Waterhouses Pumping Station

A series featuring points of interest along the line of the canal, past or present.

One of the most prominent landmarks in the Daisy Nook area was the Waterhouses Pumping Station, situated between the staircase locks and the Fairbottom Branch. This was not part of the canal's original design and was built as an afterthought to pump water back up past the locks.

Its existence raises a number of questions, since the canal engineers hadn't originally thought it necessary.

There were a number of sources of water supply to the long pound between Bradley Bent in Hollinwood and Fenny Field at Fairbottom, including streams and water pumped from mines. The accidental formation of Crime Lake, following the collapse of the culvert taking Wood Park Brook beneath the canal embankment shortly before the canal opened, meant that the Wood Park Brook itself became an additional feeder into the canal.

Indeed, there seemed to have been a risk of too much water entering this pound, perhaps overtopping the bank, because in 1798, 2 years after this part of the canal opened, overspill weirs were constructed, at Woodhouses and just above the Waterhouses locks, to run surplus water off towards the river.

However, it is easy to imagine that during drier periods there may have been insufficient water to keep the locks operational.

With each lock having a fall of around 10 feet, it would take about 40,000 gallons of water from the pound to fill the lock. Some boats would also pass through the 4 locks at Hollinwood, letting water down from the reservoir there, but probably the majority of the boats would have served destinations on the long pound.

The other factor that may have led to the construction of the pumping station is the unpredictable demands of having a lock staircase in the middle of the Waterhouses locks.

Staircase locks make less efficient use of water than single chamber locks. A boat going up through the lock staircase after a boat had come down would take 2 lockfuls of water from the pound above, as the upper chamber would need to be filled twice, whereas a boat going down after a boat had come up would take no new water from the pound above, as the upper chamber would have been filled by the previous boat.

A boat following another boat through in the same direction, whether up or down, would take one lockful of water from the pound above.

Thus, in theory at least, the water demand at a 2-rise staircase averages out at one lockful per boat, compared with an average of 0.75 lockfuls with a single lock.

The more chambers a staircase has, the less efficient it is in water usage: e.g. a 3-rise staircase averages 1.25 lockfuls per boat. (See explanation and table following this article.)

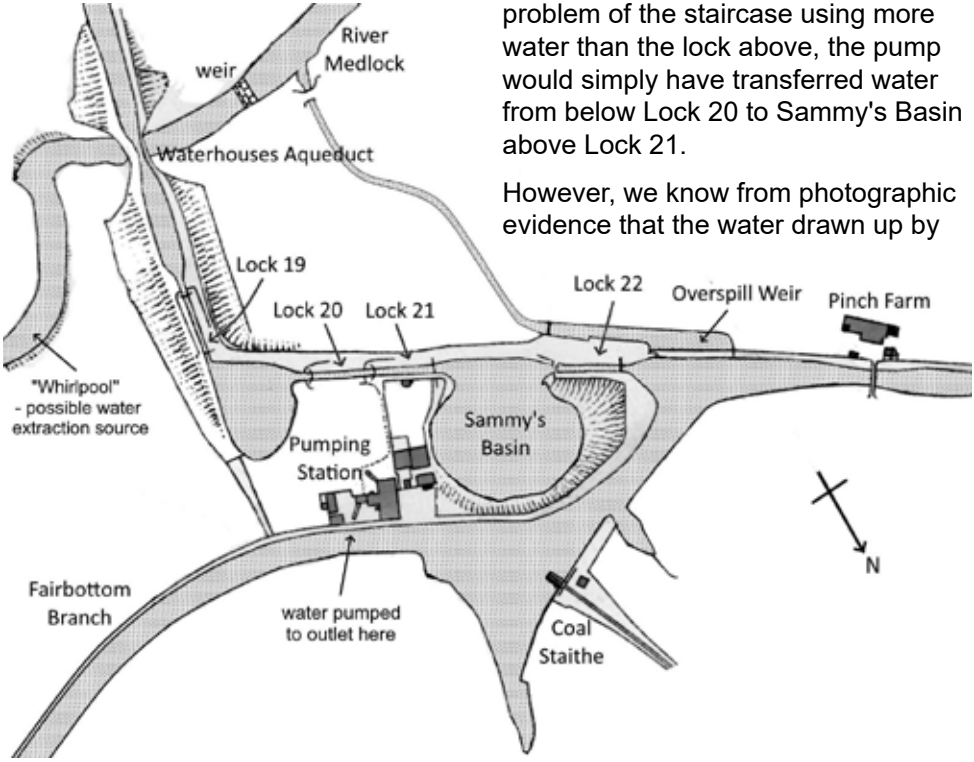
Staircases of more than 2 locks work slightly more efficiently in terms of water usage when a number of boats pass through in the same direction, before allowing a number of boats to

Waterhouses Pumping Station and locks. Photo: Garry Jones of Littlemoss

pass through in the other direction. However, with a 2-rise staircase, as at Waterhouses, this would have made no difference to the efficiency.

The fact was that the staircase locks would have used more water overall than the single lock above (average of 1 lockful for Locks 20/21 compared with 0.75 lockfuls for Lock 22) meant it was likely that the small circular pound between (now known as 'Sammy's Basin') would frequently have become short of water.

This was a problem that could have been dealt with by the lock keeper running water through Lock 22. It would have needed on average one additional lockful of water to be run through for every three boats that passed through.



This would have been time-consuming for the lock keeper, slowed down the movement of boats and would have been an additional drain on the long pound above the locks during drier periods. Therefore the canal company would have been able to justify the expense of constructing and operating a pumping station.

Thus, in 1812, 16 years after the locks were opened, the pumping station began operation, using a Boulton and Watt style beam engine, which had been bought from Engine Pit at the end of the Werneth Canal, where it had been used for pumping water out of the mine until the pit's closure.

The exact details of what the pumping station actually did are not clear. If its purpose was simply to solve the problem of the staircase using more water than the lock above, the pump would simply have transferred water from below Lock 20 to Sammy's Basin above Lock 21.

However, we know from photographic evidence that the water drawn up by

Painting of the Pumping Station and Lock Cottages seen from the Fairbottom Branch, by local artist Vanessa L. Dixon.

the pump ran into a wooden channel and passed below the towpath into the Fairbottom branch, on the level above Lock 22, which suggests that part of its purpose was to keep that long pound topped up.

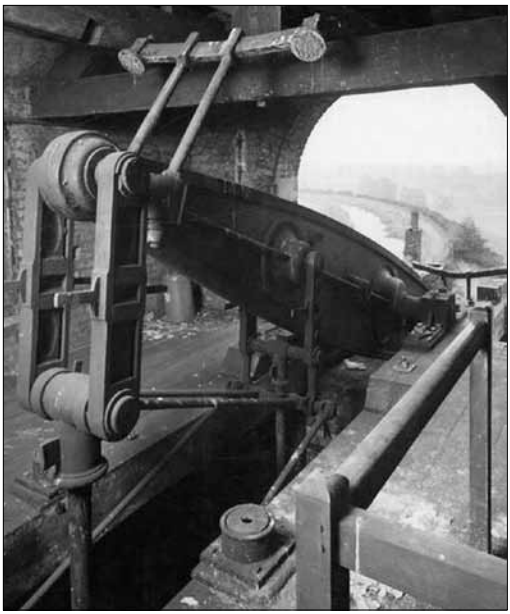
It is not clear where the pump drew the water from. To draw from below Lock 20 would have risked that short circular pound running dry. From below Lock 19 seems more likely, with that long pound extending to Ashton and Marple.

A number of personal recollections suggest that the water was actually drawn from the River Medlock. A weir just downstream of the aqueduct created a deep pool which would have been an ideal source. Children paddling in the river in the 1930s recalled seeing, upstream of the aqueduct, a 'whirlpool' which their parents warned to keep away from.

Was this caused by water being extracted by the pump? As to whether the pump had sufficient horsepower to raise water from the river, don't forget that it had previously been used to draw water from a coal mine.

Feeding the water into the Fairbottom level would have done nothing to solve the issue of the unequal water usage of the locks. Was there another channel that could feed water into

Right: the beam of the pumping engine, with the Fairbottom Branch in the background.



Sammy's Basin if required? This is possible but there is no evidence of this. The exact purpose and workings of the pumping station remain something of a puzzle.

After boat movements trailed off in the 1930s the pumping station fell into disuse. In the 1940s Vincent Ferranti of the Hollinwood-based electrical equipment and electronics manufacturers took an interest in the steam engine and commissioned drawings of it with a view to its preservation but, sadly, nothing came of this. By the 1950s the pumping station was in a derelict state. It was demolished in 1972 as part of the scheme that created Daisy Nook Country Park. A few stones can be found poking from the ground on the grassy slope which now occupies the site of the pumping station. It is possible that the rubble from the demolition was buried here during the landscaping. There are stories that the huge beam from the engine was thrown into one of the empty lock chambers and then buried.

The demise of Waterhouses Pumping Station is a sad story. There are pumping stations elsewhere (such as at Leawood on the Cromford Canal and Crofton on the Kennet & Avon Canal) that have been conserved and are now tourist attractions. Unfortunately the 1970s were still a time when canal heritage was not seen as important and this landmark feature of our industrial past has been lost forever.

Martin Clark

Left: the wooden trough which carried water from the pump to the Fairbottom Branch.

Water usage of Staircase Locks

When a boat arrives at a single chamber lock, that lock should be either full or empty, depending on which way the previous boat had gone.

A boat going down the lock when the previous boat came up will not take any new water from the pound above.

However, in all other situations, the passage will take one lockful of water from the higher pound. (Of course, some locks have leaky gates and we may arrive to find a lock partly full, which will affect the theoretical water usage.)

Staircase locks are a little more complicated as they need to be prepared before a boat enters. A boat going downhill will need the top chamber to be full and all other chambers empty. A boat going uphill will need the bottom chamber to be empty and all other chambers full.

When a boat descends a staircase, as each chamber is emptied, it fills the chamber below. When a boat ascends a staircase, each chamber is filled from the chamber above.

The table below shows that staircases use water less efficiently than single chamber locks. The more chambers a staircase has, the less efficient in water usage it is.

It is possible for narrowboats to pass going in opposite directions on broad lock staircases, which helps to reduce the average consumption. Passing on a staircase is not, of course, possible if the locks are narrow.

	number of lockfuls taken from pound above			
	single lock	2-rise staircase	3-rise staircase	5-rise staircase
boat going up when previous boat also went up	1	1	1	1
boat going up when previous boat went down	1	2	3	5
boat going down when previous boat also went down	1	1	1	1
boat going down when previous boat went up	0	0	0	0
overall average numbers of lockfuls taken from pound above per boat movement	0.75	1	1.25	1.75