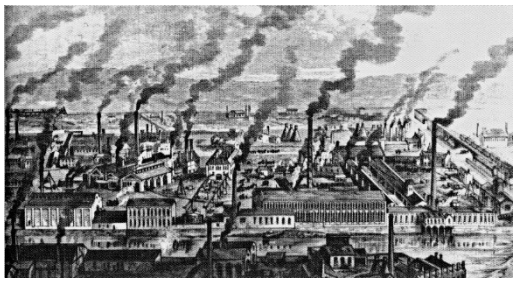
Aldenham Reservoir – the first 225 years

The subject of this paper is Aldenham reservoir, so let's start by asking why Aldenham and why reservoir? The answer to the first part is that although it's much nearer to the village of Elstree (less than a mile away) than it is to that of Aldenham (about three miles away), when it was built it was in Aldenham parish, using parish in the sense of a basic unit of local government. The boundary between the two parishes ran along Watling Street, dividing Elstree village in half, until it was moved in the 1930s. Everything on the west side was in Aldenham, which is why Aldenham House, now part of Haberdashers' school, just across the road from the reservoir, and the former Aldenham bus works, now the site of the Centennial Park industrial estate, near its southern end, are so named. And when the boundary was moved, it was redrawn around the western edge of the reservoir itself, so although the water is now in Elstree, everything beyond is still in Aldenham - hence the name of Aldenham country park.

And although it's sometimes referred to as a lake, which would be a natural landscape feature, what we're discussing is an artificial body of water, constructed for a particular purpose, and that's why it's a reservoir. This is actually a French word, meaning a place where something is stored or reserved.

So, if it was built for a purpose, what was that purpose, and what was here before the reservoir?



To understand why it was built, we have to go back more than two centuries to the second half of the eighteenth century. The industrial revolution was getting under way, the steam engine had been invented as a means of powering machinery, the fuel for the engines was coal, so the new factories which were springing up were mostly in the coalfields, including the English Midlands. But a factory is no use if you haven't got transport to being in your raw materials and distribute your manufactured products. Railways hadn't been invented yet, and the condition of the roads was very poor, so you could only use them to move goods in carts or on packhorses, which greatly limited the loads you could carry. Much the cheapest way of moving large quantities of goods was to float them on water. If you're on or near the coast, that's fine – but there's a clue in the name Midlands – they're not near the sea. You could use rivers if they're big enough and they flow in the right direction, but there's no river that flows from the Midlands to London, which was the largest centre of population and the largest market for goods (and, as well, for coal to use as a domestic fuel). So if you haven't got a river, the only solution is to build a substitute, i.e. a canal.

By the 1780s you could get between the Midlands and London by inland waterway, but it involved using a rather slow and roundabout route going by canal to Oxford, and then down the River Thames from there. So the Grand Junction Canal Company was set up by act of Parliament in 1793

to promote the 18th century equivalent of High Speed 2, that's to say a more direct and faster route between the Midlands and the capital.

And here's a map of it. It actually started at Braunston in Leicestershire, from where it was connected by other existing canals to Birmingham, and it then ran south through Northamptonshire and Buckinghamshire, over the Chilterns to enter Hertfordshire near Tring, then down the Gade valley past Hemel Hempstead to Rickmansworth, and on down the Colne Valley past Uxbridge to join the Thames at Brentford. It's a rather winding route, because canals have to be built on the level to stop the water in them running away, but where they can't avoid going over a hill they use locks, which are like a staircase for boats. That's what the black arrows on the map represent, and this picture reminds us what a set of canal locks looks like. And here are some of the horse drawn barges that were used for carrying the goods.

What does any of this have to do with Aldenham? The Grand Junction Canal was miles away, the other side of Watford. But canals are artificial waterways. They're full of water, but the water has to come from somewhere. Every time you open a lock gate, you lose water from the higher to the lower level, so you have to keep topping the water level back up. And the only place this water could come from is the nearest river.

Remember : the Grand Junction Canal followed the River Colne along what is now the west side of London. So the company was given powers to transfer water from the river into the canal when it needed to. But this would have the consequence of reducing the flow of water in the river itself, and that was a problem because along the banks of the river there were already a number of mills or small factories driven by water power, i.e. water wheels. The owners of these premises were naturally opposed to anything that might reduce the river's flow sufficiently to affect their operation.

So a clause was put into the Act saying that whenever the river fell below a certain level, the canal company had to top it up again. In order to do that, it had to have a store of water available. And that's what the reservoir was for. It was built by damming the very shallow valley of a stream called Tykeswater, which flows into the Colne just north of Radlett. The dam blocked the flow, so the water was impounded behind it to form the reservoir, and then whenever the river level dropped, water could be released to flow down Tykeswater and help to fill it up again, so that the canal could also be topped up without preventing the mills from operating. To ensure that the company complied with its obligations, the mill owners were entitled to appoint a reservoir superintendent, though the company had to pay his salary. And although the mills have long since gone, the reservoir remains, and could still be used for its original purpose if that were necessary.

If the reservoir was built only in the mid 1790s, what was here before? This is a map published in 1791, i.e. only a couple of years earlier. It reaches from Aldenham in the north to Stanmore in the south, and from Bushey in the west to what was then called Barham Wood in the east. In the middle is Elstree, also then known as Idlestree. The blue shape superimposed in the middle is the reservoir. Most of the land around is shown plain, which was farmland, but just to the west of Elstree there's a speckled area, stretching across to Bushey, which was uncultivated or heathland, with the black wiggly line of the stream, i.e. TykesWater, running from south to north across it.

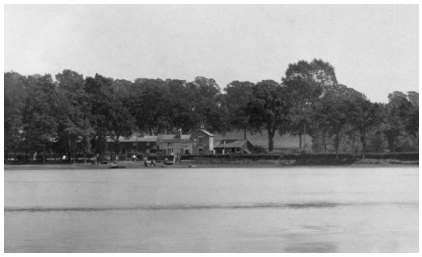
A reason why it was uncultivated is that it may well have been boggy. And a reason for thinking this is that there's a clue in the alignment of the road which runs up the middle of the map. That's Watling Street, which was originally built by the Romans, who were famous for constructing straight roads over long distances. The road comes absolutely straight from London along the Edgware Road to the top of Brockley Hill, where there was a Roman settlement. But instead of going dead ahead, it then turns half right through Elstree as far as the junction of Allum Lane, and then turns half left in order to go dead straight for the next eight miles until it reaches Verulamium, which was the Roman city just to the west of present-day St Albans. Why did the Romans put this dog leg in their road? It seems likely that they were avoiding marshy ground, and that it was the fact that the ground was still marshy that made it an obvious choice as a site for the Grand Junction Canal company to build its storage reservoir.

The land on which it was built was part of Aldenham Common, and the canal company had to pay £30 an acre to compensate the Lord of the Manor and various other people with a right to use it. The site originally purchased covered 68 acres, so the cost was £2040, or about £120,000 in today's money, and a further 10 acres were purchased in 1801 to increase the volume. The dam which holds in the water is 436 yards long, and 25 feet high in the centre. It was built between 1795 and 1797, and is popularly believed to have been constructed using the labour of prisoners of war who had been captured in the course of the war with revolutionary France which was then in full swing. This was the first war – at least since Roman times - when captured enemy combatants were held for long periods, rather than being exchanged, and they seem to have been billeted all over the country.

Very few if any impounding dams of its size had been built in England at that time, so its builders had very little relevant hydraulic engineering experience to draw upon, and they simply used uncompacted local clay and soil, presumably dug out of the bed of the reservoir itself. Unfortunately clay is not a stable building material, and is liable to shrink and crack in dry weather, so the dam has been giving trouble from subsidence ever since. As early as 1802 there was an attempt to raise its height and strengthen it by covering it with a protective layer of sand and gravel, using horses to tread it down, and topped by a thin layer of soil planted with ryegrass. The cost was £400, i.e. £20,000 in today's money. But only two years later the water had to be lowered in a hurry to allow urgent repairs and strengthening to be carried out. There was a sluice at the north end of the dam to control the water level, but it's not clear what form it took originally, as the current apparatus is much more recent. It's an interesting insight into the progress made in civil engineering during the 19th century that although damming Tykeswater proved fairly challenging around 1800,

100 years later a British engineer called Sir William Willcocks successfully dammed the Nile at Aswan and tamed the floods which had governed life in Egypt for millennia.

Records of the reservoir during its first hundred years are fairly scant. The earliest picture seems to be this one, dating from 1822. It appears to be looking east towards Elstree on the hill beyond, with the dam out of sight on the left. The cottages near the water's edge are probably the same as, or on the site of, those in this 1880s photograph.



They can also just be seen on a 1914 painting by Owen Wynne Apperley, which is in the Bushey Museum collection. They may have housed canal company workers.

This is a close-up view, taken before they were demolished in the 1960s. The site they occupied is now the car park of the Fishery pub in Watford Road.

In the 1830s there was a house called Elm Place on the corner of Aldenham Road and Watford Road, where a cul de sac called Land's End is today, which was rented by Charles Macready, one of the leading actors of that era. We know from his diary that he liked to walk around the reservoir, and in August 1839 he was visited by his close friend Charles Dickens, with whom he went rowing on the reservoir after the christening of his son in Elstree church. Local directories in the 1870s and 1880s refer to its use for boating and fishing, and say that it had become a favourite haunt of wildfowl and waders. An 1883 book on Greater London tells us that "the reservoir is well known to ornithologists and anglers. It is a beautiful lake, nearly one hundred acres in extent, embosomed in grassy hills, secluded with aquatic trees, and consequently the great attraction of the place."

But sadly there are entries in the parish register relating to local children who lost their lives while swimming in the reservoir, and in 1891 The Times recorded the inquest into the death by drowning of two 22-year old Dutch students from a Catholic theological college in Mill Hill.

In the closing decades of the 19th century and the opening decades of the 20th, Aldenham House which is half a mile to the north of the dam was the home of the Gibbs family, headed by Lord Aldenham. One of its members, named Vicary Gibbs, was an eminent botanist who created ornamental gardens surrounding the house, filled with rare plants from all over the world. These included some water gardens, with a series of pools and cascades connected by an artificial stream, a section of which still exists. The

stream was fed by a pipe from the reservoir, and consumed six million gallons of water a year. The pipe must have worked as a siphon, because it is recorded that the head of the water gardens was three feet higher than the supply valve at the reservoir, and whenever water was drawn off by the canal company, the gardens ran dry. It's not clear where this valve was located.

If we compare a late 19th century OS map of the reservoir with one from the present day, the most obvious changes are the appearance of the country park and its car park in the north west corner and the industrial estates to the south. The basic shape of the reservoir itself, which has been likened to that of a boxing glove, hasn't changed, but if it seems a little smaller in the modern map, that's

because it is. The water level has been lowered to reduce pressure on the dam, and the woodland has encroached, particularly around the thumb of the glove, which is called West Bay.

The Boat House (which is now the Angling Club's building) and the Sailing Club on the modern map are 20th century additions, and what was a little peninsula at the east end of the dam has become an island. In the south there is an extension of the reservoir on the opposite side of Watford Road called the Mere, which is connected to the main body of water by a pipe or conduit under the road, and is now heavily overgrown with reeds and rushes. This is what the Mere looks like now, with the remains of the sluice gate or penstock which controlled the flow of water through a pipe or conduit under the road into the main reservoir, and this is where the pipe emerges under the perimeter path.

There are S-bends as you approach the reservoir in either direction along the A411, either from Bushey or from Elstree, which is where what was originally a straight road (though not a Roman one) was diverted along the causeway which separates the main body of water from the extension. This aerial photo from the 1930s shows the road diversion and the Mere very clearly.

The excellent local museum on the top floor of Boreham Wood library has a collection of photographs relating to the reservoir, though unfortunately many of them are undated and you have to look for clues like the clothing that people are wearing to guess when they were taken.

These pictures are from postcards of what they wrongly identify as Elstree Reservoir, and all show the little peninsula which is now an island, near the eastern end of the dam, with sailing and boating taking place. They probably date from around 1905. The yacht with the white sail is believed to have belonged to Sir Percy Everett, a local squire who lived at Schopwick House in Elstree and was a friend of Robert Baden-Powell, with whom he served as Deputy Chief Scout.

Here is the same view today.

And we actually know the name of the little girl in this shot – it's Elsie Scrivenor, who was out boating with her mother and grandmother.

You could also get a fishing permit for 2/6 (12.5p) and compete with the resident herons to catch roach and eels.

The first World War lasted from 1914 to 1918, and there are two~~wo~~ events related to the reservoir recorded during these years. One was the building - or more likely the extension - in 1915 of a tunnel under the dam which carries a pipe from an inlet a few yards offshore to a discharge valve feeding into the spillway which is now effectively the source of Tykeswater. The date is carved over the entrance, but why this work was done during the middle of a world war, I have no idea. But this is how the water level is still regulated, and the valve is opened regularly to test that it is operational. There are also valves at the upstream end of the tunnel, under the inlet, but access is constricted and these are normally left open.

The second was the accidental death of a resident of one of the reservoir cottages, who was killed while standing outside his property by a plane, piloted by a Canadian, on a training flight from the temporary military airfield at Shenley. The reservoir was being used for target practice, and the machine gun misfired.


The Reservoir Head, Elstree.

There are local residents around who recall that in the interwar decades of the 1920s and 30s, the reservoir was a popular alternative to a day at the seaside, for swimming, boating and fishing. Teas were served from the reservoir warden's house which had been built in 1898 at the east end of the dam.

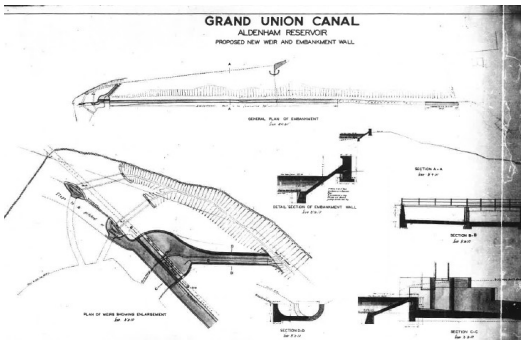

Elstree Reservoir Bathing Pool

There was another tearoom about halfway between the dam and Watford Road, run by Freestones bakery, on the site now occupied by the sailing club base. In the early 1930s sand was brought in to create an artificial beach, a jetty was constructed for bathers, and novice swimmers could use a small pool at the water's edge. Here's the same view today. What's very striking about the aerial view from 1938, showing the beach, is how much more overgrown this whole area has since become.

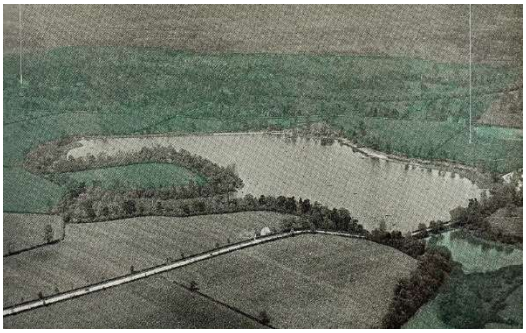
In 1928 the Grand Junction was merged with various other canals companies to become part of the Grand Union Canal, and in 1947 this was nationalised and ultimately came – with the reservoir – into the ownership of British Waterways. An isobath means an underwater contour, and this isobath map produced for the Grand Union company in 1939 shows that at that time it had a maximum depth of 19 feet, though much of it was a lot shallower.

These pictures show that at this time the dam was essentially still just the clay structure, with an overlay of gravel, that it had been for 140 years.

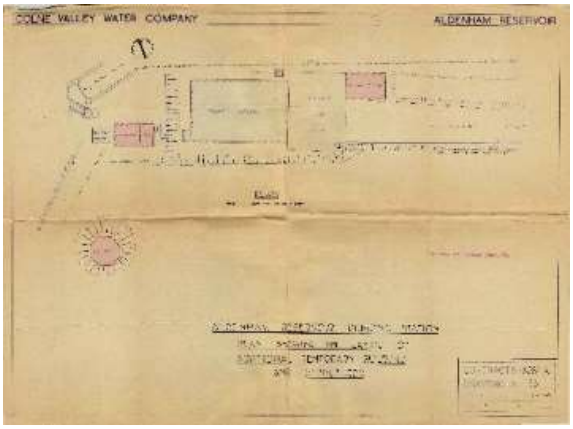
This made it vulnerable to erosion by wave action, and in 1938 the canal company decided to build a concrete wall along the entire upstream face, i.e. next to the water, with a step at the foot to break the impact of wave action. At the same time it reconstructed and enlarged the weir at the north end, with a footbridge across it, and turned the spillway into a concrete trough. The structure today is essentially the same as that shown in these drawings, which include a couple of pre-existing overflow conduits adjacent to the weir which have been disused for many years but can still be seen.



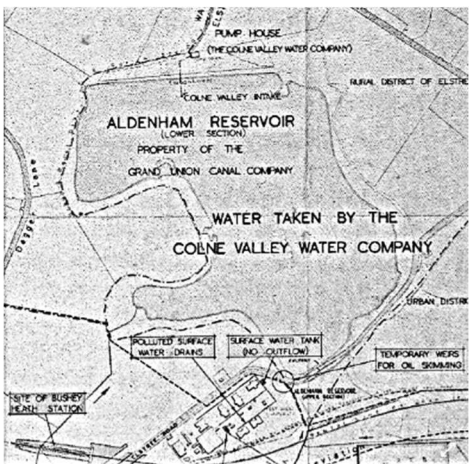
Another significant event at this period was the acquisition by the Hertfordshire and London county councils and the Barnet (later renamed Elstree) rural district council, under various pieces of early green belt legislation, of most of the land around the reservoir, in order to prevent it from becoming developed as part of the outward expansion of London. The green areas in this picture show the area that was protected in this way – a fact that became significant forty years later.



In 1937 the canal company came to an agreement with the Colne Valley water company to allow the latter to draw off water for public supplies when required, and the pipework in the tunnel seems to date from this time. This meant that the reservoir had to be protected from possible pollution, so public swimming came to an end. A surface level intake was constructed, which is visible as a dot in the water in this 1949 aerial view. The reason for using Aldenham as backup storage for the public water supply was that the water levels in the large reservoirs to the south west of London were lowered during World War 2 as they were thought to be at serious risk of breaching by enemy bombing.



There was a pump house built near the tunnel mouth, and in 1940 the water company drew up plans for what are described as “additional temporary buildings and structures”, shown in pink on this plan, which included a chlorination shed, an elsan closet (implying that there would be regular staffing), and what is described as a redoubt, which seems to mean some sort of sentry point. There is also an existing eel trap chamber shown, presumably designed to allow any eels which were in danger of being sucked into the pipe to be rescued. None of these temporary buildings appear actually to have materialised.



This plan dates from 1947, and was produced by the water company to support a petition it tabled in parliament to protect its interests in the event of the Northern line being extended (as then proposed) from Edgware to a new terminus at Bushey roundabout (note “site of Bushey Heath station” in

the lower left corner). At the top it shows the water intake and pump house, and next to the Mere it shows what are described as temporary weirs for oil skimming.

These can just be seen on the edge of the Mere in this 1952 shot, and are referred to in a later engineering report as humus or settling tanks. They were needed because the buildings in the adjacent field had been put up during the war in which to make or test aero engines, and the land had become badly contaminated with oil, which was seeping into the water. This site later briefly became the Danziger film studios and now houses a couple of small industrial parks. The tanks are still there, as shown in this shot, but are not visible from any point to which there is official public access.

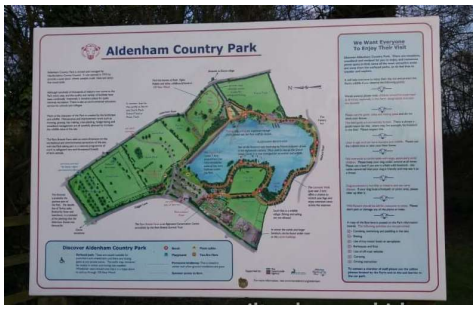
Although swimming was banned when the reservoir became a standby source for public water supply, sailing and angling have continued to this day. It has been the home since the 1920s of the Aldenham Sailing Club, which now has racing fleets of Laser, Illusion and Enterprise dinghies, and sponsors the Pico and Optimist classes for juniors. It's interesting to see how the number and shape of sails has altered with time.

Carp, roach, bream and pike are resident in the reservoir, although there has been a problem with poachers since the last water bailiff retired several years ago. Fishing rights were recently acquired by the Aldenham Angling Club, based in the very inelegant former boat house (actually, a nissen hut) near the east end of the dam, built by the canal company in 1939. It has now embarked on a programme of improving the facilities for anglers, and as you walk round, you will see the remains of several small jetties which were used by anglers in years gone by.

For the ornithologically inclined, the reservoir's resident wildfowl include swans, coots, moorhens, ducks, herons, grebes, cormorants and Canada geese, plus occasional more exotic visitors such as black swans and Muscovy ducks.

Pumping continued at least intermittently until the 1960s. The agreement with the water company lapsed in 1973, and the pump house was demolished. Reverting to the dam, there used to be trees along its crest and covering its downstream shoulder, whose roots served to stabilise the clay and keep the local water table low. But these were removed in 1975, because of concerns about leakage through root channels or the possible damage which would result if a large tree was uprooted. An unintended consequence has been to encourage gradual movement of the clay fill, heightening the general sense of instability.

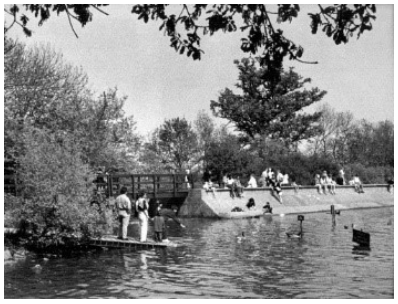
The reservoir had long since ceased to be used for its original purpose, i.e. to top up the River Colne, and as far as British Waterways was concerned it had become an unwelcome liability. But by great good fortune it was at this point that a white knight suddenly came riding to its rescue, in the shape of Hertfordshire county council. You will recall that some of the land to the north and east of the reservoir was in county council ownership, and in the mid 1970s the council was blessed with a particularly far-sighted and imaginative leadership, which decided to use some of this land to develop a recreational amenity in the form of a country park.



The council laid out the car park, nature trail and Winnie the Pooh's 100 Aker Wood, built an adventure playground, refreshment kiosk, toilets and warden's house, and created a rare breeds farm, with herds of Bagot goats, English longhorn cattle, a family of shire horses, and various varieties of sheep, pigs and poultry, all of which were open to the public free of charge. It became extremely popular, drawing visitors from miles around. Along the nature trail there were some tree sculptures, including one on the island near the angling club HQ which very few people knew about until recently, because there's no public access and it was obscured by scrub vegetation.

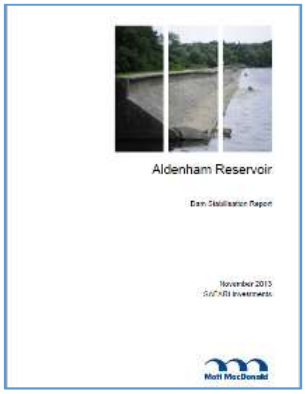
And as part of this development, the council took out a 42 year lease on the reservoir, after British Waterways had completed some urgent repairs to the dam, in order to preserve it for public enjoyment. Dam maintenance was part of the lease. In the 1980s the council installed drains on the downstream face and in 1998 it undertook some major strengthening works in the form of the sheet piling which you can see towards the eastern end. But the council never owned the reservoir itself, and the concrete posts you see around the edge mark the boundary between council land and reservoir land.

But times change, councillors come and go, and by 2012 a very different county council leadership decided that in an age of austerity it no longer wanted to be in the business of running recreational services. So it put the management of the park out to competitive tender, and for the past six years it has been run by Aldenham Renaissance, a not-for-profit community interest company.



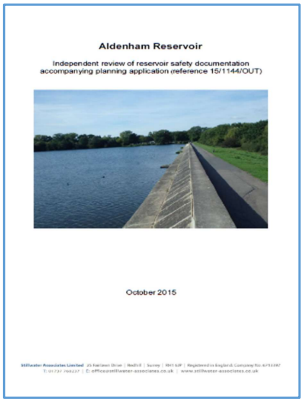
ALDENHAM COUNTRY PARK
A Free Range Experience

The reservoir had only been leased by the county council, and when British Waterways decided to dispose of it, without much local publicity, in around 1990 it was acquired by a somewhat elusive company registered in Panama, called Safari Investments. Included in the deal was the ownership of a field between the Mere and the Fishery pub, on the south side of Watford Road. The only visible result of Safari's ownership was the demolition in 1998 of the warden's house and its replacement by the rather grandiose mock Tudor mansion called Reservoir House which overlooks the dam today, and which was sold in 2012 for £2.8 million.

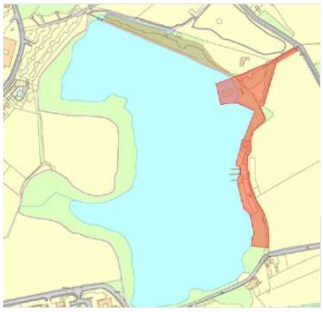


In 2014 Safari commissioned a report from a firm of consulting engineers on the condition of the dam. This recommended some immediate repairs estimated to cost £6400 plus on-going annual maintenance costs of £25,500. But to ensure the longer-term future of the dam, it recommended either major reconstruction costing £1.5 million or its complete replacement at a cost of £2 million, a figure subsequently revised to £3,350,000.

The following year Safari submitted a planning application to Hertsmere council for building up to 150 houses on the field next to the Mere, using the argument that the need to raise the funds required to fix the dam (which would come from the proceeds of this development) constituted the "very special circumstances" needed to justify the release of this land from its green belt status. The council commissioned its own engineering report, from a different firm, which concluded that there was no current requirement for any capital works to be undertaken, and that while it is possible that further settlement of the embankment may result in the need for further remedial works in the long term, it was not considered that a complete rebuilding of the dam would be a viable option.



Safari withdrew this application before it could be determined by the council, and offered the reservoir for sale to various local groups and authorities, none of which was willing to bid for it. In the event it was sold at the end of 2015 for a fairly modest sum to two local entrepreneurs trading as Liberty Lake Leisure (aka Liberty Aldenham), and since the county council's lease expired at the end of 2016, they have also been responsible for its upkeep. They resubmitted the application for housing, with an undertaking to establish a community interest company, to be funded out of the proceeds, which would own and maintain the reservoir in future. But this was rejected by the council's planning committee in October 2016.

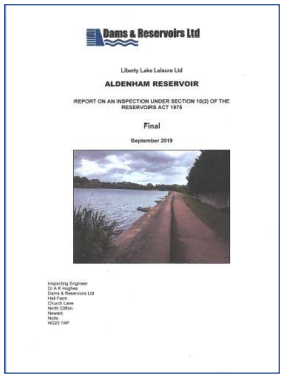


Last year Liberty Aldenham came forward with a new scheme, involving the creation of what was described as a "Nature Retreat" along the eastern shore between Reservoir House and The Fishery. This would have provided 50 pods, which were actually wooden cabins accommodating either 4 or 2 people, each with a shower, toilet and kitchen area. There would have been a service road to convey people and luggage between the car park and the pods. The sailing club would have been relocated on county council-owned land inland from the pods, though it would still have had access to a jetty. The fishing club hut would have been

demolished to make way for a café and a boat hire facility, offering canoes, paddle boards and rowing boats, plus cycle hire.

Hertsmere's planning officers recommended rejection of the scheme, on green belt grounds, and the council imposed a tree preservation order on the whole of the land surrounding the reservoir in Liberty Aldenham's ownership. The application was therefore dropped, causing the current state of uncertainty. Meanwhile, Liberty Aldenham had commissioned a further engineering survey, which it filed – as the law requires – with the Environment Agency. A redacted copy of this has come into the public domain. The key findings are that

- the reservoir/dam is adequately maintained and is generally in a satisfactory condition
- the overflow arrangements are satisfactory and adequate to pass the design flood outflow
- the margin between the top of the dam and wave wall and the overflow level is more than the margin recommended in "Floods and Reservoir Safety"
- there are effective means of lowering the reservoir level
- no movement of the surrounding land has been noted which might affect the stability of the reservoir.


Dams & Reservoirs Ltd

Liberty Lake Leisure Ltd

ALDENHAM RESERVOIR

REPORT ON AN INSPECTION UNDER SECTION 10(2) OF THE RESERVOIRS ACT 1975

Final

September 2019

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Or to sum it up in two words, "don't panic". But there was also a covering letter from the engineer, in which he says that it is his expert belief that the dam movement patterns will continue and could accelerate with time and thus he believes it prudent to allow for significant capital investment to rebuild or replace the embankment in due course. He goes on to suggest that Liberty Aldenham "may consider a temporary or permanent reduction in water level to reduce the load on the existing structure." It in turn has said, in a letter to Oliver Dowden MP and others, that "As owners of the reservoir property we need to manage our perceived risk based on our available and limited resources. We have therefore considered it prudent to reduce the level of the water in the reservoir initially by only a metre but subject to further assessment by our supervisor." And I think it's fair to add, though it's not in the letter, that the recent near-collapse of a dam of similar age and structure at Whaley Bridge in Derbyshire has concentrated minds considerably, not least the insurers'. So the sluice has been opened and the water level is now down by a metre, exposing tracts of foreshore around the perimeter (and the long-submerged punts) - though it has been even lower at times in the past, as an aerial shot taken on 24 June 1949 attests. Notices now warn of the danger of venturing onto the deep slurry of the mudflats.

So, what does the future hold? Liberty Aldenham is understandably trying to minimise its losses and its risk exposure. It appears that the county council and Hertsmere simply don't want to know. Every local group wants something to be done, but nobody has been at all clear about what. The situation was the subject of a report to the members of Elstree and Borehamwood Town Council in March, when all of its members agreed that the reservoir was a beauty spot, a recreational amenity, a wildlife haven, and "the jewel in the crown of Elstree and Borehamwood", all of which were under threat - before simply moving on to other business. So at the end the council was challenged, from

the public gallery, to do something constructive, by approaching all of the relevant parties, by getting talks going, by calling for ideas, and by using its powers and its influence to seek a viable way forward. Happily it agreed, but what action it will actually take remains to be seen.

Meanwhile, the dam is still there, and being regularly monitored. And by whatever means it is achieved, our hope and prayer must be that the reservoir remains for future visitors to enjoy throughout their lives, just as it has been for this pair of reservoir dogs through all of ours.

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