

WELBECK ABBEY RESERVOIRS

Welbeck, Nottinghamshire



Heritage Statement

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Final

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SUMMARY OF PROJECT DETAILS

TJC Project Code:	C65
OASIS ID:	thejesso1-369402
Project Type(s):	Heritage Statement
National Grid Reference:	Great Lake (SK 58165 72435), Carburton Forge Lake (SK 59135 72288) and Carburton Lake (SK 60005 72479)
County:	Nottinghamshire
District/Unitary Authority:	Bassetlaw
Parish:	Welbeck
Elevation (above Ordnance Datum):	c. 50 - 40m
Planning Reference(s):	TBC
Designation Status(s):	Welbeck Abbey Registered Park and Garden
Prepared by:	James Thomson MCIFA
Reviewed by:	Oliver Jessop MCIFA
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NON-TECHNICAL SUMMARY

This report presents the results of a heritage statement to inform mandatory safety works to Welbeck Abbey Reservoirs, Welbeck, Nottinghamshire. The study focuses on the dams of Great Lake (SK 58165 72435), Carburton Forge Lake (SK 59135 72288) and Carburton Lake (SK 60005 72479).

The site encompasses three dams primarily associated with a scheme of landscaping within the Welbeck Estate attributed to the 5th Duke of Portland.

Great Lake dam dates to the mid to late 19th Century (between 1850 and 1880), representing an expansion of an earlier 18th Century lake over the site of former water meadows. Carburton Forge Lake dam dates to the late 19th Century, built on the site of an earlier string of reservoirs of early post-medieval date and the site of a 17th Century iron forge. Carburton Lake dam is believed to date to the early 19th Century and is likely associated with the formation of water meadows to its east. All the dams retain the majority of its 19th Century fabric, although with piecemeal alterations. None of the dams are Listed Buildings, however the intrinsic significance of this group of assets is considered to be of regional significance, and to make a positive contribution to the significance of the Welbeck Abbey Park grade II registered park and garden.

The proposed scheme of improvements to the dams will result in an overall impact to the significance of the historic environment, principally deriving from structural changes to the culvert and sides of the cascade at Great Lake dam. This impact is considered to amount to less than substantial harm and will be weighed against the significant benefit to local communities and the ongoing conservation and preservation of the Welbeck Abbey Park registered park and garden from the added resilience of the dams during flood episodes.

I INTRODUCTION

BACKGROUND

This report presents the results of a heritage statement to inform mandatory safety works to Welbeck Abbey Reservoirs, Welbeck, Nottinghamshire (**Figure I**). The study focuses on the dams of Great Lake (SK 58165 72435), Carburton Forge Lake (SK 59135 72288) and Carburton Lake (SK 60005 72479).

AIMS

The purpose of this report is to gain an understanding of the historic environment resource in order to formulate (after ClfA, 2014):

- an assessment of the potential for heritage assets to survive within the area of study;
- an assessment of the significance of the known or predicted heritage assets considering their archaeological, historic, architectural and artistic interests;
- strategies for further evaluation whether or not intrusive, where the nature, extent or significance of the resource is not sufficiently well defined;
- an assessment of the impact of proposed development or other land use changes on the significance of the heritage assets and their settings; and
- strategies to conserve the significance of heritage assets, and their settings

SCOPE

This assessment was undertaken in accordance with the Chartered Institute for Archaeologist's standards and guidance for historic environment desk-based assessments (2014), and in reference to the policies and guidance of the National Planning Policy Framework (NPPF).

The scope of this report included desk-based research; and a site inspection and walk-over survey.

The desk-based research and assessment of setting has utilised the existing Woburn Estate Parkland Management Plan (Historic Landscape Management Ltd (HLM), 2016) to provide background information to place the site within its context and to identify heritage assets that may possess settings which could be affected by proposed scheme of works at the site.

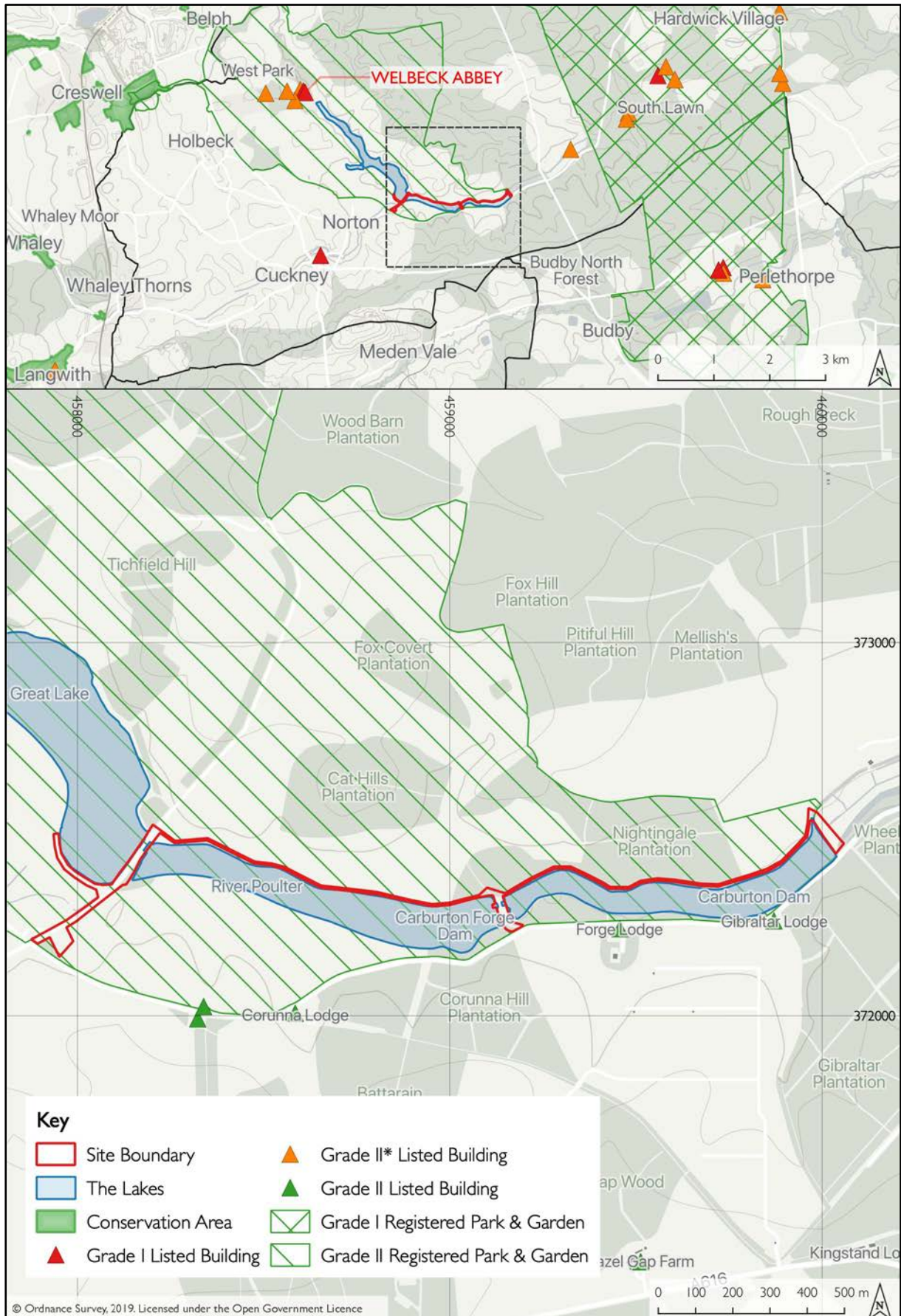


Figure I: Site location plan

2 METHODOLOGY

DESK-BASED RESEARCH

A review of the previous archaeological archives and documentary sources has been undertaken to identify gaps in knowledge, and to ensure that the historic character of the site and study area is understood. The primary sources consulted included:

- The Welbeck Estate Parkland Management Plan (HLM, 2016);
- Online archaeological resources; and
- Relevant publications held in The JESSOP Consultancy reference collection.

All sources consulted are listed in **Section 9** of this report.

SITE APPRAISAL

The site was inspected in September 2019 by Oliver Jessop MCIfA and James Thomson MCIfA in order to identify the presence, extent and character of known and possible archaeological remains and historic structures, and to consider factors in the former use and management of the site that may have affected the survival of buried archaeological remains. The scope of this was consistent with a Level 1 (visual record) for landscape recording established by Historic England (HE, 2007a).

WRITTEN RECORD

This report provides a discussion of the results of the preceding stages of desk-based research and survey; an assessment of the significance (including a description of their setting) of heritage assets identified at the site and those within the wider area identified to be sensitive to change at the site; an assessment of impact; and recommendations. The assessment of setting followed the approach set out by Historic England (2015), referring to the heritage values identified in the National Planning Policy Framework (2019), and referencing appropriate guidance including Historic England's conservation principles (2008) and selection guides and DCMS designation criteria (2013 & 2018).

Assessment of Significance

The significance of heritage assets is their value to this and future generations because of the archaeological, architectural, artistic or historic interest embodied in their physical presence and way in which they are experienced (after definitions in NPPF). Establishing what factors contribute to the significance of an asset, and how, is crucial to understand its vulnerability to change and in ensuring appropriate conservation strategies are identified which preserve and enhance that significance. Significance is expressed in this report on a five-point scale of negligible, local, regional, national or international.

Heritage Significance		
International	Heritage assets of outstanding universal value which fulfil the criteria for inclusion on the UNESCO World Heritage List.	1
National	Heritage assets of special interest or national importance that fulfil the criteria for listing (i.e. as a Scheduled Monument, Conservation Area, Listed Building, Registered Park and Garden, Registered Battlefield or Protected Wreck Site).	2
Regional	Heritage assets that fulfil the criteria for local listing (as set out by local authority guidance or Historic England's advice note on Local Listing). Broadly defined, such assets possess architectural or historical interest that notably contributes to local distinctiveness or possesses archaeological interest that contributes towards the objectives of a regional research agenda.	3
Local	Heritage asset that fails to fulfil the criteria for local listing but that possesses sufficient interest in one area to be considered a non-designated heritage asset.	4
Negligible	Heritage asset of very limited heritage interest, typically due to poor preservation, survival or restricted contextual associations.	5

Elements of a heritage asset, including elements of their setting, may not contribute equally to its significance, reflecting where there is capacity for an asset to support change without loss of significance, or where there are opportunities for significance to be enhanced. This sensitivity is expressed in this report on a five-point scale of high, medium, low, neutral and negative:

Sensitivity (contribution to significance)		
High	Element is fundamental to the key heritage interest/s that define the significance of the asset.	H
Medium	Element makes an important contribution to the significance of the asset, but likely relates to either a phase of lower heritage interest or relates to a key phase but has been affected by moderate (under 50%) loss of fabric.	M
Low	Element makes a slight contribution to the significance of the asset; its interest having been compromised due to substantial loss or alteration (over 50%)	L
Neutral	Element does not contribute to the significance of the asset.	N
Negative	Element represents an unsympathetic change which detracts from the significance of the asset.	Neg

3 SITE DESCRIPTION

LOCATION

The project includes three large lakes formed within the Welbeck Estate along the River Poulter, including (from west to east), the Great Lake, Carburton Forge Lake and Carburton Lake. The redline boundary of the planning application encompasses the dams of these three lakes, an access track along their northern edge, and an access track and proposed site compound to the south of Great Lake's dam.

GEOLOGY

The underlying geology at the site comprises sandstone of the Lenton Sandstone Formation within at Great Lake, and sandstone and pebbly gravel across the Carburton Forge Lake and Carburton Lake (BGS, 2019).

The geology of the site is reflected in the local vernacular where sandstone forms the principal fabric of buildings in the area, although Steetly Stone (a magnesium limestone) is also common as an import into the area.

DESIGNATION

The site lies within the Grade II Welbeck Abbey Registered Park and Garden (NHLE: 1000556).

4 UNDERSTANDING THE SITE – HISTORIC BACKGROUND

INTRODUCTION

The following baseline has been prepared in reference to the Welbeck Estate Parkland Management Plan (HLM, 2016), extracting information that is relevant to understanding the prior use of the site, the development of the lakes, and the presence of known heritage assets and potential archaeological resource in the area.

PREHISTORIC

The Welbeck Estate lies on the eastern edge of the Magnesian Limestone, including an area of deep gorges cut through by rivers over time and creating natural caves and rock shelters, with the most significant group at Creswell Crags believed to have been occupied between 60,000 and 10,000 years ago by nomadic groups.

Evidence for later prehistoric occupation is sparse in the Welbeck Estate itself, however sites in the wider area illustrate a continuation of occupation through the Neolithic and Bronze Age with an increasing emphasis on farming activity. Settlement in the area intensified during the Romano-British period, with potential evidence of tile making in the vicinity of Tile Woods to the south of the lakes.

MEDIEVAL PERIOD (1066-1540)

Welbeck is not recorded as a settlement in the Domesday Survey of 1086, and the extent of early-medieval occupation in the area is generally poorly understood.

In 1153-54 Richard de Flemmaugh established a colony of Premonstratensian canons at Welbeck, with his son Thomas later founding the abbey and endowing it with surrounding land and woodland. By 1330 the abbey had acquired substantial holdings including the whole manor of Cuckney, together with the towns or hamlets of Cuckney, Langwith, Bonbusk, Holbeck, Woodhouse, Milnthorpe, Clowne, and Norton by Cuckney. The use of the land at the site during this period is not known, although its location along the River Poulter likely put it within an area of meadows. It is also likely that fishponds were present on the river, or its tributaries, although again their location is not known.

POST-MEDIEVAL (1540-1901)

During the Dissolution of the Monasteries the crown seized the land and buildings at Welbeck, soon after passing into private hands. Plans for construction of a new hall were designed by Robert Smythson in around 1615, when it is also likely that formal gardens around the hall were also laid out.

The earliest map showing the landscape west and south of Welbeck Abbey, dating to 1629 (**Appendix I.1**), shows a series of courtyard around the hall with large lakes to the east (on the site of the upper two-thirds of Shrubbery Lake to the north of the Great Lake) and west (no longer extant but to the south of Cowclose Wood). The River Poulter is shown following sinuous route southwards with, eventually bifurcating east of the present Great Lake dam to form two channels, the northern segmented into a number of small pools. Although only the northern bank is shown within the site, it illustrates the site was divided into a number of irregular enclosures.

The river was dammed at Carburton Forge Lake dam in the late 1690s to create a pond for an iron forge on the northern bank. These works presumably replaced the earlier arrangement of pools shown on the 1629 map. In 1695 10 acres of land were leased to John Wheeler of Worcester to build a forge, dam and floodgates. The forge was built for the Derbyshire and Nottinghamshire Company.

A significant phase of change within the wider estate took place in the mid 18th Century under the ownership of the Countess of Oxford when she employed the landscape gardener Francis Richardson to draw up plans for a new informal landscape. Whilst the site lay outside of these proposals, a map of Norton parish (**Appendix I.2**), surveyed in around 1766, shows the southern side of the river, illustrating the Great Lake proposed by Richardson had been constructed (then ending north of the current extent). At the site itself the map indicates a bridge at the point of Great Lake dam, and a broad area labelled Carburton Dam within the vicinity of Carburton Lake.

The first detailed map of the whole area is Sanderson's map of 1835 (**Appendix I.3**) which illustrates the extent of the Great Lake as that of 1797, with the area west of the present Great Lake dam occupied by water meadows. Two watercourses cross the line of the present Great Lake dam, which is marked by a road which enters a semi-circular plantation north of the river and, then following a tree lined route to northwards. To the west, between the watercourses, is a system of channels reflecting the presence of water meadows. To the east, the two watercourses join to form Carburton Forge Lake, with a dam shown towards the site of the present Carburton Forge Lake dam, adjacent to two small buildings north of the dam labelled Carburton Forge. East of the forge

is a further sinuous lake, on the line of Carburton Lake, with a dam at the present site of Carburton Lake dam. Two watercourses are again shown at this point.

The next major phase of change within the site occurred under the 5th Duke of Portland, William John, in between his inheriting the estate in 1854 and his death in 1879. William John Arthur Charles James Cavendish-Bentinck, 6th Duke of Portland then succeeded to the estate, evidently continuing improvements.

Changes to the dams during this period included the:

- Construction of Carburton Lake by 1835;
- Safety works to Carburton Forge Lake in 1859;
- Works to sluices on Carburton Forge Dam in 1862;
- Possible construction of present Great Lake dam in 1862;
- Works to sluices and addition/replacement of gates on Great Lake dam in 1880; and
- Enlargement of Carburton Forge Lake in mid 1880

Whilst further changes to the estate continued through the 20th Century, these would never have been of the same scale as those seen in the 18th and 19th Centuries, and no further substantial works were undertaken within the site. There are a few records of maintenance works, including works undertaken to Carburton Dam Lake to rebuild sluices and outlet gates in 1987, although it is likely there have been many more piecemeal repairs over time.

SUMMARY OF ARCHAEOLOGICAL POTENTIAL & SIGNIFICANCE

The assessment has identified the potential for remains relating to Carburton Forge to survive on the northern bank of Carburton Forge Lake dam. The forge was established in the late 17th Century and was extant until its demolition in the mid 18th Century. Remains of the forge, including elements of masonry walls, earthworks and deposits of demolition material and industrial waste. It is unusual for forge sites of such date to survive outside of developed areas, and as such any archaeological remains are likely to be of regional archaeological interest in respect to improving knowledge of the origin and use of the site and technological developments in metal working during the early post-medieval period.

Further potentials for archaeological resources that may survive within the site have been identified through review of the history of the site and records in the wider area, including:

- Negligible potential for remains relating to prehistoric activity – whilst activity is recorded in the wider area, the degree of landscaping that has occurred within the area of the lakes is such that survival of any such remains is highly unlikely, although if they were to survive they would likely be of at least regional significance in relation to what their investigation could tell us of the nature and extent of human activity within this area.
- Low potential for remains relating to the medieval and post-medieval development of the landscape, including earlier phases of water management such as the chain of ponds depicted on the 1629 map in the vicinity of Carburton Forge Lake. As with the remains of previous periods, it is likely that the degree of impact associated with the construction of the existing lakes and dams will have impacted the remains of any such features within the site.

The effect of the scheme on potentially sensitive archaeological remains is discussed in **Section 6**.

5 UNDERSTANDING THE SITE – SITE APPRAISAL

LANDSCAPE CHARACTER

The site represents three lakes formed along the course of the River Poulter in the 18th and 19th Centuries as part of the gradual expansion of the informal landscaped part of Welbeck Abbey.

Evidence from the 17th Century suggests the landscape at this time comprised of large irregular parcels, most likely put to productive agricultural use. Whilst this area survived outside of the park through the 18th Century, by the mid-19th Century it was gradually enclosed and re-landscaped to remove its earlier pattern of fields and meadows. Within this context the site can be divided into three principal character areas:

- The Great Lake,
- Carburton Forge Lake and
- Carburton Lake.

An assessment of the individual heritage assets that make up these areas is included in the gazetteer below.

SIGNIFICANCE AND SENSITIVITY OF ASSOCIATED HERITAGE ASSETS

As a whole the site represents a key part of the design of the Welbeck Park (a Grade II registered park and garden), being intentionally developed to enhance the artistic qualities of the landscape which is also reflected in the architectural embellishment of spillways to the Great Lake dam and Carburton Forge Lake dam. The significance of the park is intrinsically linked to the contribution of its constituent elements and will thus be sensitive to any change to the fabric of heritage assets within the site.

The parkland within which the site is situated also forms part of the setting of a number of heritage assets within the wider area, including a number of grade II listed structures (monument to Lord George Bentinck, Bentinck Lodge, Corunna Lodge, Forge Lodge, and Gibraltar Lodge; **Figure 1**) and the non-designated Lodge no. 11 east of Carburton Lake dam. These heritage assets all draw significance from the form and character of the landscape in Welbeck Park but are not deemed to be sensitive to the scheme. This is due to each being situated at a sufficient distance from the site that the scale of the proposed works would not result in any appreciable change to the contribution made to their setting by the positive characteristics of affected heritage assets at the site.

The effect of the scheme on potentially sensitive heritage assets is discussed in **Section 6**.

GREAT LAKE DAM

I.1: Great Lake Dam

Type: DAM

Date: Mid 19th Century

NGR: 458158 372422

Description:

Straight dam supporting an unmetalled north-east to south-west aligned track. Upstream the dam is faced by a masonry wall with rock faced sandstone coping (the wall and apron of dam are not visible through the water) and downstream it has a grassed glacis incorporating a cascade (**Feature I.12**).

The dam wall curves round to the south-west giving way to a grassed verge. To the north the dam wall abuts a west-east aligned wall of late 20th century fabric.

South-east of dam is a deep rock cut channel comprising outlet of by-pass sluice (**Feature I.2**).



Significance:

- * Medium level of historic interest deriving from its association with a scheme of improvements to the Welbeck Estate by the 5th Duke of Portland, William John, made in around 1862. The present dam represented an expansion of an earlier 18th Century lake, covering an area of 18th Century water meadows, themselves formed on unimproved meadows of the 17th Century. The dam also has technological interest as a significant 19th Century water management feature, with surviving sluices.
- * Medium level of architectural and artistic interest. Whilst the overall aesthetic of the dam is not significantly ornate, the cascade represents a significant landscaped element providing the sound of falling water to travellers across the dam and being visible from the tracks along the northern bank of Carburton Forge Lake. The dam also forms a vantage point towards Welbeck Abbey, visible in the distance across the Great Lake where areas of open pasture and woodland are used to articulate the topography and provide a greater sense of depth.

The design of the cascade is such that the culverts from where the water discharges are obscured, with a low lying soffit set with pitted limestone rubble and vegetation.

The presence of gates and railings, possibly added in 1880, are characteristic features of managed estates, and add to the historical and artistic interest of the dam.

Of Regional Intrinsic Significance, but making a Medium Positive Contribution to significance of the Grade II Registered Park and Garden of Welbeck Park

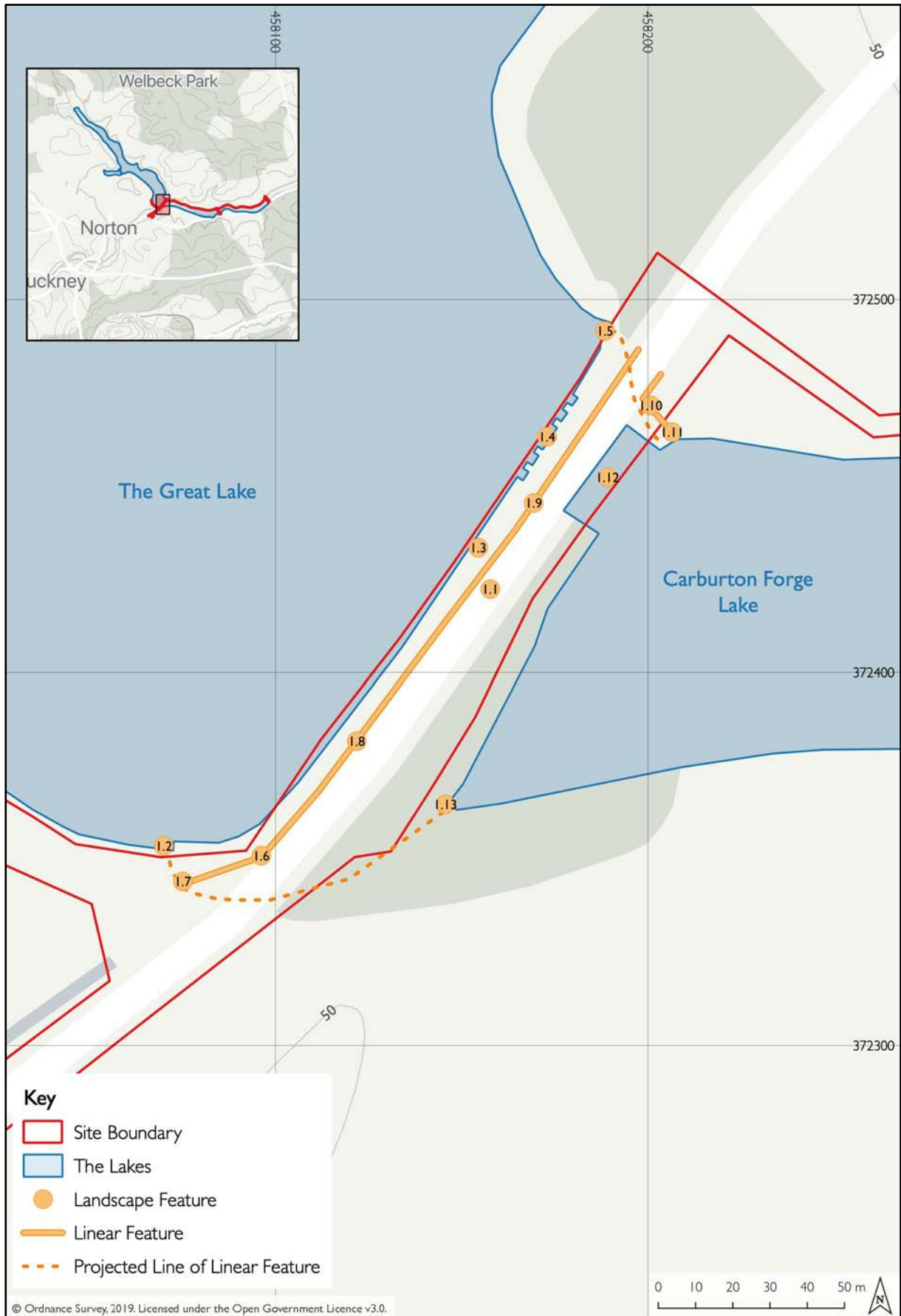














Figure 2: Landscape features at Great Lake Dam

Landscape Feature	Description	Contribution to Significance	Picture
<i>Component Assets</i>			
<p>I.2: Sluice <i>Type: DAM</i> <i>Date: 1880</i> <i>NGR: 458070 372353</i></p>	<p>Sluice structure with two stems visible</p> <p>Western stem is cast iron, tapering with collar and square cap with brass fitting.</p> <p>Eastern stem is cast iron with circular cap marked "KIRKLAND ENGINEER MANSFIELD 1880".</p> <p>Extensive concrete alterations to intake structure. Gates etc. not visible below water.</p>	M	
<p>I.3: Sluice <i>Type: SLUICE</i> <i>Date: 1861</i> <i>NGR: 458154 372433</i></p>	<p>Sluice with two iron stems set back from edge of dam and surrounding by cast iron foot plate. The stems both have circular caps marked "KIRKLAND ENGINEER MANSFIELD 1861".</p>	M	
<p>I.4: Sluices <i>Type: SLUICE</i> <i>Date: Mid 19th Century</i> <i>NGR: 458173 372463</i></p>	<p>Six identical sluices with limestone rubble breakwaters set in concrete, crossed by steel footbridges and remnants of cut-off iron leaf-litter grates. The sluices themselves comprise of iron lintels supporting central threaded stem with brass fittings, engraved with "KIRKLAND ENGINEER MANSFIELD" and individually marked with dots, one through to six.</p> <p>Internal culverts are reported to be concrete.</p> <p>Gates etc. not visible below water.</p>	M	
<p>I.5: Sluices <i>Type: SLUICE</i> <i>Date: Mid 19th Century</i> <i>NGR: 458188 372492</i></p>	<p>Pair of sluices set into the sandstone masonry of the dam wall.</p> <p>Northern sluice has cast iron column surrounding threaded stem and iron frame. Surrounded by segmental iron litter grill with iron plate foot plate.</p> <p>Southern sluice has cast iron column surrounding threaded stem and brass fittings.</p>	M	

Landscape Feature	Description	Contribution to Significance	Picture
<p>I.6: Estate Fence Type: FENCE Date: Mid-Late 19th Century NGR: 458075 372343 to 458197 372486</p>	<p>Six bar estate railing formed from flat iron sections with circular rail at top.</p>	M	
<p>I.7: Gate Type: GATE Date: Mid-Late 19th Century NGR: 458075 372344</p>	<p>Field gate composed of cast iron posts with fluted columns, and collar and conical cap. The gate is of a 6-bar iron type with cross bracing and scrollwork to stiles at either end. Components all corroded and gate evidently mishapen.</p>	L	
<p>I.8: Gate Type: GATE Date: Mid-Late 19th Century NGR: 458122 372382</p>	<p>Pedestrian gate composed of cast iron posts with fluted columns, collar and conical cap. The gate is of a 6-bar iron type with cross bracing joined at intersection with a circular boss, spiked scrollwork to stiles and spear-headed spikes along upper rail. Components all corroded and gate evidently mishapen.</p>	M	
<p>I.9: Gate Type: GATE Date: Mid-Late 19th Century NGR: 458169 372445</p>	<p>Field gate composed of cast iron posts with fluted columns, collar and conical cap. The gate is of a 6-bar iron type with cross bracing joined at intersection with a circular boss, and scrollwork to stiles. Components all corroded and west post sheared with failed repair.</p>	M	
<p>I.10: Estate Fence Type: FENCE Date: Mid-Late 19th Century NGR: 458202 372478 to 458207 372462</p>	<p>Six bar estate railing formed from flat iron sections with circular rail at top.</p>	M	

Landscape Feature	Description	Contribution to Significance	Picture
<p>I.11: Gate <i>Type: GATE</i> <i>Date: Mid-Late 19th Century</i> <i>NGR: 458207 372464</i></p>	<p>Pedestrian gate composed of cast iron posts with fluted columns, collar and conical cap. The gate is of a 6-bar iron type with cross bracing joined at intersection with a circular boss, and scrollwork to stiles. Components all corroded.</p>	M	
<p>I.12 Cascade <i>Type: CASCADE</i> <i>Date: Mid 19th Century</i> <i>NGR: 458189 372452</i></p>	<p>Straight rock cascade of four steps formed from pitted limestone boulders. Water emerges from sluices beneath a rubble lined soffit, heavily screened by vegetation.</p>	H	
<p>I.13 Footbridge <i>Type: FOOTBRIDGE</i> <i>Date: Mid 19th Century</i> <i>NGR: 458146 372365</i></p>	<p>Footbridge formed from two thick sandstone slabs, overlying leat from by-pass sluice (Feature 1.2). Stone lined apron to toe of dam visible beath water.</p>	L	

CARBURTON FORGE LAKE

2.1: Carburton Forge Dam

Type: DAM

Date: Late 19th Century

NGR: 459141 372278

Description:

Straight dam supporting an north to south aligned grassed track. Upstream the dam is faced by a masonry wall of rock faced limestone with sloping rubble faced apron (patched in concrete) and downstream grassed glacis incorporating a spillway structure (**Feature 1.7**).

The dam wall curves round at either end, running a short distance before turning to grass verge to the south and sandstone retaining wall to the north.



Significance:

- * High level of historic interest through its association with the 17th Century Carburton Forge, its technological interest as a 19th Century dam, and in representing a designed element of the scheme of landscape improvements implemented by the 5th Duke.
- * Medium level of architectural and artistic interest in respect to its association with the lake and intentionally designed aspects of its cascade that provide an audible experience and interest in views across Carburton Lake within its relatively near proximity.
- * Medium level of archaeological interest in relation to the 17th Century Carburton Forge and the cartographic evidence for an earlier string of dams through the area on the 1629 Senior map.

Of Regional Intrinsic Significance, but making a Medium Positive Contribution to significance of the Grade II Registered Park and Garden of Welbeck Park

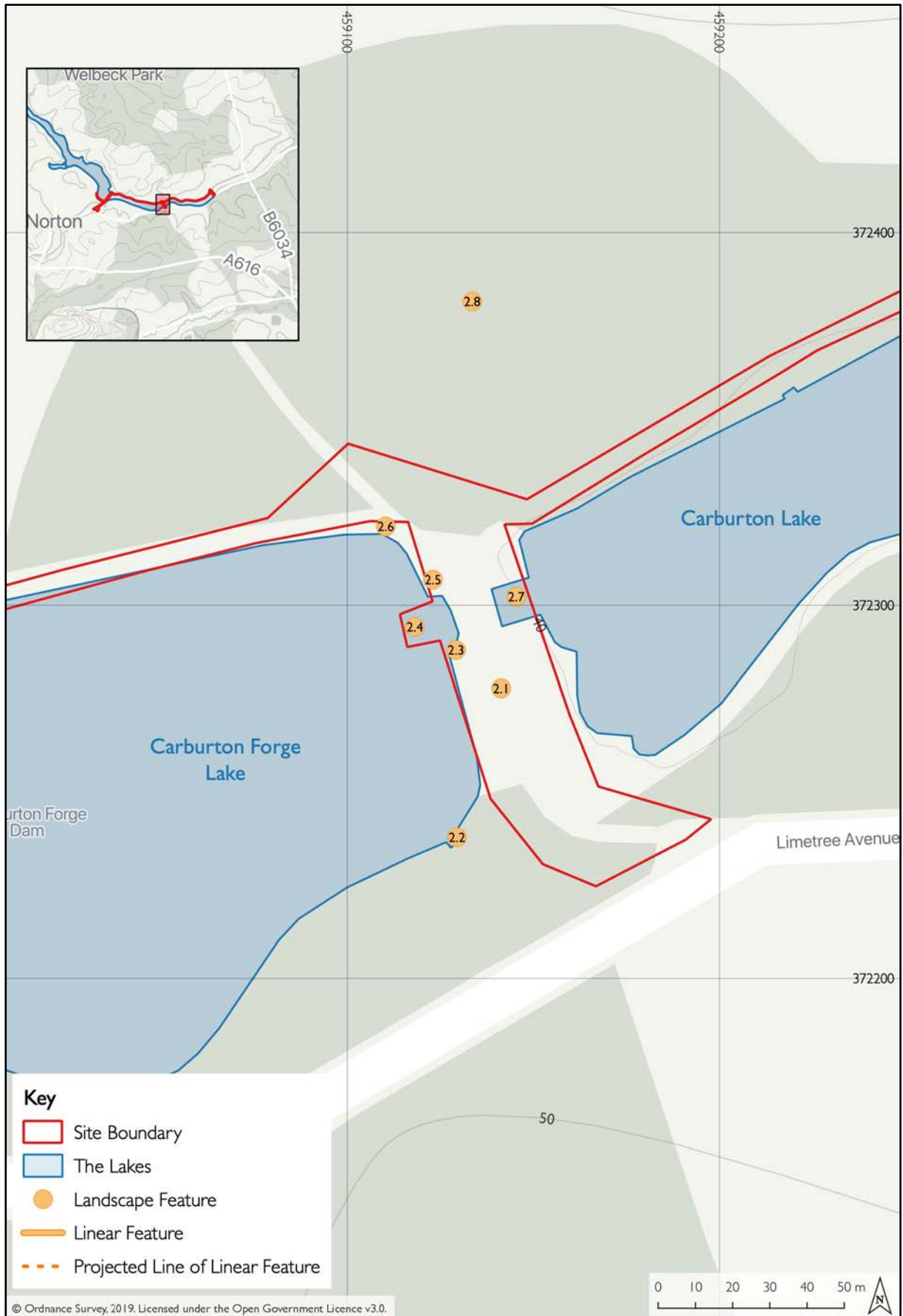









Figure 3: Landscape features at Carburton Forge Lake Dam

Landscape Feature	Description	Contribution to Significance	Picture
<p>2.2: Sluice Type: SLUICE Date: Late 19th Century NGR: 459130 372238</p>	<p>Sluice structure with one cast iron cased stem with circular cap. Set within a stone surround, with iron plate covering the inlet. There is a segmental leaf litter grill in front of inlet.</p>	M	
<p>2.3: Sluice Type: SLUICE Date: Late 19th Century NGR: 459129 372288</p>	<p>Sluice with rock-faced limestone inlet structure and segmental arched culvert. Remains of sluice gate for three rising gates evident from iron frame encased in added concrete breakwaters. Sluice crossed by cast iron grill footbridge.</p>	M	
<p>2.4: Spillway Type: SLUICE Date: Late 19th Century NGR: 459118 372294</p>	<p>Masonry spillway structure, comprising of rectangular well chamber projecting out into dam, with brick built walls and ashlar coping. Internally braced by arched brick walls. Two low level sluices drain into the structure with cast iron encased stems. A cast iron walkway is supported across the well on brick piers and RSJs with cast iron handrail with ornate stanchions. The southern handrail is replaced in steel. The overflow structure appears to now lie well above the operational level of the dam.</p>	H	
<p>2.5: Sluice Type: SLUICE Date: Late 19th Century NGR: 459123 372307</p>	<p>Sluice with rock-faced limestone inlet structure and segmental arched culvert. Remains of sluice gate for three rising gates evident from iron frame encased in added concrete breakwaters. Sluice crossed by cast iron grill footbridge.</p>	M	
<p>2.6: Sluice Type: SLUICE Date: Late 19th Century NGR: 459110 372321</p>	<p>Sluice with cast iron tapering column with collar and square cap with brass fixing for threaded stem. Inlet modified with concrete.</p>	L	

Landscape Feature	Description	Contribution to Significance	Picture
<p>2.7: Cascade <i>Type: Cascade</i> <i>Date: Late 19th Century</i> <i>NGR: 459145 372302</i></p>	<p>Cascade enclosed by rockfaced stone abutments walls within downstream glaciis of Carburton Forge Lake dam.</p> <p>The cascade is stone lined with seven steps.</p> <p>Two segmental arched culverts enter the cascade from the west. The wall between them has a central vertical recessed channel, possibly for removed water level monotoring equipment.</p>	<p>H</p>	
<p>2.8: Remains of forge <i>Type: Ruins</i> <i>Date: 17th Century</i> <i>NGR: 459134 372382</i></p>	<p>The site of the former Carburton Forge is situated in woodland to the north of the dam. Whilst no remains are visible within the present dam that would indicate the incorporation of the forge's earlier dam, there are remains of the forge buildings visible above ground, and more remains are anticipated to survive archaeologically.</p>	<p>H</p>	

CARBURTON LAKE

3.1: Carburton Lake Dam

Type: DAM

Date: Mid 19th Century

NGR: 460012 372496

Description:

Straight dam with upstream wall built from rockfaced stone, with slab coping, and downstream grassed glacis. To the south-east is a deep rock-faced stone outlet structure set into the glacis forming the outfall from **Feature 3.2**.







Significance:

- * Medium level of historic interest in respect to its technological interest as a 19th Century dam and through its association with the scheme of landscape improvements implemented by the 5th Duke.
- * Low level of artistic interest as a vantage point for experiencing the outer designed elements of Welbeck Park against the improved agricultural land of its hinterland.

*Of **Low Intrinsic Significance**, but making a **Medium Positive Contribution** to significance of the Grade II Registered Park and Garden of Welbeck Park*



Figure 4: Landscape features at Carburton Lake Dam

Landscape Feature	Description	Contribution to Significance	Picture
<p>3.2: Sluice <i>Type: SLUICE</i> <i>Date: Late 19th Century</i> <i>NGR: 460037 372435</i></p>	<p>Sluice with dual operating stem supported on cast iron lintle. The structure of the sluice walls is of sandstone blocks. The sluice has a semi-circular leaf litter grill with cast iron cover.</p>	H	
<p>3.3: Sluice <i>Type: SLUICE</i> <i>Date: Late 19th Century</i> <i>NGR: 459975 372520</i></p>	<p>Sluice structure with single threaded stem, cast iron frame and replaced oak lintel. Large semi circular litter grill with iron walkway and removable steel grills.</p>	H	
<p>3.4: Pipeline <i>Type: PIPE</i> <i>Date: Late 19th Century</i> <i>NGR: 459972 372525</i></p>	<p>Exposed pipe bridging Top Dyke, supported on brick pier.</p>	N	
<p>3.5: Bridge <i>Type: BRIDGE</i> <i>Date: Mid 19th Century</i> <i>NGR: 459973 372535</i></p>	<p>Bridge over Top Dyke. Rock faced parapet with slightly pitched coping, and ashlar voussoir. Deck is grassed over. Eastern parapet has collapsed. Water level to just below soffit.</p>	H	

6 IMPACT ASSESSMENT

PROPOSED DEVELOPMENT – DESCRIPTION

Great Lake

The works involve the removal of the existing concrete culverts through the dam, with minor excavation required, and the installation of new, larger pre-cast concrete culverts to provide additional spillway capacity, over a length of around 35m. On the adjacent (southern) 'Poulter Dam' there will be minor earthworks required to regularise the crest level of the dam, addressing minor undulations to make the dam crest even and level. These dams are believed to date from around 1840 to 1880.

Inert sandy clay fill, to be excavated from Carburton Dam is to be transported to Great Lake dam to raise the full length of the crest by approximately 50cm on average. The new (raised) crest road will be reinstated in a concrete material to provide a more robust surface for agricultural vehicles and machinery, noting that the dam currently forms a major route through the estate for farming.

Carburton Forge Lake

The works are of a minor nature, to reduce the level of coping stones on an overflow structure, re-using the existing stones, and to install a marker kerb along the existing crest to define a fixed level.

Carburton Lake

The works involve the lowering of a length of approx. 75m of the dam by 30 to 40cms, and regrading the downstream (eastern) slope. A tied concrete block system is to be used to provide protection to the dam during incidences of high rainfall, and this will be covered in topsoil to allow grass growth and reduce the impact of this new surface. Although the resulting visual impact is expected to be minimal, mitigation screening planting is proposed to further reduce the effect.

The improvement works comprise concrete for constructing low walls at either end of the dam and for anchoring the Grasscrete system.

PROPOSED DEVELOPMENT – POTENTIAL IMPACTS

The proposal comprises modifications to the three dams within the site to bring them in line with new regulations controlling reservoirs. The proposed alterations comprise:

1. Great Lake Dam:
 - a. Raising of the crest across the dam with new track;
 - b. Removal of existing sluices to cascade and creation of a new weir;
 - c. New culvert and modification of upper level of cascade;
 - d. New cascade side walls; and
 - e. Repair or like-for-like replacement of gates and railings.
2. Carburton Forge Lake Dam:
 - a. New crest stone across dam; and
 - b. Lowering of walls of auxiliary spillway.
3. Carburton Lake Dam:
 - a. Crest regraded with addition of new crest stone across dam;
 - b. Regrade glacis to construct new grassed over spillway with new concrete beam and raised bund to toe of glacis; and
 - c. New walls to either side of the spillway.
4. Formation of a construction compound to the south of the Great Lake.

IMPACT ASSESSMENT

An assessment of the effect of the proposed works has been undertaken, considering the contribution made by the affected element to the significance of the building, archaeology, or the setting of other heritage assets, and the nature of any effect (both negative and positive) to that contribution. The definitions for the scale of effect adopted is set out in **Table 1**. For ease of reference the impacts has been tabulated (**Tables 2-3**), with reference numbers linking to the list of proposed works above.

Table 1: Levels of effect referred to in the impact assessment

Effect of Proposal		
Very Positive	Proposals will greatly reveal or enhance the contribution the effected element makes to the significance of the heritage asset, and/or substantially contribute towards the conservation of the asset.	++
Positive	Proposals will better reveal or enhance the contribution the effected element makes to the significance of the heritage asset and/or contribute towards the conservation the asset.	+
Neutral	Proposals will preserve the contribution the effected element makes to the significance of the heritage asset.	o
Negative	Proposals will result in the partial loss of the positive contribution the effected element makes to the significance of the heritage asset and/or will have a detrimental effect on the conservation of the asset.	-
Very Negative	Proposals will result in the total loss of the positive contribution the effected element makes to the significance of the heritage asset and/or will have a significant detrimental effect on the conservation of the asset.	--
Uncertain	Effect uncertain: more information required.	?

Table 2: Assessment of permanent impact of proposed works on heritage significance

Ref.	Description	Intrinsic Significance of Heritage Asset	Contribution of Effected Element	Effect of proposal	Heritage Impact Assessment
Great Lake Dam					
1a	Raising of the crest across the dam with new track;	3	H	-	The raising of the crest will change the historic profile of the dam, whilst the proposed concrete slab track will introduce a hard landscape feature where the road is currently unsurfaced. These proposals are required to provide the required height of the dam and a level crest height to ensure even distribution of forces in an overtopping event. The artistic interest of the dam draws value from the rural character of the track, the loss of which will reduce the contribution of this element to the significance of the dam and wider historic landscape. Whilst the historical interest of the dam derives value from the profile of the dam in relation to its technological interest, it is considered that the changes are sufficiently small that the change in overall profile will not be readily appreciable.
1b	Removal of existing sluices to cascade and creation of a new weir	3	M	--	The proposal will remove the sluices and introduce a new weir structure. The weir is to be brick built with stone crest. The breakwaters of the existing sluices have been altered in concrete but appear to retain 19 th Century sluice gate mechanisms.

					<p>These proposals are required to provide the required flow through the dam, and the necessary structural strength and resilience.</p> <p>The total loss of these elements will reduce the historical interest of the dam in respect to the integrity of its original fabric and the legibility of its design and operation.</p>
lc	New culvert and modification of upper level of cascade	3	H	-	<p>The existing culvert beneath the road will be replaced with precast box culvert sections with bullnose stone or brick piers constructed facing up and down stream between sections, and the upper level of the cascade will be replaced with a concrete spillway.</p> <p>This proposal provides the required flow through the dam, and the necessary structural strength and resilience.</p> <p>The loss of this part of the cascade will reduce the contribution the cascade makes to the architectural and artistic interest of the dam and wider historic landscape through changing the visual aesthetic of how the water exits the dam (from obscured culverts to open culverts) and through introducing a level approach to the cascade in place of its present uneven decent.</p>
ld	New cascade side walls	3	H	-	<p>New walls are to be built to either side of the cascade reusing material recovered from alterations to the cascade and supplemented where necessary with imported matching material.</p> <p>This proposal supports the required flow dynamics through the dam.</p> <p>The addition of side walls to the cascade will alter the visual aesthetic of the feature and will reduce the legibility of the original design and the contribution this makes to the significance of the dam and wider historic landscape.</p>
le	Repair where feasible or like-for-like replacement of gates and railings	3	M	o	<p>The existing estate railings on the western side of the track along the dam crest will be repaired or replaced like-for-like.</p> <p>This proposal is required due to the regrading of the dam crest.</p> <p>The existing gates and fence are believed to be secondary additions but possess artistic interest in relation to the design of the gates and historic interest in relation to their contributing to the landscape character of the area.</p> <p>The fence and gates are in variable states of decay, with evidence of failed repairs evident. The proposals to repair where feasible will preserve what fabric can be preserved, whilst the proposed like-for-like replacements, where suitable matches can be confirmed, will preserve the overall contribution of these features to the significance of the dam and historic landscape.</p>

Carburton Forge Lake Dam					
2a	New crest stone across dam	3	H	o	A new low crest is proposed along the western side of the track across the dam. These proposals are required to provide the required height of the dam and a level crest height to ensure even distribution of forces in an overtopping event. The scale of the intervention will be minor and will not affect an appreciable reduction in the historic, artistic or architectural interest of the dam or its contribution to the wider historic landscape.
2b	Lowering of walls of auxiliary spillway	3	H	o	The walls of the auxiliary spillway are to be reduced by 300mm, replacing the existing stone coping. This proposal is required to match the planned reservoir level and achieve the necessary level of flow through the dam. The scale of the intervention will be minor and will not affect an appreciable reduction in the historic, artistic or architectural interest of the dam or its contribution to the wider historic landscape.
Carburton Lake Dam					
3a	Crest regraded with addition of new crest stone across dam	4	H	o	A new low crest is proposed along the eastern side of the track across the dam. These proposals are required to provide the required height of the dam and a level crest height to ensure even distribution of forces in an overtopping event. The scale of the intervention will be minor and will not affect an appreciable reduction in the historic, artistic or architectural interest of the dam or its contribution to the wider historic landscape.
3b	Regrade glacis to construct new grassed over spillway, with new concrete beam and raised bund to toe of glacis	4	H	o	The downstream side of the dam will be regraded to create a spillway chute to guide water over in an overtopping incident. Whilst scale of the intervention is relatively large, the spillway will be grassed over such that it will not be appreciably different within views towards it.
3c	New walls to either side of the spillway	4	H	+	New stone-faced concrete walls will extend from either side of the dam, tying into the kerb of the road to the south and the parapet of the bridge across the Top Dyke to the north. Whilst this proposal will introduce new structures alongside the dam, they will not be tall and are situated to either side where they will be screened by vegetation. The proposal will require the rebuilding of the collapsed parapet of the Top Dyke bridge which has collapsed, restoring its original plan form and contributing towards its conservation.
Archaeology					
4	Formation of a construction compound to the south of the Great Lake dam.	4	?	o	The proposed construction compound is to be constructed to the south of the Great Lake dam within an adjoining field. No known archaeological resources are associated with this area, which is shown on historic maps to have comprised of agricultural land since the

					<p>17th Century.</p> <p>Given the length of time under arable use, and the likely low degree of impact from the construction of the compound (topsoil stripping and formation of gravel surface), there is not considered to be a risk of impacting potential archaeological remains.</p>
Welbeck Park					
	Proposed changes to the dams of Great Lake, Carburton Forge Lake, and Carburton Lake	2	M	-	<p>The proposed scheme will result in impacts to the historic integrity and design of the dams, including minor changes to their profile through the reshaping of crest heights and alterations to the aesthetics of the cascade on the Great Lake dam.</p> <p>The scale of the proposals are not such that they will result in an appreciable change to the landscape character, comprising comparatively localised impacts that will largely only be appreciable on a smaller scale. The relative sensitivity of these sites is also reduced in representing 19th Century additions to the park, rather than elements of the key 18th Century parkland design, their relative remoteness from the house, and the more limited scope of views overlooking the assets from a proximity where the changes would be noticeable.</p> <p>Overall, therefore, it is considered that whilst the scheme will impact the overall integrity of the parkland through impacts to elements that positively contribute towards its significance, the scale of the impact will be minor.</p>

7 DISCUSSION

SUMMARY OF SIGNIFICANCE

The site encompasses three dams primarily associated with a scheme of landscaping within the Welbeck Estate attributed to the 5th Duke of Portland.

Great Lake dam dates to the mid to late 19th Century (between 1850 and 1880), representing an expansion of an earlier 18th Century lake over the site of former water meadows. The dam retains the majority of its 19th Century fabric and water management structures although all have been affected to varying degrees by piecemeal repairs and alterations during the 20th Century. The dam as a whole is considered to be of **regional significance**, deriving from its historical, architectural and artistic interest, and to make a **positive contribution to the significance of the Welbeck Abbey Park grade II registered park and garden**.

Carburton Forge Lake dam dates to the late 19th Century, built on the site of an earlier string of reservoirs of early post-medieval date and the site of a 17th century iron forge. The dam retains the majority of its 19th Century fabric and water management structures although all have been affected to varying degrees by piecemeal repairs and alterations during the 20th Century. Earthwork remains and potential buried archaeological remains relating to the former forge survive within woodland immediately north of the dam. The dam as a whole is considered to be of **regional significance**, deriving from its historical, archaeological, architectural and artistic interest, and to make a **positive contribution to the significance of the Welbeck Abbey Park grade II registered park and garden**.

Carburton Lake dam is believed to date to the early 19th Century and is likely associated with the formation of water meadows to its east. The dam retains 19th Century fabric and water management structures, although again all have been affected by piecemeal repairs and alterations during the 20th Century. The dam as a whole is considered to be of **local significance**, deriving from its historical, architectural and artistic interest, and to make a **positive contribution to the significance of the Welbeck Abbey Park grade II registered park and garden**.

SUMMARY OF IMPACTS AND ENHANCEMENTS

The proposed scheme will impact the historical, architectural and artistic interest of Great Lake dam such that its heritage significance, and contribution to the significance of the designated Welbeck Abbey Park, will be reduced. The principal harm arising from the works to the cascade structure to improve its operation, robustness and flow capacity which are essential to the success of the scheme. The impact has been reduced by design, including considered detailing of piers and side walls in

appropriate material; and the conservation of remaining structures. The impact to the legibility and integrity of design of the overall feature is also considered to be less than would arise were a new sluice to be constructed to provide the required outfall.

The proposed scheme will not impact the heritage significance of Carburton Forge Lake dam. The character of this dam is more functional than that at the Great Lake, and has a greater capacity to support change without affecting its heritage interests. In addition, the proposed works are relatively minor and will not affect the overall technological or artistic interest of the structure or its contribution to the significance of the designated Welbeck Abbey Park.

The proposed scheme will have a minor positive impact to the significance of Carburton Lake dam. Whilst the structural changes to the dam are considerable, the sensitivity of the dam to the proposed alterations of crest height and creation of spillway chute is lowered by its functional form which has the capacity to support these changes without impacting its heritage interests or its contribution to the significance of the designated Welbeck Abbey Park. The minor positive impact arises from the proposed rebuilding of the collapsed parapet of the 19th Century bridge over Top Dyke, a positive heritage asset within the context of the dam and the wider park.

CONCLUSION

The proposed scheme of improvements to the dams at the site are considered to result in an overall impact to the significance of the historic environment, principally deriving from structural changes to the cascade at Great Lake dam. This impact is considered to amount to less than substantial harm and will necessarily be given special weight by the local planning authority when determining the proposals against the benefits of the scheme. Any such balancing exercise should include consideration of a significant benefit to local communities and the ongoing conservation and preservation of the Welbeck Abbey Park registered park and garden from the added resilience of the dams during flood episodes.

8 SUPPORTING INFORMATION

AUTHORSHIP

This report was prepared by James Thomson MCIFA. Quality assurance was provided by Oliver Jessop MCIFA.

ACKNOWLEDGEMENTS

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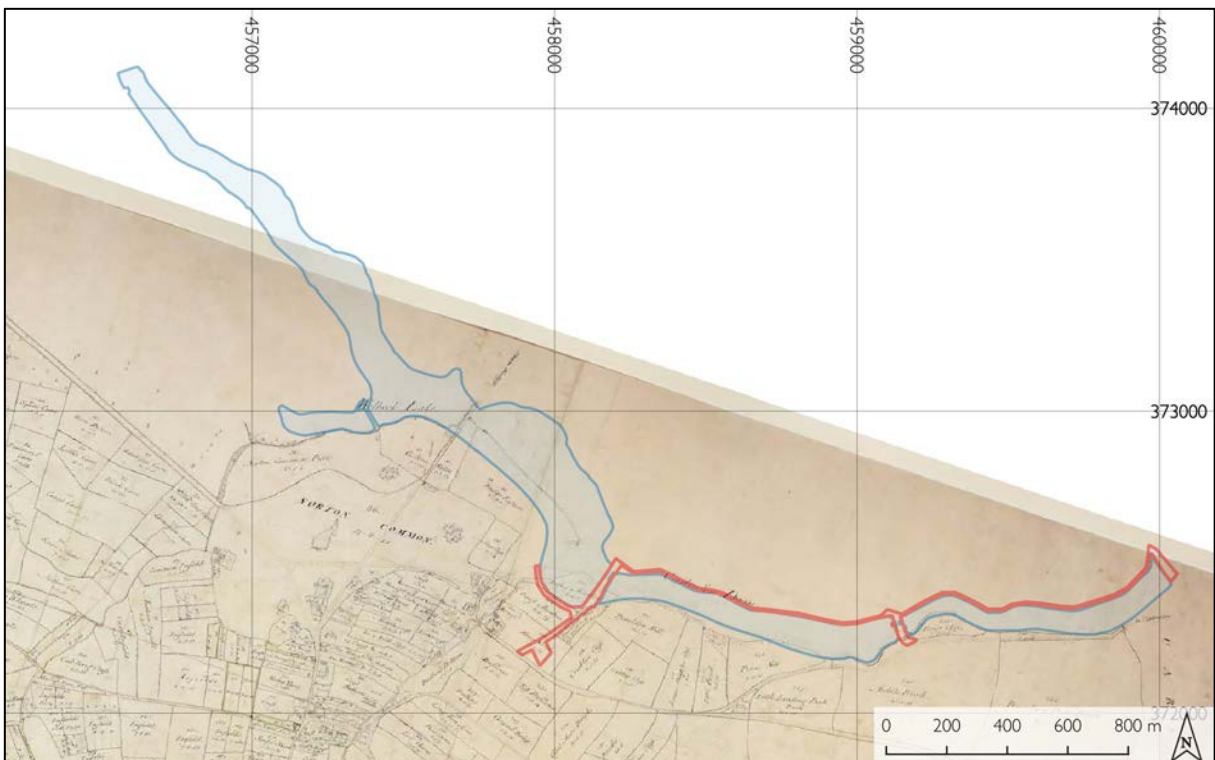
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APPENDIX I:

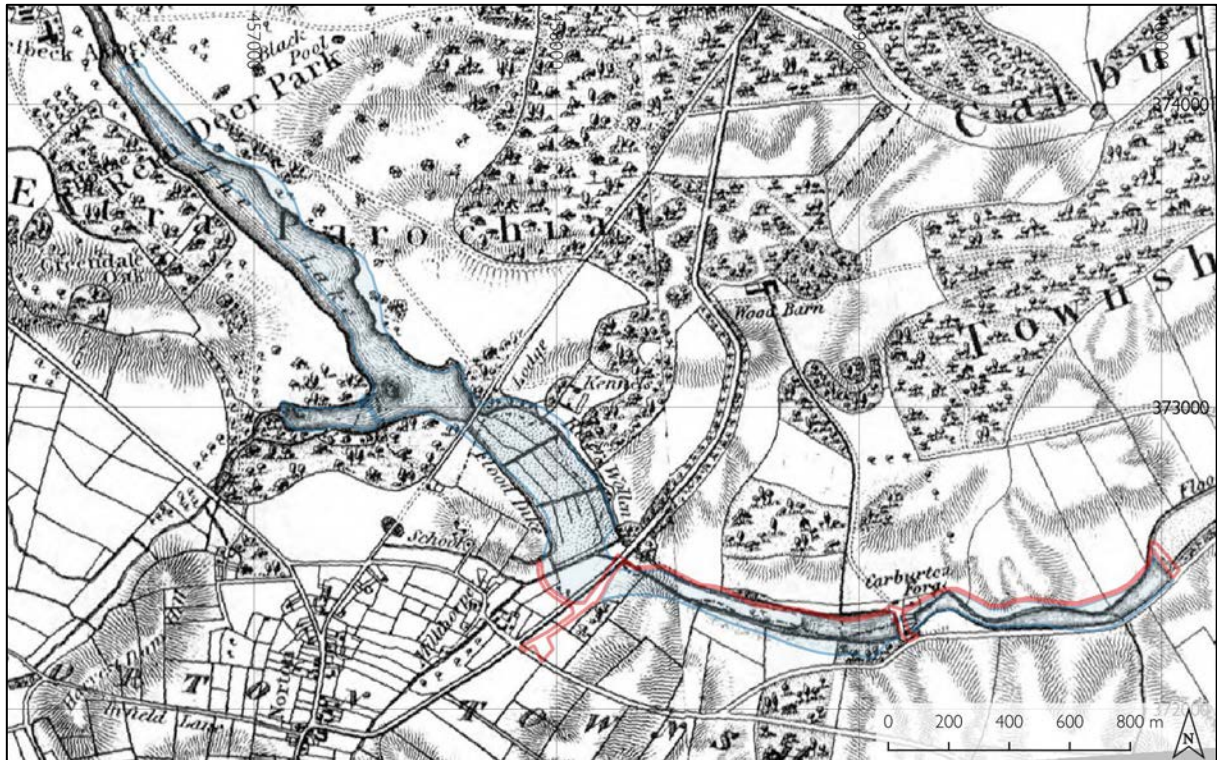
HISTORIC MAPPING



Appendix I.1: 1629 William Senior's map of Welbeck Estate showing existing lakes and site boundary
© Welbeck Estate Archive



Appendix I.2: 1766 map of Norton with additions by Henry Repton in 1797 showing existing lakes and site boundary
© Welbeck Estate Archive



Appendix I.3: 1835 George Sanderson's map of Twenty Miles around Mansfield showing existing lakes and site boundary

APPENDIX 2:

NATIONAL HERITAGE LIST FOR ENGLAND DESIGNATION DESCRIPTION

WELBECK ABBEY

OVERVIEW

Heritage Category: Park and Garden

Grade: II

List Entry Number: 1000556

Date first listed: 01-Jan-1986

LOCATION

County: Derbyshire and Nottinghamshire

District: Bassetlaw and Bolsover

Parish: Elmton, Whitwell, Carburton, Holbeck, and Norton

National Grid Reference: SK 56610 74062

DETAILS

A late C18 landscape park by Francis Richardson and Humphry Repton which has its origin as the grounds of a Premonstratensian abbey. The Abbey, now a country house, is surrounded by mid C19 gardens, the late C19 and early C20 gardens of Alfred Parsons and Walter Partridge, and the C20 gardens which succeeded the early C17 and then late C17 garden.

Historic Development

Welbeck Abbey, a Premonstratensian foundation, was established in 1153-4 by Thomas de Cuckney. After its Dissolution in 1540 it was acquired by Gilbert Talbot, seventh Earl of Shrewsbury who in 1597 leased it to his brother-in-law Sir Charles Cavendish, son of Bess of Hardwick. Sir Charles purchased the Abbey in 1607 and Robert Smythson produced a plan for rebuilding for him. Sir Charles' son, Sir William Cavendish (d 1677) was created first Duke of Newcastle in 1665. He called in John Smythson to build a riding school and stables. The dukedom became extinct on Sir William's death. John Holles, Earl of Clare who married Sir William's daughter, Lady Margaret Cavendish, was created Duke of Newcastle of the second creation in 1694. Designs by William Talman (1650-1719) and Sir John Vanbrugh (1664-1726) were discussed in 1703 but nothing was built. The Duke's only child, Lady Henrietta Cavendish-Holles (1694-1755) married Edward Harley, second Earl of Oxford, and when she inherited Welbeck further building work commenced. Lady Oxford called in Francis Richardson who produced two plans. Lady Margaret Cavendish-Holles-Harley inherited Welbeck on the death of her father, Lord Oxford, in 1741, later marrying William,

second Duke of Portland (d 1762). Building work was carried out in the early 1760s and late 1770s by John Carr of York (1723-1807), including a chapel in 1763. Humphry Repton (1752-1818) produced Red Books in 1790, 1793, and 1803 for the third Duke, William Henry Cavendish Bentinck (1738-1809) outlining his proposals for alterations to the landscape. He recommended emphasising the piano nobile of the Abbey by raising a sloping bank in front of the basement, laying out the pleasure grounds, deepening and extending the lakes, and building new bridges. His second Red Book dealt with the situation of the Abbey and his third Red Book suggested building a new house on a hill to the north of the Abbey. In 1810, Bulstrode Park (qv), home of the dukes of Portland was sold and Welbeck Abbey became their main residence. Alfred Parsons and Walter Partridge worked on the gardens from 1899 to 1905. Since 1952 part of the site has been leased to Welbeck College; Welbeck Abbey remains (1999) in private ownership.

Description

LOCATION, AREA, BOUNDARIES, LANDFORM, SETTING Welbeck Abbey is situated 7km south-west of Worksop and 3.5km east of the village of Creswell. The site covers c 1140ha. The western boundary largely follows the A60 while the northern boundary partly follows the line of Millwood Brook then continues east through woodland, south of Manor Hills. The eastern boundary crosses woodland, running first south then south-east to the east end of Carburton Dam Lake. The southern boundary runs west along an unclassified road, parallel for part of the way to Carburton Dam Lake and Carburton Forge Lake, to Tile Kiln Wood in the south-west corner of the site. The setting is arable and woodland in an undulating landscape.

ENTRANCES AND APPROACHES The main entrance is at Main Gates Lodge, off the A60 at the south-west corner of the site, 1.7km from the Abbey. The drive, known as Winnings Road because of a row of almshouses known as the Winnings (listed grade II), extends north-east, then north to Welbeck estate village. A further entrance is located 220m north of the main entrance, from where another drive curves north-east for 550m, terminating at a lodge immediately south of the walled kitchen garden. The entrance to the kitchen garden, now (1999) a garden centre, and the Gasworks, now (1999) the Harley Gallery, is 750m north of the main entrance, some 1.65km from the Abbey. Sharing this entrance and running to the north of the Gallery is the entrance to Welbeck College and to the offices housed to the rear of the Gallery. This drive continues north of the walled garden then bifurcates, with the northern path continuing past the north of the stables and then north-east to West Park. The southern path leads to the estate village. Some 2km north from the main entrance and c 2km from the Abbey at Gunabrig Lodge, a road runs south-east past Fishpond Lodge to join the drive from Creswell Crags then continues past Oaksetts Lodge to the stables. Park Lodge

lies on the southern boundary of the site, c 1.6km from the Abbey. From this lodge a drive runs north for 300m then north-west for a further 1km before curving north again for 350m and entering the pleasure grounds. The path continues for 150m to Grotto Lodge and then runs north-east for 550m to arrive at the gates (mid C19, listed grade II) standing 150m west of the Abbey. Another drive enters the site 500m north-west of the village of Norton and 1.85km south-east of the Abbey, by Bunker's Hill Lodge (c 1860, listed grade II), built of ashlar with a decorative tiled roof. The drive goes north for 850m then curves north-west for c 1km before turning north to arrive at the west entrance of the Abbey.

Around the boundaries are a number of other lodges, all of which date from c 1860 and are listed grade II. A network of paths crosses the site both east to west and north to south.

PRINCIPAL BUILDING Welbeck Abbey (listed grade I), a stone-built L-shaped building, stands in the centre of the site, west of Shrubbery Lake. The entrance front to the west is of two storeys, with three-storey towers at each end and a central four-storey pedimented entrance with a Baroque-style porte-cochere. The three-storey Oxford wing stands to the south. Chapel Court, an extension of the entrance front, curves north-west to the rectangular chapel and library wing. The west front overlooking Shrubbery Lake is one of the garden fronts, the other being the south front of the Oxford wing.

Robert Smythson (1535-1614) produced a plan for rebuilding the Abbey for Sir Charles Cavendish but only a small part of these proposals were carried out. The south wing was reconstructed and the west wing remodelled by John James (c 1672-1746) for Lady Oxford in the period 1741-52 after a survey in 1741. Alterations to the east front were made in 1764-5 by John Carr of York. The west front was remodelled by Humphry Repton in 1790 emphasising the piano nobile of the house by hiding the basement with a sloping bank. In the 1860s the fifth Duke rebuilt the south wing, and built a series of underground rooms and a glass-roofed conservatory connected by tunnels. After a fire c 1900 the south wing of the Abbey was remodelled by Sir Ernest George (1839-1922).

The Stables (listed grade I), which stand 950m west of the Abbey, are built around a square courtyard with entrances to the north and south. They are now (1999) College offices. Earlier stables, demolished in the 1860s, had been built in 1625 by John Smythson. The Riding School, 800m west of the Abbey, was built by John Smythson (d 1634) in 1622 for Sir William Cavendish. It were remodelled into a chapel and a library for the sixth Duke in the 1890s to designs by John Dando Sedding (1838-91) who died before the work was begun. To the south-east of the Riding School is the mid C19 estate village, converted to school buildings in the mid to late C20.

Set within Roomwood Plantation, north of Welbeck Park and some 1.2km north-east of the Abbey, is Welbeck Woodhouse (listed grade II), built in 1930-1 for the Marquis of Tichfield to designs by Walter Brierley (1862-1926) and Mr Rutherford. This site is almost identical to that chosen by Repton for his proposal for a new house at Welbeck in 1803 (CL 1933).

GARDENS AND PLEASURE GROUNDS The gardens are situated on the south and east fronts of Welbeck Abbey, with further west the Sunken Garden and a fountain garden to the north. From the forecourt at the west entrance the south front garden is approached down steps at the side of the Oxford wing, with pairs of urns at top and bottom, leading to a terrace. From the steps, a path joins the main terrace path which runs east and west. The western part of the path has a wall as its northern boundary for 90m, then curves south and south-west to join the south drive. East of the steps the path runs parallel to the south front of the Abbey and continues to join the lake-side path beside Shrubbery Lake. Off this path, aligned with the central canted bay of the south front, a path leads south to ornamental gates set in a low balustraded wall, the southern boundary of the lower terrace, which overlooks the cricket ground. The path widens midway along and is edged with yews set around a large copper, marble, and ashlar fountain decorated with cherubs, garlands, and mythical heads, set in a circular basin (listed grade II with the walls); between the paths is a lawn. Some 40m east of the fountain path a path leads north to steps to an upper terrace of the east front garden. To the south-west of the Abbey is a summerhouse.

South-east of the east front, with the steps to the upper terrace of the east front garden forming its western boundary, is a small ornamental vegetable garden surrounded on three sides by a small hedge. The vegetable garden is grassed between the beds with a well in the centre. North of this garden are the upper terraces on the east front which overlook Shrubbery Lake. They are entered by steps from the south front terrace or from steps set in the balustraded eastern wall. The east garden is on two levels with central steps leading from the upper terrace to the lower terrace, now (1999) a rose garden. On the northern edge of the terraces stand two summerhouses (listed grade II), the one on the upper terrace having a curved colonnade. The one on the lower terrace is semicircular with a gabled copper roof supported on ashlar piers. A fountain, aligned with the centre of the east front and the central steps, is set in the centre of the lower terrace.

The Sunken Garden (late C19 and C20, listed grade II), 230m west of the Abbey, was created by the sixth Duke from the excavations for the fifth Duke's enormous Bachelor's Hall. The mid C19 Glass Court abuts its northern edge, with gated entrances down steps into the Garden from the north-east and south-east corners and in the south a sloped stone pathway. To the north, abutting Glass Court, is a large pedimented summerhouse with stone pillars to the front and wooden

pilasters to the rear. In the centre of the Garden is a tennis court flanked on the north by an ornamental pool and on the south by a swimming pool, converted from the southern ornamental pool. Around the outer edge of the pool and tennis court are brick pergolas. Against the south wall is a small temple with a roof supported by four herms with, on the back wall, a pedimented ornament dated 1641, and an inscription celebrating the peace of 1919 at the end of the First World War. In the middle of the east side of the Garden is a statue and in the middle of the west side is an ornamental well. The Sunken Garden was part of a design commissioned in 1899 from Alfred Parsons (1884-1914) and Captain Walter Croker Saint-Ives Partridge (1855-1924) (Milette 1995). The fountain garden, 160m north of the Abbey, was also included in this design and was a rectangular garden with a central fountain; it is now (1999) an assault course. West of this, set among ornamental trees, mainly cedar, is another assault course. A grotto with a rusticated entrance (listed grade II) is situated 30m north of the Abbey.

William Senior's survey of Welbeck Abbey and its surroundings, made by 1629, showed elaborate water gardens to the south and east of the house. Arcades lay at either end of a long canal to the east and another canal flowed to the south under two taller buildings or pavilions, approached by steps. John Smythson's design for one of the pavilions survives (Girouard 1983). The gardens are no longer extant. Francis Richardson made a survey for Lady Oxford in 1748 of the park and gardens at Welbeck. This shows formal gardens with two terraces on the south front, a water garden of seven interconnected rectangular pools to the east and, at the north end of the water garden, a walled orchard. The terraced gardens are illustrated in a watercolour of c 1730 (Harley Gallery). Also in 1748, Richardson produced a plan which swept away the formal gardens. Repton laid out a pleasure garden in the 1790s (Stroud 1962). From 1899 to 1905 Parsons and Partridge worked at Welbeck, their design including the south and east terraces, the Sunken Garden, the walk beside Shrubbery Lake, and the fountain garden (Milette 1995).

PARK Parkland surrounds the gardens and pleasure grounds of Welbeck Abbey to the north and south with Shrubbery Lake dividing them from the park to the east. The lakes, known as Gouldsmeadow Lake, Shrubbery Lake, Great Lake, Carburton Forge Dam, and Carburton Dam divide the site on a north-west to south-east axis running from the tip of Gouldsmeadow Lake c 1.1km north-west of the Abbey to Carburton Dam at the south-east corner of the site, 4km south-east of the Abbey. Between each lake are bridges carrying paths into the parkland. The bridge (listed grade II) between Shrubbery Lake and Great Lake has a late C19 gateway with iron gates and screens. The parkland north-west of the Abbey is known as West Park which is bounded on the north-west by boundary plantations. The paths which cross this part of the park are partly underground, forming part of the complex of tunnels which runs throughout the site. Several lodges

are set within this part of the park: West Park Lodge, 1.1km north-west of the Abbey; Gouldsmeadow Lodge, 1.15km north-west of the Abbey; Millwood Lodge (c 1860, listed grade II), 1.7km north-west of the Abbey; and Oaksetts Lodge, 1.1km west of the Abbey. To the east of Gouldsmeadow Lake is White Deer Park, now (1999) arable. This park is crossed by a tunnel 890m long which ends at Tunnel End Lodges standing 1.2km north-east of the Abbey within ornamental trees. In the south-west corner of White Deer Park, on the eastern shore of Shrubbery Lake is a wooden boathouse (listed grade II). South-east of White Deer Park is Welbeck Park which is broken up with plantations and is now mainly arable. The parkland to the west of the lakes is also now (1999) arable.

Richardson's plan of 1748 shows a lake where Gouldsmeadow Lake is now. Mrs Delaney (1700-88), a good friend of the Duchess of Portland, wrote in 1756 that 'they are floating a valley' (Thacker 1994). Repton recommended the building of new bridges and deepening the lake (Stroud 1962) and his Red Book of 1793 shows a scheme for draining the lake to provide a new approach (CL 1933).

KITCHEN GARDEN The 10ha kitchen garden complex is located 1.1km west of the Abbey. The west of the area is now (late C20) a garden centre and car park. The greenhouses (Messenger & Co, early C20) set in the western end of the north wall are still extant. The eastern gardens, bounded to the east by the east garden wall, are now paddocks. To the north-west of the garden is the early 1990s Harley Gallery, the entrance to which is through gates off the car park. The Gallery is built on the site of the Gasworks built by the fifth Duke to light his tunnels. Within the courtyard of the Gallery is a fountain (1990s) set within a pond with stepped sides fed by two concrete water features set at each end of the south side of the courtyard.

OTHER LAND West of the main site, c 3km west of the Abbey and covering c 24ha are Creswell Crags (scheduled ancient monument). The Crags comprise a wide gorge with rugged limestone cliffs containing caves on either side. In the centre is a lake, the area to the west being very silted up (1999). The lake was used for wildfowl shooting from the early C18 and the Crags were used as source of building stone. Excavations in the late C19 revealed relics of the Palaeolithic era as well as evidence of cave dwellings of 20,000 BC and others from the C5 and C6 AD (Player 1997).

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