

# Bersham Colliery

## History

The site was originally known as Glanrafon Colliery and sinking was started in 1864 by Messrs Barnes & Co of Liverpool who traded as the Bersham Coal Company. The site was originally a brickworks and some of the hand-made bricks were used to line the shafts. Sinking proved to be difficult and was not completed until 1879, with the first coal not being sold until 1874.

In 1912, Bersham Coal Company became a subsidiary of Broughton & Plaspower Coal Co Ltd but continued to operate independently. In 1936 the parent company was acquired by Lancashire Steel Corporation Ltd and it then absorbed the subsidiary to operate the colliery directly. In 1947, in company with a huge number of private firms, the National Coal Board took over Bersham and in 1986 they changed their name to British Coal Corporation. The last coal was brought up in December 1986 when it was closed by British Coal as being uneconomical. Work continued into early 1987 to salvage equipment from underground but quite a lot was abandoned.

There were two shafts which originally had steam winding engines but these were replaced by electric ones in later years. No.1 Upcast Shaft was 10ft diameter and 1,260ft deep. It had a 175h.p. electric winding engine and was used for manriding with a three deck cage capable of holding 12 men. No.2 Downcast Shaft was 12ft in diameter and 1,269ft deep. It had a 300h.p. electric winding engine and was mostly used for winding coal and materials. Its maximum load at a time was 2 tonnes and it averaged around 2,000 tonnes per day.

The worst disaster was in 1880 when there was an underground explosion that killed eight men, including the manager Mr Pattison. A ninth man dies of his injuries nine days later. There is a memorial to these men in Rhostyllen Church. In 1933 the headgear on the main shaft caught fire and had to be replaced by the surviving metal one, which came from Gatewen Colliery. There was another serious fire around the shaft head in 1937 but this was fortunately without loss of life. One ex-miner can remember the cage being brought to surface while the headgear burned above!

The underground workings stretched as far as Erddig Hall and a large section of solid coal was left underneath it to prevent subsidence. Despite this, however, serious damage was caused through adjacent subsidence, the kitchen roof having to be held up with girders. The National Coal Board had to pay out compensation for this. At one time over 100 pit ponies were in use underground and they were permanently stabled there but these were replaced with haulage engines in 1954. In that same year pithead baths were opened which had facilities for up to 1,100 men.

Coal was mined by hand up until 1935 when mechanised extraction was introduced. Miners from another local colliery were brought in to operate this and much resentment was caused with the existing workers. In 1961, in the Quaker Seam, mechanisation was brought in on a large scale and in 1963 it was used to drive two dipping tunnels from the existing pit bottom to the Ruabon Yard and Queen Seams. The intake tunnel was 1,770ft long and dipped at 1 in 5, being equipped with a conveyor and manriding facilities. The return tunnel was 1,350ft long and dipped at 1 in 4, being used for supplies.

The following plant was in use :-

Ventilation - a 1,148h.p. Howden Electrical Axial flow fan was installed in 1975 to provide ventilation. This had previously been used at Gresford Colliery and supplied 250,000 cu ft of air per minute.

Steam Raising - a coal-fired boiler was installed in 1964 and a methane-fired boiler the following year which together produce 3,650lbs of steam per hour. This is used in the pithead baths and space heating.

Power Supply - electricity was obtained from the Merseyside & North Wales Electricity Board with a maximum demand of 2,620 kilowatts. The incoming supply of 11KV was transformed to 3.3, 550, 440, 240, and 110 volt supplies.

Compressed Air - two 550h.p. electrically powered compressors were installed in 1951 with another 112h.p. unit in 1970.

Methane Drainage - five vacuum pumps were placed at surface to extract methane from the workings. Up until 1978, it was released into the atmosphere but then it was sold to the local brickworks (Dennis of Ruabon) to fire their tile kilns. There was a 2 mile underground pipeline with a contract to supply up to 3 million therms of gas per year. This was equal to around 13,000 tonnes of coal.

Coal Preparation - Baum box washers were used that could handle 80 tonnes of coal per hour.

Dirt Disposal - originally dirt was placed on their own tip but in the later years it was transported by road to the old Hafod Colliery tip and Pen-y-Bont Quarry at Newbridge.

Shunting - The colliery had a fan of sidings off the Shrewsbury - Chester railway line. Due to the tight curvature (until the 1981 remodelling to permit 'merry-go-round' working) only 4 wheeled locomotives could be used. There was known to have been a loco called SARAH here in the late 19th century of which little is known. The first confirmed was SNOWDON, which arrived from Brymbo Steelworks in 1919. It was built by Beyer Peacock of Manchester in 1886 with works number 811. These first two locomotives had gone to unknown destinations before 1940.

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Until the 1930s, Bersham drew its workforce from the local area, ie Rhos, Ponciau and Rhostyllen. This led to a strong family tradition of mining with sons following fathers into the pit, in which Welsh was the main language. This changed, however, as nearby pits closed and men were transferred in, with the workforce then being drawn from an area between Chirk and Mold. The largest workforce on site was in 1958 when there were 1,011 workers. This gradually dropped to around 500 in the later years, with coal being won from the Queen Seam and then the Two Yard Seam. The former was 1.1 metres thick and was worked towards Wrexham some 3 kilometres from shaft bottom at a depth of 1,410ft. The coal was normally extracted using two longwall faces, each equipped with five-legged hydraulic roof supports and coal cutting machinery. The faces were successfully operated in both advancing and retreating longwalls, despite thin seams and unfavourable geology at times.

Prior to 1950, Bersham coal went to a variety of markets including heavy industry, railways and a firm making dye stuffs for soap making. In the latter years about 90% of the coal went by rail to the John Summers Steelworks at Shotton for making coke. The rest was supplied to the Central Electricity Generating Board. At the very end the coal was finely crushed at shaft bottom and blown up to surface in pipes using compressed air.

In 1999, members of Shropshire Mines Trust visited the site and were concerned at the deteriorating condition of the building. They met with Wrexham County Borough Council to discuss ways that the headgear and engine house could be preserved and it was agreed that a local Trust should be set up to lease the site from the Council. The legalities of the lease took quite a while to sort out and working parties to start cleaning the enginehouse did not start until April 2001. In the meantime, the Bersham Colliery Trust had been set up and incorporated. The site was made safe and the engine and building cleaned but hardly any local people came to help. In the end, the Trust was wound up in 1992 through lack of local interest. The site is within an industrial estate and the security staff have keys to the engine house.

### **Surface Remains**

The obvious feature is the headgear with wheel still in place. The red brick engine house next to this is complete and houses the original electric winding engine. Other buildings have now been taken over as part of a small industrial estate. The headgear and engine house have been surrounded by a security fence and placed on the ground within the

compound are large mining artifacts such as the Point of Ayr winding engine, chocks and a panzer. The tip is still there but there are threats to remove it.

### **Description – Nigel Chapman**

Situated to the east of the Wrexham-Ruabon road and less than 2 miles from Wrexham church, the colliery belonged to the Broughton and Plas Power Colliery Company. It was sunk about 1870 to work one of the upper seams of coal for the benefit of a brickworks. The shafts were soon deepened to the Main Coal of the area, and were sunk in the centre of the royalty.

Originally owned by the Barnes family of Liverpool, it was taken over by the Broughton and Plas Power Company in 1910 and extensively modernised. In 1926 the colliery was electrified and in 1936, when the Broughton and Plas Power Company was reconstructed, the Lancashire Steel Corporation developed a financial interest and further improvements were made to the colliery.

The coal seams worked at Bersham were of exceptional quality and provided one of the best coking coals in the country. In 1901, when the Bersham Colliery Company were owners, Mr A Shaw was the manager with 675 men employed underground and 94 on the surface. In 1914, with Mr K Brown as manager, gas, household and steam coal was mined with 862 men underground, and 117 on the surface. During 1938 Mr J Tully was the manager, with 550 men underground and 140 on the surface. The annual output was 500,000 tons. By 1941, 800 workers with 600 underground produced 300,000 tons annually.

An explosion in 1880 killed 8 men including Mr Pattison the manager. The No.2 pit head was destroyed by fire in 1910 and a new steel girder headgear erected.

The proprietors are the Bersham Colliery Company Limited, of which Mr F Barnes is managing director. Mr J Walker is consulting engineer and Mr Alfred Shaw certificated manager. The mineral field, leased from various owners, has an aggregate area of about 800 statute acres.

The colliery was established in 1879, in which year shafts No.1 and No.2 were commenced. The Main Coal, the principal seam of the district, was reached at a depth of 420 yards from the surface. The Quaker Seam was intersected at a depth of 378 yards. The two seams furnish at the present time the whole of the mineral output of the colliery, and these yield various qualities of coal. No.1 shaft is the downcast and 10ft. in diameter. No.2 shaft is the upcast and of 12ft 6in. diameter, being placed 90 yards south of No.1. Both shafts are utilised for winding coal. A section of No.2 shaft is set apart for pumping purposes.

The section of the Quaker Seam is as follows:-

Inferior roof of black metal.

Coal 5ft. in thickness, being good steam coal.

Underclay 9in, in which the holing is made.

The section of the Main Coal is as follows :-

Top or bind coal                    1' 6"    This is excellent house coal.

Shale parting                        1"

Middle Coal                         3' 6"    Steam quality, good.

Hard parting                         3"

Bottom or bench

Coal, holing made                    3' 0"    Steam quality, good.

at the bottom.

Total coal 8' 0".

The roof of this seam is very weak and friable in the south and east part of the properties. It is much stronger in the north and west, where the metal is intercalated with thin bands of ironstone. At present the three qualities of Main Coal are sent out of the mine without separation. The Main Coal is raised at No.1 pit. The Quaker and Main Coal are raised at No.2 pit.

### **Method of Working**

Both seams are got on the long-wall principle. The general dip of the strata in the Denbighshire coalfield is to the east but locally the dip varies greatly, as will be seen from the following diagrams. The following is a plan of the method of working the main coal at Bersham Colliery

There is no definite cleavage in the coal. The stalls are usually 17 yards in breadth, with a gate road 3 yards wide in the middle of each. The gateways are supported by packwalls of 4 yards width and chocks on each side, as shown on Fig. 1. Each packwall is composed of two facing walls 18 in. thick; one, A A, adjoins the gate road, and the other, B B, is next to the waste. The former is built with large stone from ripping down top in the gateroad canch; the latter is built with fallen stone got from the waste. Cross walls of the same thickness are built between the face walls at 2 yards apart. The spaces thus enclosed, each 3 yards by 2 yards, are filled up with smaller material got from the waste. Chocks are built 2 ft. square on each side of the gate road at every 2 yards, shown at C C, which are left in these positions. At the face two rows of props are always upstanding, placed 5 ft. apart. As soon as the coal face has been advanced about 4 ft. another row of props is set up; the back row is then drawn out, and the packwalls are advanced another stage. Rails are laid between the two rows of props, gauge 1 ft 10 in. No explosive is used in breaking down coal or in ripping the roof in gate roads. Safety lamps of the Protector Mueseler class, locked with lead rivets, are used; spirit is burnt.

### **Ventilation**

The mines are ventilated by a fan of the Guibal type, which, with the driving engines, were made by Messrs Walker, of Wigan. The engines are duplicated; each has a horizontal cylinder 24 in. diameter by 22 in. stroke, and are in use alternately. The fan is 30 ft. diameter and 10 ft. wide, being driven direct from the engine. At a speed of 62 revolutions per minute the circulation of air through the workings of the two mines amounts to about 150,500 cubic feet per minute, with 1¾ in. water-gauge.

### **Underground Haulage**

There are three hauling engines, all placed at the surface. No.1 engine has a pair of horizontal cylinders, 10 in. diameter by 18 in. geared 1 to 5 for endless rope haulage on double roads for the Main Coal east haulage. The haulage roads are shown on the following sketch.

The 0 driving pulley on the third-motion shaft is 4 ft. diameter. An endless rope is taken two and a half turns around this pulley, then passes down No.1 pit to A, B and C; it then returns to A, from thence back to the engine at the surface. The tubs are run in couples, attached to the rope above by lashing chains, front and back. Double roads are laid throughout. Tension gear is placed at T<sup>1</sup>, another at C.

No.2 engine (for the west haulage) has two horizontal cylinders, 10in, diameter by 18 in. geared 1 to 5. The C driving pulley is 4 ft. diameter, being keyed on the third motion shaft. An endless rope is taken two and a half turns around the pulley, thence down No. 1 pit to

a tension pulley; then to the point, A, and westward to D; then back to A and up the pit to the engine. The tension pulley is placed at T<sup>2</sup>. The tubs are run in sets of twelve together, over a single road, first inwards then outwards, the average speed being about five miles per hour. In this method a shorter length of rope is required as compared with the main and-tail rope system, and two drums are dispensed with.

The Quaker Coal haulage roads are shown on the following sketch. The engine has two horizontal cylinders, 9 in. diameter by 12 in., geared 1 to 8. An endless rope is taken two and a half turns over a 4 ft. pulley. The rope is worked with double road on the same principle as No.1 haulage. The endless rope passes down No.2 pit to F and G, then inwards with empty tubs to H; outwards with full tubs to G and, and to the drop staple at K, where they are lowered from the Quaker Seam to the Main Coal, a depth of 40 yards, so as to be raised together with a portion of the Main Coal output at No.2 pit.

### **Pumping**

The principal pumping engine has a 24 inch cylinder, 4 ft. 6in. stroke, geared 1 to 6. A flywheel is placed on the first-motion shaft. From two cranks on the second-motion shaft two horizontal connecting rods actuate two quadrants placed over the pit. One of these raises water from the depth of 202 yards, with 10 in. bucket, length of lift 90 yards. The other quadrant raises water with a 12 in. bucket, length 112 yards, up to the surface. The engine operates day and night at the rate of 6 up-strokes per minute. A smaller engine raises water that is intercepted at depth of 80 yards. Water is raised in tanks from the Main Coal at night-time through No.1 shaft; the tanks each carry about 500 gallon of water, and are run into the cages.

### **Winding**

No.1 winding engine has two horizontal cylinders, 24 in, diameter, 4 ft. 6 in. stroke, slide valves, flat rope drums 8 ft. diameter. It raises three tubs in each cage, one above the other, the tubs carry an average 8½ cwt. No.2 winding engine has two horizontal cylinders, 30 in. diameter, 6 ft. stroke, slide valves. This engine was made at the Worsley Mesnes ironworks. The drum is cylindrical, 16 ft. diameter. Lock coil ropes are used for winding, made of best plough steel, 1 in. diameter Four tubs are raised in each cage, one above the other. Three guide ropes are adopted for each cage.

### **Boilers**

There are ten boilers, three being Lancashire form and two of the Galloway's pattern.

### **Screens**

A screening and cleaning plant, made and erected by Messrs Mowle and Meacock of Chester, is now nearing completion. It consists of three angled screens, two for Main Coal and one for Quaker Coal, with a lower screen (inclined in a contrary direction) under each for nuts and slack. The upper screen is made of perforated steel plates, having shoots over the plates reaching to the picking belts, which are made of steel wire. The Main Coal belts are 42ft. long and 4 ft. wide, the Quaker belt is 32 ft. long, 4 ft. wide. Screens consisting of both Main and Quaker Coals, have belts of 49 ft by 4 ft. The slack from the nut screen, drops into hoppers and from thence into trucks. The whole Plant is designed to work automatically, by gravity and by power. A small steam engine gives motion to the creepers, screens, and picking belts.

### **Electric Light**

This installation, consisting of a Crompton dynamo and accessories, was erected by the Corlett Electrical Engineering Company, of Wolverhampton. The machine supplies light for all surface works including two arc lamps for the sidings and a number of incandescent

lamps of 16.32 and 50 candle-power and a cable is taken down No.1 pit for lighting the gate roads for 100 yards inward.

### **Distribution**

The coal for export is shipped from Birkenhead. The Great Western Railway passes near to the colliery and conveys and distributes the coal to towns in the locality and to Shrewsbury.

Said to have been sunk in 1867 by Mr. Barnes of Liverpool. Major fire around the pit head on August 6th 1937. In its heyday the colliery employed more than 100 horses who were stabled underground.

The steel headframe existing on the Downcast Shaft was taken from the No.1 shaft of the Gatewen Colliery following its closure in the early 1930s. The wooden headframe over the Downcast Shaft at Bersham was destroyed in a fire in 1933. The Downcast shaft was fitted with a pneumatic system which blew coal up a pipe from the shaft bottom. It was said to deliver about 50 tons per hour. The colliery was closed during December 1986 because of the loss of markets and the general economic circumstances.

### **Locos – Michael Shaw**

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This information is taken from the Industrial Railway Society's book 'Industrial Locomotives of North Wales'