

Mines Around St. Agnes West Kitty, Wheal Kitty & Penhalls and Polberro, St. Agnes

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The numerous setts around St. Agnes have been worked for some 200 years. Latterly, several companies used electrical plant.

WEST KITTY

West Kitty was comprised of a number of setts, including Polbreen and Wheal Friendly. A new Cost-Book Company took over in 1904.

The Stamps were at Jericho (SW73355075), where had been erected twenty Californian Stamps driven by a water-wheel, supplementing the nine driven by a 30" beam engine. The running costs were increased by the need to cart all tinstuff over there, so at one time consideration was given to erecting an aerial ropeway, but nothing came of this idea.

By 1905 the adventurers had closed down on all setts except Wheal Friendly, though they continued working the 50" pumping engine on Reynold's Shaft (SW71985081) and the 40" on Thomas Shaft (SW72015057).¹ Bins were erected at Wheal Friendly to hasten the loading of carts.

They decided to deepen Wheal Friendly Shaft (SW72025116), which was then vertical to 76fm below adit (40fm), and installed a 60" pumping engine.

In 1907 they built a Dressing Floor at Wheal Friendly, to save on cartage to Jericho.² Two Holman Pneumatic Stamps were installed (SW72025123) equivalent to twenty Californian Stamps, as well as 3 Wilfley Tables, 2 Vanners, 72 Ragging Frames and 8 Revolving Frames, all driven by a 16" x 24" horizontal steam engine steamed by a 30' x 6' Cornish Boiler. This new treatment plant was started in August 1908 after a number of delays.

In February 1909 the Thomas and Reynold's engines were closed down, but this affected the water level in Wheal Kitty, so arrangements were made for the Reynold's engine to be started up in November 1910.³

There were various difficulties in the new dressing plant, including a shortage of water and the cracking up of the foundations of the Pneumatic Stamps.⁴

In May 1909 the London office was closed and a new committee and local Purser appointed. Mr. J.H. Collins had been trying around this time to get elected.⁵

A limited company, West Kitty Mines Ltd, was formed on 1st March 1910 and they decided to close down all work on Thomas and Reynold's sections.^{6&7}

This new company was soon in financial trouble and without capital provided by St. Agnes Consolidated Mines Ltd, it would not have been able to carry out the large development programme.⁸

In 1913 a fault developed in the bottom pitwork in Wheal Friendly Shaft and the stopping of the engine allowed the water to rise. A diver was hired from Falmouth Docks and changed the valves in 18' of water; not the first time that a diver worked in a Cornish mine.⁹

The fall in the price of tin following the outbreak of war, coupled with the labour shortage due to the call-up of men, led to all operations being stopped in October 1916.

The plant and machinery were seized on a Distress Order and offered at auction, without reserve, in November 1916. The list included the 60" engine, an electric lighting plant and an oil engine.¹⁰

WHEAL KITTY AND PENHALLS UNITED LTD.

The old cost-book company running Wheal Kitty was closed down in 1904. The mine was bought as a going concern by J.H. Collins & Sons who formed a new cost-book company. They then acquired the adjoining setts of Penhalls and Gooninnis, and in 1907 registered Wheal Kitty & Penhalls United Ltd.¹¹

They started to overhaul Sara's Shaft (SW72445132) on Penhalls section, which was then vertical to 520' with adit about 270'. A new enginehouse was built, in which was installed a 65" engine bought from Tindene, with 18" pit-work in the shaft. The new wooden headgear was 60' high and the steam winding engine had two 14" x 12" cylinders driving two 6' drums through 3:1 gearing. The compressor supplied three drills.¹²

Pending the completion of the new pumping engine they used electric power in the first stage of un-watering the property, the inflow to which had been increased by the stopping of the two pumps on West Kitty.

A 150 HP cross-compound horizontal steam engine was installed at Sara's Shaft and connected to the two 30' x 8' Lancashire Boilers intended to steam the pump. A belt drove a 100kW Lancashire Dynamo 550v 3-phase alternator on which the direct-driven 110v exciter could also supply 50 lamps.

An overhead line was built to Pryors, or New, Shaft (SW72495086), where two Worthington vertical 3-throw double-gear ram pumps were installed at 65fm level. These were driven by 55 HP motors running at 720rpm, giving 300gpm to 350' and which became known as "Matilda Jane" and "Beatrice Maud". A third pump of the same make and rating was installed at adit level (45fm).

Hoisting on the Wheal Kitty section was by means of one engine which could draw from four shafts - Pryor's, Vottle (SW72525076), Sunny Corner (SW72805092) and Old Sump. A tramway ran between these shafts and the Stamps.

The Stamps were on the side of the valley, between the two sections, and a 30" double-acting beam engine with two flywheels drove the battery of 48 Cornish Stamps (SW72385110). This engine and house were re-built after damage by fire in June 1905.¹³

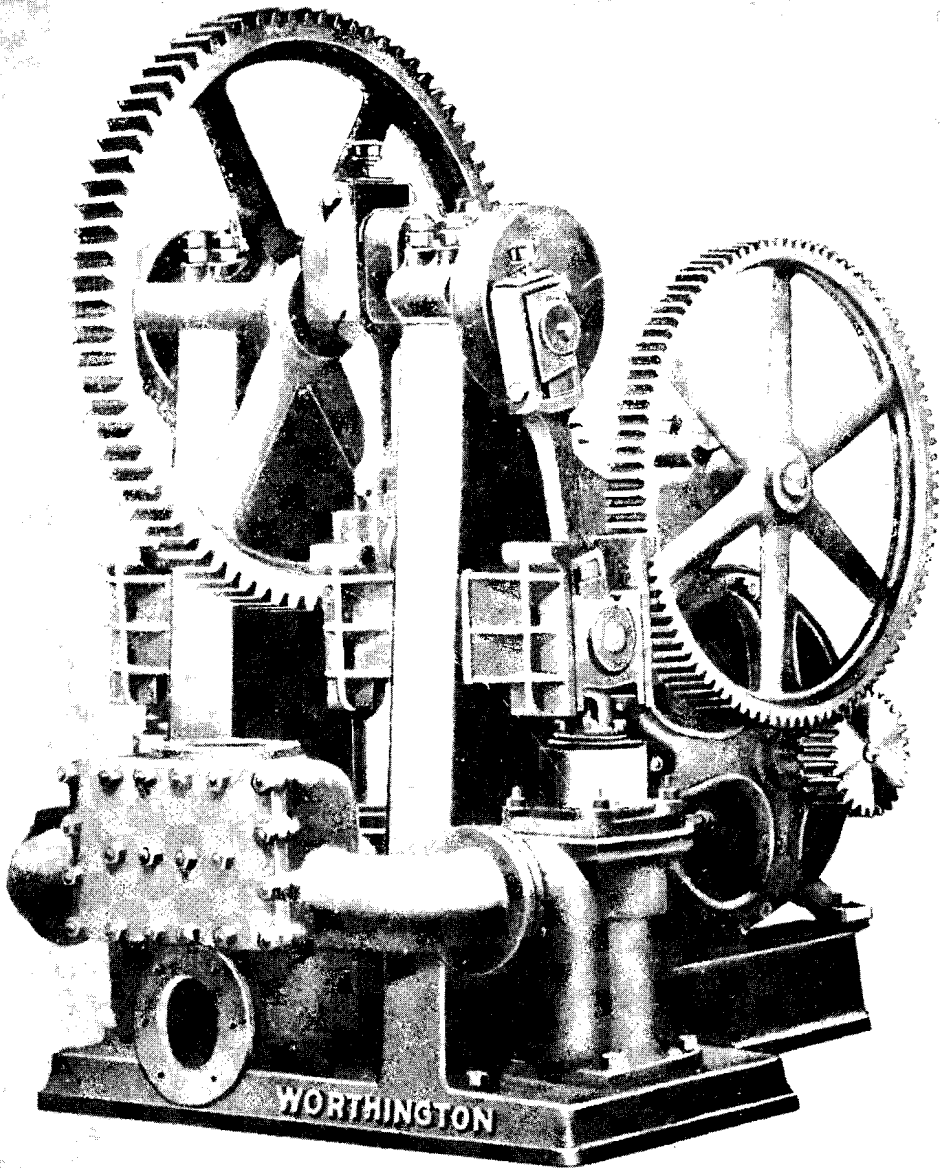
In 1910 an arrangement was made with West Kitty to start up the 50" Reynold's engine and so to allow the electric pumps to be used elsewhere.¹⁴

There was a fatality in 1911 when a man was drowned by being lowered by mistake into water as a result of the driver having been distracted by unauthorised visitors in the winding house.¹⁵

The 30" d/a Stamps Engine was offered for sale in March 1916.¹⁶

Work was suspended in September 1916 due to the low price of tin and shortage on men due to call-up, and a Receiver was appointed.¹⁷ Nothing came of the negotiations to

amalgamate with West Kitty. The mine finally closed in 1919, but no details are known of the disposal of the electrical plant.



Worthington vertical 3-throw double-gear ram pump. Wheel Kitty, 1907. (Mining World)

ST. AGNES CONSOLIDATED MINES LTD.

This company, a subsidiary of the National Minerals Corporation Ltd, and whose directors included Mr. E. Schiff, was incorporated on 24.12.09.¹⁸

They acquired just about every unworked sett in the St. Agnes area, including Polberro, West Polbreen, West Kitty, Polbreen, Blue Hills, East Blue Hills and Wheel Prudence.

The intention was to work all these mines in a combined scheme using electricity from a central power house on 2.5kV lines.

This power house was to be above Trevaunance Harbour, and fuel for the four 500 HP diesel generators would be brought in by sea (SW72055173).

If this site was not obtainable the alternative was on the southern corner of Blue Hills sett, overlooking Jericho Stamps, where a dam would provide considerable water storage. It was admitted that this site was not central.

The plan was to re-furbish Wheal Friendly Shaft and to develop from the bottom of it, and also to un-water Turnavour Shaft, Polberro, with a 300gpm Sandycroft ram sinking pump operated by a 50 HP hoist and capstan. They also intended to re-open Main Engine Shaft on Blue Hills (SW72845168) and Highburrow Shaft on East Blue Hills (SW73715190).

Initially, ore-treatment was to be at Wheal Friendly Mill and Jericho Mill, each of which was to be re-furbished and converted to electric drive. As one of the concentrates had a cupiferous content it was possible that it would be treated by the Elmore process.

If output rose sufficiently to warrant a central Mill this would be at Polberro, close to the harbour, though this would require water to be pumped to it. Alternatively, it could be erected at Jericho and a dam built to impound water.

Consideration was given to erecting an aerial rope-way on the western setts to Polberro, but such a rope-way from West Kitty to Jericho was not regarded as practicable.

The power house was never built and in fact this company did little other than work Wheal Friendly.

A Receiver was appointed on behalf of the Schiff group in March 1915 and nothing more was heard of this company after October 1916.¹⁹

The wood and iron buildings on Jericho were offered at auction in October 1917, and the plant and machinery on Trevaunance Mine, including a Goodman Air Compressor, two dynamos and a 6 HP Crossley suction gas engine, were offered in November 1917.²⁰

The closing of Jericho Stamps soon affected the output of Trevellas Coombe Tin Stream (SW73055130), which was dependent on tin lost from Jericho, and those works soon closed.

WHEAL KITTY TIN LTD.

This company was formed in 1925 by the London Tin Syndicate, a subsidiary of the Anglo Oriental & General Investment Trust. They acquired the rights on Wheal Kitty and Penhalls United, as well as those of Wheal Friendly.²¹

This Trust also promoted the re-opening of Parc-an-Chy and Poldice; Polhigey and Wheal Vlow.

They overhauled the engine on Sara's Shaft, then down to 730', and replaced the 18" pitwork with new 16" units.²² Over the shaft was erected the wooden headgear from Palmer's Shaft, South Crofty, which was used initially for baling.

A new Belliss & Morcom vertical steam-driven Air Compressor, No. 1655, was installed. This was rated at 185 HP @ 290rpm and gave 1000cfm at 80psi.²³

A new Mill was erected to the north west of Sara's Shaft (SW72395138), including 40 Californian Stamps (each 1050lbs), James Tables and a new type of concentrating table by A.R. Harvey. Mineral separation was by flotation.²⁴

Supply from Cornwall Electric Power Company

By July 1926 the mine was in trouble with coal supplies, as a result of the General Strike in May, so they decided to change to electric power. A Supply Agreement was signed on 22.7.26 with CEPCo for 500kW, minimum charge of 50kW, at 440v, for which a contribution of £2,400 was paid.²⁵

A 10kV line was built from Tolgus to Wheal Kitty and on to Trevemper and Retew, where it linked with the line from Truro. A short spur line was built from the main line close by the old Couthouse to the substation, which was originally the power house, and in it was installed an OCB and a bank of 125kVA transformers. In 1929 a bank of 150 10/3kV transformers was added (SW72385130). All six came from Tolgus.

A second spur line was built from Wheal Kitty across the valley to Wheal Friendly, where a 125kVA transformer was installed at the foot of the terminal pole. Supply to both shafts was available by March 1927.

The un-watering operation

The intention was to un-water Sara's and Wheal Friendly Shafts, deepen each shaft and then connect them by a drive from 880' level in Sara's to the 842' level in Wheal Friendly.

Two Harland multi-stage centrifugal sinking pumps were used, each giving 300gpm to 850'; one to supplement the engine on Sara's Shaft and the other in Wheal Friendly.²⁶

The shafts were un-watered, Sara's was sunk to 950' and Wheal Friendly to 842'. By January 1930 they had linked both shafts, thereby improving ventilation and reducing pumping costs. All hoisting was then done by the new electric hoist on Sara's Shaft.²⁷

The Electric Winding Engine

This was installed on Sara's Shaft and had Metro-Vick control gear and 80/160 HP 3-phase 440v 575rpm motor, driving two 6' 6" x 2' 6" drums at 32rpm through multi-toothed clutches. The two totally-enclosed reduction gears and clutches were made by the Power Plant Co, and the drums, 6" deep taking 1000' of 1" rope, and frame were by Uskside Engineering Co. This machine was identical to that at Polhigey.²⁸

The Mine in trouble

The amount of tin recovered and the price received for it was not very encouraging. There was talk of driving to Polberro and of re-opening Turnavour Shaft over there but nothing came of those ideas.²⁹

The price of tin fell and the mine was closed in August 1930. The water was allowed to rise but the surface plant and machinery was kept maintained with the hope of re-opening.

The highest recorded MD was 430kW in September 1929.

The Belliss & Morcom steam-driven Air Compressor, No 1655, was sold to Glasshouse Colliery, Stoke-on-Trent, and remained running there until scrapped in 1959.³⁰

POLBERRO MINE

Polberro Tin Mines Ltd, was formed in 1934 by the London Tin Syndicate to re-work Turnavour Shaft. They had acquired from Mineral Products Ltd, a licence to obtain minerals, which had been issued by the Duchy of Cornwall.

A start was made on un-watering Turnavour Shaft (SW71795136) which was then

down to 644' with adit at 240'. A new wooden headgear was erected and the Metro-Vick Winding Engine moved over from Wheal Kitty, together with a motorised capstan from Sump Shaft. The Capstan Shed was between the struts of the headgear, with the Winder Shed behind it. Air was provided by a Belliss & Morcom 1000cfm vertical 2-stage Air Compressor, direct-driven by a 210 HP motor. This was in a shed beside the Winder, with a vertical Receiver outside. This compressor could have come from Porkellis Tin Mines Ltd.

The shaft was re-timbered with a double skipway, and a landing stage built in the headgear. Wagons raised in the skips were man-handled on a tramway on a wooden gantry which curved around past the waste tip on to the top of the Crusher Bins (SW71795137). The crushed tinstuff was then trammed to the bins above the Stamps. Men and materials entered the cages at ground level.

If prospecting results were encouraging the idea was to erect an aerial ropeway across the valley to Wheal Kitty Mill. However, this plan was dropped and instead that Mill was dismantled and re-erected on almost the identical layout at Polberro (SW71805145). The equipment included 40 heads of Californian Stamps, James Sand & Slimes Tables, sub-aeration flotation machine and a Harding Ball Mill, 4' 6" diameter.³¹

A Supply Agreement was signed with CEPCo on 27.7.37. for 600kW, minimum MD charge of 50kW, for which a contribution of £950 was made. The spur to Wheal Friendly was extended to a substation building near the shaft (SW71735135).

A threat of flooding

By October 1938 they were down to 770' and had installed station pumps at that level, where they also started to drive southwards to look for the Wheal Kitty lode.

The ground was known to be faulty but they struck the fault earlier than expected in March 1939. There was an inrush of water, raising the total inflow to equal the pump capacity.

As there was no sump or large working to absorb this inflow loss of supply would soon result in the flooding of the station pumps.

For a fortnight the position was critical and the author was sent out by CEPCo to stay on the mine and to be available to switch over the 11kV supply to come from Fraddon should it fail from Hayle. Fortunately there was no loss of supply but all underground work had stopped, and it took three weeks to clear the water before an extra station pump could be installed. Subsequently an alternative supply was brought to the substation by a spur from the line to Cameron Camp.

Further troubles

The shaft was down to 820' in December 1939 and station pumps installed. Sinking continued and 1100' was reached in September 1940, with station pumps installed at 1090'.

All these pumps were Mather & Platt Plurovane Centrifugal Pumps.³²

On the surface the Mill was complete to 50% capacity in March 1940. Unfortunately, a vertical diamond drilling to 180' below the shaft failed to find the lode. By now, money was running out and labour hard to obtain owing to National Service demands. Very little tin had been recovered.

The prime purpose of the company - the inter-section and development of the Wheal

Kitty lodes-remained unfulfilled. The government refused aid and the mine was closed in March 1941 after all the pumps had been withdrawn.

The company went into voluntary liquidation and the liquidator offered all plant and machinery for sale by auction on 20th May 1941.³³ It is not known where the electric winder went but the wooden headgear was bought and erected by the company which was then exploring Cligga.³⁴

The scene in 1985

Thomas Shaft was capped and the enginehouse, less roof, was in fairly good condition, though bricks are missing from the top of the stack. Reynolds enginehouse was demolished some years ago, together with the buildings around it, and dwellings have been built in this area. On Wheal Kitty Sara's enginehouse was still standing and in reasonable condition, though the iron bands were rusty and falling off the stack, from which bricks were missing from the top.

The various loadings of the Treatment Plant remained virtually intact, as did the sub-station building. The buildings that remain here were being used for industrial purposes. Further south the Counthouse still stands as a dwelling.

On Polberro Turnavour Shaft is capped, with '1941' on the concrete. The enginehouse walls were intact, with the remains of an asbestos sheet roof still in place and the gothic-shaped window openings intact. Bricks were missing from the top of the stack. The loadings of the winding engine, compressor and capstan were gradually being covered by tipping from the adjacent sportsground. The water tank was still standing.

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Notes on Pumping Engines around St. Agnes

Reynold's Shaft 50". Bought by a clayworks around 1909 and dismantled. When they returned to measure the building they found it demolished. Never re-erected and soon scrapped.

Thomas Shaft 40" Harvey. 1863. First at West Polbreen, then to Thomas Shaft. Finally at Carpalla to 1944. Stored by Science Museum.

Old Sump Shaft, Wheal Kitty 50" Copperhouse, 1852. To Parkandillack in 1912 and still there, and moved by compressed air.

Sara's Shaft, Wheal Kitty 65". Previously at Tindene. Installed 1907 and scrapped in late 1930's.

Gooninnis 50" Harvey, 1863. Previously at Penhalls & Trevaunance Mines. To Gooninnis 1899 and Goonvean 1910, where it remains.

Turnavour Shaft, Polberro 60". Initially at North Pool then South Penstruthal. To Polberro 1886 and to Wheal Friendly in 1905. Evidently scrapped after auction in November 1916.

Eric Edmonds joined the Cornwall Electric Power Company in January 1938 and retired from SWEB in 1979. His interest in the early history of the company enabled him to save all the original Supply Agreements and a number of other files which were about to be destroyed prior to moving to new offices.