on the Cassilis field.

From 1949, ore from the Cassilis mine was treated at Avery's furnace plant at the Mt Hepburn/King Cassilis mine. Mining exploration of the former Cassilis Co. leases has taken place on several occasions since.

References: Cecil & King
Christie, pp. 49-50.
Department of Mines Annual Reports, 1904-16.
Dunn (1907/2)
Fairweather (2), pp. 43-64.

DESCRIPTION & INTERPRETATION OF FEATURES:

CASSILIS GMC TREATMENT WORKS

The treatment works is located on a spur overlooking a gully containing a number of intact (brightly-coloured) slum ponds. The works has four main levels:

Level 1 (uppermost)—This level has the remains of a large loading ramp, which was fed by a tramway that runs around the spur to the mine workings.

Level 2—On this level are the battery foundations and engine beds. The front of a platform is retained by a substantial brick wall.

Battery—At the base of the ramp are a row of decaying mortar blocks, tie bolts and concrete footings for 20 head of stamps.

Battery engine—An arrangement of large concrete mounting beds are located on the side of the loading ramp. Covering 10 m square, they are partly buried and obscured by blackberries.

Level 3—Features on this level include:

Levelled area—25 m x 10 m retained by a substantial brick and stone wall.

Vats—Outlines of a row of five narrow (10 ft x 4 ft) brick and concrete-rendered vats.

Furnace—20ft-high riveted iron furnace. The 6ft-diameter furnace is completely lined with red fire bricks and has a 9 ft high, 3 ft diameter, chimney stack.

Level 4—Gully level.

Unidentified foundations—At the foot of the brick and stone wall associated with Level 3 is a largely buried arrangement of decaying bed-logs and concrete footings.

Furnace bed—At the base [?] of the first slum pond is the remains of a roasting furnace. Most of its brickwork has been demolished; only the stone base is intact, measuring approximately 40 ft x 10 ft. Visible in the face of the first slum pond is a section of the furnace's brick chimney stack, standing 8 ft high. Its flue measures 4 ft wide, with walls [OF FLUE OR STACK?] two courses thick.

Electricity substation—On the opposite side of the gully to the iron furnace on Level 3 are the concrete foundations of a small electricity substation. The foundations are enclosed by thick blackberries.

INTEGRITY/CONDITION: Good

CULTURAL SIGNIFICANCE:

The site has:

Historical significance—The Cassilis GMC Treatment Works is historically significant as a characteristic and well preserved 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, with its intensive use of machinery, played an important role in the development of Victorian manufacturing industry. The Cassilis Gold Mining Company was the largest and most successful mine on the Cassilis field and in the early 1900s had the most extensive treatment plant in Victoria.

Scientific significance— The Cassilis GMC Treatment Works is scientifically significant because it contains a large range of relics documenting the different treatment processes undertaken on the site.

Archaeological potential— The Cassilis GMC Treatment Works 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.

Natural values— The Cassilis GMC Treatment Works is also important for its evocation of the adventurousness, hardship, and isolation that was part of mining life in the high country areas of the State.

Network values— Linked to Site No. 59.0, Victoria Falls Hydro-Electric Power Station. The Cassilis GMC constructed a hydro-electric power station on the Cobungra River, about 6.5 km from its junction with the Victoria River, just below the Victoria Falls.

SIGNIFICANCE RANKING: Site listed on Heritage Inventory

Assessed by: David Bannear *Date:* May 1995

PLACE NO. & NAME: **59.0 VICTORIA FALLS HYDRO-ELECTRIC POWER STATION**
[Connected with] Swifts Creek (Cassilis) goldfield
HI No. ***H8323-0016***

LOCATION: South bank of Cobungra River, about 6.5 km from junction with Victoria River, just below Victoria Falls.
MUNICIPALITY: East Gippsland Shire Council
LAND USE/STATUS: Victoria Falls Historic Reserve (100 ha)

EXISTING HERITAGE LISTING: Victoria Falls Historic Reserve

SITE HISTORY:
In 1907, the Cassilis GMC constructed a hydro-electric power station on the Cobungra River, about 6.5 km from its junction with the Victoria River, just below the Victoria Falls. Water from Victoria River was delivered to the power station by a race built along the spur separating the Cobungra and Victoria Rivers. The race was unlined and measured 3 ft deep, 4 ft wide at the bottom, and 7 ft wide at the top. It filled a settling dam at the top of the spur, from which point water was delivered to the power plant by 1650 ft of piping, which reduced in size from 34 inches to 38 inches diameter. The power station was equipped with a Voith pelton wheel, and began operating in 1908. A power line ran between the power station and the Cassilis mine, a distance of some 27 km.

A holding dam of 250 million-gallon capacity was to have been constructed on the Victoria River, at the commencement of the water race, but this was not done. As a result, an insufficient supply of water caused frequent power shortages and stoppages at the Cassilis mine. The power station's poor performance was largely to blame for the ultimate closure of the Cassilis mine in 1916. Early in that year, a dam was built above the power plant, but the first substantial rains washed it away. The power plant was sold to a Tasmanian silver mine in 1917.

References: Christie, pp. 57-61

DESCRIPTION & INTERPRETATION OF FEATURES:
Features of the Victoria Falls power station site are concrete floor and footings, tower, settling dam, pipeline site, and former water race.

Power station—A concrete floor (48 ft x 32 ft) with mounting beds, etc., for a large pelton wheel, and a concrete tower. The tower (11 ft x 5 ft x 12 ft high) has three cubicles, which housed the choke coils. The largest mounting bed (10 ft x 6 ft, 2 ft high, with 1½ft-thick walls) has a 7ft-deep sump from which runs a 4ft-wide, 3ft-deep culvert which drains to the river. The pelton wheel has been removed from the site.

Settling dam—An oval-shaped dam, measuring approximately 40 m x 25 m, is located at the top of the spur overlooking the power station. The dam has a large concrete outlet station (9 ft x 6 ft, with 1ft-thick walls) which has a 16ft-deep sump.

Pipeline—An overgrown channel running down the spur marks the position of the pipeline, which ran from pressure dam to generating plant.

Water race—The old water race from Victoria River to the power station now forms the road to the Victoria Falls

CONDITION OF FEATURES: Apart from some wild roses are free of vegetation.

CULTURAL SIGNIFICANCE:
The site has:

Historical significance—The Victoria Falls Power Station site is historically significant as a characteristic and well preserved 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, with its intensive use of machinery, played an important role in the development of Victorian manufacturing industry. The power station was built by the Cassilis Gold Mining Company, the largest and most successful mine to operate on the Cassilis field.

Scientific significance— The Victoria Falls Power Station site is scientifically significant because it is one of the few sites left in Victoria which documents the adoption of electric power for gold mining. The remains of power stations associated with gold mining sites are rare in Victoria. The foundations of the Victoria Falls Power Station in Gippsland, alongside those of the Victorian Deep Lead Power Station (at Moolort) are the best preserved in the State.

Archaeological potential— The Victoria Falls Power Station site is archaeologically important for its potential to yield artefacts and evidence which will be able to provide significant information about the technological history of hydro electric power in Victoria.

Natural values— The Victoria Falls Power Station site is also important for its evocation of the adventurousness, hardship, and isolation that was part of mining life in the high country areas of the State.

Network values— Linked to Site No. 58.0, Cassilis Gold Mining Company. The Cassilis GMC constructed the hydro-electric power station on the Cobungra River in 1908.

SIGNIFICANCE RANKING: Site listed on Heritage Inventory

Assessed by: David Bannear *Date:* May 1995

PLACE NO. & NAME:	**60.0 ODELLS GULLY BATTERY**
	Swifts Creek (Cassilis) goldfield
VHR No.	***H1275***
HI No.	***H8423-0009***

LOCATION:	North side of Odells Gully, Upper Swifts Creek
MUNICIPALITY:	East Gippsland Shire Council
LAND USE/STATUS:	Cassilis Historic Area (3,620 ha)

EXISTING HERITAGE LISTING: Cassilis Historic Area

SITE HISTORY:

Odells Gully, a tributary of upper Swifts Creek, between Cassilis and Brookville was named after Jack Odell, who was Mining Registrar for the Omeo Subdivision during the early 1880s. The locality was characterised by small, patchy reefs. Like those at Long Gully (Cassilis) to the north, the Odells Gully reefs were first opened up in about 1888. Operations there probably peaked in the early 1890s, but small parties worked the reefs throughout that decade and into the early twentieth century.

According to Fairweather, a handful of batteries operated in the Odells Gully–Upper Swifts Creek locality between the early 1890s and 1908, but details of their precise locations are sketchy. The Dawson family—of Dawson City, Haunted Stream—were active in the area, and Fairweather mentions a battery erected by them in 1896 at the head of Swifts Creek, which a Dawson descendant claims was once part of the original (1867) Swifts Creek Quartz Crushing Co. battery, at the foot of Charlotte Spur. That was a 15-head plant—probably three boxes of five heads—so the Dawson's battery could conceivably have been one of the five-head components. Also mentioned is a Dawson-owned steam-driven battery on the ridge between the two branches of New Rush Creek, also nearby, in c.1898. It is possible that the two Dawson batteries were actually the same one, shifted from one locality to another. The remains of the battery now standing on the north side of Odells Gully might correspond with the same battery, or components of it, moved again at a later period.

Fairweather also refers to a battery of unspecified size, erected at Hayward's Old Stop mine near the junction of O'Dell's Creek and Swifts Creek in the early 1890s, and later known as Dyson's battery. Frank Cherry erected a battery—said to be four-head, ex-Haunted Stream—at the head of Swifts Creek in 1908, which was most recently used by Martin and son, working the Arizona mine at Brookville, in 1937. Writing in 1975, Fairweather believed that the battery was still standing.

References: Fairweather (2), pp. 202-4.
Flett, p. 176.
Mining Surveyors' Reports (Omeo Subdivision), September 1867.

DESCRIPTION & INTERPRETATION OF FEATURES:

Features of the Odells Gully battery site are a standing 5-head battery, portable engine, and small cyaniding plant.

Portable engine—Double cylinder engine, still standing on its four wheels, but moved about 100 m from its original position. The wheels have wooden spokes and felloes, steel hubs and tyres, and were manufactured by "...[illegible], Gainsborough". The engine is in good condition and still has its wooden cladding and some brass fittings around the piston rod. The cylinder is 10 inches in diameter and 14 inches long, and the total length of the engine is 11 ft.

Battery—5-head, wooden-framed battery, still standing although the cam shaft has dropped slightly. The battery was manufactured by Langlands, Foundry, Melbourne. The fly wheel is 4 ft in diameter. The stems are of the screw-tappet type and the battery box has a wooden splash plate. The steel-lined wooden loading chute has collapsed. Nearby is a small ore truck.

Iron framework—Above the battery is a heap of iron framework, perhaps intended for repairing or upgrading the battery.

Cyanide works—In the gully near the engine is a small tailings dump, one small galvanised iron vat and at least one depression containing iron rings from a collapsed timber (oregon) vat.

The presence of cyaniding vats suggests 20th-century use (or re-use) of the plant—probably as recently as the 1930s. Cherry's 1908 battery, used by Martin and son as late as 1937, seems the most likely candidate, were it not said to have only four stampers, rather than the five of the extant battery.

CONDITION OF FEATURES: The smoke box of the steam engine has rusted out. Otherwis e the site components are in good condition for their age. The shifting of the portable steam engine from its original position suggests a [recent?] abandoned attempt to remove it from the site altogether.

CULTURAL SIGNIFICANCE:
The site has:

Historical significance—Odells Gully Battery site is historically significant as a characteristic and well-preserved 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, with its intensive use of machinery, played an important role in the development of Victorian manufacturing industry.

Scientific significance— The Odells Gully Battery site is scientifically significant because it contains a unique collection of relics, including an extraordinarily well-preserved battery and portable steam engine.

Archaeological potential— The Odells Gully Battery site 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 in Victoria.

Natural values— The Odells Gully Battery site is also important for its evocation of the adventurousness, hardship, and isolation that was part of mining life in the high country areas of the State.

SIGNIFICANCE RANKING: Site listed on Victorian Heritage Register
Site listed on Heritage Inventory

Assessed by: David Bannear *Date:* May 1995