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Name: Lake Margaret Power Scheme
Status: Permanently Registered
Tier: State
State

THR ID Number: 10863
Municipality: West Coast Council
Boundary: CPR7604

<u>Location Addresses</u>	<u>Title References</u>	<u>Property Id</u>
, QUEENSTOWN 7467 TAS	N/A	N/A
, QUEENSTOWN 7467 TAS	N/A	7772249
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Statement of Significance: (non-statutory summary)

No Statement is provided for places listed prior to 2007

Why is it significant?:

The Heritage Council may enter a place in the Heritage Register if it meets one or more of the following criteria from the Historic Cultural Heritage Act 1995:

a) The place is important to the course or pattern of Tasmania's history.

The Lake Margaret Power Scheme (LMPS) is of historic cultural heritage significance because it is important in demonstrating the evolution or pattern of Tasmania's history, inclusive of it being:

(i) an outstanding example of one of the earliest hydro power stations developed in Australia, and the fourth hydro scheme developed in Tasmania after Mt Bischoff, Duck Reach and Moorinna.

(ii) a landmark site in the evolution of hydro technology in Australia on two levels:

"the LMPS demonstrated the early potential of the technology for large scale industrial and domestic power generation through multiple-turbine installations, heralding the development of vast hydro schemes in Tasmania, Victoria and NSW. The LMPS has exceptional ability 'more than any other power station in Tasmania' (Davies 2006) to demonstrate early twentieth century hydro technology within Australia, including the demonstration of engineering aspects derived from nineteenth century mining technology.

"the LMPS was the largest privately developed hydro power station in Australia, and potentially the Southern Hemisphere, reflecting the role of the mining industry in the introduction and development of hydro technology within Australia, and delineating the transition point after which hydro schemes (and electricity supply generally) became publicly funded and State-run.

(iii) a landmark site in the evolution of industrial practices at the Mt Lyell mine, where hydro was introduced in response to the escalating cost of providing power by wood burning, the demand of 2000 tonnes of firewood per week having been a key factor in denuding the Queenstown landscape of its forest cover.

(iv) a landmark site in the early provision of electrical power for private domestic use in Australia, whereby the Mt Lyell company established electrical supply from the LMPS to the homes of its workers within Queenstown (subsequently Zeehan and Rosebery), provided subsidised electrical appliances and actively promoted domestic use.

(v) historical association with early twentieth century discriminatory immigration policy under Prime Minister Billy Hughes, where the arrival of a second wave of Maltese migrant labourers (British citizens) in 1916 coincided with the national conscription debate and 214 Maltese were refused entry to Australia because of their potential to threaten the jobs of Australian soldiers fighting abroad. After a national backlash many of these workers were eventually sent to work at the LMPS. This event is significant in the political and nation building identity of Australia. The LMPS is also of outstanding significance for its strong associations with historical phases and themes that have shaped Tasmania and its community:

(i) the development of mining on the West Coast and specifically at Mt Lyell - being developed and operated to service the mine, its subsidiary mining activities and the communities,

(ii) the development of hydro power and domestic electrical services in Tasmania - the LMPS being one of a small group of highly significant hydro sites, and having associations with the HEC which has contributed to Tasmania's identity as a hydro state,

(iii) the use of migrant labour in the construction of major infrastructure - a contingent of Maltese labourers and stonemasons being recruited for the major civil engineering components at the LMPS.

(iv) the development of on-site accommodation within close proximity to work that illustrates the complexities of private and public space overlapping and also illustrates the continuous association of housing employees on site for 92 years.

b) The place possesses uncommon or rare aspects of Tasmania's history.

The Lake Margaret Power Scheme (LMPS) is of historic cultural heritage significance because it demonstrates rare, uncommon or endangered aspects of Tasmania's heritage, as:

(i) the second oldest hydro power station in operating condition, the largest and ultimate technological expression of a privately operated hydro power station as defined above in criterion:

(a) Evolution Pattern,

(ii) the first semi automated power scheme in Australia through the 1931 development of the lower station,

(iii) incorporating a 2.2km woodstave pipeline which is likely to be the largest, or at very least one of the largest, surviving structures in the world made of King Billy pine, an endemic Tasmanian timber of historical and social value and which is now a scarce resource. Industrial woodstave pipelines are exceptionally rare nationally, if not internationally, and this pipeline represents the largest of four examples surviving in Tasmania. Of specific importance is the exceptional integrity of the fabric relating to the development of the LMPS from 1914 - 1931, which makes the site an exemplar of pioneering hydro technology and the related social history of a semi-isolated industrial settlement.

c) The place has the potential to yield information that will contribute to an understanding of Tasmania's history.

The Lake Margaret Power Scheme (LMPS) is of historic cultural heritage significance because it has potential to yield information that will contribute to an understanding of Tasmania's history. The fabric and records pertaining to the LMPS have the potential to yield information of outstanding importance in respect of early hydro technology and its application to mining and domestic power.

The LMPS is an outstanding example of industrial archaeology, especially as an example of an early power station site and associated village. A vast array of archaeological evidence, derived from the construction phase (including transport networks and pipelines from different periods, workshops and construction camps), and the operational phase (including transport networks, hatchery, air raid shelters, housing and recreational sites, exotic garden plantings, tip areas adjacent to the village) have the potential to yield information in respect of the development of the site and its social history. The surrounding areas including the old camp sites and particularly the village have research potential into early twentieth century hierarchical practices of social space and cultural practices including class and race distinctions in a work environment. The village illustrates a close-knit community that had class distinctions on a micro scale, families vs. single men quarters, outside community vs. LMPS community interactions. The potential information from this site may also contribute to wider research frameworks nationally and internationally. For example the place of women and families living in industrial and work environments and the innovations that evolve as a result of living in small and remote communities is a new area of research internationally.

d) The place is important in demonstrating the principal characteristics of a class of place in Tasmania's history.

The Lake Margaret Power Scheme (LMPS) is of historic cultural heritage significance because it is important as a representative in demonstrating the characteristics of a broader class of cultural places, in that:

- (i) it is of outstanding importance as an early hydro scheme in Australia,
- (ii) it possesses an exceptional ability to demonstrate the principal characteristics of a complete power scheme and associated outbuildings and residential complex in the twentieth century. It is one of a few sites in Australia whereby the whole process of power generation, construction, staffing and community life at an industrial settlement is readily evident.

e) The place is important in demonstrating a high degree of creative or technical achievement.

The Lake Margaret Power Scheme (LMPS) is of historic cultural heritage significance because it is important in demonstrating a high degree of creative or technical achievement. The LMPS has an exceptional ability to demonstrate early twentieth century hydro, hydraulic and civil engineering technology, better than any other site in Australia. Of specific importance is:

- (i) the exceptional integrity of the operational equipment (dam intakes and valves, pipeline, penstock manifold and surge pipe, penstock and haulage, turbine intakes and valving, dc exciters, Pelton wheel turbines and governors, ac generators, control and switching gear, etc), most of which originates from 1912-1938, with the two key elements being:

- two types of turbines from the early 20th century

- 7 Pelton wheels in the main station and a Francis turbine in the lower station,

- woodstave pipelines, nationally rare and one of only four examples remaining in Tasmania, incorporating use of local King Billy pine. The general retention of any superseded equipment in-situ.

- (ii) the ready visibility of the equipment due to above-ground installations at publicly-accessible locations.

- (iii) design innovations that reflect the extremely wet environment including the elevated floor, and use of metal wall and ceiling claddings in a unique corrugated iron village and no longer extant camp sites known as 'Tin Towns'. The LMPS has outstanding significance for its exceptional ability to demonstrate the settlement infrastructure of a remote industrial site, as provided by the site owner, with specific reference to:

- (i) variations in the siting, size and detailing of accommodation buildings (Managers House, Superintendent's House, Staff Cottages, Single Men's Quarters, distinct Maltese camps) that demonstrate a strong social and racial hierarchy,
- (ii) application of a uniform cottage design for the general staff housing, that demonstrates a higher standard than the equivalent miners housing at Mt Lyell,

- (iii) early 20th century provision of electrical services (cooking, heating, lighting) within the accommodation, and the exceptional occurrence of electrical power being used at the Superintendent's House to provide in-ground heating for the vegetable garden, lit walkways and exterior lighting on verandahs etc and the free or subsidised provision of electricity to entice workers' families to live on site.

f) **The place has a strong or special association with a particular community or cultural group for social or spiritual reasons.**

The Lake Margaret Power Scheme (LMPS) is of historic cultural heritage significance because it has strong or special meaning for the Tasmanian (and potentially the Australian) communities because of social and cultural associations. These cultural associations encompass its aesthetic values-patronised by a cross-section of the Tasmanian community, photographers and tourists-derived from:

(i)the LMPS display's dramatic visual qualities of the natural landscape setting-with variation between the rain forest of the settlement to the subalpine setting of the dam, vistas to the sea, and the array of sprays from the woodstave pipeline-together with the introduced equipment, structures and relics,

(ii)auditory & other sensory qualities of the power station in operation and of the woodstave pipeline water movement and leakage. The LMPS is of major social value at a regional level, and through its local role as a key service provider and place of work or recreation, its heritage and tourism value as an iconic piece of civil infrastructure and hydro technology, and its integral association with mining at Mt Lyell. These social values occur to a lesser degree state-wide, through the re-settlement of persons with strong work-based or social connections to Lake Margaret and Mt Lyell. The LMPS is of special importance to past residents and operational staff, due to the inevitable overlap of work and social life that occurs in semi-remote settlements that draws the community together. The dependence upon others within the community renders it close-knit, through a sense of pride in the contribution of the LMPS to the economic and domestic well-being of the region, which provides strong emotional attachments evident in oral histories and interviews undertaken during the assessment. LMPS forms a prominent visual and cultural landmark on the outskirts of Queenstown

g) **The place has a special association with the life or works of a person, or group of persons, of importance in Tasmania's history.**

The Lake Margaret Power Scheme (LMPS) is of historic cultural heritage significance because it has a special association with the life or work of a person, a group or an organisation that was important in Tasmania's history. The LMPS is of outstanding significance for its integral role in the development of Mt Lyell by the Mt Lyell Mining and Railway Company, which developed and operated the LMPS for most of its life. The company was at one time the largest copper producer in the British Empire and the longest operating mining venture in Australia, and is synonymous with the frontier spirit that led to the development of the West Coast and in the economic prosperity that mining brought to the region, and to the State. The LMPS is of historic cultural heritage significance because it has a special association with the life and work of Robert Carl Sticht, a person who was important in Tasmania's history. The LMPS was established at the direction of Sticht, General Manager of the Queenstown mine of the Mount Lyell Mining & Railway Co. Ltd from 1897-1922. He successfully pioneered pyritic smelting and is credited with much of the successful development of Mt Lyell. He had the vision to embrace the new hydro technology as part of the industrial reform at the site, and to provide domestic electricity to his workforce as part of a social reform process. Sticht also held one of the finest private libraries in the Commonwealth, a library that now forms part of the Mt Lyell Collection (Blainey 2000:262). The mineral stichtite commemorates his name.

The LMPS is of historic cultural heritage significance because it has a special association with the life and work of a large group of people that were important in Tasmania's working class and immigrant history.

h) **The place is important in exhibiting particular aesthetic characteristics.**

Heritage approval is required for work that will result in changes to the nature or appearance of the fabric of a Heritage place, both internal and external.

Please refer to the Heritage Council's Works Guidelines (www.heritage.tas.gov.au) for information about the level of approval required and appropriate outcomes.

Heritage Advisors are also available to answer questions and provide guidance on enquiries@heritage.tas.gov.au or Tel 1300850332

This data sheet is intended to provide sufficient information and justification for listing the place on the Heritage Register. Under the legislation, only one of the criteria needs to be met. The data sheet is not intended to be a comprehensive inventory of the heritage values of the place, there may be other heritage values of interest to the Heritage Council not currently acknowledged.

Setting:

The Lake Margaret Power Scheme (LMPS) is located in the upper catchment of the Yolande River on Tasmania's west coast, centred approximately 10 km north of Queenstown and 3 km east of the Zeehan Highway.

Lake Margaret is of glacial origin, albeit modified in constructing the scheme, situated at 660 metres above sea level in the west coast mountain range extending northward from Mt Lyell and including Mt Sedgwick to the east, Mt Cyril to the west and Mt Geikie to the north. The catchment covers approximately 20 sq kms of subalpine environment including part of the Southwest Conservation Area and includes 11 more glacial lakes—Mary, Martha, Magdala, Myra, Monica, Philip, Apollos, Paul, Peter, Polycarp and Barnabas.

The Power Station and Village sit astride the Yolande River amidst temperate forest towards the base of the range, some 2.5 km downstream of the dam, with the Lower Power Station a further 2 km downstream.

The foothill area between the Power Station and Zeehan Highway, includes the site of Valetta, the Maltese workers camp, plus the original tramway and power line easements. This area was originally known as Howards Plains, a name that has since been transferred to the airport environs, 5km to the south (Rae 2006).

The original tramway terminus site occurs immediately west of the present intersection of the Zeehan Highway and Lyell Highway, whilst the Sub-station is located at the Mt Lyell mine on the northern fringe of Queenstown.

Description:

The Lake Margaret Power Scheme (LMPS) entry comprises all the land previously leased by the Mt Lyell Mining and Railway Co (MLM&RCo) from the Crown and since vested in the Hydro; the transmission line easement connecting to and including the Lake Margaret Sub-Station at Queenstown (leased by Copper Mines of Tasmania); the tramway from the LMPS to the area known as the tram terminus at the Strahan turnoff on the Lyell Highway (including part of the current access road); Lake Mary, Lake Philip, Lake Paul, Lake Apollos, Lake Martha, Lake Magdala, Lake Myra, Lake Monica, Lake Apollos, Lake Peter, Lake Polycarp and Lake Barnabas and their interconnecting waterways; the Basin Lake and part of Leslie Creek which includes an old camp site at the north western fork of the creek.

The entry includes all the physical fabric related to the LMPS. Details of the key significant elements of the LMPS are arranged into five (5) functional precincts (based on the Conservation Management Plan (Davies 2006) and additional features assessed by Heritage Tasmania). The whole of the LMPS constitutes a major industrial archaeological site.

Dam & Pipeline Precinct (#1)

This precinct encapsulates the major engineering infrastructure for capturing and diverting water to the power station, however it includes minor elements to facilitate staff access, operation and maintenance along with archaeological evidence from construction and pipeline rebuilding phases. [For itemised structure list see datasheet in related documents.]

Village Precinct (#2)

A complex of residential buildings and recreational elements constructed by the MLM & RCo to accommodate staff and their families on-site. [For itemised structure list see datasheet in related documents.]

Power Station Core Precinct (#3)

This precinct encapsulates the major engineering infrastructure for power generation, from the penstock and surge pipes to the power station, along with archaeological evidence from the construction phases. [For itemised structure list see datasheet in related documents.]

Lower Power Station Precinct (#4)

This precinct encapsulates the major engineering infrastructure from the 1931 expansion of power generation in the LMPS, from the Lower Weir to the Lower Power Station, along with archaeological evidence from the construction and operational (1931-94) phases. [For itemised structure list see datasheet in related documents.]

Broader Site Context (Precinct #5 + additional elements outside of the CMP precincts)

This precinct encapsulates the remainder of the place as defined on the map, which forms the landscape setting of Precincts 1-4 and includes a number of broadly distributed historical elements. [For itemised structure list see datasheet in related documents.]

History:

Early History of the Area

Lake Margaret was discovered by Thomas Bather Moore, west coast explorer, prospector and track-cutter who named the lake for Margaret Officer, a family friend. He had cut a track from Lake St Clair to the Pieman River in 1877, and passed through the upper Yolande River catchment leaving a blazed tree (now removed) on the shore of Lake Mary. Lake Mary was named for Jane Mary Solly, Thomas future wife whilst Lake Martha was possibly named after his mother (Binks Aug:2006 and McShane, TB Moore:1982:32). TB Moore was considered as the greatest of all the West Coast explorers, his last major project occurred in 1915 which involved the clearing of the route for the Lake Margaret transmission lines (Dickens 2001:36).

By 1900 the upper Yolande catchment had been partitioned into mining leases, although these were unlikely to have

been subject to any activity more intensive than exploratory prospecting by individuals or small teams. The lower catchment, south of the penstock, appears to have been subject to substantial clearing with tracks and timber-getting camps established for the purpose of obtaining fuel for the Mt Lyell mine. Evidence of the early tram tracks and walking tracks remain.

The history of the Lake Margaret Power Scheme (LMPS) is inextricably linked with that of the Mt Lyell Mining and Railway Company (MLM&RCo). Copper mining operations at Mt Lyell represent one of the most historically significant mining operations to date in Australia, and who developed and operated the LMPS for most of its life. The MLM&RCo was at one time the largest copper producer in the British Empire and the longest operating mining venture in Australia. The company is synonymous with the frontier spirit that led to the development of the West Coast and in the economic prosperity that mining brought to the region, and to the State.

One of the most successful periods of development for the MLM&RCo, which coincides with the development of the LMPS, occurred when Robert Carl Sticht was General Manager of the Mt Lyell mine from 1897-1922. He successfully pioneered pyritic smelting, and had the vision to embrace the new hydro technology as part of the industrial reform at the site and to provide domestic electricity to his workforce as part of a social reform process. Sticht collected one of the finest private libraries in the Commonwealth, now part of the Mt Lyell Collection (Blainey 2000:262) and part of which now resides in the National Gallery of Victoria (McShane Jan:2007). The mineral stichtite commemorates his name.

By the early 1900s, fuel costs had become a serious issue in MLM&RCo operations at the Mt Lyell mine, where the furnaces were consuming over 2,040 tonnes of timber each week. The local area had been denuded of trees, whilst labour and infrastructure costs were escalating with a tramway network having to be constructed into the surrounding forest areas solely to transport the vast quantities of fuel needed. Hydro electric power generation had been trialled on the West Coast during the 1880s, when a small plant had been used for lighting at the Mt Bischoff mine. Other small plants were soon installed at the Moorina mine and for the Duck Reach Power Station at Launceston.

In 1893 the Lake Margaret area was first surveyed by HM Chrisp for MLM&RCo as a potential source of hydro-electric power. By 1896 Huntley James Clarke concluded that the Yolande River was capable of sustaining a small power station.

Construction of the Scheme

At the instigation of Robert Sticht, in 1911 the MLM&RCo commenced construction of what is believed to be the fourth hydro electric power station constructed in Tasmania, the Lake Margaret Power Scheme (LMPS). To provide power for machinery and lighting at Mt Lyell it needed to be substantially larger than any other scheme yet constructed, initially utilising four 1.2 MW Pelton-wheel turbines, with the flexibility of installing further turbines within the power station subject to operational needs. The initial stage required the substantial investment of 164,000. When hydro power was connected to the mines smelter in 1914, the saving over timber fuel costs was calculated at 50,000 per annum. (Blainey 1978:178). Thus the LMPS was to facilitate the economic viability of the mine and lessen the deforestation pressure on the Queenstown landscape.

Commencement on the LMPS was delayed until June 1912 due a major strike at Mt Lyell in November 1911, national labour shortages and unfavourable working conditions. Maltese stonemasons and labourers were actively recruited for the LMPS development and would become the predominant workforce in constructing the key infrastructure (Tiddy 2005:13), although migrant labour from the United Kingdom was a prominent force at Mt Lyell during this time and also used on the LMPS.

The first wave of 15 Maltese workmen was employed by the MLM&RCo in June 1912. They were described as the first coloured labour to be employed. (Mercury 21 June 1912:6). By 1913 approximately 133 Maltese were onsite, and by August in excess of 140 Maltese employed. (York 1990:52-53).

The Maltese workers were housed in segregated camps as a matter of company and union policy but supervised by Australian foremen (York, 1986:40). A camp named Valetta (after the capital of Malta) was established at Howards Plains, on a tram track previously built for timber-getting. Early photographs illustrate a camp of tents and corrugated iron buildings serviced by a corrugated tin shop called the FO Henry Store (Tasmanian Mail 29 August 1912:19). There was also a camp-site near the dam (Site Survey Plan 1911), and one in the Sedgewick valley named Gozo (named after an island within the Republic of Malta). The name Gozo was reused for the site of a temporary power plant (Whittington:1914:203) and the titling of the first house in the row at the Village as Coza Cottage may be a corrupt derivation of this name.

Initial tasks included scrub clearing and extending the existing timber-getting tramway to the Power Station site (York 1986:38 & York 1990:51). Bridges, rock cutting and heavy filling were finally completed by the end of the year (Wright, 1915:162).

At the dam site, work commenced with the Maltese sluicing sand and gravel from the original lake bed to a point below the Yolande Falls. These materials were hauled by a flying fox back up to the pink conglomerate rock outcrop that forms the rim of the lake to make the concrete for the dam wall, by which the natural lake level was raised by 6m. Channels were carved 50m long through the bedrock of the rim and around the island, and dry stone walls constructed to facilitate drainage of water from the deepest point at the middle of the cirque to the outlet valve house at the dam. Channels were also constructed, or alterations made to the natural drainage lines, to drain water from several of the higher lakes into Lake Margaret (Crocker 2006).

The Maltese built the freestone walls along the route of the wooden pipeline and its attendant tramway leading from the dam to the penstocks. Where the pipeline and tramway traverses the sheer conglomerate rock face, hammer and tap methods were reportedly used to excavate the ledge, with no explosives being used. (Crocker 2006).

The 2.2km wood stave pipeline conveying water from the dam to the penstocks above the power station was constructed of Douglas fir or Oregon (*Pseudotsuga menziesii*). The two penstocks were fabricated from steel to handle the increased pressure in the pipe as the water descended to the turbines.

The Maltese are also credited with construction of the Power Station building 1912-14 (York 1986:42) and, in later years, clearing and erecting of the transmission lines using poles of Celery Top pine (*Phyllocladus aspleniifolius*) (Binks Oct:2006, LMPS Report:1915).

During 1913 a temporary hydro plant was installed to provide lighting so work could continue 24 hours a day. Twenty-four Maltese workers who refused to work on the Sabbath were sacked (York 1986:41). Construction-period photos indicate a scattered workers camp on the hillside beside the penstocks, and suggest the Village housing to accommodate the station operators was one of the final items of development at the site. Little is recorded of the building of the Sub-station at Mt Lyell, which utilises the same construction methods as the Power Station whilst dating from this later phase.

Following the First World War, electricity generation at LMPS was expanded. Two additional Pelton-wheel turbines were installed and a third penstock added, with the works being completed by 1920

These works may have included labour from another wave of Maltese migrants. Their arrival in Australia in September and November, 1916 coincided with a government call for conscription and promises by Prime Minister William Billy Hughes against the importation of cheap foreign labour (York 1990:76, 80-96 & 2003). One group had arrived aboard the Arabia and out of 97, 47 were recruited by the MLM&RCo (York 1990:75). A second group of 214 arrived aboard the Gange (York 1990:84). These Maltese, who were British citizens, were initially prevented from landing in Australia. After failing a dictation test given in Dutch, they were interned on New Caledonia, but after some time and considerable deprivations were allowed entry. Their story is part of the history of internment during the First World War, anti-conscription and the White Australia policy. 43 surviving Maltese are recorded as coming to Mt Lyell in 1917 following their release (York 1990:75, 93-4, 99, 1986:60). Descendants of LMPS Maltese workers remain in Tasmania today.

A cornerstone of Robert Sticht's social reform policy, was the provision of electricity to mine workers and the supporting commercial and social infrastructure of Queenstown. By the 1920s electrical power from the LMPS was reticulated through Queenstown, and later connected to Zeehan and Rosebery. In 1937 that the Hydro Electricity Commission (HEC) made State-sourced power available to west coast communities through the construction of the West Coast transmission line, whilst the LMPS continued to provide power into the state grid and thus indirectly power regional communities until 2006.

A concrete fish hatchery for 100,000 ova was constructed nearby. Some claim this was to provide sport for the company directors of the MLM&RCo but it would, later if not originally, serve a higher function as part of the Inland Fisheries hatchery network.

To accommodate increased operational and public demand, including the installation of a floatation plant at Mt Lyell, the generating capacity of the LMPS was expanded again in 1930-31, with the inclusion of a 7th Pelton-wheel turbine at the Power Station in a simple iron-clad addition, and the construction of the Lower Power Station. This included the construction of the lower weir, a 2km wooden pipeline constructed of Karri (*Eucalyptus diversicolor*) feeding a steel penstock above the lower station, which housed a 1.5 MW Francis turbine. This turbine type is better suited to the lesser vertical fall from the weir to the turbine. This was the first remote controlled [semi automatic] station in Tasmania, and second in Australia after the four small stations of the Rubicon/Royston scheme [fully automated, state owned] constructed in Victoria in 1928 (McCutchan 2007).

A small construction camp known as Tin Town and made of corrugated iron houses was located nearby with a connecting tramway constructed off the main line into the Power Station and Village. These have since been removed but archaeological evidence may provide insights into the lifestyles and conditions endured by the pioneers/migrants

in the area (Godden Mackay:93).

Later Developments

In 1938, the main wood stave pipeline from Lake Margaret to the steel penstocks was replaced due to exterior deterioration of the original Douglas fir staves. King Billy pine (*Athrotaxis selaginoides*) sourced from the Tyndall Range was used for the replacement staves, along with steel hoops fabricated at Mt Lyell. To minimise disruption to power generation during the replacement process, the majority of the new pipeline was constructed alongside of the original and thence keyed into the dam valve house and penstocks at each end.

During the 1940s or early 1950s, an additional staff house (#1) was constructed adjacent the tramway/road on its approach to the Power Station. A further staff house (#3) was added within the Village during the 1960s.

In 1954, a substantial section of the wood stave pipeline to the lower power station was replaced with King Billy pine, and by 1970 the remainder had been replaced with a hardwood.

One of the greatest social changes to the LMPS occurred in 1964 when the original 2ft (600mm) gauge tramway running 11 km from the Power Station to Penghana Hill, was closed down and road access provided from the Zeehan Highway. In the early years the tramway had run a Kraus locomotive with carriages, which was later replaced with Riley and Vauxhall rail motors (Tiddy 2002:25), and an Alpha-Romeo petrol-driven locomotive. The tramway, which formed the only vehicular access into the power stations and village since construction, has been described as the life-blood of the community — conveying all supplies and people including the twice-daily run for school children. Consequently the residential occupation of the Village by MLM&RCo staff declined, as people progressively favoured commuting from Queenstown over living onsite.

Prior to 1995, the existing sheds beside the penstock (that house the wood stave-making machine) were relocated to this site from the Penghana Hill tramway terminus, where they had been used to house the tramway locomotives and rail cars. By 1987 the original Station Manager's House and two of the Staff Cottages (located between #2 and #3) had been demolished.

In 1965 the transmission line was replaced, and between 1969 and 1980 the Dam and Power Station had a number of key components upgraded by MLM&RCo. A new single and larger-diameter penstock was installed alongside the original triple-penstock, which ceased to operate. The main control boards within the power station were replaced with a modern integrated unit, around which a sound-proof control room was constructed. A range of upgrades to generating plant and the transformer yard were also undertaken.

In 1985 the MLM&RCo, suffering financial difficulties, negotiated the sale of LMPS to the HEC. MLM&RCo leased LMPS back for a peppercorn fee.

In 1993, MLM&RCo disaggregated various engineering and fabrication functions, including the operation of LMPS. LMPS station manager Scott Newitt established Lake Margaret Enterprises, subsequently Lake Margaret Heritage Company (LMHC), and recruited previous LMPS operators into this company. LMHC undertook operations and maintenance of LMPS under contract to MLM&RCo, until its demise in December 1994, and thence under contract to Hydro Tasmania a government business enterprise which has taken over HEC accountabilities for managing LMPS until April 2003 (Newitt 2007).

In 1994 the Lower Power Station was closed due to concerns over the safety of the penstock (Newitt 2007). The wood stave pipeline, which had been drained as a precaution, soon shrank and collapsed (Tiddy 2005:37).

Due principally to its private ownership and continuous operation, the LMPS has retained nearly all of its early infrastructure and equipment including the dam and lower weir, wood stave pipelines, penstocks, manifolds and surge pipes, two power stations, the village settlement of seven original and two later cottages, single-mens quarters and community (badminton/dance) hall, plus a range of associated structures and features.

Hydro Tasmania, continued to operate the station until 30 June 2006. A few houses within the Village continue to be used for staff accommodation and provide a presence onsite. The LMPS continues to be managed by Hydro Tasmania and at December 2006 is presently the subject of major feasibility investigations into its upgrading or repair.

Life on the Scheme

The Lake Margaret Power Scheme (LMPS) was an integral part of residents' lives, and village life saw a blurring of boundaries between working and private lives. Women cooked hot lunches and delivered them onto the work site. Children had to be restricted in their play areas to keep them away from sleeping shift workers. There was a playground of swings and slides located at the southern end of the Village, and a swimming pool and sportsfield on a terrace below. Exotic trees and shrubs were planted around the Village and neat gardens maintained at the cottages. Many social gatherings were organised for the local residents but outsiders were excluded from participating. The

Village Hall is most likely a recycled and adapted Mt Lyell building relocated to the site (Godden Mackay 1994:48). At least one marriage had taken place at the top near the lake. At least one child was born in the Village, although most women would leave the village sometime prior to delivery rather than risk an emergency tram ride.

There were no medical rooms or space allocated for emergencies in the village. Any accident victims or those with serious illnesses were quickly sent to the Queenstown hospital via the tramline — emphasising the importance of this link to the outside world. During the Second World War prior residents recall that the women in the village undertook voluntary first-aid courses and a room was set up in the single-men's quarters. Children vividly remember the air-raid drills. Red Fire Boxes were located on trees alongside the front of the houses in the village. A pine tree outside the Martin's house (R5 Figure 1.4 Davies 2005:5) was always decorated as a Christmas tree. At Christmas time the power station would shut down and only one generator would be operated (Crocker 2006).

The Superintendent's house was off-set at the southern end of the row of workers' cottages. It is a larger building and features a different floor plan than illustrated in the other worker's cottages with an additional bedroom. This house features a large return verandah that had external lighting. The front room of this house featured a Wunderlich pressed metal ceiling. Patterned linoleum and wallpaper were used throughout the houses. The uses of corrugated iron cladding, elevated floors and metal ceilings are all examples of adaptive innovations that reflect the extremely wet environment. The village is a unique prefabricated (by the MLM&RCo) corrugated iron group of buildings. The construction camp sites known as Tin Towns were less decorated but utilised simple iron structures for their ease of transport and construction.

The front garden of the Superintendent's house was wired with electrical heating elements by Frank Thomas, the Superintendent of the LMPS, to assist in the growing of vegetables, an innovation made possible by free power (Crocker 2006). The MLM&RCo encouraged the use of power by employees by subsidising the power to Queenstown and Gormanston residents and gave free power to Lake Margaret residents. Electrical appliances were also subsidised. "On account of the very high cost of fuel in the district the Co encourages its employees to use electric power for domestic cooking and heating, electric stoves, water heaters and smaller household appliances are sold to employees on a liberal time-payment basis." (Preston 1934: 31). Hot water cylinders, stoves, radiators, grillers, kettles and electric irons, light fittings were all items readily available to residents at reduced prices (Electricity on the West Coast of Tasmania Activities of the Mount Lyell Mining and Railway Company in Tasmania reprinted from Australasian Electrical Times July 27, 1926).

The second house along from the Superintendent's house was where the Martin family lived. (Figure 1.4 house R7 Davies 2005:5) Sunday School lessons were conducted here once a month early on a Thursday evening and most children in the village attended. A church service was conducted later in the evening by Mr Ray, a visiting minister from Queenstown. Mrs Martin was a strict Methodist and during the services her husband, Ernie Martin, played a pedal organ that is still with the family (F Martin 2002: QVMAG & Martin:2006). This house displays community values as a place of worship and meeting place. Former managers, Ed McDonald and later Don Russell, lived in the Manager's house on the other side of the hill overlooking the Power Station. (noted as house ruin Figure 1.4 Davies CMP:5)

Drainage around the houses in the village consisting of underground wooden stave pipes was identified by Heritage Tasmania Officers. Evidence of at least one piece of the pipe exposed at the front of one of the houses was located (R4 Figure 1.4 Davies:5). More recent pipes provide drainage and water for fire fighting within the village, whilst the sewer lines were located at the rear of the buildings (Crocker 2006).

The pipeline service tramway has been a popular walking track for residents and tourists since 1914. Appreciation of the wilderness was becoming a world phenomenon at this time. Some residents were also keen photographers such as George Barvich, a Czech operator at the power station, and his mate Frank Martin, would often undertake walks for photographic purposes. The pipeline was also walked on a daily basis by the Lake Margaret operators for meteorological readings and checks of water levels at the lake.

The Wood Stave Pipeline

Constructed of King Billy pine (*Athrotaxis selaginoides*) planks held in place by steel hoops, this 2.2 kilometre wood stave pipeline is perhaps the best known feature of the LMPS. The original pipeline was laid by the Australian Wood Pipe Co of Sydney and constructed of well seasoned Douglas fir or Oregon (*Pseudotsuga menziesii*) imported from Canada. The staves, 1 thick and 6 wide were formed utilising an imported German stave-making machine. An extant wood stave machine is housed in an old open air shed below the haulage and is possibly the only one in existence in Australia. According to oral sources this is not the original machine. The original machine was sent to Bradshaw Mill at Strahan and then later to the Lyell Mines (Crocker 2006). The current machine has certainly been used for making staves for the pipeline in the past. The pipe was not fastened but designed to rest on the ground, on bearers, sleepers and on elevated trestles being held in place by sheer weight (LMPS Report 1915:46). The wood stave pipeline lasted only 24 years before being replaced in 1938 by King Billy pine felled from the nearby Tyndall Range to the west of Lake Margaret. J Howard of Zeehan was awarded the contract to supply the local timber. Evidence of the track he

carved out in the Tyndall Range with his bulldozer is still visible (Saunders 1998:161).

Approximately 18,000 steel hoops are fastened to the pipe in a staggered pattern. The thickness of the band commences at 5/8 and as the pipeline approached the top of the penstock, the spacing does not change but the thickness of the band increased to 7/8 to cater for the increased pressure of the water. (Crocker 2006&7). The steel hoops used to clamp the staves together for the pipeline were made locally by boiler-makers at the Mt Lyell workshops but were maintained and adjusted regularly at 50m intervals. Some areas of the pipeline contain additional bands and reinforcement but these are adhoc where there have been repairs undertaken. There were up to five people employed on a team that maintained the pipe as part of their duties. (Crocker, Nov:2006). Regular maintenance work was conducted at the blacksmith's shop located on the tram track/pipeline half-way to the dam and at the work shed at the dam. These buildings also served to shelter workmen from the rain (Saunders 1998:62).

Inevitably, after 68 years in use, the pipeline has deteriorated significantly. Pressure fluctuations in operating the system resulted in regular maintenance that included routine hoop greasing and re-tensioning, joint-plugging with timber wedges and running a mix of leaf mould and sawdust through the pipe. Part of the daily routine of inspections included: "Wooden wedges driven in the leaking seams using a tomahawk to cut and drive them in" (Saunders 1998:61). These maintenance procedures are no longer practiced.

A 4ft branch pipe on the upper side was constructed as a vent [surge] pipe . . . made of the same wood stave construction but has utilised King Billy for testing of the durability of this species compared to Douglas fir. (LMPS Report 1915).