Historic Environment Desk-based Assessment at the Old Flint Mill Consall Forge Wetley Rocks Staffordshire NGR SK 0046 4839

Site code: CFM 15

Produced for

Consall Hydro Ltd.

by

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Non-technical summary

Stoke-on-Trent Archaeology Service carried out an historic environment desk-based assessment (DBA) to accompany development proposals for a hydro scheme at the Old Flint Mill, Consall Forge, Wetley Rocks, Staffordshire (NGR SK 0046 4839).

The study was undertaken between the 20th April and the 12th May 2015 and involved an assessment of cartographic and documentary sources, and an inspection of the site (on the 22nd April). The DBA gathered information on the historic environment within a radial study area of 500m diameter around NGR SK 0046 4839, centred on Consall Mill. Three designated and 16 non-designated heritage assets were identified within the study area, and the respective significance of each was assessed. The direct and indirect impacts (i.e. on the setting of designated examples) of the proposed development upon those assets most affected by the scheme were also assessed. Recommendations for possible archaeological mitigation were also made.

1.0 Introduction

1.1 Stoke-on-Trent Archaeology Service has been commissioned by Alistair Wilkins on behalf of Consall Hydro Ltd (hereafter the Client) to undertake an historic environment desk-based assessment (DBA) on a proposed hydro scheme at the Old Flint Mill, Consall Forge, Wetley Rocks, Staffordshire (centred on NGR SK 0046 4839) (Figs. 1 & 2). The DBA will accompany a planning application made to the local planning authority (LPA), Staffordshire Moorlands District Council.

1.2 The proposed scheme, to be carried out in collaboration with the Canals & Rivers Trust, involves the refurbishment of the site to allow the use of a modern water turbine for the generation of power. The scheme would encompass the refurbishment of the intake from the canal situated to the west of both the mill complex and the adjacent lock, and of the existing culvert and screening tank, which extends to the south east. A new by-water pipe for fish would extend north east from the screening tank back to the canal. The turbine, contained within a shed sited on the east-facing bank of the existing tail pond, would be fed via a new buried pipe extending south east from the screening tank (Fig. 3).

1.3 The DBA was produced between the 20th April and the 12th May 2015; a site visit was made on the 22nd April. All work was undertaken in accordance with the Chartered Institute for Archaeologists' (CIfA) *Standards and guidance for historic environment desk-based assessment* (December 2014), which states that:

> Desk-based assessment will determine, as far as is reasonably possible from existing records, the nature, extent and significance of the historic environment within a specified area. Desk-based assessment will be undertaken using appropriate methods and practices which satisfy the stated aims of the project, and which comply with the Code of conduct, Code of approved practice for the regulation of contractual arrangements in field archaeology, and other relevant by-laws of the CIfA. In a development context desk-based assessment will establish the impact of the proposed development on the significance of the historic environment (or will identify the need for further evaluation to do so), and will enable reasoned proposals and decisions to be made whether to mitigate, offset or accept without further intervention that impact.

1.4 The DBA gathered information on the historic environment within a radial study area of 500m diameter around NGR SK 0046 4839 (centred on the Old Mill) (Figs. 3 & 20; appendices 1 & 2).

1.5 The DBA was compiled using baseline documentary and cartographic records as well as published and unpublished material for heritage assets from the following sources:

- Staffordshire Historic Environment Record (HER)
- Staffordshire Archive Service (Stafford Record Office & Stoke-on-Trent Central Library)
- The National Heritage List for England (NHLE)
- The Potteries Museum & Art Gallery, Hanley, Stoke-on-Trent

1.6 The following abbreviations have been used in the report:

HER Historic Environment Record
NGR National Grid Reference
PRN Primary Record Number
LPA Local Planning Authority
OS Ordnance Survey
HLC Historic Landscape Character
NHLE National Heritage List for England

1.7 The archive for the project will be stored at The Potteries Museum & Art Gallery, Hanley, Stoke-on-Trent (site code: **CFM15**).

2.0 Legislation and planning policy context

2.1 The DBA has been written within the legislative and planning policy context set out below.

2.2 ***Planning (Listed Buildings & Conservation Areas) Act 1990.*** This sets out the provisions for designation, control of works and enforcement measures relating to listed buildings and conservation areas. Section 66 of the Act states that the LPA must have special regard to the desirability of preserving the setting of any listed building that may be affected by the grant of planning permission. Section 72 of the Act states that special attention shall be paid to the desirability of preserving or enhancing the character or appearance of conservation areas.

2.3 *The National Planning Policy Framework (NPPF), 2012*

2.3.1 Since March 2012, the planning system in England has been defined by the *National Planning Policy Framework* (NPPF). This framework leads with a presumption in favour of sustainable development, which should seek 'positive improvements in the quality of the built, natural and historic environment' (S9).

2.3.2 At its heart, the NPPF is governed by twelve land-use planning principles, including a requirement for heritage assets to be conserved in a manner appropriate to their significance (S17). When determining applications affecting heritage assets, LPAs should require an applicant to describe the significance of the assets affected, including any contribution made by their setting. The level of detail should be 'proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance' (S128). In cases where an asset is of archaeological interest, LPAs should require developers to submit a desk-based assessment and, where necessary, undertake field evaluation. LPAs should take such assessments into account when considering the impact of a proposed development on an asset, to avoid or minimise conflict between the asset's conservation and any aspect of the proposal.

2.3.3 'Great weight' should be given to the conservation of designated assets (e.g. listed buildings, scheduled monuments, conservation areas etc.); the more important the assets, the greater the weight should be. Any harm or loss should require clear and convincing justification; substantial harm to or loss of a grade II listed building, park or garden should be exceptional and, in the case of assets of the highest standard (e.g. Scheduled Monuments, Grade I and II* listed buildings, World Heritage Sites etc.), should be wholly exceptional (S132). Significance can also be affected by development within the setting of a heritage asset. Developments that will lead to substantial harm to, or total loss of, significance of a designated asset should be refused unless it can be demonstrated that substantial public benefits can be achieved through the scheme, which outweigh the impact on the asset (S133). A similar, albeit proportional assessment should be undertaken for projects where less-than-substantial harm to the significance of a designated asset is likely (S134).

2.3.4 In cases where an application will impact upon a non-designated asset, a balanced judgement will be required regarding the scale of harm or loss and the significance of the

heritage asset (S135). Non-designated assets of archaeological interest that are demonstrably of equivalent status to scheduled monuments should be considered subject to the policies for designated assets (S139).

2.3.5 LPAs should require developers to 'record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence….. publically accessible' (S141). Various methods and levels of recording are available, including archaeological evaluation, watching briefs and historic building recording.

2.4 *Local planning policy*

2.4.1 *The Staffordshire Moorlands Core Strategy* (Staffordshire Moorlands District Council 2014), which replaces the 1998 Local Plan, defines the historic environment as 'a resource for which the district is renowned' (S8.6.8). The Strategy's principal heritage and conservation policy is as follows:

Policy DC2 -The Historic Environment

The Council will safeguard and, where possible, enhance the historic environment, areas of historic landscape character and interests of acknowledged importance, including in particular scheduled ancient monuments, significant buildings (both statutory listed and on a local register), the settings of designated assets, conservation areas, registered historic parks and gardens, registered battlefields and archaeological remains by:

> *1. Resisting development which would harm or be detrimental to the special character and historic heritage of the District's towns and villages and those interests of acknowledged importance.*
>
> *2. Promoting development which sustains, respects or enhances buildings and features which contribute to the character or heritage of an area and those interests of acknowledged importance through the use of conservation area appraisals, design statements, archaeological assessments, characterisation studies and Masterplanning.*

> *3. Preventing the loss of buildings and features which make a positive contribution to the character or heritage of an area through appropriate reuse and sensitive development, including enabling development, unless their retention is not viable or there would be substantial planning benefits to outweigh the loss.*

The policy recognises the value of statutorily designated assets and also the character of the wider landscape. Buildings of local interest that are not protected by statutory designation will be identified for retention using an adopted SPD (S8.6.8). A proposed Design SPD and any relevant Conservation Area management plans will help ensure sensitive development within areas of heritage importance (S8.6.11).

2.4.2 The Old Flint Mill falls within the scope of policy SS7 - *Churnet Valley Area Strategy*, which is supported by the *Churnet Valley Masterplan*, adopted by Staffordshire Moorlands District Council as a Supplementary Planning Document (SPD) on the 26th March 2014. The Masterplan presents a comprehensive framework for the future development of the Churnet Valley:

> *…sustaining and enhancing the natural, built and historic environmental quality of the area, its settlements and its hinterland through managed change which provides for rural regeneration largely based on sustainable tourism* (S5.2.1).

It recognises the importance of the historic environment in the area, particularly the contribution made by surviving evidence of industrialisation (S4.1; S5.2.1; S8.2). 'Green' initiatives will also be encouraged (S6.1.1). The Masterplan divides the Churnet Valley into eight local character areas: the Old Flint Mill sits within the 'Central Character Area' (number 4), comprising Cheddleton, Consall and Ipstones (S7.4). The area is identified as being of high landscape value (S7.4.1), within which the Caldon Canal and other heritage sites (such as Cheddleton Flint Mill and Consall Forge) are key features (S7.4.2). Minimal development is recommended for the area, such as the conversion of existing buildings and sensitive development to maintain and/or support existing facilities (S7.4.3).

The Masterplan's Sustainable Transport statement (S8.4) recognises the significant recreational, biodiversity and heritage value of the Caldon Canal to the general character

of the Churnet Valley. It also repeats the Core Strategy's support (policy SS7) for the designation of the Churnet Valley as an Area of Outstanding Natural Beauty (AONB) (S6.8.7).

2.4.3 Core Strategy Policy SD2 - *Renewable/Low-Carbon Energy*, states that an element of future energy demands will be met from renewable or low-carbon sources. Suitable schemes will, therefore, be supported subject to certain considerations. These include the impact that a proposal might have upon the landscape and 'interests of acknowledged importance' such as the historic environment.

3.0 Methodology for assessment of significance

3.1 In accordance with the requirements of the *NPPF* (S128), an assessment of significance has been undertaken for all heritage assets identified within the 500m radial study area around NGR SK 0046 4839 (see appendices 1 & 2; Fig. 20). Although the *NPPF* does not present a complete hierarchy of significance, it does specify that **designated assets** such as Scheduled Monuments, Battlefields, Grade I and II* listed buildings and World Heritage Sites are of the highest value (S132). This approach has been extrapolated for other designated (Grade II listed buildings, Conservation Areas etc.) and **non-designated assets** (sites of archaeological interest, locally listed buildings etc.) to produce the assessment criteria presented in Table 1. The assessment also takes into account other complementary cultural heritage evaluation models, such as that presented in volume 11 of the *Design Manual for Roads and Bridges* (Highways Agency, 2007).

3.2 The potential impact of the proposed development upon heritage assets within the search areas is considered in section **9.0**.

Table 1: Criteria for assessment of significance

Significance	Type of Heritage Asset
High	Heritage assets of national or international importance, including: • Scheduled monuments and sites proposed for scheduling • Non-designated sites that are demonstrably of equivalent status to scheduled monuments identified in the HER • Grade I & II* listed buildings • Grade I & II* registered parks & gardens (and other designed landscapes of outstanding interest, quality and importance) • Designated wreck sites • Registered battlefields • World Heritage Sites • Conservation Areas of exceptional character and integrity
Medium	Heritage assets of regional importance, including: • Grade II listed buildings • Grade II registered parks & gardens (and other designed landscapes of discernible coherence and integrity) • Conservation Areas • Non-designated heritage assets, such as archaeological sites and locally listed buildings, of distinctive regional importance identified in the HER
Low	Heritage assets of local importance, including: • Non-designated heritage assets of distinctive local importance identified in the HER
Negligible	Heritage assets of little or no importance, including: • Sites, etc. recorded in documentary sources, but now destroyed • Sites of archaeological investigation recorded in the HER, but which produced nothing of interest • Assets that are poorly preserved
Unknown	Areas where potential sub-surface remains have not been investigated.

4.0 Site location and character

4.1 The Old Flint Mill in the hamlet of Consall Forge is located in the Churnet Valley between Cheddleton and Froghall, roughly 6 miles south of Leek. Although historically within Cheddleton parish, it is now within the civil parish of Ipstones. The mill complex occupies a narrow plot of land between the Caldon Canal to the north and the North Staffordshire Railway to the south. The River Churnet runs immediately to the south side of the railway.

4.2 The canal is within Staffordshire Moorland District Council's Caldon Canal Conservation Area (ref. 130), which covers the section that extends from Stockton Brook to Froghall, as well as the Leek Branch which runs from Hazelhurst to Leek.

4.3 The Historic Environment Character Assessment for the Staffordshire Moorlands describes the Churnet Valley as having woodland slopes, with a concentration of industrial activity (associated with both iron working and flint grinding) in the valley bottom along the line of the Caldon Canal and the North Staffordshire Railway. Above the valley are early field systems associated with dispersed single farmsteads or farmstead clusters (Staffordshire County Council 2010, 17).

4.4 The Historic Landscape Character (HLC) map for the study area (Staffordshire HER) (Fig. 21), using character types defined in the *Methodology for the Refined HLC for Staffordshire* (Staffordshire County Council 2011) shows that this stretch of the Churnet Valley is wooded and is predominantly characterised by *ancient woodland*, a character type which likely 'had… origins in at least the medieval period' (Staffordshire County Council 2011, 14). To either side of the river there is also a narrow corridor of *other early woodland*, defined as woodlands 'which have been identified on historic maps…these may be on the site of ancient woodland which date to at least the medieval period' and also of *other recent woodlands* (woodland established since the 1880s) (Staffordshire County Council 2011, 14-15). An area identified as *plantations*, a character type generally of 20th-century date, is located on the south side of the valley (Staffordshire County Council 2011, 15). Beyond the woodland, at the periphery of the study area, *early assarts*, defined as 'areas of land which have been enclosed out of ancient woodland' are identified to the north east, as well as to the north west and south.

An area of *early irregular enclosure*, generally assumed to date from the post medieval period, is identified to the south west (Staffordshire County Council 2011, 8).

4.5 The solid geology of the study area comprises sandstones of the Rough Rock, and Woodhead Hill Rock types - sedimentary bedrocks of the Carboniferous period. The drift comprises Alluvium (clay, silt, sand and gravel) of the Quartenary period in the core of the study area; none are recorded for the periphery (British Geological Survey).

5.0 Baseline information (for the 500m radial study area)

5.1 ***Designated assets.*** The Staffordshire HER and the NHLE feature only three designated heritage assets within the study area, details of which are presented in appendix 1 and Fig. 20. The assets include the Caldon Canal Conservation Area within which the others are located (namely Consall New Lock – PRN 03114 and a canal milepost – PRN 13409).

5.2 ***Non-designated assets.*** The Staffordshire HER has entries for 16 non-designated assets within the study area. The majority of these assets are associated with the Caldon or with industrial activity concentrated alongside the canal and railway. Details of these assets are presented in appendix 2 and Fig. 20.

5.3 ***Previous archaeological investigations.*** A historic building recording of the cellar in the stone-built, westernmost block of the mill was carried out in 2007 prior to alterations (Staffordshire HER Event ID EST1654). This block was thought to date to the site's original 17th-century use as a slitting mill; a number of structural alterations were recorded within the cellar along with the remains of two flint grinding pans. A second historic building programme, this time of the main mill building, took place in 2010 (Staffordshire HER Event ID EST2214). This identified areas of re-building at the west end of the building, which possibly incorporated earlier structures, and also the likely locations of water wheels and power transmission. Most recently a building recording project undertaken in 2011 (Staffordshire HER Event ID EST2307) recorded a row of calcining kilns and a range of buildings housing settling arks at the east end of the mill complex, all constructed in the 1840s for the flint mill.

5.4 The site has also been examined in the course of a desk-based assessment carried out by Staffordshire County Council in 1993, which looked at the industrial archaeology of the Churnet Valley (Staffordshire HER Event ID EST1176).

6.0 Historical and archaeological background

6.1 The Churnet Valley has been sparsely occupied for much of its history. Upland areas appear to have ben cleared for agricultural use during the later prehistoric period and small farming and mining communities established. Evidence for this early activity is, however, limited to a few burial monuments and also an Iron Age hillfort at Bunbury. Similarly, there is little evidence for activity during the Roman and early medieval periods; the latter probably saw a decline in activity associated with worsening climatic conditions during the mid 6th century. By the medieval period, however, the area seems to have been re-settled, albeit, in scattered small farmsteads. Industrial activity focused along the valley bottom, making use of both the ready water supply and nearby mineral wealth, was also developed during the medieval period. During the post-medieval and industrial period many mines were extended and mills converted to flint and colour grinding in order to serve the burgeoning pottery industry in nearby Stoke-on-Trent (Staffordshire Moorlands District Council 2014, 14-15).

6.2 There is no evidence for prehistoric or Roman activity within the study area. The earliest activity seems to be the assarts and early irregular enclosure identified on the HLC map (see section **4.4** & Fig. 21), although it has been suggested that Consall Old Mill, also known as Consall Lower Mill (PRN 04799), began its life as a medieval corn mill. There is some evidence for post-medieval farming and industrial activity (lime kilns – PRN 04798, ironstone workings – PRN 04797, farmstead – 52671, and trackway - 56720), but the majority of monuments date to the 18th and 19th centuries and are industrial in nature.

6.3 The Consall Flint Mill site is first referred to in 1683, in relation to nearby Consall Forge, located one mile up-river. Consall Forge was one of several iron working sites owned by the Foley family in the 1680s. The current mill site was chosen for the erection of an associated slitting mill (used to cut metal sheets into thin strips), space being somewhat limited on the forge site itself (Thompson 1974, 40). The new slitting

mill was housed in a large stone building, which was later incorporated into the flint mill (Staffordshire County Council and Staffordshire Moorlands District Council 1993, 6).

6.4 Conversion of the slitting mill into premises suitable for grinding flint had taken place by 1778. A 1795 lease for the 'newly erected Consall Flint Mill' describes how part of the ironworks were taken down and a 'flint mill and new buildings' were erected (Staffordshire County Council and Staffordshire Moorlands District Council 1993, 83). This conversion from slitting mill to flint mill took place just a year after the construction of the Caldon Canal; the canal company had been required to obtain permission from the mill owners in order to turn the existing race into a canal, with the mill retaining the right to draw water from the canal (Paish 2015, 3). This no doubt seemed as an opportunistic moment to change the use of the mill and capitalise on the growth of the pottery industry in nearby Stoke-on-Trent, making best use of this new, cheaper and easier transport network.

6.5 New buildings were also erected in the 1830s by then owner and lord of the manor John Leigh of Consall Hall, and by 1845 the mill had more or less achieved its current basic plan (Sherlock 1976, 170) (Figs. 8 to 10). The mill site, sold off as part of the Consall Estate in 1841, was described as being extended on the 'most improved principles' with two new water wheels of iron that were 30 feet (9.14m) in diameter and 9 feet (2.74m) wide. It also included kilns, arks, stabling, and cottages for the mill men. The brochure relates that the wheels drove 17 or 18 pans in all, producing 300 to 350 tubs of slop per week (SRO D554/27/3). A turbine was added in 1851 to drive four further pans (Job 1989, 25). In the late 19th century, the mill was converted for use in colour grinding and cylinder (or ball) mills were installed (Sherlock 1985). The cylinder mills remained in use for grinding glazes for the pottery industry until 1982 (Staffordshire County Council and Staffordshire Moorlands District Council 1993, 54).

6.6 Records show that by 1850 the mill was occupied by a William Bowers (Kelly 1850, 237). By 1864 it was in the joint ownership of Gustavus Thomas Smith and Charles Fergison Smith, the latter of Consall Hall, but was leased to a George Goodwin (SRO D3272/5/12/1). George, a flint grinder, and his son John, a flint and stone merchant, remained at the mill until at least 1896 (Kelly 1896, 199 & 458). An early 20th-century advertisement for the mill (Fig. 19) indicates that by that period it was being operated by

W. & A. Podmore, manufacturers and millers of materials for the pottery, glass, enamel, iron and brick industries, with headquarters at the Caledonia Works in Shelton, Stoke-on-Trent. The firm, later trading as W. Podmore & Sons Ltd (Pottery Gazette & Glass Trade Review 1947), continued in occupation of the mill until at least the 1960s (Leek Post & Times 2010).

7.0 Cartographic evidence

7.1 A survey of historical maps of the site was carried out, the details of which are presented below. The precise direction of north varies somewhat between those maps and plans of the site that were not produced as OS editions. For the sake of consistency, orientations used in the descriptions provided below were derived from Grid North as positioned on historical and modern OS maps.

7.2 *Robert Plot's map of Staffordshire, 1686* (Fig. 6)

Plot's map shows the settlement of *Cunsall*, some distance to the east of which is the River Churnet (marked as *Churnet flu*). The mill site is not indicated, but is located approximately near to the river crossing shown equidistant between *Moselie* and *Froghall*.

7.3 *Yates' map of 1775* (Fig. 7)

Yates' map shows the general area prior to the construction of the Caldon Canal. The mill site is not depicted on the map, but lies within a wooded area on the northern bank of the River Churnet, to the south west of *Hill House.*

7.4 *Plan of Canal & Towing Path at Consall Mills, Previous to 1834* (Fig. 8)

The plan shows the mill in detail. *Consall Flint Mills* comprises a core of five buildings, with a sixth some distance to the west, sandwiched between the Caldon Canal to the north and the River Churnet to the south. One of the central group of buildings sits on an outlet into the Churnet. Three flint kilns are depicted within a sub-circular plot or enclosure immediately to the west of the main mill buildings. A feeder arm from the Caldon Canal extends beneath the *old towing path* and terminates against the western boundary of the kiln enclosure. The plan shows an existing lock within the Caldon, but also features proposals for the re-alignment of the canal with a new lock system and tow path immediately to the north.

7.5 ***Plan of Canal and Towing path at Consall Mills from 1835 to the Construction of the North Staffordshire Railway*** (Fig. 9)

The configuration of the flint mill is much altered and enlarged from that shown on the 1834 plan. A collection of four inter-connected buildings now forms the main body of the mill, the northern edge of which sits on the Churnet. The northernmost range of the main block includes a transverse rectangular feature, the function of which is unclear. Three detached rectangular structures, the longest of which probably appears on the 1834 plan, sit on the northern side of the main building. An L-shaped arrangement of eight flint kilns is marked within an enclosure to the west. Four buildings, three of which form a discrete group, are located further to the west. Of the grouped structures, the largest is probably an adaptation of a building shown in this location on the previous map.

The Caldon Canal has been altered in broad accordance with the proposals indicated on the 1834 plan and now features a basin to the south of the main waterway, with a bridge to the west. A new lock features within the modified canal, with a second 'side lock' indicated to the south. Flood gates are also shown to the south west of the canal basin.

The course of the River Churnet has been altered in the vicinity of the three westernmost mill buildings, where it is now also crossed by a narrow bridge. Another crossing extends through the river obliquely to the west of the bridge.

7.6 ***Plans of the Consall & Cheddleton Flint Mills and Lands July 21st 1848*** (Fig. 10)

The complex (now labelled as 'Upper Mills') retains much of its earlier appearance, although the eight flint kilns are no longer depicted. A row of four small square structures, probably representing kilns, are positioned on an approximate north-south axis to the east of the main mill building. New buildings have been constructed parallel to the Caldon Canal to the north-east of the main mill. A large mill pond is shown to the east, with multiple feeds from the River Churnet; *Lower Mills* is situated at its eastern end.

7.7 ***Plan of Consall Upper and Lower Mills, Limekilns and Lands adjoining 1852*** (Fig. 11)

The plan essentially replicates the 1848 map, but shows the proposed route of the North Staffordshire Railway, which passes to the south of the main mill complex. Land

ownership and tenure is also indicated: the Upper Mill is described as 'let to Mr. William Bowers Jnr'. To the east, the Lower Mill is owned by Messrs Tredwell.

7.8 ***Plan shewing the Consall Mill Pound etc. previous to the construction of the North Staffordshire Railway 1853*** (Fig. 12)

The map adds detail to previous surveys. The basin off the Caldon is annotated as a 'Mill Pound'. The crossing over the Churnet is identified as a foot bridge, with a horse ford to the west.

7.9 ***Draft plan of Consall Flint Mills, with lands adjoining situate in the parishes of Ipstones, Kingsley, and Cheddleton in the County of Stafford… November 1862*** (Fig. 13)

Substantial changes are evident in the environs of the mill. The North Staffordshire Railway has been constructed below the mill complex, resulting in the relocation of the River Churnet on a line to the south of its original route. To accommodate this move, a new race, which extends beneath the railway, has been created from the flint mill. The Caldon Canal has also been altered, with the main waterway essentially restored to its pre-1835 alignment. The basin and side lock are now positioned to the north of the main canal. A wharf connected to a tramline is indicated on the northern bank of the basin; another is shown on the opposite side of the canal. Cranes are illustrated to either side of the canal in the vicinity of the basin. A set of flood gates are again shown to the north of the canal, a short distance from which is a second gate.

The mill complex is depicted in considerable detail, with its various elements identified. A waterwheel is indicated in the north-eastern corner of the westernmost range of the mill; a pentrough is shown in association with the wheel, with two other examples marked to the south. A unit to the north of the main flint-milling range is identified as a 'Rock Mill', presumably used to crush large flint pieces into smaller fragments suitable for grinding. Of the buildings positioned parallel to the Caldon Canal, the westernmost range contains flint arks; that to the east accommodates a blacksmith, two dwellings and a carpenter's workshop. A saw pit lies to the south east of the carpenter's shop. On the western side of the mill is the L-shaped arrangement of eight flint kilns first shown on the 1835 map (see above **7.5**), but absent from subsequent surveys. A row of six examples , aligned approximately north-south, are positioned on the eastern side of the mill, some of

which are no doubt those depicted in this location on the 1848 and 1852 maps (see above **7.6** and **7.7** respectively).

The mill is served by a private, *occupation*, crossing over the railway and Churnet; a *foot road* is located a short distance to the east.

7.10 ***Plan of the Canal and Towing Path at Consall, 1864*** (not illustrated)
The plan illustrates the same site layout as the previous survey.

7.11 ***1888 Ordnance Survey map*** (Fig. 14) (1:10,560 scale)
The configuration of the mill complex has changed, with the main building having been extended to connect with the westernmost of the ranges positioned parallel to the Caldon Canal. The building also appears to have encroached upon the area in which the L-shaped arrangement of eight flint kilns was previously shown. Neither this bank of kilns nor that shown on earlier plans to the east, are depicted, but this may be due to the general lack of detail provided by the map. The lock system adjacent to the mill is labelled as 'Consall New Lock'.

7.12 ***1900 Ordnance Survey map*** (Fig. 15) (1:10,560 scale)
Further alterations to the layout of western end of the mill complex are evident. Once again, flint kilns are not depicted.

7.13 ***1925 Ordnance Survey map*** (Fig. 16) (1:2,500 scale)
The flint mill has been extended in its north-eastern quarter, filling the gap between the main building and the range identified as containing flint arks on the 1862 plan (see above **7.9**). The flint kilns are shown in their previous locations, although both banks feature fewer examples, with six in the western arrangement and five in the east. The mill race appears to have been culverted.

7.14 ***1945 Ordnance Survey map*** (Fig. 17) (1:10,560 scale)
A long, narrow (unroofed?) structure now extends to the south-west from the previously extended mill building. This appears to occupy the location of the eastern bank of flint kilns, but extends further to the south, passing over the course of the culverted race. No kilns are shown on the western side of the mill.

7.15 ***1966 Ordnance Survey map*** (Fig. 18) (1: 2,500 scale)
A small, sub-ground extension is visible at the western end of the mill. The extension first shown on the 1925 OS map (see above **7.13**) has now been separated from the main building by a feature indicated as a platform. No kilns are specifically identified within the mill complex; the narrow feature shown in the location of the eastern bank on the 1945 OS edition is now identified as a sub-ground structure, probably marking the position of the kilns' draw mouths. Presumably, the kiln hovels were removed prior to the production of the 1945 map. The unit marked as a smith's shop on the 1862 plan (see above **7.9**) is now a dwelling, labelled as 'Mill Cottage'.

8.0 Site inspection

8.1 A site visit was made on 22nd April 2015, during which written notes were made and digital photographs taken.

8.2 The Consall Flint Mill complex comprises a group of brick and stone buildings ranged along the southern bank of the Caldon Canal, where the gap between it and the railway to the south widens out to form an 'island' (Plate 1). At the west end of the complex is the main brick-built mill building with an earlier stone block to the west, both of which have been converted for residential use. Behind the main mill and extending to the east is a range of brick canal-side buildings (formerly housing settling arks), which are in the process of refurbishment and conversion as holiday cottages. Further east, and also ranged along the canal side are brick and stone cottages (some formerly workshop buildings). The land upon which the mill complex is sited is generally level, but slopes steeply downwards from west to east where the locks occur. In addition, the area immediately surrounding the main mill building is stepped down; the access road, which roughly follows the course of the canal, slopes down into this area. The wooded slopes of the valley and the curving course of the canal, mean that the buildings are more or less obscured upon approach from both the canal and the access road. There is more visibility to and from the railway. The River Churnet, which is further to the south and at a lower level, cannot be seen from the mill.

8.3 The existing water intake is sited on the grassy southern bank of the canal, at the point just before it narrows for the lock. This is a wide opening with a timber lintel, which leads into a culvert (Plate 2). The culvert extends a short distance south east, at

which point there is an open tank for a metal sluice mechanism (Plates 3 & 4). A brick or stone archway (indicating the continuation of the culvert, which then forks with tunnels extending eastwards to both the north and south sides of the stone block at the west end of the mill – see Fig. 5) is evident on the south-east side of the sluice, although the whole is overgrow with brambles making this hard to see. The culvert and sluice are located within a grassy terraced area, with a concrete retaining wall to the south and east (Plate 5), and a stone retaining wall to the north.

8.4 The proposed route of the buried pipe for the turbine extends a short distance south across this terraced area, before extending south east down the tarmac access road and straight across the stepped-down section surrounding the main mill building, to the banks of the tail pond. This lower area (Plate 6) is for the most part a rough concrete hard-standing, although there is a grassed over garden area immediately next to the building. It is bounded by a concrete-capped stone wall on its south and east sides. The higher ground to the east is also a rough concrete hard-standing, separated from the tail pond to the east, and the railway to the south, by dumps of earth and brick.

8.5 The tail pond is roughly an elongated oval in plan and on an NW-SE alignment. It has steep overgrown banks and is surrounded by trees on all sides, except that adjacent to the railway where the trees have recently been felled (Plate 7). There is a brick arch in-let from the former tail race (again very overgrown) low down in the side of the east-facing bank (Plates 8 & 9), below the location of the proposed turbine shed. At the south-east end of the tail pond, there is a stone arch out-let into the River Churnet (Plate 10).

8.6 The proposed route of the by-water pipe extends north across the terraced area and down the grassy slope to the bank of the canal (Plate 11), where it is to exit just above the water level. The sides of the canal here are stone that has been built up with concrete, raising the height and forming a hard-standing between the canal and the adjacent buildings (Plate 12).

9.0 Assessment of impacts

9.1 *Direct impacts.*

9.1.1 The DBA has considered the likelihood of the proposed development having a direct impact upon heritage assets within the study area. The criteria for assessing the magnitude of these potential effects measures the degree of change to the baseline condition of a feature. This magnitude can be categorised as **high**, in which there is a total or major alteration to the condition or character of the feature; **medium**, in which there is a partial alteration of character; **low**, in which there is a slight, detectable alteration; or **imperceptible**, in which the change to the baseline condition is barely distinguishable.

9.1.2 Of the three designated and sixteen non-designated assets located within the 500m radial study area (Fig. 20; appendices 1 & 2), the proposed development will impact directly upon two of the non-designated assets, namely the Caldon Canal (PRN 02214) and Consall Flint Mill (PRN 02248). Works impacting on the Caldon Canal, which according to the criteria set out in section **3.0** can be assessed as of **medium** significance, would entail the repair (if necessary) of the existing in-take and the creation of a new outlet in the south bank of the canal for the 300mm diameter by-wash pipe. These works are very limited in their scope and are, therefore, considered to have a **low** impact.

9.1.3 Works impacting upon the Consall Flint Mill complex (of **low/medium** significance) include the refurbishment of the existing culvert and open tank, the installation of underground pipes (one carrying water to the turbine, and one serving as a by-wash), the installation of a turbine, and the construction of a turbine shed. Both the culvert and tank are extant structures, with the latter containing the sluice mechanism. The proposals involve the retention of both the culvert and the open tank structure, but the sluice mechanism would be removed and replaced with modern screening apparatus.

9.1.4 The installation of the underground pipes for both the turbine feed (900mm diameter) and the by-wash (300mm diameter) is unlikely to impact on known buried remains associated with the mill. Although the route of the turbine feed pipe, clearly crosses the course of the River Churnet prior to the construction of the railway (Figs. 6 to 12), and possibly the east end of the mill (tail) race, built to take water away from the mill following the railway's construction (Fig. 13), both features are below the level of

the turbine feed pipe and would remain undisturbed. The culverted tail race is thought to be at least 1.60m below the maximum depth of excavations for the turbine feed; this is based on the level of the top of the culvert at the out-let into the tail pond, which is c.4.50m below ground level and with an estimated gradient of 1:50 rising up to the west, and on a maximum excavation of 2.00m for the turbine feed pipe. The river is at least another 1.00m below the level of the culvert top. The turbine and its enclosing shed, to be built into the east-facing bank of the tail pond, are to be placed to one side of the existing out-let and their construction will not impact on either the out-let or the connecting culvert.

9.1.5 The overall impact of the proposed works on Consall Flint Mill, therefore, is considered to be **low**, resulting in the alteration of the tank and removal of the sluice mechanism, but with mill's tail race most likely to remain undisturbed.

9.2 ***Impact on the setting of designated assets***

9.2.1 In accordance with the NPPF (S132), consideration was made of the impact of the proposed hydro scheme on the setting of designated assets situated within the 500m radial study area. This exercise does not constitute a formal assessment of the visual impact of the scheme on all aspects of the historic and natural environment within the area, but instead to review the possible impact on the setting of relevant assets.

9.2.2 In determining the potential impact, it is necessary not only to consider the significance of the respective assets (based on the criteria set out in section **3.0; Table 1**), but also the relative contribution that setting makes to understanding and appreciating these assets. Settings with the highest value will, therefore, typically make a strong positive contribution to the asset's significance, providing vital historical, archaeological or architectural context. Those of the least value will offer little or no contribution to the asset. This discernible relationship between the two elements also means that setting cannot be defined simply as all land visible from an asset.

9.2.3 A **high-level** impact will result in a fundamental change to the setting of an asset, causing substantial or comprehensive loss of significance. A **moderate** impact will effect discernible changes to setting, which will in turn partially alter the nature and value of the principal asset. **Low** and **negligible** impacts will be slight or indiscernible.

9.2.4 Three designated assets are located within the study area, comprising Consall New Lock adjacent to the mill, the mile post a short distance to the west of the mill, and the Caldon Canal Conservation Area (Fig. 20; appendix 1). Of these assets, it is the setting of the Conservation Area, and of the New Lock (both considered to be assets of **medium** significance), upon which the proposed hydro scheme is likely to have the most potential impact.

9.2.5 The immediate setting of the mill, sandwiched between the canal and the railway, retains its industrial character. The mill buildings are obviously of industrial, utilitarian design, although converted for residential use; the canal and railway remain in use, albeit this use is now largely recreational. The proposed scheme is very much in-keeping with this industrial context, making use of water power as was historically the case at the mill. The new infrastructure for the hydro scheme is generally hidden, or designed to minimise visual impact, and also makes use of existing structures where possible. The new pipelines would be below ground and the turbine shed is to be a low structure, discretely built into the bank of the tail pond, hidden from view from the canal and most of the mill buildings. More open views are possible from the railway, but these would again be minimised by the low height of the building against the bank behind. The use of an appropriate colour on the exterior of the shed would further reduce its impact. The in-let from the canal, and the culvert and tank are existing structures which would be utilised in the proposed hydro scheme, as is the outlet from the tail pond into the river. Of these the refurbished tank, to be fitted with new screening apparatus and surrounded by safety fencing, is likely to have the most impact on the character of the setting, although this would be as much due to the clearance of undergrowth from the surrounding area as to the installation of new equipment and fencing. The screening apparatus itself, to replace the sluice mechanism currently located within the tank, would be of utilitarian character, similar in nature to its predecessor. The surrounding safety fencing is unlikely to fundamentally alter the character of the setting as long as a style and material appropriate to the industrial nature of this setting is chosen. Given the overall discrete nature of the proposed development as described above, its likely impact on the setting of both the Conservation Area and Consall New Lock would be **low to negligible**.

10.0 Conclusions and recommendations

10.1 The DBA has provided documentary, cartographic and archaeological evidence to chart the development of Consall Mill and its environs. It has gathered evidence of designated and non-designated heritage assets within a 500m radius of the mill site, and assessed both their significance and the potential direct and indirect impacts (i.e. on the setting of designated examples) on those elements most likely to be affected by the development proposals.

10.2 In summary, it is likely that the proposals for a hydro scheme at Consall Mill will have a **low** direct impact on both the adjacent stretch of the Caldon Canal, and the mill complex itself. The impact of the proposed scheme upon the setting of designated assets, chiefly the Conservation Area and Consall New Lock is considered to be **low to negligible**.

10.3 Ground-works associated with the proposed hydro scheme are unlikely to disturb the remains of the redundant water courses that formerly carried water to the mill wheels and then out again, originally into the river, then later into the tail race and pond. The disturbance of features associated with the mill that are not indicated on historical maps cannot, however, be entirely ruled out. The refurbishment of the tank also, involving the removal of the existing sluice mechanism, would result in the loss of evidence relating to the mill's historical operation. As such, the LPA could request that a programme of archaeological investigation accompany the development, probably as a condition of planning permission. This response would be consistent with that advocated by the *NPPF: Section 12 – Conserving and enhancing the historic environment* (S141) and the *Staffordshire Moorlands Core Strategy* (DC2).

10.4 Below are some suggestions for mitigation of the proposed hydro scheme. It must be noted that these are merely recommendations, put forward to suggest a coherent methodology for examining the site. It may well change in light of revised development proposals or the specific requirements of the LPA, acting on the advice of the Staffordshire County Council Principal Archaeological Officer.

- An **archaeological watching brief** carried out during groundworks necessitated by the hydro scheme. This would ensure against the loss of archaelogical remains that could not be anticipated in advance of development.

- A programme of **archaeological recording** concentrating on the tank structure and sluice mechanism, and undertaken prior to development works, would ensure against any loss of evidence resulting from the refurbishment of this area. A **photograhic survey** (as outlined in the English Heritage guidelines *Understanding Historic Buildings: a guide to good recording practice*, 2006) would achieve a good visual record of the sluice, and related structures, prior to its removal.

11.0 Acknowledgements

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