World Heritage
news
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Preparing for electrification

AHEAD of the planned electrification of the Midland Main Line from Bedford to Sheffield by 2020, Network Rail is talking to national and local groups regarding the conservation challenges for the stretch of line running through the Derwent Valley Mills World Heritage Site (DVMWHS).

The line from Derby to Chesterfield is one of the most important survivors of the 'pioneering phase' of England's railway development.

It was designed by George Stephenson, with his son Robert, leading railway engineers of the day, to form part of the North Midland Railway. This line opened in 1840 as the central link in their grand vision for a trunk route running from North to South.

Today the vast majority of structures on the Stephensons' railway in the Derwent Valley survive essentially unaltered since their construction 175 years ago.

The main challenge facing Network Rail is to find the most sensitive and pragmatic solutions for the electrification of this historic railway line in an early industrial landscape of international importance.

To begin this process, Network Rail assisted English Heritage in a comprehensive designation survey that resulted in 30 bridges, viaducts and tunnel portals on the Midland Main Line being listed.

Ten of these new listings are in the DVMWHS and its Buffer Zone.

Network Rail is committed to working with local stakeholders to achieve the best solutions for the electrification of the Midland Main Line through the Derwent Valley. There have been several consultations to date with Belper Civic Forum and the WHS, and these will continue as the project moves forward.

See Network Rail's supplement starting on page 5 for more information on the history of the North Midland Railway, its importance in the WHS, what this means for the electrification project, and the next steps.

NATIONALLY IMPORTANT: Derwent Viaduct, Ambergate, was listed Grade II* as a result of English Heritage's designation survey, putting it in the top 8% of listed structures.

War centenary remembered

ONE HUNDRED years on from the outbreak of World War One, activities have taken place in the World Heritage Site to commemorate the event and remember those who died in the conflict.

Events over the summer centred on Belper, where poppies were seeded on the Chevin hillside, eventually spelling out 'WWI'.

On August 4, the day of the centenary, a blessing ceremony for the poppy field was followed by an evening service in St Peter's Church.

The previous day, the original Belper War Memorial, a hollow structure created around the Market Place lamp in 1919, was recreated for the first of a number of remembrance gatherings on significant centenaries over the coming years.

About 250 people came to the service and placed flowers around the memorial, as had been done in 1919.

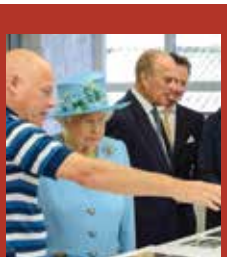
The Belper Branch of the Royal British Legion plans to plant a memorial oak tree in the Memorial Gardens on November 11, and for December a community performance event - Home For Christmas - is planned.

A new website, telling the stories of each Belper man killed in action during that war, was launched in August, thanks to research carried out by Richard Pinkett, and more activities will be announced in coming months, not just for Belper but the wider Derwent Valley and World Heritage Site.

WE REMEMBER: The recreated 1919 memorial in Belper Market Place.

Derwent Pulse set to flow through October - Page 2

Students deliver a hi-tech scanning project - Page 3



Royal visitors for John Smedley - Page 4

United Nations Educational, Scientific and Cultural Organization

Derwent Valley Mills inscribed on the World Heritage List in 2001

Derwent Pulse all set for October

HUNDREDS of lights will cascade down the River Derwent in October as part of Derwent Pulse - one of the largest art projects ever commissioned in the county.

The course (pulse) of the river will be illuminated by pulsating digital spheres shepherded by riverside communities from the source in Bleaklow to its mouth at the Trent.

Throughout October, Derwent Pulse will flow through Bamford, Hathersage and Grindleford to Chatsworth Estate. The lights will then move south, shooting the rapids at Matlock and contributing to the Matlock illuminations, before flowing past the mills in Belper and Derby prior to meeting the Trent.

Devised and led by artist Charles Monkhouse, Derwent Pulse will offer local communities the chance to shepherd the lights, take part in helping map the modern Derwent, or volunteer to handle or photograph the project.

And, of course, Derwent Pulse will be a great audience attraction.

The lights that form Derwent Pulse are controlled by small circuit boards designed by Derby Makers at the Derby Silk Mill Museum. Each light contains a miniature computer, GPS module and radio transmitter and receiver. This allows the lights to respond to the landscape they pass through while echoing the industrial pulse that originated in the valley.

"This is a fantastic project that will provide a fascinating spectacle as it flows down the river. It also gives everyone a chance to become involved in making it happen. It's the biggest commission we have attempted and proves how the past can be a source for artistic inspiration," said Cllr Ellie Wilcox, Chair of the World Heritage Site.

Derwent Pulse is a commission by the Derwent Valley Mills World Heritage Site, with support from

the Arts Council for England, The Sustainable Development Fund (administered by the Peak District National Park Authority) and mills in the World Heritage Site.

For more details on the project visit www.derwentpulse.org

Sphere of influence

SCULPTOR Rachael Carter worked with the DVMWHS Team and Amber Valley Borough Council to site her latest work in the Belper River Gardens.

Rachel trained in Derby and designs and creates works for garden and landscape settings.

The piece 'Bronze Grand Sphere' was produced by hand weaving with wax lengths in Rachel's trademark woven swirls to produce the sphere.

It was then transformed into bronze using the ancient 'lost-wax' casting process.

It was premiered at the 100th Chelsea Flower Show before being donated to the River Gardens in Belper.

REVEALED: Rachael watches the sphere being unveiled by Councillor Mark Robertson.

DerwentWISE wants you to get involved!

LAST ISSUE, we highlighted that the Heritage Lottery (HLF) funded Landscape Partnership Scheme has been given the go ahead to deliver a range of projects over the next five years.

The team is now in place and comprises of Scheme Manager Tania Pells; Finance and Administration Officer Nadine Stevenson; and two Community Engagement Officers, Dave Savage (Natural Heritage) and Annice Fuller (Cultural Heritage).

The scheme and staff are hosted by Derbyshire Wildlife Trust who, along with 14 other partner organisations, aim to inspire and engage people to care about the Lower Derwent Valley.

"With well over 60 projects covering landscape conservation management, training, heritage and the arts, there will be something for all ages to get involved in," said Tania Pells, DerwentWISE Scheme Manager.

"The project area stretches from Matlock Bath, through the wonderful ancient woodlands, following the River Derwent through the Derwent Valley Mills World Heritage Site right into Derby City. The scheme is all about getting communities involved in their surroundings and history by encouraging people to learn more and provide opportunities to access this inspiring and unique landscape."

DerwentWISE and partners have already attended three events this summer at the ECO Centre Spring Fair, Belper Goes Green and Inspiring Derby at the Derby Silk Mill. This

enabled the team to start raising awareness of what they do and why.

The next community event will be part of the Cromford Mills Discovery Days where the team will be hosting a walk around Lea Wood and Cromford Canal.

You will also have the chance to meet the two community officers and sign up for volunteering projects such as 'Heritage at Risk' and habitat restoration.

The scheme will work with local people, schools, community groups and landowners so if you are interested in getting involved or just want to be kept informed, email the team at derwentwise@derbyshirewt.co.uk or telephone 01773 881188.

A new website should be available by January 2015, in partnership with the DVMWHS, so be sure to look for it after Christmas.

WISE TEAM: Dave, Nadine, Annice and Tania - the new DerwentWISE officers.

DATA DISCOVERY: Scanning in Darley Abbey Mills, with the floor coloured by elevation, revealed the worn paths made by mill-workers as they serviced the machines, shown here in red.

Students use technology to better understand the WHS

TECHNOLOGY Then, Technology Now - a Heritage Lottery-funded Young Roots project - was designed to engage young people and help them understand more about why the area is so important.

By using cutting-edge digital technology to record and visualise the sites, the participating students from Highfields School in Matlock and Belper School had an opportunity to learn new skills, such as laser scanning, photogrammetry, 3D modelling, 3D printing, game engines, animation and video editing.

The project was developed by its six principal partners: Derbyshire County Council's Environmental Studies Service; the Derwent Valley Mills World Heritage Site; Trent & Peak Archaeology; Nottingham Trent University; and the two schools.

The students created a number of projects using different technology. One involved laser scanning at Darley Abbey Mills to highlight the wear pattern in the floor, made by mill-workers over many years.

With Arkwright's Second Mill at Cromford, traditional measurements recorded with a hand tape were fed into two types of software to virtually rebuild the demolished mill.

At Leawood Pumphouse, dozens of individual laser scans of the interior and exterior of the building were combined to create a 'fly-through' and produce a 3D-printed solid plastic scale model.

At Belper North Mill, the basement level was recorded and reconstructed using a video game programme to create an explorable environment complete with moving waterwheel and machines.

At Belper's Long Row, laser scans of the interior and exterior of the workers' housing allowed the students to create a historical 'fly through' of the entire street.

The quality of the work produced to date by the students has been extremely high and will be used within the World Heritage Site's attractions to assist with explanation and interpretation.

All of the finished products will be available to view online at ***www.derbyshire.gov.uk/techthentechnow*** from 30 October 2014.

FOR THE RECORD: Photography in the Darley Abbey Mill schoolroom (above).

CREATING HISTORY: A 3D-printing of a scale model of Leawood Pumphouse (left).

Royal visitors for John Smedley

HER MAJESTY The Queen returned to John Smedley Ltd after 46 years in July, accompanied by The Duke of Edinburgh, who was visiting the company for the first time.

The visit came one year after Her Majesty granted the company its first Royal Warrant of Appointment for supply of fine knitwear to her Household.

All staff and shareholders of John Smedley were keen for Her Majesty to see the dedication applied to developing their British manufacturing base, and the care devoted to maintaining a world renowned brand.

Her Majesty was conducted on a tour of the factory by Ian Maclean, Managing Director, and Charles Marsden-Smedley, Chairman, and was shown all stages in the process of making fine merino garments.

Her Majesty also learned more about the history of the company from a display of archive materials and witnessed a fashion show of the latest John Smedley collections.

Helping out TV's 'The Mill'

BOTH seasons of Channel Four's TV series 'The Mill' have seen authentic mill machinery in use by the cast - thanks to one of the Derwent Valley Mills.

Two lorry-loads of machinery from Sir Richard Arkwright's Masson Mills were taken to Quarry Bank Mill in Cheshire for the filming of the series.

Musuem manager Andrew Martin said: "They took a lot of spinning mules, spindles, rollers and pulleys which you can see in the programme."

Although the borrowed items haven't returned yet, the other working mules are demonstrated every day at 11am and 2pm (12 noon and 2pm Sundays).

Masson Mills are also celebrating after receiving a 2014 award from TripAdvisor for the number of five-star reviews they've received from visitors.

WORKING MACHINERY: One of the spinning mules in Masson Mills.

First phase is completed

THE OPENING of a new Visitor Centre for the Derwent Valley Mills World Heritage Site at Cromford Mills has moved a step closer.

Phase One of the work - to decontaminate and refurbish the largest building on the mill site - has now been completed, and the kitting out of the visitor centre, and four floors of business units above, is due to begin soon.

LOOKING GOOD: Arkwright Society Chief Executive Sarah McLeod shows the the Chair of the World Heritage Site Board Councillor Ellie Wilcox around the newly restored building.

New look for Strutt's North Mill

THERE have been major changes at Strutt's North Mill in Belper over the past year.

As well as a major revamp for the main gallery and the creation of a new exhibition space, the museum has seen the arrival of new manager Debbie Richards and community engagement officer Sue Reaney.

A packed events guide has just been released and is available at the mill and in libraries and other attractions along the valley.

READY TO RECEIVE VISITORS: Volunteers Sheila and Roy Hartle and Community Engagement Officer Sue Reaney with the new events guide for Strutt's North Mill.

MIDLAND MAIN LINE ELECTRIFICATION PROPOSALS

All you need to know on the history of the North Midland Railway, its importance in the WHS, what this means for the electrification project, and Network Rail's next steps

Putting the North Midland on the Railway Map

AT AN early stage of the Midland Main Line electrification project, Network Rail appointed Alan Baxter & Associates as heritage advisors.

Alan Baxter & Associates' report on the history and significance of the route identified the former North Midland Railway through the Derwent Valley Mills WHS as the most architecturally and historically significant part of the Midland Main Line.

This is due to the exceptional quality of its design and construction, its importance in the grand vision of its eminent designers, the Stephensons, and the remarkable extent to which it has survived unaltered since opening in 1840.

It is now an important part of a World Heritage Site designated for its role in the Industrial Revolution.

Despite this huge significance, the North Midland Railway remains, to some degree, a largely unknown aspect of our national railway heritage.

This is a notable contrast to Isambard Kingdom Brunel's Great Western Railway, which was designed and constructed at the same time.

This supplement explains how research carried out for the Midland Main Line electrification project is helping to contribute to a new understanding of the national importance of the North Midland Railway.

Thanks to this work, the line is already becoming better known.

In March 2014, the 'little-known masterpiece of railway building' was the subject of a lecture to the Victorian Society by leading engineering historian Robert Thorne.

SITE INVESTIGATIONS: Network Rail and Alan Baxter & Associates personnel investigating the Belper Cutting.

MIDLAND MAIN LINE ELECTRIFICATION PROPOSALS

The North Midland Railway

THE NORTH Midland Railway Company was formed by a group of investors who wanted to connect the industrial areas of Derbyshire and Yorkshire with the south of the country.

In 1835, they commissioned the famous engineer George Stephenson to survey the route from Derby to Leeds.

George later appointed his son Robert, who was helped closely by the Assistant Engineer Frederick Swanwick, to see the project through to completion in 1840.

The Stephensons and Swanwick designed the North Midland Railway line to have gradients no greater than 1 in 250 to suit the limited power of contemporary steam locomotives.

To achieve such gradients the line from Derby followed the River Derwent as far as Ambergate and then ran through more difficult terrain up the valley of the River Amber via Wingfield and Clay Cross to Chesterfield, then over to Rotherham and via Wakefield to Leeds. This route meant that heavy civil engineering works were required.

It was necessary for the contractors to move an average of 131,000 cubic yards of earth for each of the 72 miles that it travelled (as a comparison, the rival Midland Counties Railway from Leicester to Derby and Nottingham required just 95,000).

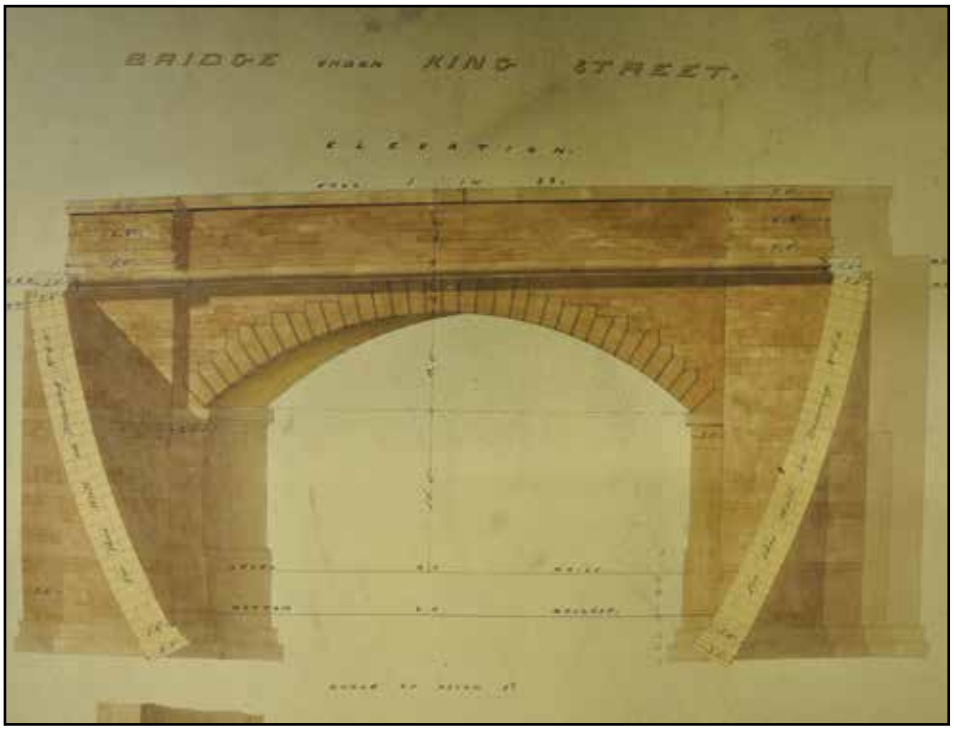
Furthermore, the line had seven tunnels; the one created at Clay Cross, through the watershed between the Trent and the Humber basins, is a mile long.

Despite these difficulties, the structures on the North Midland Railway were beautifully designed in the landscape, nowhere more so than the Derwent Valley. They were also incredibly well built: the impressive extent to which the line from Derby to Chesterfield is preserved today is unusually rare for a railway of this date.

AN ENGINEERING LEGACY: Strutt's Bridge at Belper (above) and the Milford Tunnel North Portal (below).

MIDLAND MAIN LINE ELECTRIFICATION PROPOSALS

Research brings greater knowledge of historic structures



BECAUSE no comprehensive history of the North Midland Railway has been written, it was necessary for Alan Baxter & Associates to carry out research on original records and drawings held in archives across the country.

These ranged from the National Railway Museum in York to the Midland Railway Study Centre in Derby's Silk Mill and the National Archives and Parliamentary Archives in London.

As well as this research, several residents of the Derwent Valley have come forward with important leads regarding new sources of information.

Many of these sources had not been previously published (or even properly catalogued) and have been of immense help to the Network Rail project team.

This included the existence of important original contract drawings held by the Midland Railway Study Centre.

Amazingly, Network Rail does not have drawings of many of the North Midland Railway structures, because they were so well built that they have not required repair.

These beautiful, ink-washed drawings are invaluable in revealing how bridges, viaducts, tunnels and cuttings were constructed 175 years ago.

BELPER CUTTING: Thanks to the discovery of drawings such as King Street Bridge (above), the project team (below) has been able to determine the depth of the stone-lining, which is in fact a decorative facing, not a structural retaining wall. *King Street Bridge drawing ©Midland Railway Study Centre.*

MIDLAND MAIN LINE ELECTRIFICATION PROPOSALS

The Strutt family and the North Midland Railway

THE HISTORIC character of the section of the Derwent Valley Mills that the Midland Main Line travels through rests largely upon the achievements of one pioneering family of industrialists, the Strutts.

By the time the North Midland Railway was surveyed in 1835, the Strutts' empire had grown under Jedediah's three sons William, George and Joseph into a thriving and profitable complex of mills and workers' settlements in Belper, Milford and Derby.

Precisely why the Strutts opposed the North Midland Railway is not known, but it seems likely that they thought it might disrupt the course of the River Derwent, which powered their mills.

This conflict resulted in several disputes with the North Midland Railway, which was forced to propose several different routes through the Derwent Valley, delaying the construction of the line.

Most significantly, the Strutts influenced the course of the line which was authorised by the first Parliamentary Bill of July 1836.

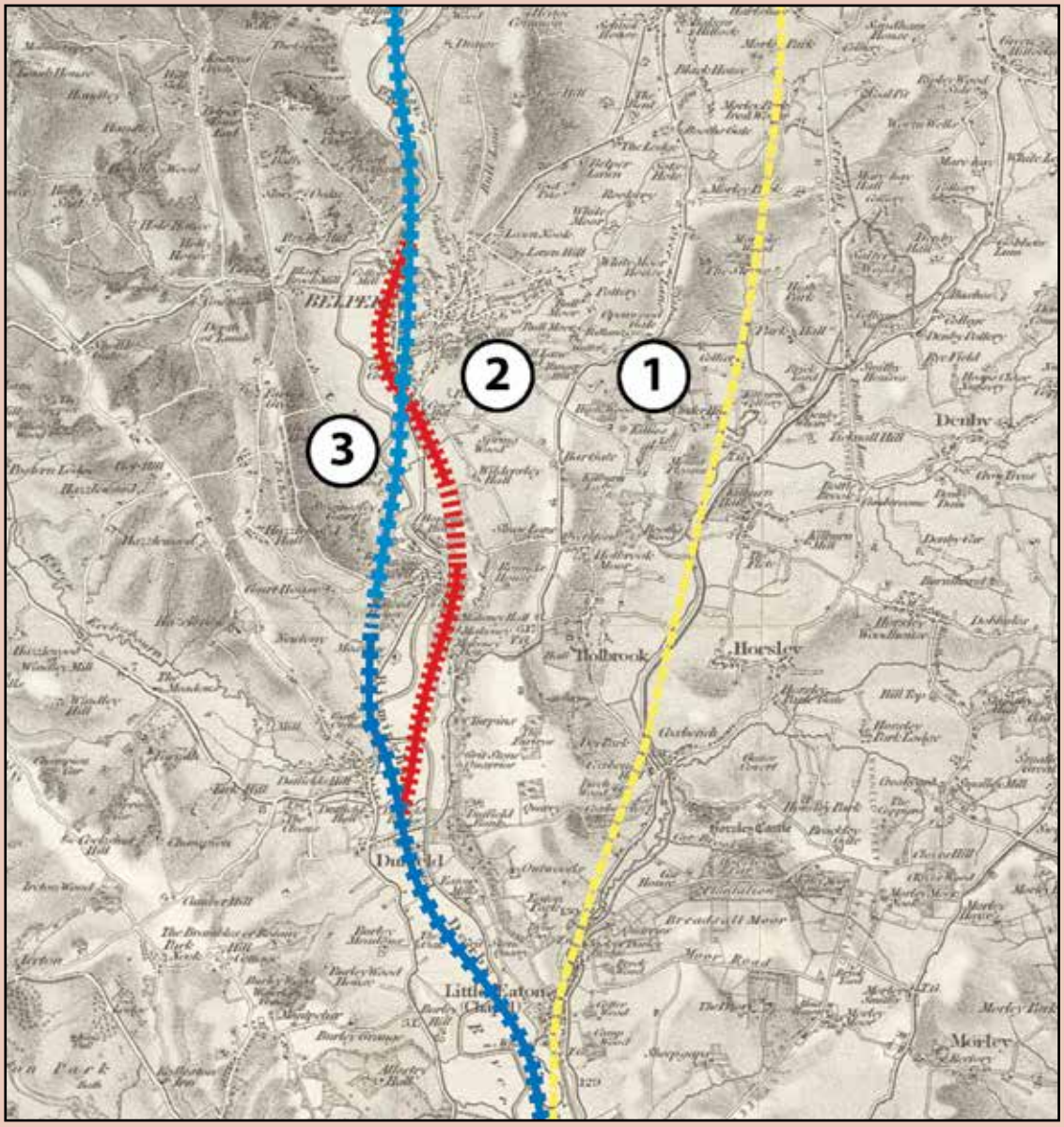
The North Midland Railway engineers were not satisfied with the curvature of this route, and so it was rectified by an Act for Deviations passed in May 1837, which took the line through the centre of Belper in a deep cutting.

Negotiating alternative routes with the Strutts

BY piecing together research from different archives, Alan Baxter & Associates has tried to assemble the definitive story of the North Midland Railway and the Strutts.

They would love to hear from anyone with further information.

1. December 1835: An alternative route to the east, by Holbrook, is suggested by the Strutts.
2. July 1836: The 'Milford Deviation', which crosses the Derwent south of Milford and curves around the west of Belper, is agreed with the Strutts and authorised by the Act of Parliament for the North Midland Railway.
3. May 1837: The 'Milford Deviation' is unsatisfactory to the North Midland Railway engineers and a further deviation to the line through Duffield, Milford and Belper is agreed and approved by Parliament. This is the line of the North Midland Railway as built.



MIDLAND MAIN LINE ELECTRIFICATION PROPOSALS

Uncovering the mysteries of the Toadmoor Tunnel

TOADMOOR Tunnel in Ambergate is a highly unusual railway structure.

Not only was the tunnel—unlike others designed by the Stephensons—constructed to a remarkable flattened ellipse profile, but it also has a series of 12 cast-iron rings inserted at its southern end.

Research at the Parliamentary Archives shows that, when questioned on the suitability of tunnelling there, the North Midland Railway's Assistant Engineer Frederick Swanwick had expected the conditions to be 'very favourable'. However, it seems that things were not so straightforward when work began on site.

Network Rail carried out a visual inspection of the tunnel with Alan Baxter & Associates and English Heritage to investigate the reasons behind its unusual design.

It appears that what Swanwick had predicted as sturdy coal strata was, in fact, a wet shale bed. When excavations began, a large landslide was triggered. This is still dramatically visible today in Thatcher's Wood to the east of the tunnel.

The engineers then decided to proceed by the cut-and-cover method: spoil was removed, stone retaining walls were built and a brick arch was thrown over the top, forming the unusual elliptical profile.

A second landslip some time later may have been the cause of subsequent deformation that caused the 12 iron rings and additional brickwork to be inserted near the south end of the tunnel.

LOOKING INTO TOADMOOR TUNNEL: Network Rail and English Heritage site investigations in June 2014.

MIDLAND MAIN LINE ELECTRIFICATION PROPOSALS

Achieving railway electrification

THE ELECTRIFICATION of the Midland Main Line will be achieved by Overhead Line Equipment, or OLE.

Although electrification of Britain's railways has sometimes been provided by the third rail system, this is now technologically obsolete.

Operationally, environmentally and from the perspective of public safety, OLE is the preferred means of powering trains throughout the world.

In OLE, masts and gantries support the overhead wire carrying the power: the contact wire. The power is then transmitted from the contact wire to the train by a sprung 'pantograph', which is attached to the roof of the moving train.

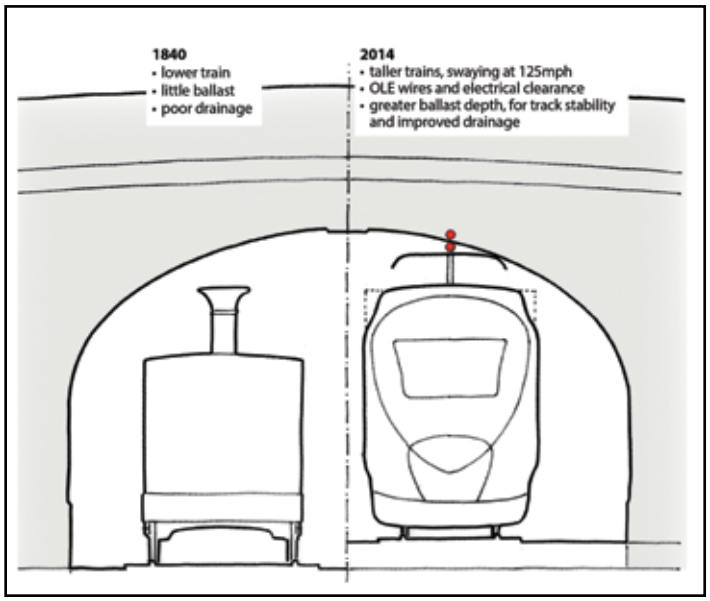
To carry the overhead wires, masts must be spaced approximately 50m apart (although there is some flexibility in spacing).

The wires themselves are normally about 1500m long and tensioned at either end. To ensure no loss of power to the pantograph, adjoining sections of wire overlap for about 180m.

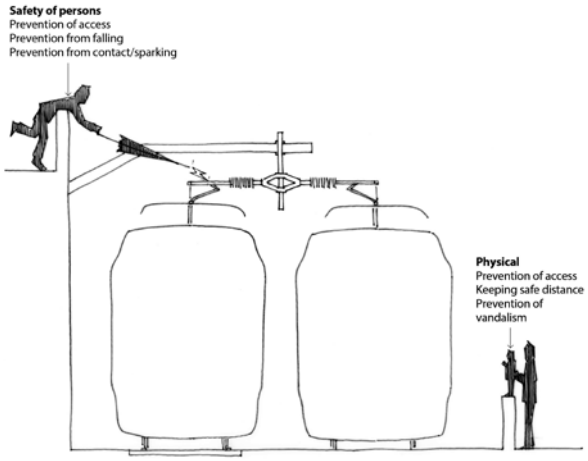
Installing OLE on existing lines can require alterations to bridges, viaducts, stations and other structures. There are three primary reasons for this: gauge clearance, public safety and mast fixings.

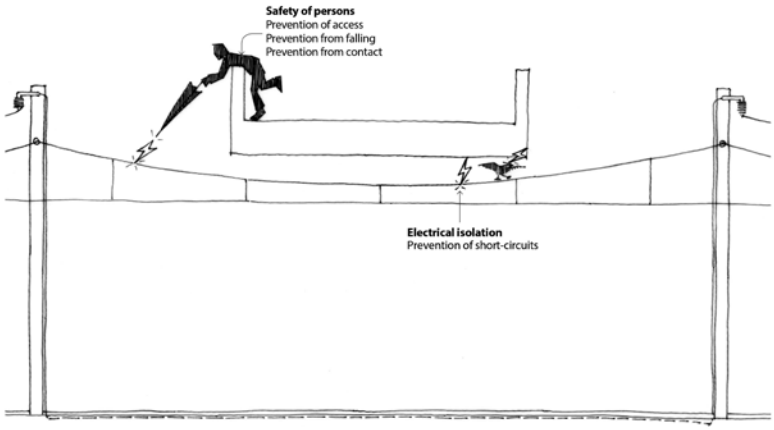
Bridges over the line and tunnels must achieve increased clearances for passing trains and the wires above them (right).

If it is not possible to alter the existing structure accordingly, then it may have to be demolished and replaced, or 'reconstructed'.



Station canopies may also need to be cut back. Better safety standards for the public means that bridge parapets will have to be raised to prevent contact with electric wires (below).



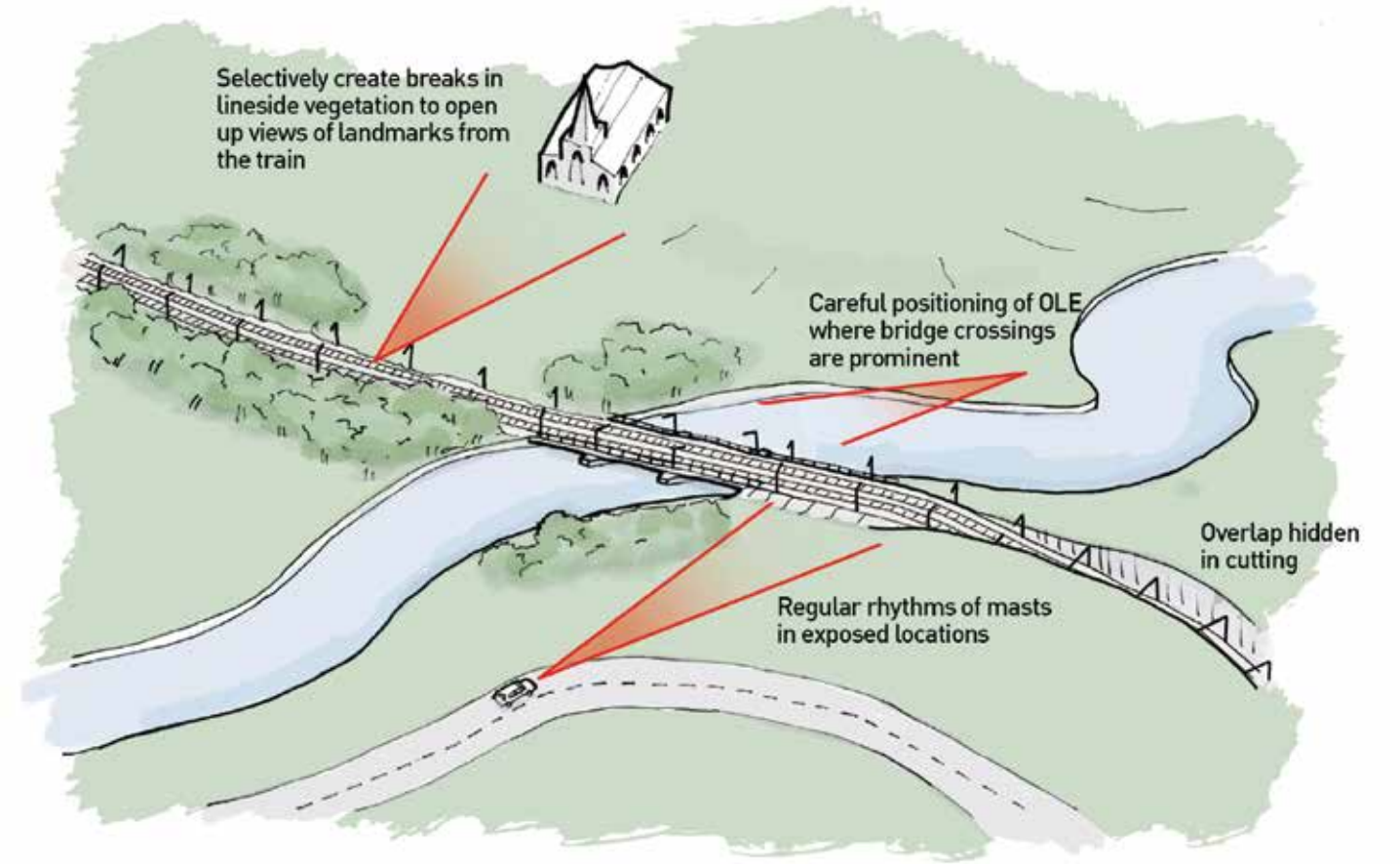


Viaduct fixings

MAST fixings are required on any viaduct longer than about 60 metres. If the viaduct is of architectural or historical interest, it may be appropriate to erect bespoke designs that respond to the particular character of the structure and its setting.

This has been done before, for example on Stephenson's Royal Border Bridge at Berwick (pictured left).

MIDLAND MAIN LINE ELECTRIFICATION PROPOSALS



Conserving the Midland Main Line in the Derwent Valley

THE STRETCH of the Midland Main Line that runs through the DVMWHS is the most architecturally and historically important part of George and Robert Stephenson's North Midland Railway.

Because of this, electrification here is being given special consideration by the project team. There are 22 listed railway bridges, viaducts and tunnel portals in the WHS and its Buffer Zone: ten of these were listed after the designation review that was carried out by English Heritage.

These new listings include two impressive, triple-arched bridges over the line in the northern outskirts of Derby (research has shown that the outer arches were built to house drainage channels) and six bridges in the sequence through Belper (between Milford Tunnel and Belper Pool).

The five-span skewed viaduct over the Derwent and the A6 at Ambergate, described by English Heritage as demonstrating 'the consistent high quality design and careful detailing of the railway structures completed for the North Midland Railway', was listed at the higher Grade II*.

Furthermore, the Midland Main Line is identified as a physical attribute of the WHS.

This is because it makes a visually and historically prominent contribution to its 'Outstanding Universal Value' as an early industrial landscape of international importance.

Network Rail, Atkins, the lead project engineers, and Alan Baxter & Associates, heritage advisors to the project, are working to develop a sensitive, bespoke solution for the provision of OLE and associated works which meet necessary operational and safety requirements while minimising visual and physical impact.

The important ecology and landscape of the Derwent Valley is being considered by other project consultants appointed by Network Rail. Atkins is carrying out a full Landscape Visual Impact Assessment, the conclusions of which will be taken into account by the project team.

A Phase One habitat survey has been commissioned to identify species under the Wildlife and Countryside Act, and Network Rail is working closely with Natural England on the usual license requirements for this.

A vegetation clearance strategy is also currently being produced to keep vegetation a safe distance from overhead wires. Details on specific areas will be clarified with lineside residents in due course.

In addition, Network Rail and the WHS Partnership are discussing the possibility of enhanced vegetation clearance in certain areas to open up lost views from the train.

MINIMISING IMPACT: How the masts and wires necessary for OLE can be intelligently integrated into the landscape of the Derwent Valley, including lineside vegetation clearance to open up lost views from the train.

MIDLAND MAIN LINE ELECTRIFICATION PROPOSALS

Planning the next steps

NETWORK Rail is committed to continued dialogue with the DVMWHS Partnership and Belper Civic Forum as internal design options are developed.

These will be refined through public consultations in early 2015, with the intention of submitting the first Listed Building Consent applications in summer 2015, for works to commence in 2016–17.

Preliminary survey work in the Derwent Valley is currently being undertaken to inform the work of Atkins, the lead project engineers, and guide them in designing the best engineering solutions.

This analysis is likely to be complete in the next few months.

Network Rail has voluntarily committed to undertaking a WHS Heritage Impact Assessment.

This will follow advice from ICOMOS, the international body that reports to UNESCO, 'to evaluate effectively the impact of potential development on the Outstanding Universal Value'.

The scope of the Heritage Impact Assessment is being agreed in advance with ICOMOS UK and the WHS Partnership.

Landscape and ecology surveys will continue to be carried out in the WHS, with publication of the Atkins Landscape Visual Impact Assessment likely at the end of 2014.

The Vegetation Management Report will be shared with local authorities via the WHS Partnership Forum. Vegetation works are likely to begin in autumn 2015, with specific applications and notifications for tree clearance in the Belper, Duffield and Ambergate areas.

Main image ©Dr Anthony Streeten/English Heritage

KEEPING PEOPLE INFORMED: A packed venue (below) for the second of two consultation presentations organised through the Belper Civic Forum, held in July 2014.

Volunteers develop a greater understanding

ALTHOUGH the Heritage Lottery Funded DVMWHS Volunteer project has ended, volunteers across the WHS continue to meet regularly to find out about changes at the attractions within the valley.

Every few months a guided tour is arranged for a different location and the volunteers are updated on new developments, so they in turn can let visitors know.

Keeping to one location on each tour allows the volunteers more time to find out what there is to see and do.

Previously, the volunteers have visited Milford, Heage Windmill and Darley Abbey.

The most recent tours included a visit to the Silk Mill in Derby where they were shown the developments and changes that had taken place since it reopened, and met volunteers working on the 'Remake the Museum' programme, designing and building new furniture for the museum.

The last tour was a boat trip along the Cromford Canal. Around 30 volunteers joined the Friends of Cromford Canal on their 'Birdswood' boat from Cromford Wharf to Leawood Pumphouse and back again. During the trip, the group found out about historical points of interest and saw the very organised, but compact, living quarters on the boat.

There are more tours planned over the coming months to keep volunteers informed.

MAKING CHANGES: Volunteers hear about the latest improvements to the Silk Mill (top).

BY BOAT: Volunteers on 'Birdswood' (right).

Managing climate change in the DVMWHS

THE LANDSCAPES of Derbyshire bear witness to changes in the earth's climate, but in recent years these natural cycles of change have been disrupted by the impact of industrialisation and spiralling fossil fuel consumption.

It is now acknowledged that greenhouse gas emissions are causing irrevocable changes to our climate system.

Whilst their precise impact upon climate remain uncertain, it seems likely that both the frequency and intensity of severe weather events will increase, with extremes of temperatures and rainfall becoming commonplace.

Looking at recent years, it seems that we are starting to experience the consequences already!

Planners and policy-makers are now starting to develop strategies to deal with the effects upon the historic environment of extreme rainfall and flooding.

A £52,000 project to develop a strategy for the DVMWHS is one of several pilot studies, funded by English Heritage, aimed at identifying environmental threats to historic environments.

The Outstanding Universal Value of the World Heritage Site rests upon its internationally important industrial heritage, which in view of its topographic location is particularly vulnerable to the impact of climate change upon flood frequency and magnitude.

Paradoxically, many of the locations that were advantageous for early industrial development correspond to environments where geomorphological and geological processes are sensitive to climate change.

The vulnerability of the Derwent Valley to environmental disaster is exacerbated by its rich history of metal and mineral mining, as the valley sides and floodplain retain a legacy of contamination that is vulnerable to re-deposition by flooding and erosion.

The project aims to understand how the natural environment of the valley has responded to climate change over the last millennium and to use this information to assist in predicting future environmental developments.

The project will involve partners from the Universities of Hull and London (Birkbeck College) and will draw together a variety of geomorphological, archaeological, historical and environmental datasets for the Core and Buffer Zones of the World Heritage Site.

These will be supplemented by computer modelling of river evolution to identify areas that are vulnerable to future environmental change.

The outputs from this project will inform the developing research and management frameworks of the DVMWHS Partnership and will provide wider lessons for assessing the threats to historic assets in the light of climate change.

New items for the archive

A LARGE number of documents, maps and photographs relating to the English Sewing Cotton Company, which ran the Masson, Belper and Milford Mills from 1897 until 1991, has been given to the Derwent Valley Mills World Heritage Site Partnership.

These fascinating items about the mills were kindly donated to the Partnership by the last manager of the Derwent Valley Mills, Tony Bowker.

The collection has been deposited at the Derbyshire Record Office in Matlock, under the accession number 4431, and should be available for public viewing by the end of the year.

IN THE ARCHIVE: One of the photographs in the collection shows the old waterwheel at Masson Mill.

New fish pass

THE TRENT Rivers Trust has successfully sought funding and installed a new fish passage at Darley Abbey.

After extensive discussions with the World Heritage Site team, they were able to install a structure which had no impact on the Outstanding Universal Value (OUV) of the Site.

Proposals are now being developed for the weirs at Milford and Belper, with the latter's Horseshoe Weir being the greatest challenge, particularly if there is to be no impact on OUV.

Housing concerns

AMBER Valley Borough Council has been looking at changes to the Core Strategy within its Local Plan, and three additional sites proposed for housing allocation in Belper have raised particular concern for being within the Derwent Valley Mills World Heritage Site (DVMWHS) or its Buffer Zone.

The Core Strategy was examined by an independent Inspector appointed by the Secretary of State, earlier this year.

The Inspector considered it necessary to suspend the examination of the Core Strategy to enable the Council to carry out certain pieces of further work, including identifying further sites for housing development.

Whilst there are a number of planning and development issues relating to the proposed sites, the World Heritage Site Partnership is limited to commenting on the impacts on the Outstanding Universal Value (OUV) of the DVMWHS.

A site visit was made to two proposed housing allocation sites at Bullsmoor, Cherry House Farm and Pottery Farm, Belper by members of the Conservation and Planning Panel.

Serious consideration was given to the potential impact of development on the Outstanding Universal Value, particularly as a recent application for residential development nearby was turned down at Appeal, with the impact the housing would have on the setting of the World Heritage Site as a key reason for refusal.

The site visit also revealed that different parts of the allocations carry various degrees of sensitivity in relation to the potential impact on the landscape setting of the WHS.

It was felt that the present extent of the housing allocation site is not acceptable, and those views have been submitted to the Borough Council for consideration.

A third site, off Derwent Street, Belper, falls within the Derwent Valley Mills World Heritage Site and is a brownfield site in need of redevelopment. It has been established, with thanks to a Supplementary Planning Document adopted in 2013, that a sensitive mixed-use would be most appropriate for the Site, including housing.

The World Heritage Site Partnership accepts this recommendation, but feels the master plan for the whole site recommended in the Supplementary Planning Document is desirable and necessary. Housing could form a considerable component, subject to impacts on OUV.

A decision has yet to be made over the inclusion of these sites in the housing allocation.

20th anniversary for twinning

DURING the World Heritage Site Discovery Days weekend in July, representatives of Belper's twin town Pawtucket, in Rhode Island, USA, came to visit and enjoy the festivities.

It was exactly 20 years since the two towns were twinned, to celebrate historic links forged early in the Industrial Revolution, when Samuel Slater took the secrets of mass produced cotton spinning from Belper to Pawtucket.

The Borough of Amber Valley was also officially twinned with Blackstone Valley, Rhode Island in 1994, so the President of Blackstone Valley Tourism Council Bob Billington and Director of Operations Natalie Carter, with Bob's partner Debra, were invited to a celebratory evening at Strutt's North Mill, before dropping in on some of the 28 Discovery Days events which took place over the following weekend.

TWENTY YEARS OF FRIENDSHIP: Bob, Debra and Natalie with representatives from Amber Valley Borough Council, Belper Town Council and Strutt's North Mill, at the event welcoming them back to Belper.

Framework for future research

A £33,000 English Heritage funded project to produce a framework to promote future research into the Site has continued to develop throughout 2014.

Led by David Knight from Trent Peak Archaeology/York Archaeological Trust, a series of workshops were held through the year to produce a series of eleven themes, divided into 52 specific research objectives.

The workshops attracted staff from the universities of Derby, Exeter, Nottingham, the Open University and Sheffield.

Also represented were museums, local groups and individual researchers, demonstrating the broad interest in the history of the Site.

This group of people are now writing short introductions to each objective for inclusion in the final document.

DVMWHS Director Mark Suggitt said: "I am delighted with the way this project has developed over the last year. It has once again demonstrated how fascinated and committed people are to learning more about what happened here and its impact on society.

"Once completed, we hope this document will inspire individuals and academic institutions to further our understanding of the Valley and its people."

Understanding the Buffer Zone

Barry Joyce, who chairs the World Heritage Site Conservation and Planning Panel, explains why the Derwent Valley Mills has a Buffer Zone, and what it is designed to do.

One of the most important aims and objectives of the World Heritage Site Management Plan is protection of the Site's setting.

Why? Well one of the reasons UNESCO put the Derwent Valley Mills on The World Heritage List was because the mills and their associated settlements remain in a largely rural landscape - as they were in Georgian and Victorian times. Because of this they provide a sense of how remarkable it must have been for rural England to have these revolutionary new operations - factories - springing up in an agricultural landscape.

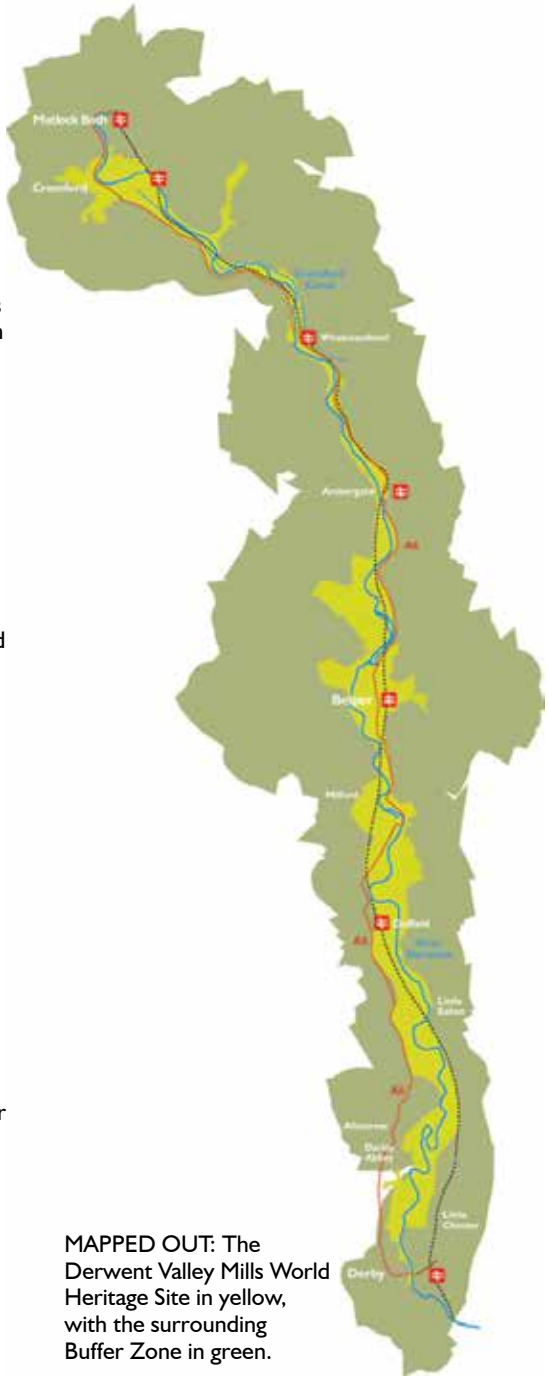
Because cotton spinning moved, early on, to Lancashire the pioneer mills and mill communities of the Derwent Valley became arrested in time, largely unaltered by the changing dynamics of further industrialisation and urbanisation.

It is therefore of vital importance that the setting of the Derwent Valley Mills remains rural. The respective local planning authorities have adopted policies to ensure this happens.

In order to be as clear as possible as to what constitutes the Site's immediate setting a buffer zone has been defined. This has been endorsed by UNESCO.

The buffer zone extends from skyline to skyline at the northernmost part of the Site, at Matlock Bath and Cromford. As the Valley's steep sides flatten out towards the south the extent of the buffer zone is reduced. The eastern part of the town of Belper is included because it sits on rising ground.

The Site's wider setting cannot be so readily zoned and here potential impacts of exceptionally tall structures, such as wind turbines, will be considered on a case by case basis.



MAPPED OUT: The Derwent Valley Mills World Heritage Site in yellow, with the surrounding Buffer Zone in green.

New plan

The DVMWHS submitted its management plan for 2014 to 2019 to English Heritage at the beginning of the year and it has now been sent on to the Department of Culture, Media and Sport and UNESCO for final approval.

The plan outlines how the Site will be managed over the next five years and identifies key projects within its main aims.

It is the result of consultation with a wide range of people and organisations within the area. We hope to gain final approval later in the year.

Once approved, the document will be available as a download on our new website.

New website

Working in partnership with the DerwentWISE project, we are developing a new website which will be ready to go live in the New Year. It will feature a more visual and user-friendly design that will guide visitors to all areas of the Site.

The new website will carry information about all the DerwentWISE projects and events as well as those organised by the World Heritage Partnership.

We have moved

The DVMWHS Team have moved offices at County Hall. Our new address is: Derwent Valley Mills World Heritage Site, c/o Economy, Transport and Environment, North Block, County Hall, Matlock, Derbyshire, DE4 3AG.

Our e-mails and telephone numbers remain unchanged. The main contact number is 01629 536831 or email info@derwentvalleymills.org

John moves on

Learning Co-ordinator John Rogers left the Derwent Valley MillsTeam in May.

WHS director Mark Suggitt said: "Our thanks to John for all his work over the past two years and we wish him every success."

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Year of Discovery in the Derwent Valley

FOR ten days in May, people were pulling on their boots, donning rain hats or sunglasses, and setting off on one or more of 70 walks along the valley.

The World Heritage Site's second Discovery Walks Festival took in plenty of sunshine and showers, and had an increased turnout and very positive feedback from participants.

A large number of dedicated World Heritage volunteers offered their knowledge and enthusiasm to ensure a whole range of walks were available.

"It's been great to see so many people putting their best foot forward to mix healthy exercise with a chance to discover the World Heritage Site's amazing story," said Councillor Ellie Wilcox, who chairs the World Heritage Site Board.

"Thanks to so many voluntary leaders and stewards, we had a packed programme to suit all abilities and interests, and the positive feedback from walkers has been overwhelming."

No sooner was the festival over than the World Heritage Site team unveiled plans for Discovery Days weekends in July (at Belper) and September (in Darley Abbey and Derby), which both proved successful, and ending with the usual week of activities in October (see below).

All set for another week of events

Following on from the huge success of 2013, this year's Discovery Days Festival will be held during the half term holiday from Saturday 25 October to Sunday 2 November.

There will be over 80 different activities taking place across the DVMWHS covering a variety of walks, talks, events and opening of historic buildings.

As in previous years, many activities will be free of charge to visitors, although we will be asking the public for donations, to help ensure we can continue with the festival.

During the week, there's a strong programme of speakers giving talks about a whole range of heritage topics.

The final weekend, centred on the Cromford area, will be as busy as ever, with one of the highlights this year being the new Friends of Cromford Canal boat, 'Birdswood'. The boat will be horse-drawn for the weekend, as the Friends celebrate canal traditions, supported by displays, stalls and traditional crafts in the Gothic Warehouse at Cromford Wharf.

With vintage vehicles and open houses, as well as events for the Hallowe'en period, there's a host of things for all ages to enjoy.

For the full programme of events (right), pop in to your local library or one of the mills for the festival booklet, take a look at the www.derwentvalleymills.org website or ring 01629 536831 for details and to book.

ON THE CANAL: The Friends of Cromford Canal boat 'Birdswood'.

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United Nations Educational, Scientific and Cultural Organization

Derwent Valley Mills inscribed on the World Heritage List in 2001