

GUILDFORD
BOROUGH COUNCIL



Chilworth Gunpowder Mills



CONSERVATION
MANAGEMENT PLAN

VOLUME 2

NOVEMBER 2011



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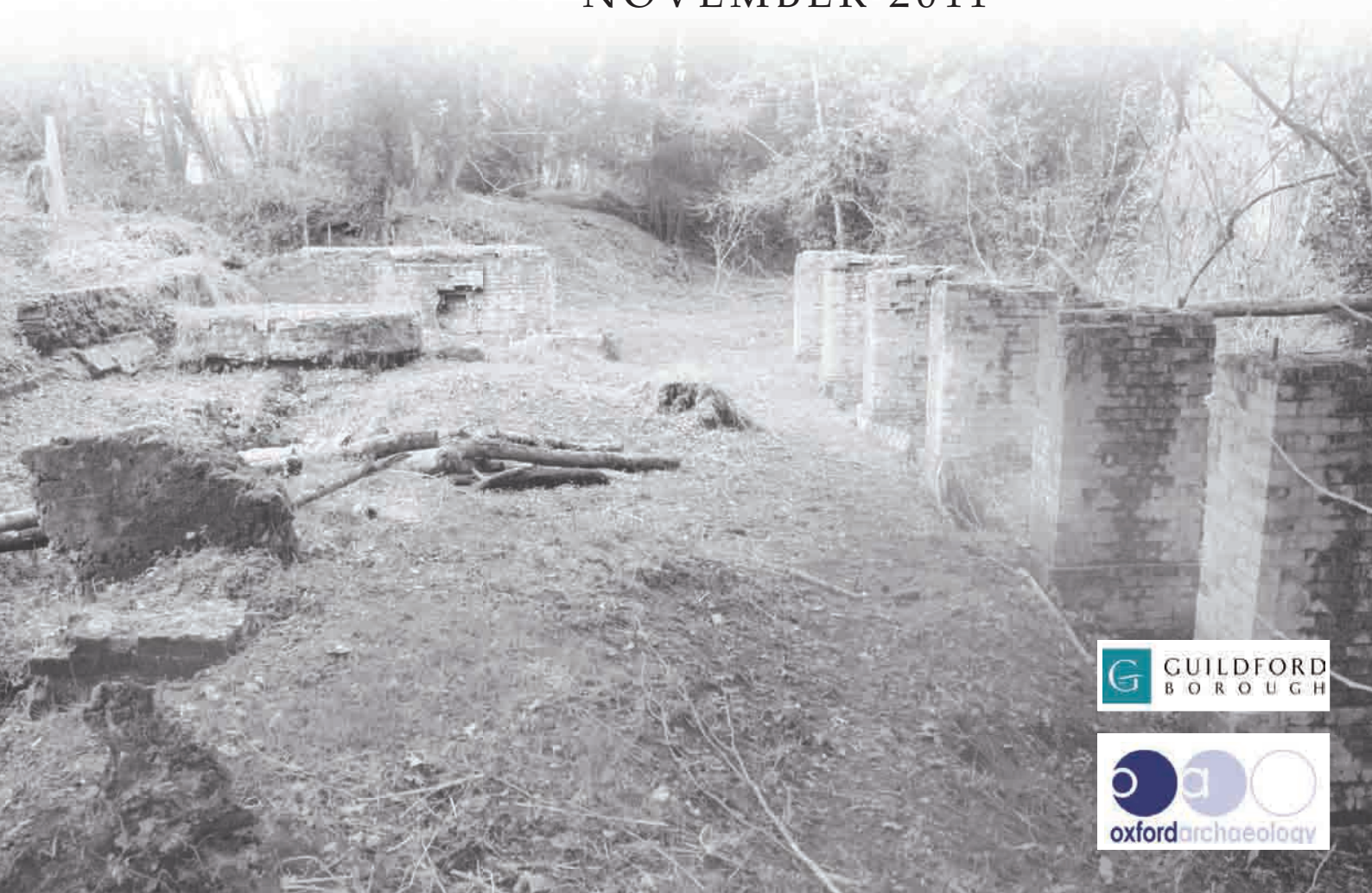




Plate 1: Reused millstones to rear of 1860s incorporating mill



Plate 2: Expense magazine

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CHILWORTH
GUNPOWDER MILLS

CONSERVATION
MANAGEMENT PLAN

INTRODUCTION
AND BACKGROUND

1 INTRODUCTION AND BACKGROUND

1.1 The site

- 1.1.1 The Gunpowder Mills at Chilworth in Surrey is a Scheduled Monument and a site of national importance in the history of gunpowder manufacture. Its significance lies partly in its longevity, it having been used to produce powder for almost 300 years prior to its closure at the end of the First World War, as well as its size and scale of operations. Unlike the Royal Gunpowder Mills at Waltham Abbey it remained a private works, although there were periods in its early history when it was the sole supplier of gunpowder to the King, and the changes in its ownership closely reflect developments in the wider gunpowder industry and society generally. It was of considerable importance in the Civil War, when it supplied powder to the Parliamentarians (very shortly after having supplied the King) as well as numerous wars with continental powers in the 17th and 18th century when the site's fortunes fluctuated with demand for powder. It is also of interest for its international links, both in its original establishment by the East India Company to supply powder for its overseas operations, and towards the end of its manufacturing history when the site was purchased and greatly expanded by an Anglo-German company.
- 1.1.2 Each of these elements to its history provide it with a multi-layered interest which can be used to interpret and communicate important elements of British history in the post-medieval period.
- 1.1.3 Although the large majority of the buildings on the site were demolished in several phases during the 20th century the site retains the substantial remains from numerous structures, as well as a small number of intact buildings, which can provide a clear story of each stage in the gunpowder manufacturing process. This potential to communicate is significantly hindered however by a lack of interpretation, which is crucial to understanding the fragmentary remains, as well as by the extensive vegetation which has spread across the site in recent decades and which now obscures many important features.
- 1.1.4 Appreciation of the significance of the site has gradually increased in the last 25 years, largely through the efforts of various local individuals (particularly Glenys and Alan Crocker) whose research has led to the publication of a considerable number of articles and books. This was followed by a major survey of the site by English Heritage in 2001-3, led by Wayne Cocroft author of *Dangerous Energy* the key publication on the national remains of the gunpowder industry.
- 1.1.5 The English Heritage report recommended that a Conservation Management Plan be undertaken for the site but since the survey was undertaken very little conservation or repair works have been commissioned. Some limited consolidation works were undertaken by Guildford Borough Council shortly before the English Heritage survey and repairs have been undertaken to the entrance gates but the main site works in the last decade have been led by the Chilworth Gunpowder Mills Group and have comprised vegetation clearance and small scale archaeological digs. The CGMG is led in a voluntary capacity by Andrew Norris who is both an Historic Building Consultant and a local resident.

1.2 Context and purpose

- 1.2.1 This Conservation Management Plan has been commissioned by Natural England and Guildford Borough Council (GBC) with funding from a Higher Level Stewardship Agreement.
- 1.2.2 The principal focus of the Plan is the part of the former gunpowder mills site which is in Borough Council ownership and therefore it only covers approximately half the footprint of the former works. However, understanding the context for the GBC land is clearly important and there are various elements such as the historical background which also cover the wider site. Consideration is given to the landscape and regional setting of the site.
- 1.2.3 The Management Plan has been commissioned to ensure that future maintenance, repair, consolidation and interpretation works are based on a clear understanding of the site, and are guided by policies and approaches appropriate to their value. Having determined the value of the resource and the factors which may put them at risk, the Plan will set out policies to help protect the place, guide the processes of future change, and propose management measures to help implement the policies. It is hoped that the Management Plan will form a step towards gaining funding for the various improvement works which are proposed here.
- 1.2.4 Guildford Borough Council recognises the national significance of the site and its obligations to preserve and protect the monument. In light of this the Council intend to undertake a programme of co-ordinated works to both consolidate or preserve the remains as well as increasing access around the site and improving interpretation. This is to be undertaken in a planned and systematic way and in accordance with recognised international best practice, hence the necessity for the overall framework of a Conservation Management Plan.

1.3 Objectives

- 1.3.1 The primary objectives of the Conservation Management Plan are:
- To enhance the understanding and awareness of the monument and its significance
 - To give guidance and prioritisation for repairs/works and conservation of the monument
 - Put in place an effective conservation and management scheme for the monument
 - Put forward any relevant recommendations in relation to an improvement in the presentation of the monument in the short, medium and long term
 - To promote the recognition and protection of the monument (at both a local and international level).

1.4 Basis and structure

- 1.4.1 This Conservation Management Plan is divided into three volumes:

- 1.4.2 *Volume 1* provides the management recommendations and outlines the proposed project
- 1.4.3 *Volume 2* contains the more detailed background to the history, understanding and significance of the site as well as a description of the Conservation issues and policies.
- 1.4.4 *Volume 3* comprises the gazetteer with separate entries for each individual element at the site. This is based on the previous English Heritage report on the site but with considerable additional detail on the vulnerabilities affecting each structure and recommendations for their conservation. Although the gazetteer concentrates heavily on the Guildford Borough Council owned land covered by this document it also includes entries for other structures or areas with a important direct relationship to the Borough Council site.

1.5 Methodology

- 1.5.1 The preparation of this Conservation Management Plan has involved a combination of site investigation, documentary research, consultation with stake holders, some limited public consultation and comparison with other similar sites. The documentary study has been based almost entirely on secondary sources and it has relied heavily on the previous research undertaken by English Heritage. The current work was intended as a continuation of the English Heritage project importance was placed on not duplicating the previous study.
- 1.5.2 Public consultation has included the distribution of a questionnaire to local people and a talk which was given to the Chilworth History Society AGM. The questionnaire was distributed at the AGM as well as in the form of a mail-shot to c.120 houses in the vicinity of the mill. Copies were also distributed to relevant individuals by Andrew Norris of the Chilworth Gunpowder Mills Group (CGMG). The questionnaire asked:
- How people use the site
 - How people value the site
 - Whether people are aware of its significance
 - Whether they have any particular link with the site
 - Whether people would like to join volunteer maintenance groups at the site
 - Whether people would support a range of enhancement works at the site.
- 1.5.3 The questionnaire was a success and c.35 were returned with valuable information on people's relationship with the site. This has been incorporated into the current work.

1.6 Consultation and acknowledgements

- 1.6.1 The Plan has been compiled in consultation with a number of key individuals and organisations whose assistance, advice and patience are gratefully acknowledged. The main steering group has consisted of:

- Adam Owen (Guildford Borough Council)
- Georgina Terry (Natural England)
- Wayne Cocroft (English Heritage, Senior Archaeological Investigator/Team Leader)
- Ann Clark (English Heritage, Historic Environment Field Advisor, Surrey and West Sussex and Natural England Historic Environment Specialist).

1.6.2 Andrew Norris from the Chilworth Gunpowder Mills Group (CGMG) has also been heavily involved in the project providing valuable advice during meetings and site visits. Chris Matcham from the Surrey Wildlife Trust has also helpfully walked over the site and advised on the particular areas of ecological interest.

1.6.3 In addition the following individuals have also been consulted and have provided useful information:

- Richard Massey (English Heritage Inspector of Scheduled Monuments)
- Tony Howe and Gary Jackson (Surrey County Council)
- Brian Harvey (Waltham Abbey Royal Gunpowder Mills)
- Mrs Parker (Lockner Farm, Chilworth)

1.6.4 We are also indebted to Shiela Smith from Swale Borough Council for meeting at the Oare Gunpowder Works, Faversham to discuss the similar development at that site and John Breeze for opening the Chart Mill (normally closed as it was out of season) also at Faversham. Arthur Percival from the Faversham Society also provided useful information on a number of restoration works in which he has undertaken a leading role.

CHILWORTH
GUNPOWDER MILLS

CONSERVATION
MANAGEMENT PLAN

UNDERSTANDING
THE SITE

2 UNDERSTANDING THE SITE

2.1 Introduction

2.1.1 The Understanding of Chilworth Gunpowder Mills, as well as the assessments of significance and the identification of issues have been based on consultation with those acknowledged above (§1.3) and on the published and unpublished material listed in the Bibliography and Sources (Appendix 1).

2.1.2 *Sources and previous research*

2.1.3 The site has been subject to considerable previous historical research including two articles published in Surrey History by DW Warner in 1975 and 1976. This has been followed by numerous articles, books and other publications by Glenys and Alan Crocker, the earliest of which were *Chilworth Gunpowder* (1984) and *A Guide to Chilworth Gunpowder Mills* (1985). *Damnable Inventions* (2000) by Glenys and Alan Crocker is another key work on the site and further considerable research, particularly on the works' early history has been undertaken by Keith Fairclough.

2.1.4 Other than the work of individual researchers and the Chilworth Gunpowder Mills Group the site has also benefited greatly from a large scale survey undertaken by English Heritage and led by Wayne Cocroft. This survey, undertaken in two phases in the winter months between November 2001 and January 2003, involved both documentary research and site investigation. The current project has not involved extensive new research of primary documentation and has relied upon the English Heritage work.

2.2 Designations

2.2.1 The Chilworth Gunpowder Mills is a Scheduled Monument (Monument No.31397). As detailed elsewhere the key focus of the current study only covers the area of the former works which is now owned by Guildford Borough Council, but the scheduling covers a considerably larger area extending both to east and west of the GBC land. The main area covered by the current project was scheduled in 1982 and this designation was then extended in 1999 to also include the later factory site to the east. The scheduled area covers virtually the entire GBC owned land but one small area (the West Lodge: see Gazetteer No.46) is excluded. This was because the West Lodge was an occupied dwelling and is listed Grade 2.

2.2.2 The entire GBC owned site, including West Lodge, is within the Chilworth Gunpowder Mills Conservation Area. Other than the West Lodge there are no other listed buildings in the current GBC owned site although there are several in the vicinity related to the former Gunpowder works.

2.2.3 The site is located on the edge of a central section of the Surrey Hills Area of Outstanding Natural Beauty (AONB), designated as being of national importance. It is within an Area of Great Landscape Value (AGLV) which is of County Importance. The site is also within Green Belt land. Chilworth

Gunpowder Works is also designated in the Guildford Borough Local Plan (adopted 2003) as an Area of High Archaeological Potential. The site has not got any formal ecological designations although it does contain some protected species.

2.3 Topography and setting

2.3.1 The gunpowder mills are located on the north side of the village of Chilworth c.4.8 km east of Guildford. The site is located below the western end of the North Downs, a ridge of chalk hills stretching east to Dover, and is immediately to the south of the steep St Martha's Hill on which sits St Martha's Church. Chilworth is located within the Surrey Hills Area of Natural Beauty. As referred to above the site is on the edge of the Surrey Hills AONB.

2.3.2 The principal reason for the gunpowder works having originally been established in this vicinity, as well as many other mills and industrial enterprises, is the Tillingbourne¹ river. This is only a relatively narrow watercourse but its steep gradient and reliable flow is ideal for driving water wheels and this power has been utilised by numerous industries including many corn mills. In 1676 John Evelyn wrote that *'I do not remember to have seen such Variety of Mills and Works upon so narrow a Brook, and in so little a Compass; there being Mills for Corn, Cloth, Brass, Iron, Powder etc'*. Evelyn was specifically referring to an area around Wotton c.10 km from Chilworth but it provides an indication of the industrial use of the Tillingbourne (Crocker & Crocker, 2000).

2.4 Historical overview and development phases

2.4.1 As stated above the current project has not involved significant new archival research and the historical background outlined below is based almost entirely on the principal secondary sources (see bibliography), particularly the report which accompanied the English Heritage survey (English Heritage 2003). As various elements of the site's history have been previously detailed in a number of publications it is not intended for the historical background here to be exhaustive. This is a relatively short summary of the background to the site which should assist in understanding the site but the existing publications should be consulted for a more in-depth understanding of particular elements of the site's history.

2.4.2 *Key development phases*

Phase I: 1626 - 1650

Phase II: 1650 - 1698

Phase III: 1719 - 1819

Phase IV: 1819 - 1885

Phase V: 1885 - 1920

Phase VI: 1920 - present

1 In the current report the single-word 'Tillingbourne' has been used as opposed to 'Tilling Bourne'. The two word version was used on Ordnance Survey maps and by English Heritage in their report but the vast majority of sources appear to use the single word.



Plate 3: Powder Punts (copyright A Hammond, from *The Gunpowder Industry* by Glenys Crocker, Shire publications)

2.4.3 *Chilworth Gunpowder Mills Historical timeline*

2.4.4 This table is intended to place developments at the gunpowder mills in their wider historical context and particularly to relate the fluctuating fortunes of the site to periods of war and the country’s social and political situation. The information is largely taken from the English Heritage report on Chilworth (2003) and other principal secondary sources.

Period/ Year	Gunpowder mill events	Wider Historical events
1601	East India Company Formed	
1606	Wire mill closes	
1624	Decision to manufacture gunpowder	
1625	Works begin on new mill at Trumpsmill	
1626	Production halts. New application to produce gunpowder using only imported saltpetre from India	
1626	Lease signed for new mill site at Chilworth	
1627	Work Halted at mill due to breach in bank of mill pond	
1628	Edward Collins takes over the Mills (rent of £200 p/a)	

1630	Three mills damaged in explosion	
1632	Company loses right to manufacture gunpowder, production stops	
1634	Company wins right to rework decayed gunpowder	
1635	Manufacture recommences under Samuel Cordwell and George Collins	
1636	New contract to supply King means factory needs extra 7 mills to increase production. These are built to west of original mills and are referred to as Lower Works	
March 1637	East India Company gives up interest in site (Fairclough 2000)	
	Upper Works developed at this time	
1640	The king owes money for gunpowder supplied	
Aug 1641	Kings monopoly of Chilworth ends	
1642 to 1649		Civil War
Nov 1642	Chilworth mills pulled down to prevent them falling into royalist hands	
March 1643	Mills working again	
Late 1647/ early 1648	Samuel Cordwell dies, his brother Robert Cordwell takes over	
1649	Original 21 year lease expires, landlord Vincent Randyll lets them on annual basis	
1650	Robert Cordwell dies, Samuel Cordwell's widow Mary takes charge	
1650	Mary Cordwell sells her stock to group of merchants	
1652 - 1654		First Anglo Dutch War
1652?	Drying stove blows up	
1653 - 1670s	Works undergoes large expansion with addition of middle works	
1660?	Mills controlled solely by Vincent Randyll	
1665 - 1667		Second Anglo Dutch War
1672 - 1674		Third Anglo Dutch War
1673	Vincent Randyll dies. Production halts	
1677	Production restarts - Sir Polycarpus Wharton and John Freeman take a 21 year lease on the mills	Conflict with France? (EH)
1684	John Freeman dies. Sir Polycarpus becomes sole proprietor of the Mills	
1687	Three new incorporating mills added to Chilworth site	
1688 - 1697		War of the Grand Alliance / League of Augsburg

1698	Sir Polycarpus Wharton's lease expires - mills run by unknown (poss Samuel Shepheard) until 1719	
1701 - 1714		War of the Spanish Succession
1704	Lower Works converted to manufacture paper	
1719	Francis Grueber takes lease on mills	
1728	Survey of mills undertaken - Upper works derelict, Middle works has only four incorporating mills. Grueber working in partnership with Thomas Coram.	
1730	Francis Grueber dies. Association with Coram ends	
Autumn 1731	Thomas Pearse acquires Chilworth mills	
1740	Pearse renews lease on works for 21 years	
1742 - 1748		War of the Austrian Succession
1743	Thomas Pearse dies and is succeeded by his son, Thomas	
1746	William Stevens becomes partner of works with Thomas Pearse	Battle of Culloden
1753	Stevens and Pearse joined by third partner Benjamin Pryce. Inventory of Chilworth assets made	
1754	Thomas Pearse assigns estate to Benjamin and Edward Pryce	
1755 - 1762	Gunpowder supplied by Edward Pryce until end of war	Seven Years War
1765	Mills in disrepair	
1765	New partnership formed between Edward Pryce and Isaac Dent	
1768	New lease on mills	
1780	Dent sole owner of mill	
1790	Dent dies and leaves mill to manager William Tinkler amongst numerous repairs a new mill is constructed.	
1775 - 1783		American war of Independence
1781 - 1784		Fourth Anglo Dutch War
1791	Charles Ball takes over paper mills	
1793		War declared on revolutionary France
1798		Irish Rebellion
1803 - 1815		Napoleonic War
1813	Erection of cylinder house and a building for refining brimstone.	

1803		Second Anglo-Maratha war between British East India Company and the Maratha Empire
1819	Gunpowder mills leased to John Sharp	
1839 - 1842		First Anglo Afghan War
1854 - 1856		Crimean War
1857 - 1858		Indian Mutiny
1865	Introduction of steam powered mills	
1870	Paper mills cease operation, bought by publisher and converted to print works	
1875	Explosives Act	
1878 - 1880		Second Anglo Afghan War
1881	Gunpowder mills sold to Charles Marcus Westfield	
1879		Anglo-Zulu war
1880 - 1888		First Boer War
1881 - 1889		Sudan Campaign
1885	Westfield sold works the Chilworth Gunpowder Company, but remains a director - large quantity of investment in works. Manufacture of 'brown powder' for British Government and colonies. Six incorporating mills supplied to Chilworth.	
1886	Four cam presses set up at Chilworth	
1888	Dove Bros. Of Islington record that they have built a new factory and magazines at Chilworth (cost £2095) - prob part of the 1885 expansion/rebuilding.	
1888	Chilworth Gunpowder Company acquires gunpowder works in Fernilee, Derbyshire.	
1889	Development of new smokeless powders	
1896	Paper Mills burn down and are not rebuilt	
1891	Cordite adopted as the British service propellant, profits fall at Chilworth who are still manufacturing brown and black powder	
1892	First Cordite factory building erected to east of main factory area (known as Smokeless Powder factory)	
1899 - 1902		Second Boer War
1901	Corning House for black powder destroyed in explosion killing six workmen	
1914 - 1918	Chilworth supplies black powder for use in signal rockets and finely milled powder for use in time fuses.	First World War
1914	Factory guarded by soldiers from Queens West Surrey Regiment. Guard boxes erected around perimeter of site.	

1915	Extension to cordite factory and some buildings added to smokeless Powder factory to cope with increased production.	
1916	Factory protected from Zeppelin attack by pom pom gun	
1917	Pom pom gun replaced by two anti aircraft guns, buildings camouflaged.	
1918	Explosives Trades Limited formed by most of the British explosives manufacturers, later becoming Nobel Industries Limited	
1919 - 1922		Anglo Irish War
1920	Chilworth Gunpowder factory closes and company put into voluntary liquidation.	
1922	Land on which factory stands sold at auction. Buildings were probably decontaminated by firing. Saleable assets including machinery sold at auction. Four incorporating mills dismantled and moved to Faversham. Many buildings converted to dwellings	
1939 - 1945	Pill boxes and anti tank blocks constructed as part of General Headquarters Reserve Position defences	Second World War
1963	Last residents leave Tin Town, contractors demolish and clear most of the remaining buildings on site.	

2.5 Early development of the Gunpowder Industry in Britain and abroad

2.5.1 Gunpowder manufacture is a complicated process which involves a series of distinct elements but it essentially comprises the mixing and incorporation of three key ingredients: saltpetre (potassium nitrate), charcoal and sulphur. The proportions used have varied slightly but they are generally 75% saltpetre, 12.5-15% charcoal and 10-12.5% sulphur. Saltpetre, the main ingredient forms naturally in warm climates such as India and north Africa, but much smaller quantities can also form in less favourable climates in dovecotes, stables and other outbuildings where urine came into contact with earth walls. There are also a number of techniques which have been used in different periods to artificially manufacture saltpetre.

2.5.2 A rudimentary understanding of the creation and properties of gunpowder developed in China in the 9th century and by the middle of the 11th century it is known that the Chinese were creating simple bombs, grenades and flame throwers. This was followed by attempts to use gunpowder as a way of firing a projectile and towards the end of the 13th century by the development of a true gun.

2.5.3 Understanding of the explosive properties of saltpetre, when mixed with sulphur and charcoal, is thought to have been introduced to the West in the first half of the 13th century and a realisation of its potential to fire projectiles developed in the 14th century. The projectiles were initially arrows, fired from bottle shaped 'guns' but the technology evolved rapidly, particularly in the west, to fire spherical objects.

2.5.4 Gunpowder was initially produced by hand, using a pestle and mortar, either on the battle field or at an arsenal such as the Tower of London. The origins of the wider gunpowder manufacturing industry in England lay in the mid 16th century when the first permanent mills and plant were established. The earliest such mill was erected at Rotherhithe, south-east London in c.1540. This site and those which followed would have utilised horse or water power to operate pestle mills.

2.5.5 In the second half of the 16th century and the early 17th century the emerging industry was centred on Surrey and was dominated by the Evelyn family. In this period following the defeat of the Spanish Armada and the great shock at the invasion attempt there was concern over the supply of gunpowder to the crown and a new system was instigated where manufacturers were appointed by Royal letters patents. The Evelyn family received a Royal contract for the manufacture of gunpowder in 1589. The Evelyn family's original

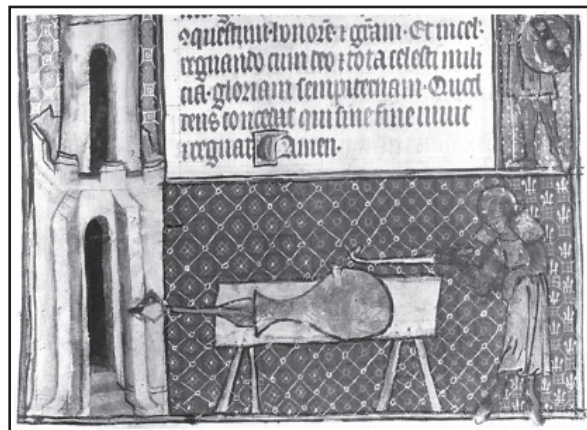
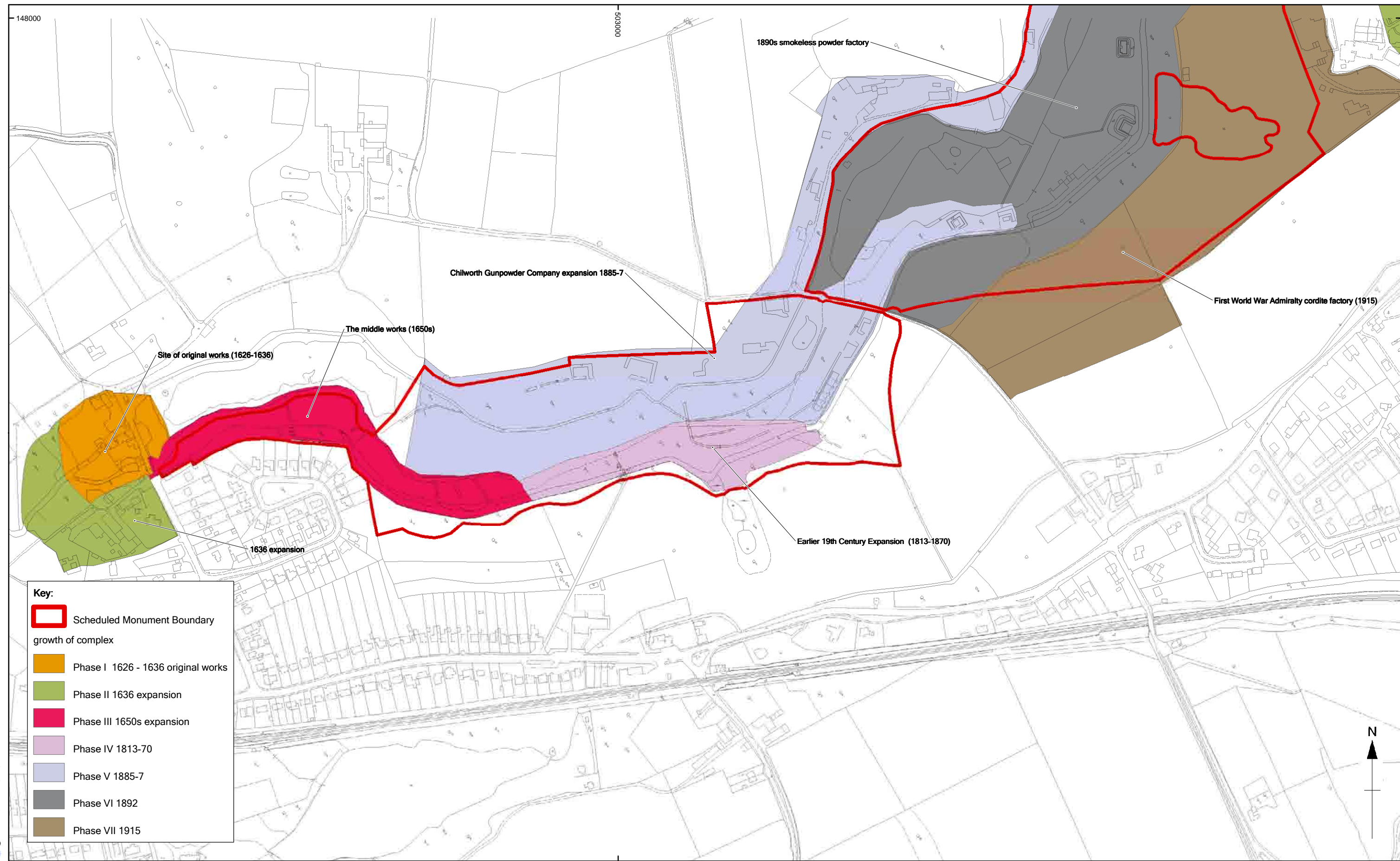


Plate 4: The earliest illustration of a gun, from *De Officiis Regum*, 1326 (Christ Church, Oxford)

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Key:

- Scheduled Monument Boundary
- growth of complex
- Phase I 1626 - 1636 original works
- Phase II 1636 expansion
- Phase III 1650s expansion
- Phase IV 1813-70
- Phase V 1885-7
- Phase VI 1892
- Phase VII 1915

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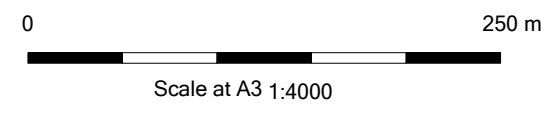


Figure 1: Historical Growth of Complex

works were located at Godstone and these were added to by new sites at Wotton on the Tillingbourne (c.10 km from Chilworth) and then at Godstone.

2.6 Phase I: 1626 - 1650

2.6.1 *East India Company Works at Chilworth (1626 -c.1636)*

2.6.2 The origins of gunpowder manufacture at the current site in Chilworth lay in the establishment of a works by The East India Company in 1626.

2.6.3 The East India Company was granted a Royal Charter in 1600 and was formed to pursue trade with the East Indies and the Indian subcontinent. The company's ships were heavily armed and due to difficulties with establishing a ready supply of gunpowder in the 1620s, as the Government prepared for war with Spain and stockpiled powder, it decided to begin manufacturing its own. The company was in a particularly advantageous position due to its existing trade links and the ready supply of saltpetre from India. A licence was granted allowing the company to manufacture powder for its own use and after a brief attempt to establish works near Egham on the edge of Windsor Forest failed, due to them interfering with the feeding of the deer at Windsor, an alternative site at Chilworth was chosen. The new gunpowder works, which opened in September 1626, utilised a disused corn mill and fulling mill at the dam where Blacksmiths Lane crosses the Tillingbourne. The main works was therefore immediately to the west of Blacksmiths Lane (outside the current GBC land which is the main focus of the current study). The new works also reused the previous mill pond but raised the height of the dam to generate greater power.

2.6.4 The East India Company Works appears to have been a moderate success. In 1627 the dam gave way and there were a number of explosions, particularly one in 1630 which necessitated the reconstruction of the mills, but powder was successfully produced.

2.6.5 In 1628, possibly related to wider financial difficulties in the company, it was decided to subcontract the works so that the company retained the main lease and official letters patent but production was undertaken by Edward Collins, a former manager at the site. Collins' tenure does not appear to have been a success and it was relatively short lived. The explosion in 1630 referred to above, together with the necessary rebuilding of the mills, would have caused a considerable financial strain on Collins and this was exacerbated by Charles I who had in 1629 dissolved parliament and began his period of personal rule. The King's need to raise money from alternative sources resulted in a more stringent application of rules surrounding monopolies and contracts such as that for the East India Company which stated that the gunpowder produced at Chilworth had to be for the sole use of the company. The authorities appear to have previously turned a blind eye to infringements of this rule but in 1632 the company lost its right to manufacture gunpowder due to it supplying other private clients. Gunpowder production therefore ceased at Chilworth, but in 1634 permission was granted for the company to resume a limited manufacture by reworking decayed powder.

- 2.6.6 In the early 1630s the monopoly for the supply of gunpowder to the King was still held by the Evelyn family but this changed in c.1635 when a new monopoly was granted to Samuel Cordwell and George Collins operating from the East India Company's works at Chilworth. By 1637 Cordwell had obtained the main lease for the site and the East India Company no longer had a stake at Chilworth.
- 2.6.7 As the East India Company Works were entirely outside the current GBC land (or along the boundary of it) it has not been attempted here to examine in detail the development of the site at this time. A fuller examination can be found in *Damnable Inventions* (Crocker G & A 2000) and the English Heritage Survey (English Heritage 2003).
- 2.6.8 *Cordwell and Collins (1636-1650)*
- 2.6.9 Between 1636 and 1640 Samuel Cordwell and George Collins were the only legal gunpowder manufacturers in the country and it appears that after a major investment to the plant the venture was for several years a considerable success (at least for the King). The mills produced much larger quantities of good quality gunpowder for the King than had previously been achieved and the supplies appear to have been regular. The works utilised the East India Company's site, to the west of Blacksmith's Lane (and outside the current GBC land) while another entirely new site was also developed some distance to the east at Albury, around what is now known as Postford Pond, also outside the current GBC land.
- 2.6.10 George Collins is believed to have been a relative of Edward Collins, who had previously run the Chilworth site, but the nature of this relationship is uncertain (Crocker G, 2000). He was a local man but the dominant partner was Cordwell who had served in the King's household and could provide the financial investment required.
- 2.6.11 During the period of the King's personal rule in the 1630s the monarch was unable to benefit from taxes previously raised by parliament and his financial position rapidly deteriorated. Apparently due to this the King was less regular in paying for the gunpowder than Cordwell and Collins were in producing it so that by the summer of 1640 he owed £4000. Presumably as a direct result of these debts the monopoly collapsed and Cordwell started selling to private customers rather than the King. In August 1641 the monopoly was formally repealed and it was then legal for anyone to manufacture gunpowder.
- 2.6.12 In 1642, the year in which the deterioration in relations between Parliament and the King led to the outbreak of Civil War, Cordwell agreed a contract to supply 500 barrels of powder to Parliament and Chilworth remained one of the principal suppliers to the Parliamentary forces throughout the war. The site was clearly of importance during the conflict and it appears that in 1642 it was initially made unusable by Parliamentary forces, when they feared it was to fall into the King's hands, and then more substantially pulled down by the King when it was about to be retaken by Parliament (Crocker, G 2000). The plant was back in operation by March 1643 and it then continued to supply Parliament.

- 2.6.13 Collins died in 1644 and Cordwell in late 1647 or early 1648. The site was then run by his brother Robert Collins until his death in 1650 when it briefly passed to his widow before being sold to a group of merchants headed by Josias Dewye.
- 2.7 **Phase II (c.1650 - 1698)**
- 2.7.1 *Josias Dewye and Vincent Randyll (c.1650 - 1673)*
- 2.7.2 Josias Dewye, was a relative of Robert Collins's wife and had previously been a partner at the Temple Mills Gunpowder Works in Essex. He took a lease on the Chilworth works in the early 1650s (by 1653 he obtained a contract from the Ordnance Office) but in the same year Vincent Randyll, Lord of Chilworth Manor, contacted the Board of Ordnance to inform them that he was no longer leasing the works to Dewye and was instead going to operate the site himself.
- 2.7.3 This phase is of particular significance to the current study because it was in this period that the part of the gunpowder works site which now forms the GBC land was established.
- 2.7.4 The area which today forms the main GBC land, and which forms the subject of the current study, is known to have been laid out in the first half of the 1650s because a survey of the site undertaken in 1677 states that this area was established by Randyll during the First Dutch War (1652-4). The same survey is the first time that the three main parts of the site were described as *the Lower Works* (the East India Company's site to the west of Blacksmith Lane); *the upper works* (Cordwell's expansion in the late 1630s) and *the middle works* (the 1652-4 enlargement). It is believed that the mill race later called *New Cut*, part of which survives on the current site, was excavated at the same time that the Middle Works were laid out.
- 2.7.5 Randyll entered into a partnership with two men from local landed families and sought advice and contacts from other individuals. However the partnership does not appear to have been a success and throughout the later 1650s and 1660s the expanded works, which were largely operated by Randyll alone, appear to have secured relatively few contracts. One notable exception was in the build up to the Second Dutch War (1665-7).
- 2.7.6 The fortunes of the works revived again in the early 1670s and particularly during the Third Dutch War of 1672-4 when large quantities of powder were produced. However, Randyll died in 1673 and production at Chilworth ceased.
- 2.7.7 It was again a war with one of the continental powers, in this case France, and the consequent increase in demand for gunpowder, which stimulated the reopening of the Chilworth works in 1677.
- 2.7.8 In this year Sir Jonas Moore surveyed the Chilworth mills site for the Ordnance Department apparently with the intention of assessing its condition and potential for being brought back into use in the event of another war.

- 2.7.9 Moore reported on the many advantages of the site including the 17 overshot water mills in good condition capable of producing 1000 barrels of powder per month, the site's fortunate proximity to good transport links to London and the Royal Dockyard in Portsmouth and the ability of the site to continue working through dry periods and great frosts.
- 2.7.10 Moore's description of the works suggests that the Middle Works had suffered a number of explosions. In this area it lists five mills: Lower Mill, Cole and Brimstone (Sulphur Mill), Middle Mill, Randills Mill and Upper Mill of which two (Lower and Randills) were said to have blown up. Each of the mills (other than the Cole and Brimstone mill) was said to have three troughs (the great timber beam which supported the mortars from a pestle and mortar or stamp mill).
- 2.7.11 *Polycarpus Wharton (c.1677 - 1698)*
- 2.7.12 Moore's report strongly recommended taking steps to reopen the site and presumably encouraged by this Sir Polycarpus Wharton, who already ran a powder mill in Wooburn, Buckinghamshire, took a 21 year lease on the site in partnership with John Freeman, who owned a gunpowder manufacturing site at Sewardstone in Essex. Freeman died in 1684 and he left his share of the Chilworth site together with Sewardstone to Wharton and his son (also Polycarpus).
- 2.7.13 Towards the end of the 17th century Wharton had become by far the largest producer of gunpowder in England and a survey by the Board of Ordnance in 1687 confirmed him as their main supplier. His main site was at Chilworth but his plants at Wooburn and Sewardstone are also significant in the national context of the development of the industry due to these plants apparently being among the first (probably the first) in the country to introduce edge-runner milling technology to replace the previous pestles. The introduction of edge-runner mills in the later 17th and early 18th century, with pairs of stones set vertically to run around a central post, was a major technological advance and provides the classic, recognisable image of the gunpowder industry. This technological advance appears to have been spurred by increasing demand for gunpowder resulting from a number of wars with other European powers as well as expanding private markets.
- 2.7.14 Evidence suggests that Wooburn may have had edge-runner mills in the 1680s and other evidence suggests Sewardstone had also incorporated this new technology by c.1694 (Crocker G & Fairclough KR, 1998). Chilworth only appears to have adopted edge-runners in the 1730s (detailed further below).
- 2.7.15 Wharton developed Chilworth into the largest gunpowder works in the country, a fact confirmed by a Board of Ordnance Survey in 1687 and it retained this status for the rest of Wharton's lease on the site which was allowed to expire in 1698 (EH survey). The reasons for the Wharton ceasing production at the site at the end of the lease were presumably closely related to his serious financial problems, apparently caused by the Board of Ordnance's failure to keep regular payments and to fulfil contracts. The financial dispute between Wharton and the Board continued without resolution until at least 1723, long after he left Chilworth and resulted in him entering a debtors prison in 1710

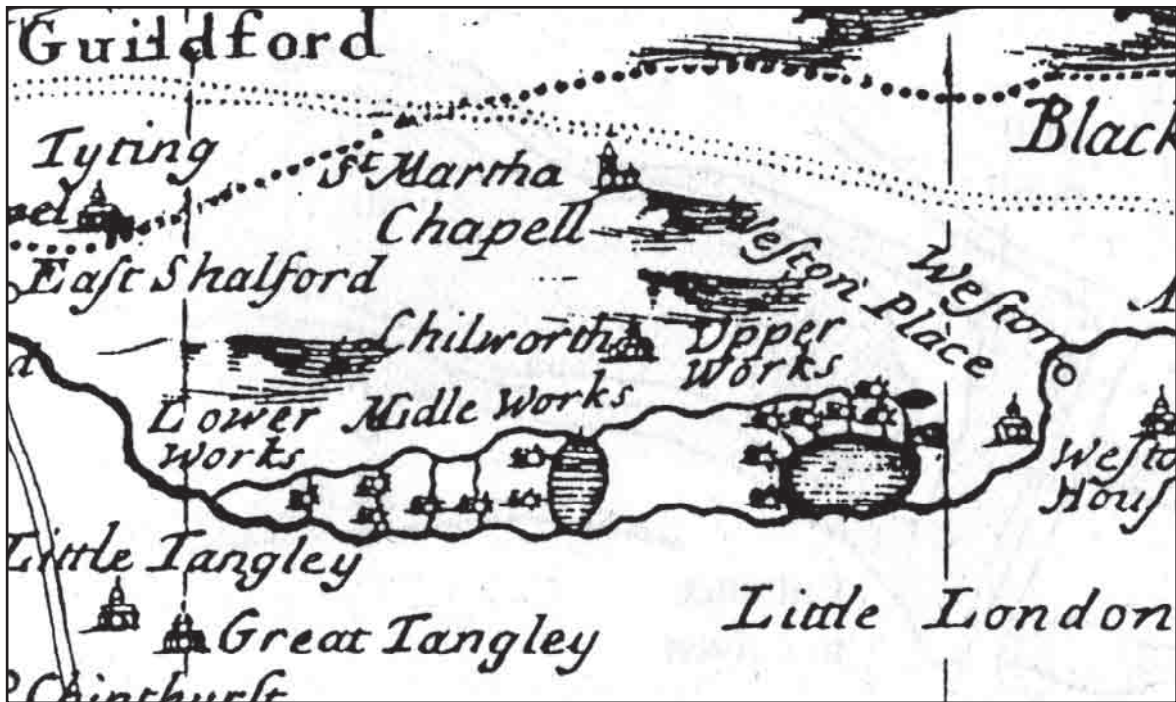


Figure 2: Detail of John Seller's map of Surrey, c.1679

2.8 Phase III: 1719 - 1819

2.8.1 Francis Grueber (1719 - 1730)

2.8.2 The early 18th century history of the Chilworth works is surprisingly unclear from documentary records and although the site was probably in operation during the War of the Spanish Succession (1701-1714) the next documented period of manufacture, after Wharton's departure, was under the ownership of Francis Grueber. Grueber was the son of a Huguenot immigrant and among the country's most important gunpowder manufacturers.

2.8.3 A detailed survey of the works was undertaken in 1728 and this map provides the earliest detailed representation of an English gunpowder works. The survey confirms how the site had shrunk from its later 17th century size under Polycarpus Wharton. The Upper Works was described as derelict and the northern half of the lower works had previously been converted to paper manufacture (in 1704). The Middle Works, which today forms the GBC owned land, had just four working incorporating mills in 1728, together with a Corning Mill, a charcoal house, a coal and brimstone mill and a proposed incorporating mill. The southern half of the lower works housed various buildings associated with the preparation of raw materials for gunpowder manufacture.

2.8.4 In this period the site has an added footnote of historical interest as Grueber formed a partnership at Chilworth with Thomas Coram, an important philanthropist who later, in 1739, established the London Foundling hospital for unwanted children. Coram was probably brought to Chilworth to clear the site's debts and bring business expertise but the partnership was relatively short lived.

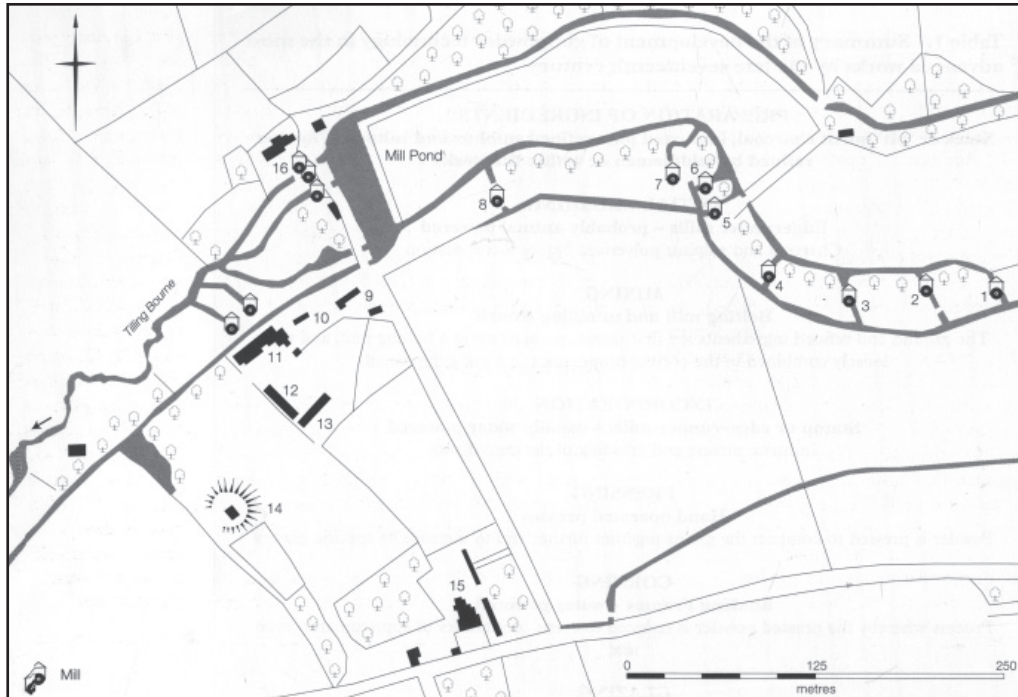


Figure 3: Chilworth Gunpowder Works in 1728
(Plan taken from *Dangerous Energy*. Redrawn from British Library Althorp Papers).

2.8.5 **Thomas Pearse (1731 - 1754)**

2.8.6 Grueber died in 1730 and although the business passed to his widow and son (also Francis) it was saddled with substantial debts and the site was rapidly sold to Thomas Pearse, a Commissioner of the Navy, in 1731. One of the interests of this period is that Pearse appears to have been the first owner to install edge-runner technology to the mills at the site. As detailed above vertical edge-runner technology appears to have been introduced to other sites in the very late 17th century but Chilworth was not in the vanguard of this advance and there is no evidence of the site adopting edge runners until 1735. In this year Lewis Morris, an American visitor, was shown the Chilworth site by Pearse and he reported four sets of stones which were awaiting installation and 'not yet put up'. It is reasonable to assume that these were for a new edge-runner mill (presumably the first at Chilworth).

2.8.7 It may seem surprising that Chilworth, which in the later 17th century was the country's largest powder mill, was not among the first to adopt the technology but it may be that Chilworth's well developed nature was the very reason for this slow uptake. Adopting edge runners would have required a considerable investment and Chilworth had already seen major investment in the 1670s to 1680s. It may also be that the rate at which the industry took up the new technology slowed in the relatively long period of peace between 1713 and 1740 due to the reduced demand for gunpowder.

2.8.8 Pearse died in 1743 and the Chilworth mill passed to his son, also Thomas, as did ownership of a number of mills in Faversham which Thomas Pearse (the elder) had acquired from Francis Grueber. This was a period of increased production for

the mills closely related, as was frequently the case, to the country being at war (The War of the Austrian Succession, 1740-1748). Pearse's mills at Chilworth and Faversham are recorded as supplying 30 per cent of the gunpowder received by the Board of Ordnance.

2.8.9 *Benjamin and Edward Pryce (1754 - 1780)*

2.8.10 In 1754 due to financial difficulties Thomas Pearse sold the Chilworth and Faversham mills to Benjamin and Edward Pryce. In 1759 the Faversham Mills were sold to the Government, to form the first Royal Gunpowder Mill, and Chilworth was then apparently operated by Edward alone. By 1765 the mills were in disrepair, possibly having fallen into disuse at the end of the Seven Year War (1756-63) but in 1766 Pryce formed a new partnership with Isaac Dent and production at Chilworth recommenced.

2.8.11 *Isaac Dent and William Tinkler (1780 - 1819)*

2.8.12 From 1780 Dent was the sole operator of the site and on his death in 1790 they passed to his manager William Tinkler. A detailed understanding of the management of the works in the later 18th century is provided by a series of surviving documents held at the Surrey History Centre (G.132/1) and these demonstrate that Chilworth underwent considerable repairs and improvements in c.1790-1 after being taken over by Tinkler. It is interesting to note that Tinkler appears to have been keen to keep abreast of technological advances made in the wider industry, particularly those developed at, or adopted by, the Royal Gunpowder Mills. In particular the documents show that Tinkler was aware of a new method of manufacturing charcoal using iron retorts rather than earthen clamps, which had been adopted at the Royal Gunpowder Mills.



Figure 4: Detail of Estate map, 1813 (© Surrey History Service, taken from *Damnable Inventions* by Alan and Glenys Crocker)

2.8.13 At this time the Middle Works comprised five incorporating mills, each driven by water wheels 24 ft (7.4 m) in diameter, as well as a brimstone house, a corning house, a dusting house, a charcoal house and a watch house (EH report).

2.9 Phase IV: 1819 - 1885

2.9.1 *John Sharp and family (1819-1881)*

2.9.2 In 1819 the site was leased to John Sharp and together with other members of his family he leased the works for the next 60 years. The first 35 years was a period of prolonged peace, after the defeat of Napoleon at Waterloo, and it was also a period of stagnation and lack of investment in the country's military establishments. This complacency was shaken by the outbreak of the Crimean War (1854-6) and substantial new investment was made in Government munitions factories. Presumably because of this records show a rise in the amount of powder that Chilworth sent to London during the Crimean War. This rise in production continued in the 1860s, possibly partly due to continuing investment in the military but also partly due to the construction of the first steam powered mills at the site which were in operation by 1865. This mill is one of main surviving structures at the site (Gaz number 20, 21, 22).

2.9.3 *Charles Marcus Westfield (1881-1885)*

2.9.4 In 1881 the works were sold to Charles Marcus Westfield, who had been with a company in Kent, Messrs Hall, that produced gunpowder and it appears was already involved in the mill in some capacity (EH report) . This is suggested by the fact that an amending licence was granted to Westfield in 1876 as part of the new Explosives Act of 1875. The 1875 Act was part of the greater regulation applied to the industry in this period and it provides a clearer understanding of the industry nationwide at this time. Chilworth was one of 28 gunpowder mills in the country when it was sold in 1881.

2.10 Phase V: 1885 - 1920

2.10.1 *Chilworth Gunpowder Company (1885 - 1920)*

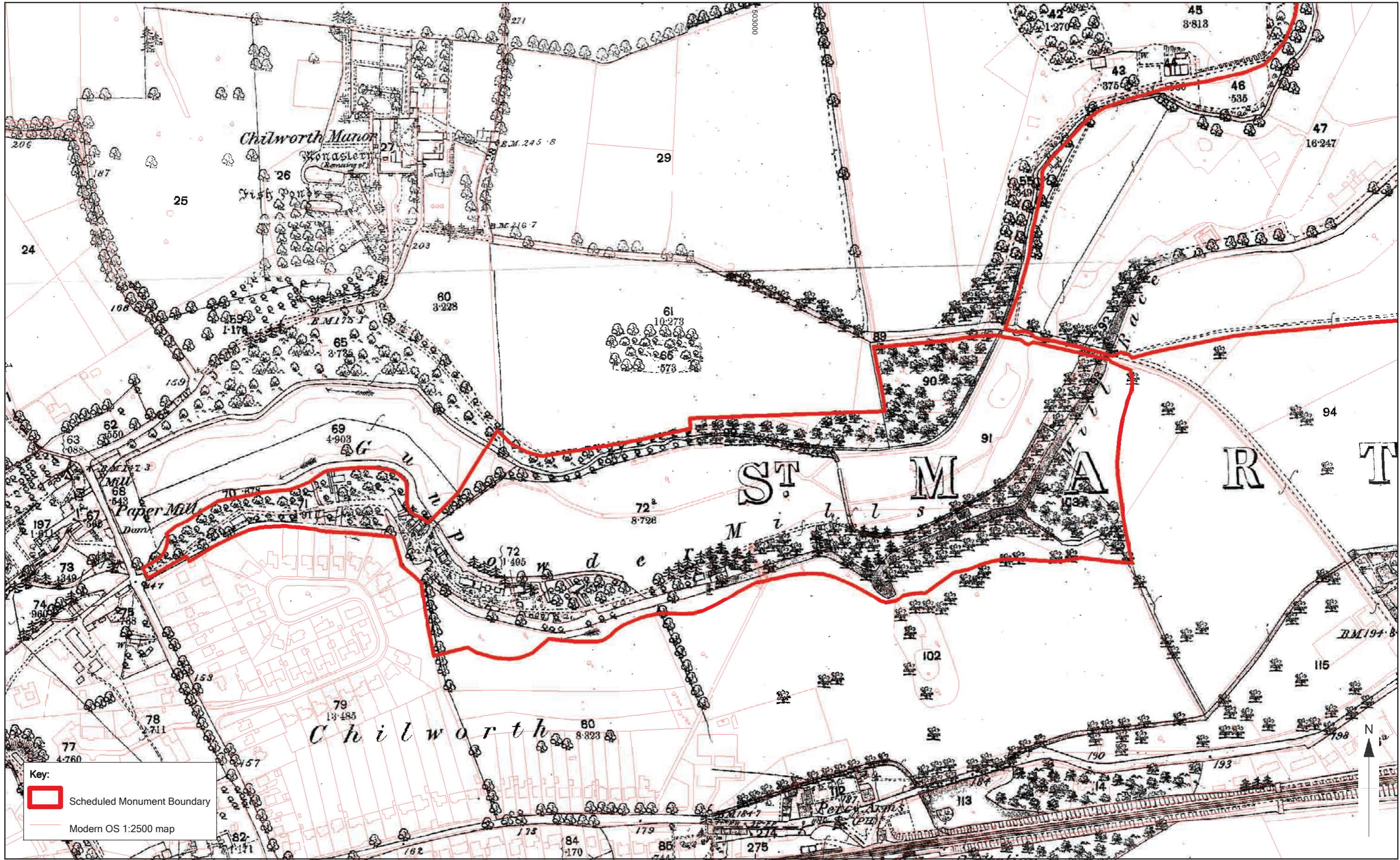
2.10.2 In 1885 Westfield sold the works to the recently formed Chilworth Gunpowder Company (CGC), an Anglo-German subsidiary to a German parent company, and the following period, up to and including the First World War, was one of the most important in the site's history with huge expansion of the works. In this period the quantity of gunpowder that Chilworth supplied to the British and Colonial Governments was second only to that of the Royal Gunpowder Factory at Waltham Abbey. This great growth of the factory was partly due the nature of the new limited company which owned the site with shareholders and much larger sums available for investment in the site, but it is also partly due to the rapid technological advances being made in the industry.

2.10.3 This period has sometimes been described as the second Industrial Revolution, when great technological advances were made, particularly in steel manufacture and the chemical industries, including the development of chemical explosives, at least partly generated by military demands. It was also the period in which Germany overtook Britain as Europe's leading industrial power.

- 2.10.4 Developments in military technology in the middle and later 19th century had led to ever greater guns requiring huge charges and these in turn led to practical difficulties with continuing to use conventional gunpowder. As an attempt to overcome this a new brown or 'cocoa' powder (coloured by the replacement of charcoal with rye straw) was developed in Germany in the early 1880s, which was compressed into hexagonal blocks. Due to the form of the blocks in which it was delivered this was known as 'prismatic' powder, although this technique of forming blocks had previously been used with black powders.
- 2.10.5 The prismatic powder was much more able to ensure a consistent burning rate in large charges and the great advantage of this over the old black powder was rapidly demonstrated and its production had begun at the Royal Gunpowder Mills, Waltham Abbey by 1885. In the same year the Anglo-German Chilworth Gunpowder Company (CGC) was formed with the specific purpose of producing the brown prismatic powder and exploiting the huge commercial opportunity offered by supplying it to the British Government.
- 2.10.6 The directors of the CGC had close links with major armaments producers in England and Germany as well as powder works also in Germany and with the far greater sums which the new limited company was able to offer for investment in the works it is clear that the CGC had great ambitions for the site. Very quickly the site was modernised with new buildings, new plant and by late 1885 Chilworth was producing brown powder (EH report). In 1888 an agreement was also made with the South Eastern Railway Company to build a tramway link to a siding at Chilworth Railway Station and this was carried over the New Cut by a new swing bridge with a central pivot that allowed punts to pass along the watercourse.
- 2.10.7 The new factory appears to have adopted the most advanced technologies available, many of which had German influence and were rare in the UK; six new steel suspended edge runner incorporating mills were installed (see EH report). The constructional techniques used were also advanced and a number of rolled steel joists in the 1885 steam incorporating mills (Gazetteer No.52), which are stamped Burbach 1884, are the earliest recognised RSJ's in the country (detailed further in EH report).
- 2.10.8 The site's link to Germany extended to the use of a retired Prussian army captain, Otto Bouvier, who acted as the site manager and who was responsible for maintaining the commercial secrecy of the processes undertaken. It is believed that Bouvier was popular locally and there does not appear to have been hostility to the German company which had taken over the site. In this period France was still seen as the main potential adversary and of course Queen Victoria had been married to the German Prince Albert of Saxe-Coburg and Gotha.
- 2.10.9 From the outset the redeveloped site was a great success, generating very large profits for the shareholders, particularly from 1887 to 1891 (EH report). However military and explosive technology was continuing to develop with great rapidity and the new brown powder, which had formed the cornerstone of the Chilworth's success in the later 1880s, was already being superseded by new smokeless chemical explosives demanded by both large-bore and quick-firing guns.

- 2.10.10 Research into producing smokeless powders had been undertaken by a number of scientists since the 1840s, including Frederick Abel at the chemical department at Royal Arsenal, and in 1889 Abel, together with his colleague Sir James Dewar, patented one such smokeless powder: cordite.
- 2.10.11 In 1891 cordite, was adopted by the British Government as its main service propellant and the impact this had on the Chilworth Company is apparent from their accounts which show a dramatic collapse in annual profits from the later 1880s to the early 1890s. In each year between 1887 and 1891 the company made a profit of between £11,000 and £19,000 whereas in 1893 and 1894 it was less than £1000 per annum (EH report).
- 2.10.12 The fact that the company was keen to be in the technological vanguard of the industry had already been demonstrated by its prismatic powder factory and in the 1880s it had been very aware of the potential for the new smokeless powders. Indeed as early as 1887 it had supplied samples of one version of such a powder (Duttenhofer powder) to the British Government. It was now apparent that the future of the industry lay in smokeless powders, and in particular cordite due to its adoption as the main British service propellant, and in 1892 the Chilworth Company commenced construction of a large new factory.
- 2.10.13 The new complex was located to the east of the existing works and is outside the direct scope of the current Conservation Management Plan. It is on private land but the kneading and press house is visible from a public footpath which passes from Lockner Farm lane towards Postford Pond. The advanced nature of these works is shown by the fact that it was at Chilworth that cordite was first manufactured by a private company.
- 2.10.14 The ownership of the company evolved, particularly after the turn of the century, through company mergers and partnerships and by c.1910 the Nobel Dynamite Trust had effectively taken control of the Chilworth Company. Nobel's was also a multi-national concern with considerable German influence and the outbreak of the First World War led to its enforced restructuring with the Explosives Company becoming entirely British owned. Although by the outbreak of the war the Chilworth Company was no longer a subsidiary of a German company, as it had been in the 1880s, it still had a number of prominent German individuals in management or positions of responsibility. Several of these anglicised their names by deed poll and the son of one of the German foremen, Heinrich (changed to Henry) Walter Wirths, died during the war while serving with the Royal Flying Corps. He is commemorated on the Chilworth war memorial.
- 2.10.15 Production increased during the war and the workforce grew to c.600 (Warner 1976) from c.300-400 in the 1890s. These increases were probably partly due to the works being operated around the clock but the site also underwent another considerable expansion with the construction of the Admiralty Cordite Factory in 1915. This was constructed on fields to north of Lockner Farm and to the south of the 1890s smokeless powder factory and similarly to the 1890s factory it specialised in finishing the cordite paste.

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Figure 5: 1872 Ordnance Survey map laid over modern layout

0 100 m
Scale at A3 1:3000

2.10.16 In common with munitions factories across the country women were employed at Chilworth during the Great War, particularly in the Admiralty Cordite Factory, and a women's football team was formed known as the 'Pioneer Ladies FC, Mr Hammond's team'.



Plate 5: Chilworth Gunpowder Works Women's Football Team (from *Damnable Inventions* by Glenys and Alan Crocker)

2.11 **Phase VI: 1920 - present day**

2.11.1 ***Tin Town (1920- c.1963)***

2.11.2 During the war explosives and munitions factories had grown rapidly and it was clear in the immediate post-war period that there was a huge over capacity in the industry. In June 1920 the Chilworth Gunpowder Company was put into voluntary liquidation. Production of gunpowder and explosives therefore ceased on the site after almost 400 years. The land was sold in July 1922 and many of the buildings were almost certainly fired. Machinery and assets were sold, including four incorporating mills which went to ICI's Oare Works in Faversham. It may be that when the Oare Works closed in 1935 these mills were among the plant which is known to have been transferred to ICI's plant in Ardeer, Scotland, and it is even possible that the incorporating mill which has in recent years been returned and reconstructed at Oare is one that originated at Chilworth (the Oare site is discussed further in Volume 1 at section 5.12).

2.11.3 Although many structures were cleared from the Chilworth site a significant number of buildings remained and many of these were converted by enterprising individuals, or people desperate due to the inter-war housing shortage, and reused as makeshift dwellings. In addition a number of new timber-framed bungalows are also said to have been erected in the central part of the factory, now owned by GBC (Crocker and Crocker, 2000). It is believed that approximately 20 families lived on the site and due to the number of dwellings with corrugated iron roofs the community became known as Tin Town.

2.11.4 Conditions in Tin Town were basic, with no mains electricity or drainage and after the Second World War the tin-town families began to be rehoused elsewhere, including council houses in Shalford (Mrs Parker pers comm).

2.11.5 Mrs Parker, who has lived at Lockner Farm for 60 years and has clear memories of tin town, has been contacted as part of the current project particularly regarding a proposal to develop some redundant buildings at Lockner Farm but also for her memories of the site. The memories Mrs Parker has is of neat gardens, 'cute' buildings, children running around the site and a vibrant community. There were two main brick houses and lots of tin structures. Mrs Parker also reports that when the last of the residents were removed from the site in 1963 and relocated to Shalford many were reluctant to go (Mrs Parker pers comm).

2.11.6 *Second World War*

2.11.7 A further aspect of the history of the site which is of some interest is the fact that it is on the line of the most important Second World War anti-invasion 'stop line'. In the early stages of the Second World War, particularly after the fall of France in June 1940, an invasion attempt was widely anticipated and a complex network of defensive structures were rapidly planned and constructed to both hinder the enemy landings and also slow attempts by the Germans to move inland across the country. This network included a number of 'stop lines' or barriers comprising a series of interlinked defensive structures and the longest and most important of these was the General Headquarters (GHQ) line which was intended to delay landings in the south-eastern corner of the country from reaching London. The vast GHQ line stretched around Greater London extending from Somerset to Essex and then up to Yorkshire and a branch of it passes through the Chilworth Gunpowder Mills site. The GHQ line utilises waterways, higher ground and natural strong points to enhance the nature of the defence and although it is hard to imagine German tanks surging through the gunpowder mills site it is likely that the main roads would have been heavily defended and when France was overrun the German army made rapid progress through wooded areas such as this.

2.11.8 The history of the Second World War defensive role of the site is visible in a number of pill boxes in the area, including one inside the current site, as well as the remains of a road block and anti-tank obstacles known as dragons teeth or pimples to the east of bridge BR8.

2.11.9 The Second World War features provide a vivid illustration of the fear of invasion in 1940 and the scale of the preparations to counter it. The pillboxes, pimples and road block are not great defensive structures like the Victorian Palmerston forts, constructed on the south coast to repel invasion from the continent in the 1860s, but they demonstrate the widespread nature of the preparations for invasion during the Second World War. Chilworth is a long way from the sea and by the time German troops and tanks had reached Surrey they would have held a strong foothold in the south-eastern corner of the country. The features are an illustration of how it was intended that the defence of the country would have continued long after a successful landing by the Germans and they resonate with Churchill's famous speech '*we shall fight on the beaches, we shall fight on the landing grounds, we shall fight in the fields and in the streets, we shall fight in the hills; we shall never surrender*'.



Plate 6: Dragons tooth at site

2.11.10 *Recent history*

- 2.11.11 By the 1950s the area covered by the current study was in the ownership of Guildford Rural District Council and the last surviving residents of Tin Town were removed in 1963. The Tin Town buildings were rapidly cleared leaving little trace other than fragments of sinks, an iron bedstead and fragments of pottery. New trees were then planted across these areas (EH survey) and the former works officially became a public open space. An angling lake was excavated in c.1980, adjacent to the historic mill pond, shortly before the site was designated as a Scheduled Ancient Monument in 1982.
- 2.11.12 Appreciation of the significance of this site, as well as other gunpowder mills, increased in 1980s with a number of publications, including *Chilworth Gunpowder* by Glenys Crocker in 1984, and the formation of the Gunpowder Mills Study Group in 1986.
- 2.11.13 In the 1990s GBC undertook some consolidation works to the 1885 Incorporating Mills and installed notice boards as well as picnic benches. Then in 2001 they commissioned (and part funded) the major survey of the site by English Heritage and also around this time the council undertook consolidation of the Packhorse Bridge (BR12). Since 2001 there have been relatively few improvements or alterations at the site at an official (GBC) level although Alison Davidson, then at the Borough Council Conservation Department was active in encouraging events and promoting the archaeological interest of the site. In this period the main developments at the site have been led by the Chilworth Gunpowder Mills Group which was set up in the late 1990s with an attached group of local volunteers who have carried out limited vegetation clearance works and some archaeological recording as well as small scale investigations led by Andrew Norris.

2.12 **Current and historic character of the site**

2.12.1 *Introduction*

- 2.12.2 In developing policies and proposals for Chilworth Gunpowder Mills it is important to have an understanding of the general character of the site and of how the current appearance has altered from the historic form. It is not intended to replicate the historic landscape at the site but the management proposals do take into account the historic form of the works, particularly reflecting the areas that were wooded and the areas that were open.

2.12.3 *Outline description of current character of the site*

- 2.12.4 The general character of much of the site today can either be seen as untouched nature or unmanaged neglect. The character has altered greatly since the works closed in 1920 and almost certainly particularly in the second half of the 20th century since the dismantling of Tin Town. The main path through the site is kept clear but signs request that visitors stick to these paths and elsewhere thick and invasive vegetation makes much of the rest of the site inaccessible. Parts of the site would always have been wooded (detailed further below) but through lack of management the site has lost its historic form.

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Scale at A4 1:5000

Plate 7: 1948 Aerial photograph with modern map overlay

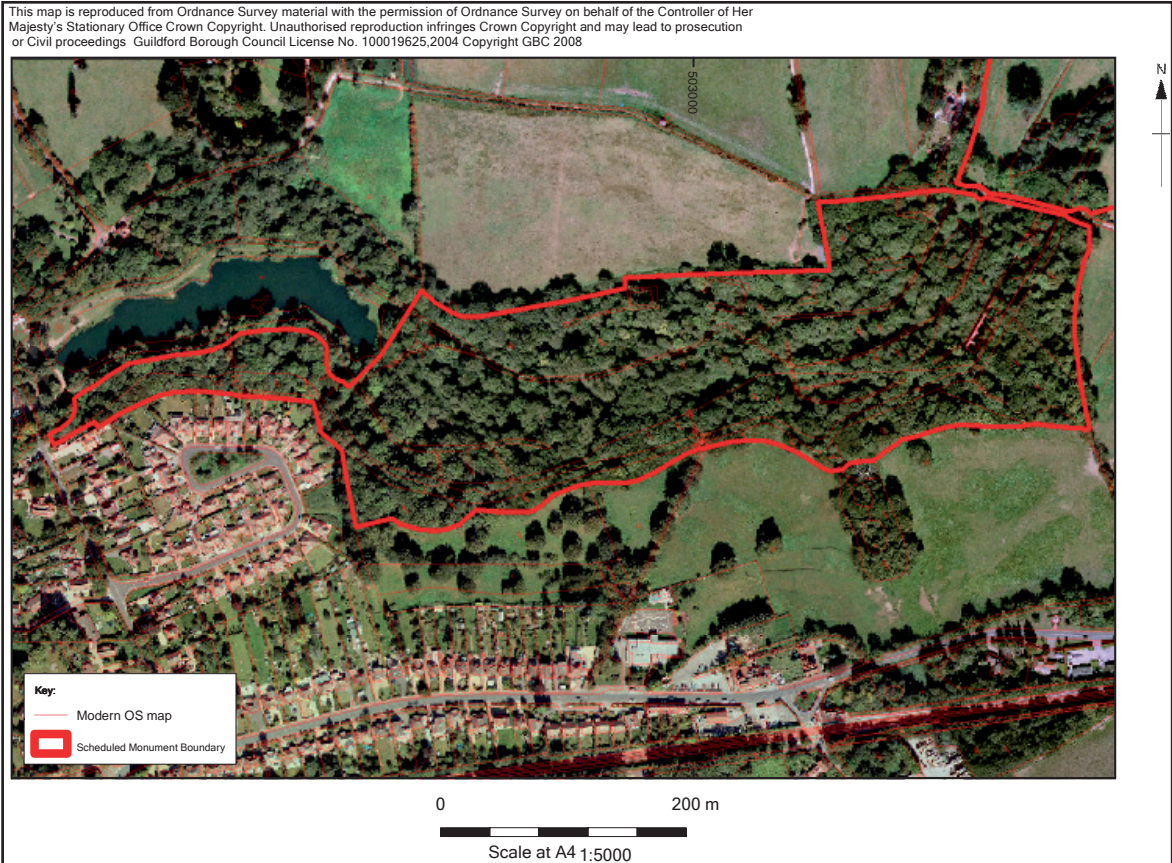


Plate 8: Modern Aerial photograph

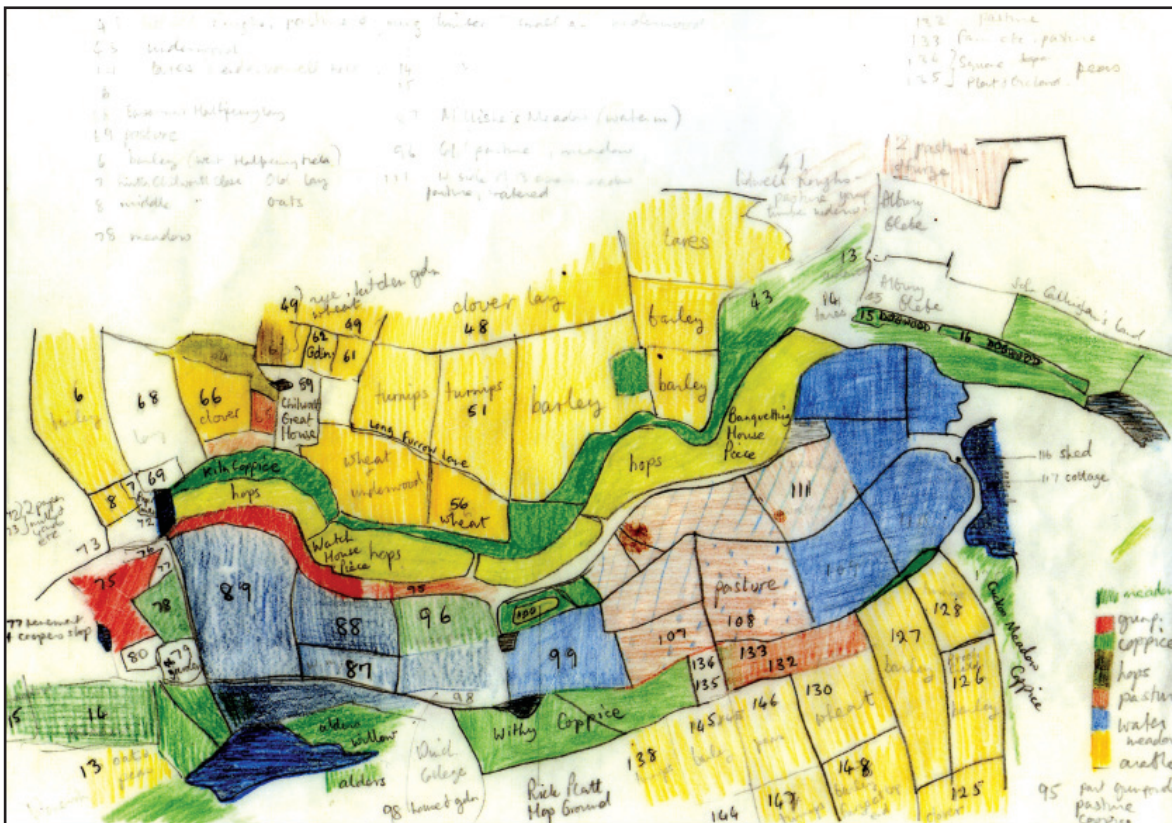


Plate 9: Land use in the early 19th century (information taken from Estate Plan of 1813)

- 2.12.5 Due to its overgrown nature it is easy to walk through the site barely noticing the large majority of the surviving remains and it is even possible to miss very large structures such as the 1885 incorporating mills. There are very few long views through the site or from the site towards the St Martha's Hill and there is a strong sense of enclosure within the site.
- 2.12.6 *Historical character of site*
- 2.12.7 The main sources of information in determining the historic landscape character of the site are historic descriptions, historic maps, a view overlooking the works from St Martha's Hill in 1888 and an aerial photograph of the site taken in 1948.
- 2.12.8 *Historic descriptions:* There are several useful historical descriptions which provide an impression of the works and the landscape. One which particularly relates to the wider landscape is from William Cobbett dated 1822: '*I came over the high hill on the south of Guildford, and came down to Chilworth, and up the valley to Albury. I noticed, in my first Rural Ride, this beautiful valley, its hangers, its meadows, its hop-gardens, and its ponds. This valley of Chilworth has great variety and is very pretty*'.
- 2.12.9 *Historic maps:* As detailed elsewhere there are a number of important historic maps of the area. These include some such as John Seller's map of c.1679 which identify the gunpowder works but the scale of which is too small to provide a clear impression of the landscape as well as several more useful later ones. Among these are an important map of 1728 (General Survey of Chilworth St Martha) which gives an indication of the landscape and shows that the mills were set within a bank of woodland between water courses. Another important map is an Estate Plan of 1813 from which landuse information has been extracted. This shows the narrow band of the gunpowder mills, a large hop-garden immediately to the north and a kiln coppice to the north of this (forming the band along the northern edge of the current site which has been identified as being of higher ecological interest).
- 2.12.10 *Historic views:* the main historic view of the Chilworth site is dated 1888 and is contained in Wyman's Commercial Encyclopedia. It is a view from St Martha's Church and provides an invaluable impression of the form of the works shortly after the site had been acquired and expanded by the Anglo-German Chilworth Gunpowder Company. Although the works are some distance away, (and the reproduction available here is of relatively poor quality) it is easy to identify features such as the main watercourses, the millpond to the east, Blacksmiths Lane, the 1885 Incorporating Mills and the tramways. The works are shown to have comprise a series of modest detached buildings with bands of woodland along the southern and northern edge's of the site. The central area is shown largely open and with few trees.
- 2.12.11 The later 19th and early 20th century 25" Ordnance Survey maps are very useful in showing the extent of the works and the nature of the surrounding landscape.
- 2.12.12 *1948 aerial photograph:* The aerial photograph clearly post-dates the gunpowder works but the site was inhabited by the Tin Town community and clear differences between the current site and that in 1948 suggests that some element of the previous management regime was maintained in this period.

- 2.12.13 Other historical evidence includes views of other powder mills such as one of Waltham Abbey dated 1735. This shows the powder works comprising a series of individual buildings adjacent to a watercourse set within a relatively narrow band of woodland. In the foreground is a large area of pasture with cattle and to the rear is a hill. The general appearance of the site would probably have had striking similarities to Chilworth.
- 2.12.14 Evidence suggests that the general character of the site would historically have been quite different to that of the modern site. Some areas would have been tree covered when the works were in operation although these wooded areas would have been carefully managed. In particular the wooded areas would have been surrounding the main gunpowder mill buildings along the southern part of the site and within the large band along the northern area. Within the woodland there would have been isolated buildings and numerous watercourses providing power to the water wheels.
- 2.12.15 The woodland would have been maintained partly to provide wood for charcoal (suggested by the kiln coppice shown on the 1813 plan), although a gunpowder works such as this would not have been self sufficient. Coppices for charcoal are likely to have been planted at Chilworth, as at other gunpowder works, and common trees for this purpose are known to have been alder, willow and alder buckthorn (or dogwood). The 1813 plan labels areas of woodland some way to the south of the current site as containing willow and alder.
- 2.12.16 Woodland also appears to have been encouraged at powder works because it was also recognised that trees close to processing buildings could provide efficient blast screens in the event of accidental explosions, which were regular occurrences at such sites. Indeed it appears that there are areas where lines of



Plate 10: View of works from St Martha's Church, 1888 (from Wymans Commercial Encyclopedia)



Plate 11: View of Waltham Abbey Mills in 1735

trees (principally yews) were specifically planted around processing buildings and similar areas of apparent deliberate planting for blast protection has also been noted at the Oare gunpowder works.

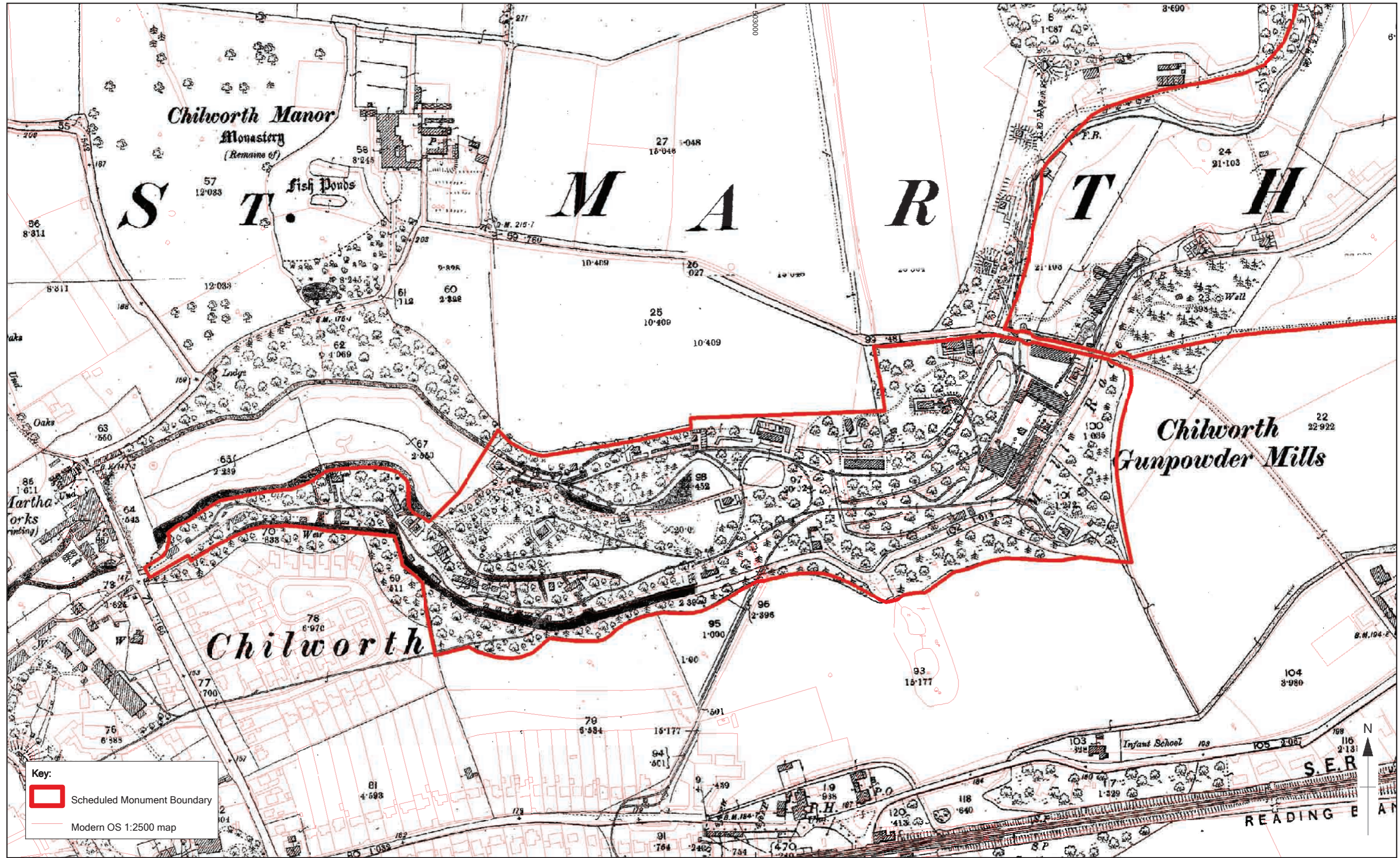
2.12.17 At Chilworth there is a distinct row of four surviving yew trees immediately to the south-east of Bridge 9 which very strongly appear to have been deliberately planted. This is between the lower incorporating mills (16) to the north-west and a complex including a charcoal store (14) and mixing house (15) to the south-east. Yew trees were identified on the English Heritage survey and this shows a clear concentration within the eastern half of the historic Middle Works (1650s expansion shown on Figure 2). This area extends from the row of trees referred to above to a pair of incorporating mills to the east (26, 26) and it housed the main processing buildings in the 17th and 18th century works. In relation to the overall complex this is a small area but whereas c.12 yews have been identified here none have been identified in the EH survey outside it². It is well known that yew trees can grow to a great age and it may be that these do survive from the 17th-century complex. Unfortunately there is no reliable, accepted means of determining the date of yew trees in the way that dendrochronology can be used for other species.

2.12.18 The site would not have had a heavily industrialised appearance like a 19th ironworks or a large cotton mill. Due to the danger from accidental explosions, buildings were relatively small, dispersed and of light-weight construction. This allowed the mills to be easily rebuilt after an explosion and ensured that in the event of an explosion there was not large quantities of building debris blown across the site.



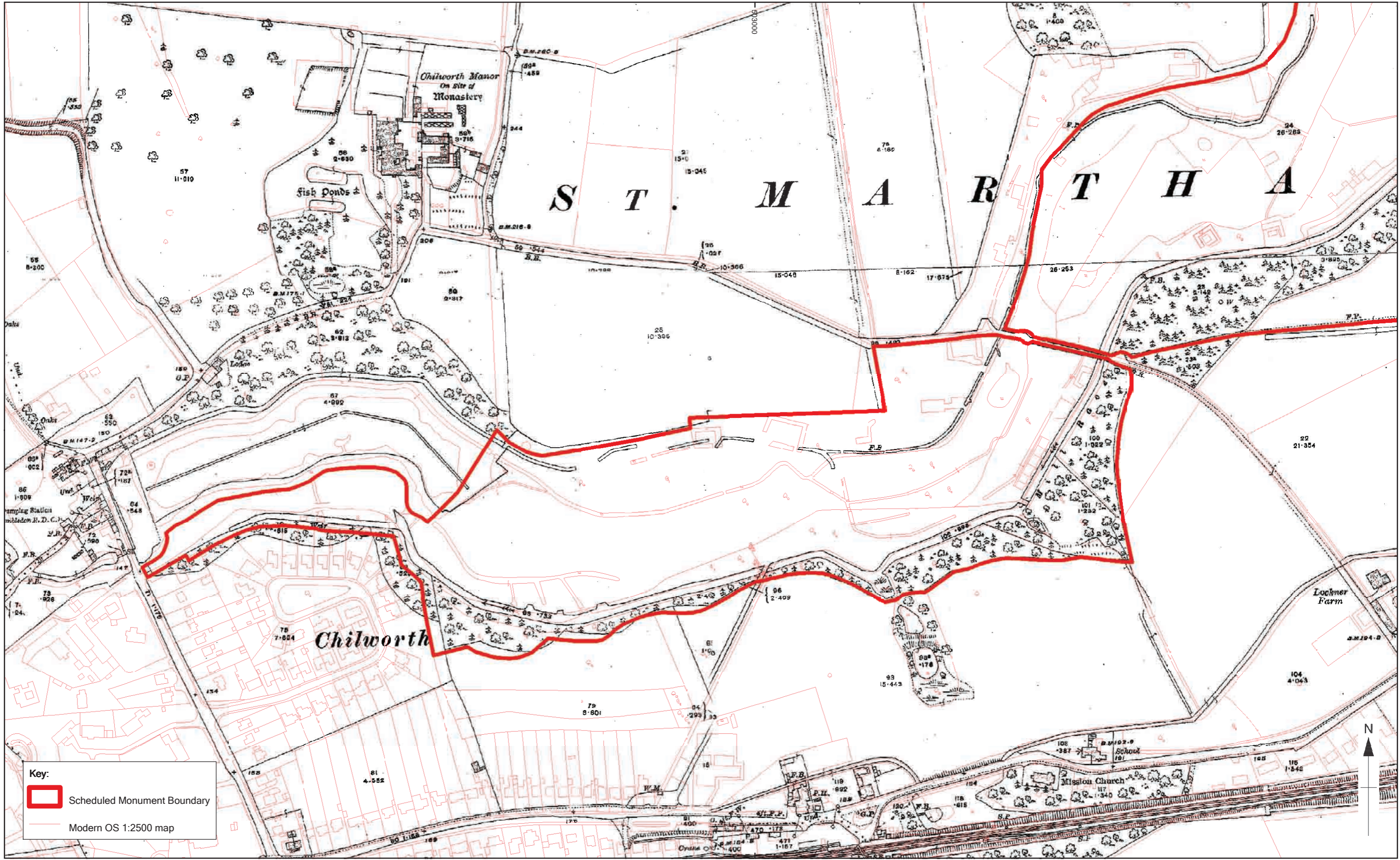
Plate 12: Yew trees planted at Chilworth for blast protection

2 The EH survey did not include a comprehensive tree survey so it may well be that there are some isolated yews outside this area but not the concentration found here.



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Figure 6: 1896 Ordnance Survey map laid over modern layout



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Figure 7: 1916 Ordnance Survey map laid over modern layout

NB: The historic layout was not shown on the 1916 map due to wartime restrictions

0 100 m
Scale at A3 1:3000

- 2.12.19 The adoption of edge-runner mills in the first half of the 18th century, replacing the previous stamp mills, would have increased the efficiency of production and reduced the noise of manufacture. It appears that edge-runner mills were sometimes known as 'dumb mills' due to their quiet operation and they are described as such on the view of the Waltham Abbey powder mills in 1735 mentioned above (Crocker 2002).
- 2.12.20 The relatively quiet nature of the site, compared to other industrial complexes, would also have been added to by the fact that there would probably only have been a modest workforce and the processes, such as grinding and incorporation were relatively slow. In common with other gunpowder works water power was used for almost the entire manufacturing life of the site. This was partly due to the obvious dangers of introducing boilers and steam power into a gunpowder works but also because water provided the regular, relatively modest power required.
- 2.12.21 The character of the site altered significantly from c.1885 when the Chilworth Gunpowder Company undertook a major expansion and investment. Historic maps show that subsequent to this the buildings were more closely spaced and surviving structures such as the steam incorporating mills (Gazetteer No.52) show that some of these were substantial, although still nothing like many other late 19th century industrial complexes. It was also only at this stage that steam power was utilised at the works.
- 2.12.22 In this period the landscape would also have been altered through the introduction of a tramway network around the site and the construction of distinctive Chilworth mounds (protective accidental blast banks) around buildings.

2.13 Natural and ecological heritage of the area

- 2.13.1 Other than the significance of the archaeological remains at Chilworth the other main interest of the site is its ecological and natural heritage. The site has been visited and discussed with Chris Matcham from Surrey Wildlife Trust who have undertaken a number of monitoring works and surveys at the site.
- 2.13.2 Although Chris Matcham confirmed that the site does not currently have any formal ecological designation (see further detail below in Part II: significance) it does have specific interests and areas where this interest is concentrated. The main areas of interest are within a band along the northern edge of the site and they include the common dormouse (a protected species), badger setts, the grass snake, as well as brook lamprey and bullhead in the watercourses. Brook lamprey is a freshwater species (not a true fish) which is not a directly threatened species but which is in need of general conservation measures to prevent a decline in its population. It has been noted at Chilworth in the New Cut, close to where the Environment Agency has undertaken some works to alter the course of the canal.
- 2.13.3 The Surrey Wildlife Trust have placed 30 dormice boxes at Chilworth and there are plans to place another 20 boxes at the site to allow it to join a national scheme. These boxes are entirely in the northern part of the site (to the north of

the Tillingbourne) where almost all the hazel trees at the site are concentrated. Hazelnuts provide food for dormice and due to the distinctive way that different animals open the nuts the empty shells also provide a very useful way of monitoring the presence of dormice. The most westerly dormice box is close to Gazetteer number 56 and the others currently extend eastwards towards the edge of the site. The SWT are now keen to also site some boxes to the west of No.56 (but still to the north of the stream).

- 2.13.4 The site includes some very old hazel trees (and other trees) which have been coppiced many times in the past and historically, when the site was a gunpowder mills, this would have been undertaken to maintain a supply of suitable wood for charcoal production. Coppicing is also important from a woodland management standpoint to encourage biodiversity, provide a rich variety of habitats and ensure that young, coppiced hazel trees produce nuts.
- 2.13.5 There is very little hazel to the south of the Tillingbourne and this reduces the likelihood for dormice inhabiting this area, as does the greater disturbance from the higher number of visitors. It does not rule out the possible presence of dormice but the lack of distinctively opened nut shells does reduce the scope for finding clear evidence of them.
- 2.13.6 As well as the concentration of hazel trees in the northern area the dormice also benefit from the tree canopy created by the relatively dense woodland which allows the animals to pass from tree to tree along adjacent branches.
- 2.12.7 The northern part of the site also includes a number of badger setts, particularly in the protective earth 'Chilworth' mounds which would have surrounded some of the powder mill buildings. The higher parts of the mounds where the earth is relatively dry provides a good environment for the badgers although this does create a potential conflict because the badger setts may damage the scheduled monument.
- 2.13.8 There are no rare trees at the site at the site and several invasive, non-native plants have been identified which should be removed. These include Himalayan Balsam and Japanese Knotweed close to the Packhorse Bridge. There are also deer (roe deer) at the site although these are neither rare nor protected.

CHILWORTH
GUNPOWDER MILLS

CONSERVATION
MANAGEMENT PLAN

SIGNIFICANCE
OF THE SITE

3 SIGNIFICANCE OF THE SITE

3.1 Basis of the assessment

- 3.1.1 Before considering the issues that affect the place, or developing policies for conservation or management, it is necessary to define what it is that gives significance to the place and therefore warrants protection. The assessments proposed below for the significance of Chilworth Gunpowder Mills are drawn from the wider understanding of the history and nature of the site which is detailed elsewhere in this report. The assessment of significance, is based on relevant and appropriate criteria as set out below.
- 3.1.2 The assessment of significance of the Gunpowder Mills site is in alignment with English Heritage's *Conservation Principles Policies and Guidance* (2008) (Section 3.3) and the key phases of significance (Section 3.4). The assessment of significance is here expressed as an overall statement of significance, followed by categorised values according to evidential, historical, aesthetic and communal values. As virtually the entire site is a Scheduled Monument it is all by definition of national significance. Its importance is as a landscape that has developed through time, rather than as the sum of its parts and an holistic approach should be taken to understanding it as a single entity. Therefore it has not been attempted to provide individual assessments of relative significance for each distinct feature at the site. However the gazetteer does attempt to show what is of particular interest about each feature (*Significance and interpretation potential*).
- 3.1.3 *Definition of heritage values*
- 3.1.4 Chilworth Gunpowder Mills is a complex site which encompasses layers of archaeological and historical development, which include a number of different functional components. These may be valued for different reasons by different people, all of which should be taken into account in determining the overall significance of a place. English Heritage have identified four areas of heritage values which will be used in determining the overall significance of the site (*Conservation Principles Policies and Guidance* 2008):

Evidential - this derives from the potential of a place to yield evidence about past human activity. This includes physical remains as the primary source of evidence and the people and cultures that made them. Significantly, where there is a lack of written records the importance of the material record increases.

Historical - this originates from the ways in which past people, events and aspects of life can be connected through a place to the present. This may include illustrative value, such as its connection to an important development such as technology, or associative value such as the connection to an important event or person.

Aesthetic - this is derived from the ways in which people draw sensory and intellectual stimulation from a place. These may be related to the design of a place for example through defensive reasons, or the informal development over time such as the relationship of structures to their setting.

Communal - this derives from the meaning of a place for the people who relate to it, this includes commemorative, symbolic, social and spiritual value. For example, some places may be important for reminding us of uncomfortable events in national history.

3.1.5 In addition, due to the nature of the Chilworth site, a similar assessment has been made of the ecological and natural-heritage value of the site.

3.1.6 As stated above virtually the entire site is defined by its scheduled status as being of national significance and therefore no attempt has been made here to provide relative levels of significance for individual elements.

3.2 Chilworth Gunpowder Mills summary statement of significance

3.2.1 **Chilworth Gunpowder Mills is a nationally significant site and one of the country's principal surviving monuments to an industry which helped define the post-medieval world.**

3.2.2 Heritage value can be measured in a range of cultural areas:

3.2.3 The *evidential value* of the Chilworth site is of importance in the potential offered by the surviving remains, both above and below ground, for future research and investigation.

3.2.4 The site has a strong *historical illustrative* value generated by its remarkably long period of operation and the fact that for much of this period it remained of considerable importance in the wider industry. The remains at the site can illustrate all the key gunpowder manufacturing processes undertaken at the site.

3.2.5 The site has *historical associative* value through its connection with a number of important events, individuals, periods and technological, social or economic developments. Among these direct associations are the English Civil War, the empire and East India Company, the First and Second World Wars and the period in the later 19th century which has been termed the Second Industrial Revolution.

3.2.6 The site also has an *aesthetic value* which is largely generated through the attractive combination of romantic fragmentary ruins from the former complex interspersed within a natural environment woodland, meandering watercourses and surrounding hillsides

3.2.7 The gunpowder mills has a *communal value* through the sense of pride that local people feel towards the former gunpowder works and the extent to which it provides a sense of identity.

3.3 Individual assessments of significance

3.3.1 *Evidential value*

3.3.2 The site has great evidential value and potential to yield evidence about past human activity. The main potential lies in the buried remains that almost certainly

survive from earlier phases of the works, often lying beneath or incorporated into the lower parts of buildings reconstructed in the 19th century. It would be commonplace for a complex such as this to reuse the same locations and water channels for individual mills and it is also likely that at least some of the buildings, such as incorporating mills, would have had substantial foundations which remain buried. The water logged nature of parts of the site may also have enhanced the likely level of preservation although the roots of trees and plants may have disturbed the remains, thus diminishing the evidential value.

- 3.3.3 The extent of these remains are clearly much less understood than the visible remains of the late 19th century complex and the site has considerable evidential value in this area.
- 3.3.4 The site also has a wider evidential value in a number of areas such as the remarkable survival of the landscape of almost the entire site from the period of the works' greatest extent. Clearly the large majority of the buildings have been lost but it is still possible to trace the outline of the vast majority of the complex and to understand the landscape of the works from the surviving structural remains, the water courses, the earth banks and other features. As with all archaeological sites such as this physical evidence can enhance our understanding of Chilworth in ways which other sources such as documentary evidence and oral history cannot.
- 3.3.5 The great evidential value of the site is partly based on its sheer size and the dense concentration of archaeological remains. This is particularly true of the GBC owned part of the site, where there is a vast number of surviving fragments from the former complex.
- 3.3.6 The potential of the archaeology of the standing buildings is similarly considerable and offers opportunities for investigation and analysis of features or areas which have not hitherto been studied in detail. This has the potential to elucidate dates, technologies, functions, contexts and sequences as well as enhancing understanding for how production around the site was organised. More remains to be learned of how dangerous processing buildings were shielded by protective banks, how materials were transported around the site and in some limited areas what paint schemes were used in buildings. Physical evidence such as fragments of sinks, bed frames and roofing material can also provide important evidence of the reuse of the site as Tin Town after the closure of the main works.
- 3.3.7 The site also retains features from the post-powder mills period with an important evidential value relating to the Second World War and the GHQ stop line as well as to Tin Town.
- 3.3.8 *Historical value*
- 3.3.9 Another key area of its significance is its historical value, both illustrative and associative, which was generated through the remarkably long period of almost 300 years in which the mills remained in operation.
- 3.3.10 *Historical illustrative:* Chilworth was a relatively early mill, established less

than a century after the construction of the first permanent gunpowder works in the country in the mid 16th century, and it very rapidly became of national significance in the context of the gunpowder industry. Although the original East India Works were only a limited success the site was already seen as having sufficient potential to justify a major expansion in the mid 1630s, under new owners, and to convince the King to grant a monopoly of gunpowder manufacture to the Chilworth site. Thus barely a decade after its establishment Chilworth became the only legal gunpowder works in the country.

3.3.11 Indeed the fact that it has always been seen as an early mill of historical interest is reflected by a claim made in the 17th century by John Aubrey that the Chilworth powder mills were the first in the country as well as by a similar claim on Bowen's map of Surrey in 1753. In the 19th century the Chilworth Gunpowder Company also published promotional material stating that the site had been established in 1570 (Crocker & Crocker, 2000).

3.3.12 Despite great fluctuations in the fortunes of the gunpowder industry generally Chilworth's prominent position remained so that in the later 17th century, under the ownership of Sir Polycarpus Wharton, the works had grown to be by far the largest in the country supplying the Board of Ordnance. In the 18th and early 19th century Chilworth's significance in the industry diminished, particularly relative to the great complexes of the Royal Gunpowder Mills established in this period at Waltham Abbey, Faversham and Ballingcollig in Ireland. However the establishment of the Anglo-German Chilworth Gunpowder Company, and the resulting expansion of the site in the later 19th century returned Chilworth to a position of prominence and significance within the industry.



Plate 13: Date '1873' built into brickwork of expense magazine

- 3.3.13 Both its relatively early date, the fact that it was of importance almost from the outset and the fact that it remained of importance until its closure after the First World War give it historical illustrative value.
- 3.3.14 The site also an historical illustrative value related to the adoption and development of new technologies, particularly in the late 19th-century period when the site was owned by the Anglo-German Chilworth Gunpowder Company. This was a period when there was rapid development in the field of chemical and explosive industries and the company remained in the vanguard of these developments utilising a vibrant interchange of technical information with other home and foreign producers. Indeed it was specifically set up to manufacture an important new brown (or 'cocoa') powder which had been developed in Germany in the 1880s.
- 3.3.15 This phase in the site's history is illustrative of a period sometimes known as the Second Industrial Revolution during which Germany overtook Britain as Europe's leading industrial power. Chilworth is of great interest in the way that it provides a reflection of these wider economic and industrial trends. The German connection also provides something of a backdrop to the slide towards the First World War in the same way that the site provides a backdrop to the slide towards the Civil War in the 17th century.
- 3.3.16 Significant developments of this period which the site illustrates and which provide the site with a historical illustrative value include:
- Suspended edge runner mills
 - Brown powder technology
 - Metric gauge tramway - probably the first in England (Crocker A, 1994)
 - German RSJ's in the 1885 incorporating mill which are stamped 1884 and which are almost certainly among the earliest steel joists used in England (The English Heritage report on Chilworth states that commercial manufacture in England of RSJs only started in 1886)
 - The pioneering use of corrugated iron particularly as revetment for earth blast mounds, which was subsequently widely copied elsewhere and which were known as Chilworth mounds
 - Improved methods of quality control - proofing
 - Modern management and an international business structure which was ground breaking for the period but which formed a model for big business in the 20th century.
- 3.3.17 *Historical associative value*
- 3.3.18 Due to the site's long period of production and sustained importance within the industry it has strong associations with key historical events which gives the site historical associative value and enhances the site's ability to increase our understanding of these events. Among these associations are:

- 3.3.19 The *English Civil War* when the site supplied the Parliamentary forces with gunpowder and changed hands during the conflict. The mills were pulled down and rebuilt at least once during the war when the site was about to fall into the enemy's hands and the complex was also of great importance during the 1630s during the period of the King's personal rule and the slide towards conflict. In this period the site held the Royal monopoly on the industry and was the only legal powder works in the country but this collapsed apparently due to the King's inability to pay for the powder produced at Chilworth. The history of the Chilworth mills in this period forms an illustration of the deteriorating relations between the King and Parliament and forms an important backdrop to this crucial period in the country's history.
- 3.3.20 The *East India Company* which established the Chilworth works was also of considerable significance in the development of Britain from the 17th to the 19th centuries through overseas trade and the establishment of the Empire. This association enhances the significance of Chilworth although it was a relatively brief period in the site's history and was only moderately successful for the company.
- 3.3.21 The *late 19th-century expansion* of the site by the Anglo-German Chilworth Gunpowder Company and further developments related to the First World War also add greatly to the interest of the site. This provides it with an international dimension and it could be argued that this phase is of international importance due to it demonstrating the internationalisation of industry in the late 19th century and the development of large industrial concerns financed by shareholders.



Plate 14: Second World War pillbox at site

- 3.3.22 The *Second World War* is a secondary phase of the site's history and the surviving Defensive structures are still of considerable historical significance. They do relate to the vast GHQ line which passes adjacent to the site to form a great defensive ring around London, extending from Somerset to Essex and up to Yorkshire, and which is the most significant defensive 'stop line' in the country. The surviving structures also have an important interpretative value in illustrating to visitors the fear which must have pervaded the country in 1940 and the desperate measures taken intended to slow the Nazi advance in the event of invasion. Preserving vast defensive lines such as this are notoriously difficult due to the danger of adhoc demolitions of individual elements gradually eroding the integrity of the overall line.
- 3.3.23 The site also has a connection with a number of other historical phases or specific events such as:
- The many other wars the country has fought since the early 17th century and the fluctuating fortunes of the site in relation to these conflicts
 - Thomas Coram, one of the partners in the earlier 18th century, who was an important philanthropist who established the London Foundling hospital for unwanted children
 - The South Sea Bubble
 - Huguenot refugees
 - Women workers during the First World War.
- 3.3.24 The documented history of the site including historic plans, maps, surveys, pictorial evidence, photographs and official papers, provide a valuable overall body of evidence illustrating how the site has evolved and adding to the significance of the complex. This surviving body of evidence is nothing like as extensive as that of the Royal Gunpowder Factories, presumably because it was a private works, but it does include a map of the site from 1728 which is the earliest detailed representation of an English gunpowder works. Extensive research has already been undertaken using the known documentary sources and this has provided a good baseline understanding of the site. There remain further avenues for study such as social or oral history studies of the Tin Town phase.
- 3.3.25 *Aesthetic Value*
- 3.3.26 When the gunpowder mills were being constructed and developed aesthetic or architectural considerations would have played very little role in their design and location. However, the fortunate combination of surviving woodland together with watercourses and archaeological ruins give the site an important aesthetic value. The surviving structures add an attractive and romantic value to the site, similar to the value placed by artists, explorers and landscape architects on ancient remains in previous centuries. Their frequently overgrown nature can be seen to add to the romantic appeal although of course this may be causing significant damage to the remains.
- 3.3.27 This value is common to other gunpowder works and other mill sites and is the reason why a number have been converted to parks or areas of council owned



Plate 15: Romantic ruins of incorporating mill at site

managed woodland. Examples include Hounslow, Oare and Chilworth. It is particularly enhanced at Chilworth by the immediately surrounding hills to the north, including St Martha's, and the wider area which forms part of the Surrey Hills Area of Outstanding Natural Beauty. The approaches to the gunpowder mills are also attractive and add to the historical character of the site. Its rural nature is also increased by the lack of visual intrusion from modern buildings. Apart from a relatively small area at the western end of the site where a number of gardens back onto the site there are no inappropriate structures visible from within the site which detract from its character. The same cannot be said for the Oare gunpowder works where the surroundings detract considerably more from the site.

- 3.3.28 This attractive nature of the site and surrounding area is reflected by the fact that there are two official long-distance walks through (or immediately adjacent to) the site.
- 3.3.29 A number of the surviving structures, particularly the 1885 incorporating mill, are also large impressive structures which add to the visual impact and aesthetic value of the site.
- 3.3.30 *Communal Value*
- 3.3.31 The gunpowder mills has an important communal value to local people both for the direct opportunities it offers for recreation and exercise in a natural environment but also for the less direct sense of history and contact with past generations. Chilworth is a small community and the fact that this was the site

of such a large and historically important complex as the gunpowder mills is a source of considerable local pride. The questionnaire undertaken in the current project has confirmed the site's value to the community with many respondents mentioning the sense of history as a main reason to visit.

- 3.3.32 For many this bond will have been strengthened by the long period in which they have lived in the locality and the questionnaires have highlighted the remarkable number of people who said that they had lived in the area for 50 or even 60 years. There are probably still a considerable number of people who lived in the area when Tin Town was occupied and possibly even during the Second World War and before. There may be people whose relatives worked at the factory before it closed (although only one questionnaire respondent stated this) and this would clearly greatly increase the communal value of the site to local people, as well as the evidential and historical value.
- 3.3.33 This value is demonstrated in communal activities such as the Chilworth Gunpowder Mills Group volunteers who control vegetation at the site and undertake minor archaeological works, as well as a Millennium Play which was performed in 2000 at Lockner Farm on the theme of the powder works. The site has seen considerable research, largely at an amateur level by very knowledgeable enthusiasts and it may be true to say that the site has been valued more at a local level than at a higher level within GBC.
- 3.3.34 Indeed the fact that the site appears to have been more valued locally than within the wider borough has probably strengthened the sense of identity that the community has with the site and increased the proprietorial role that some neighbours feel towards the former works. There is a particularly strong relationship for a number of neighbours whose property adjoins the former works and whose gardens open directly onto the site.
- 3.3.35 The site has considerable symbolic value and has the ability to evoke a broad spectrum of both pride and shame in its historic past. There may be great pride felt, particularly in local people, towards the bravery and endeavours of past generations to give this site such an importance in the history of the gunpowder industry and in major events such as the Industrial Revolution, the Civil War and the First World War. However there may also be unease felt regarding the supply of gunpowder to fight wars, particularly overseas wars of empire. The site may even evoke a sense of horror when considering the industrial-scale slaughter of the First World War using explosives produced at Chilworth.
- 3.3.36 The site has a valuable potential to communicate such uncomfortable truths about the past although this potential will only be realised through careful interpretation.
- 3.3.37 The German ownership of the site in the later 19th and early 20th century, including up to the outbreak of the First World War, adds to this element of the site's symbolic value.
- 3.3.38 The site also has something of a commemorative communal value due to the significant number of explosions and fatal accidents at the works. Although there are currently no formal commemorative stones or plaques at the site such

a feature would be appropriate at the site and may be incorporated there in the future.

3.3.39 *Ecological value*

- 3.3.40 The gunpowder mills site was assessed in 1996, together with other similar areas in Guildford Borough, and considered for either formal protection (such as a statutory SSSI) or for non-statutory designation (e.g. a Site of Nature Conservation Importance, SNCI). At this time, although c.80 SNCI sites were identified in Guildford Borough, the Gunpowder Mills was not judged to be of particular ecological importance to warrant formal protection or designation.
- 3.3.41 This does not however mean that the site has no ecological value or worth and it appears that in recent years a number of important rare species have been identified at the site. These have included brook lamprey and bullhead in the stream and canal (New Cut) but the principal interest is the fact that the common dormouse is known to inhabit the site. The dormouse is a both nationally and locally rare and it is officially endangered and protected. The gunpowder mills site forms part of a small concentration of known dormice nesting sites in the vicinity and it this link between local sites is of importance because it should allow the numbers of dormice in each area to breed and colonise new territories.
- 3.3.42 Chris Matcham from the Surrey Wildlife Trust has stated that for a period the gunpowder mills was the best site in Surrey for dormice (although this has now been superseded by another location: Merrow Down, also owned by GBC).
- 3.3.43 In addition the previous assessment was not a comprehensive study covering all aspects of wildlife potential. The site may be formally designated in the future as areas such as this are slowly being reviewed as possible County Wildlife Sites.
- 3.3.44 There are no trees at the site considered to be rare or significant in a wider ecological context relative to other similar sites although as stated elsewhere the natural and overgrown character is greatly valued by many local people who visit the site.

CHILWORTH
GUNPOWDER MILLS

CONSERVATION
MANAGEMENT PLAN

CONSERVATION
ISSUES AND
POLICIES



4 CONSERVATION ISSUES AND POLICIES

4.1 Aims and approaches

4.1.1 The aim in identifying issues and proposing policies is to enable the conservation management of the Chilworth Gunpowder Mills site so as to ensure that what is of significance about the place survives for the benefit of future generations as well as serving the needs of the present.

4.1.2 The approach adopted in establishing issues and developing policies is drawn directly from the principles and supporting guidelines set out by English Heritage in *Conservation Principles, Policies and Guidance*, 2008. English Heritage have also produced a series of other documents which provide guidelines and advice for managing historic sites. Among these documents are *Making the Most of Your Local Heritage*, 2008 and *Managing Historic Assets*, 2009.

4.1.3 Representing the essential foundation for current and future conservation planning and protection in the historic environment, the six guiding Principles are:

- 1 Understanding the significance of places is vital
- 2 The historic environment is a shared resource
- 3 Everyone should be able to participate in sustaining the historic environment
- 4 Significant places should be managed to sustain their value
- 5 Decisions about change must be reasonable, transparent and consistent
- 6 Documenting and learning from decisions is essential.

4.1.4 To reflect the principles through all aspects of policy development, issues and their resultant policies are considered in groups in order to:

- Ensure that the evolution, character and significance of the Gunpowder Mills are fully understood as the essential basis for decision-making
- Secure methods of management which safeguard and protect the elements of the place which are of significance and value
- Promote a philosophy of conservation which retains evidential and other values, and ensures that they remain accessible to future study and understanding
- Foster a regime of conservation management which secures a long-term future for the place through its coherence, sustainability and relevance;
- Create opportunities to promote and extend public access and understanding of the place, through its presentation and the involvement of the public in its care and development
- Resolve possible conflict between differing conservation demands through clear and cogent policies, and the integration of conservation with the public interest.

4.2 Existing policy framework

- 4.2.1 An overall policy framework for protection of the site and setting exists in national and local policies and in guidance notes. The relevant statutory planning policy framework has until recently been set out in the Government's PPG (Planning Policy Guidance) 15: *Planning and the Historic Environment* and PPG16 (*Archaeology and Planning*). PPG15 covered detailed guidance on the protection of the built historic environment, including listed buildings, conservation areas and historic landscapes while PPG16 provided guidance on Scheduled Monuments as well as archaeological areas and remains.
- 4.2.2 These are now replaced by the unified and shortened Planning Policy Statement (PPS) 5, covering both areas of application and supported by an associated PPS Practice Guide. This is a joint publication by the Department for Communities and Local Government, Department of Culture, Media and Sport and English Heritage.
- 4.2.3 Chilworth Gunpowder Mills is afforded statutory protection as an historic asset by virtue of its status as a Scheduled Monument, designated for its national importance by the Secretary of State under the Ancient Monuments and Archaeological Areas Act, 1979. This details the principles of scheduled monument designation, nature of the protection and the procedure for applying for SMC.
- 4.2.4 The national legislation and guidance documents are supported at local level by the policies of the Local Authority set out in its Local Plan, with relevant policies covering the Natural and Built Environment, Landscapes and the Historic Environment.
- 4.2.5 ***Guildford Borough Local Plan*** (adopted in 2003) includes the following policies which are relevant to the Gunpowder Mills site:
- 4.2.6 *Conservation Areas (Policy HE2, HE7 - HE10)*: Proposals for development will not be permitted if they do not preserve or enhance the character or appearance of the conservation area as identified in the character assessment document. Development proposals which are outside a conservation area but which would adversely affect its setting, or views into or out of it will be refused.
- 4.2.7 *Areas of High Archaeological Potential*: 'Where development proposals fall within an area of high archaeological potential as identified by the County Council, the Borough Council will require that an initial assessment of the archaeological value of the site be submitted as part of any planning application'.
- 4.2.8 *Scheduled Monuments and other sites and monuments of national importance (Policy HE11)*: Planning permission will not be granted for development which would harm the archaeological importance of scheduled monuments and other monuments of national importance or their settings'.
- 4.2.9 *Locally listed buildings (Policy HE6)*: In considering applications for development affecting buildings included on the local list the council will have regard to the

effects on the development on the architectural or historic interest of the buildings and its setting.

- 4.2.10 *Surrey Hills Area of Outstanding Natural Beauty (Policy RE5)*: The SHAONB is of national importance and will be subject to the most rigorous protection. Development inconsistent with the primary aim of conserving the existing landscape character will not be permitted.
- 4.2.11 *Area of Great Landscape Value (Policy RE6)*: Development within the Area of Great Landscape Value should be consistent with the intention of protecting the distinctive landscape character of the area.
- 4.2.12 *Species protection (Policy NE4)*: Planning permission will not be granted for any development that would be liable to cause any demonstrable harm to a species of animal or plant or its habitat protected under British law unless conditions are attached requiring the developer to take steps to secure their protection’.
- 4.2.13 *Green belt development (Policies RE1 - RE3)*: Within the Metropolitan Green Belt new building will be deemed inappropriate unless it is for the following purposes: agriculture and forestry; essential facilities for outdoor sport and outdoor recreation, cemeteries and other uses of land which preserve the openness of the Green Belt and which do not conflict with the purposes of including land within it; limited extension alteration or replacement of existing dwellings. Chilworth is one of a number of settlements where new building will be permitted for ‘community or employment facilities appropriate to the scale of the settlement’ although this will not be permitted where it ‘involves the loss of important open spaces or harms the character or appearance of the area’ (Policy RE3).
- 4.2.14 The *Guildford Landscape Character Assessment (LCA)* was adopted in January 2007 and forms part of the evidence base supporting policies within the Development Framework. The current site forms part of the Tillingbourne Greensand Valley Area (Area L1).

4.3 Conservation issues and policies

- 4.3.1 Issues and vulnerabilities that affect the place are set out below and grouped broadly according to *Conservation Principles* (2008). These are interpreted as being:
 - Assembly of sufficient knowledge for a proper understanding and assessment of the place, in all its important aspects (*Understanding, recording and research*)
 - Protection of the significance and values of the place (*Protection of significance*)
 - Ensuring that strategies for maintenance, repair, restoration or alteration of the site are of a standard to safeguard significance and avoid erosion of the asset (*Conservation*)
 - Ensuring that arrangements for the protection of significance are sustainable over time (*Sustainability*)
 - Resolution of potential conflict between differing interests and other public objectives (*Resolution of conflict*)

- Securing maximum benefit for the wider community, promoting a sense of sharing and participation in the resource and reflecting its public ownership (*Enhancement, legibility and access*)
- Enhancing the visitor's understanding of the history and significance of the site (*Visitor issues and interpretation*).

4.3.2 For each of the policy areas a summary of how the significance of the place is vulnerable is provided followed by policies designed to retain those significances.

4.4 **Policy Area A: CONSERVATION**

4.4.1 *CONSERVATION PRINCIPLES*

4.4.2 The remains at Chilworth require an extensive programme of conservation repairs and consolidation the vast majority of which will be fixing and resetting brickwork and other structures. It is vital that these repairs are undertaken to the highest standards using recognised principles and techniques of conservation.

4.4.3 In many places there are sections of collapsed brickwork which survive immediately adjacent to voids in walls or structures from where they have clearly fallen. In a number of cases it would be appropriate to re-set these sections of brickwork in their historic location although a cautious approach to this should be taken and it will not be appropriate where identifying the historic location of the brickwork is speculative.

4.4.4 **POLICY 1: Guildford Borough Council will adopt high standards and best current practice in the care and conservation of the Gunpowder Mills site, in line with the philosophy enshrined in the English Heritage document *Conservation Principles*.**

4.4.5 *Policy 1.1: Maintenance of standards*

4.4.6 To repair, develop and maintain the Gunpowder Mills site in accordance with international and national conservation principles and policies and to ensure that all statutory and legal requirements are met.

4.4.7 *Policy 1.2: Detailed schedule of repairs*

4.4.8 A detailed schedule of repairs will be drawn up, using the outline recommendations contained in this document, and implemented by an appropriate conservation builder. All works of repair and maintenance should be to good conservation standards and undertaken under a Scheduled Monument Consent. They should be carried out in a manner which retains significance, avoids the destruction of evidence, follows historical accuracy in design, materials and workmanship, and should be recorded in permanent form.

4.4.9 *Policy 1.3: Employment of contractors*

4.4.10 To ensure that the design and carrying-out of repairs or alterations take account

of the significance of the Gunpowder Mills, utilise historically-appropriate materials and techniques and ensure that these are undertaken in accordance with suitably qualified professional advice.

- 4.4.11 Guildford Borough Council should seek to achieve and maintain high standards of Health and Safety provision for staff, volunteers, contractors and visitors to the site.
- 4.4.12 ***ROUTINE MAINTENANCE***
- 4.4.13 The key to the successful long-term maintenance of the structural remains at the gunpowder mills will be a regular cycle of maintenance and inspection that should prevent the development of crises from often quite minor issues. Such a cycle of routine maintenance has been lacking in the past and this has led to many of the issues, particularly relating to structural condition, which face the site today.
- 4.4.14 A robust, planned, preventative maintenance and repair regime based on sound knowledge of the site, with regular inspection and review, early identification of problems and prompt/responsive maintenance and repair should ensure that once the remains have been stabilised and consolidated they remain in good and sustainable condition and that costs remain manageable.
- 4.4.15 The inspections, and the preparations of maintenance within forward work plans will be based on the principles detailed in the English Heritage document *Managing Heritage Assets*. The periodic inspections will check: i) the condition of the monument; ii) that previous recommendations have been applied; iii) that maintenance standards are appropriate; iv) to identify urgent works and v) to plan long term works.
- 4.4.16 **POLICY 2: Planned schedules of preventative maintenance for the Gunpowder Mills site both above and below-ground should be performed.**
- 4.4.17 ***Policy 2.1: Incremental site maintenance***
- 4.4.18 A regular programme of inspection supported by careful maintenance and repair, preferably based on quinquennial periods, should be established and maintained. Regular condition reports should be implemented, including fixed point photographic record when appropriate, ensuring that the place remains in good order and that all aspects of its significance are protected. Effective systems should be maintained to report on potential or actual defects. This should include the means to monitor gradual deterioration or change.
- 4.4.19 ***Policy 2.2: Maintenance policies***
- 4.4.20 Policies to guide both council and contractors' staff when planning or carrying out work at the site should be translated into specific, costed work programmes. Work programmes can also form the record of works carried out, augmented by additional reports where appropriate.

4.4.21 *Policy 2.3: Quality assurance*

4.4.22 Care should be taken to ensure that historic fabric is not damaged by maintenance or repair activities. Systems should be set up to control the quality of minor works of repair; it is important that the same high standards are applied to minor as to major works of repair.

4.5 **Policy Area B: PROTECTION OF SIGNIFICANCE**

4.5.1 *PROTECTION OF EVIDENTIAL VALUE, AUTHENTICITY AND INTEGRITY*

4.5.2 In addition to damage to the site from wear and tear, vegetation and vandalism there is also considerable potential threat to historic fabric and irreplaceable archaeological evidence from inadequate protection or badly informed decisions relating to repairs or alteration. Lack of knowledge relating to the significance of the site may potentially have a detrimental effect on the historic fabric, which is particularly at risk through intrusive site investigations.

4.5.3 The remains at Chilworth require extensive consolidation works and this will be followed by ongoing maintenance. It is essential that all these works are informed by a detailed understanding of the significance of each feature and of particular elements within each feature that add to their understanding. For example it will be important to retain joist sockets which may indicate the location of former floors and iron fragments may survive from former adjoining structures relating to the historic use of the building. Repair works to historic fabric will have to be informed to ensure that key features and the overall character of structures are retained.

4.5.4 The ongoing management of the site will include many other works which have potential to impact the evidential value, authenticity and integrity of the remains. This may include the installation of signs, notice boards and interpretation panels, the creation of boardwalks and wheelchair friendly tracks as well as various health and safety measures. Each of these may have a direct impact on the fabric or an indirect impact on the understanding of the structures.

4.5.5 Unless allowed under a Scheduled Monument Consent, there is a presumption against intrusive investigation work such as excavations to avoid potential damage to historic remains and archaeology. The Chilworth Gunpowder Mills Group has been granted Scheduled Monument Consent by English Heritage for specific works in predefined areas to be undertaken using sound archaeological principles. Metal detectorists may also constitute a threat to the site.

4.5.6 In addition at Chilworth there is potential for well meaning but misguided investigative archaeological works which are not properly planned or undertaken and which cause damage to historic remains. A number of programmes of archaeological works have been undertaken at the site, particularly by the Chilworth Gunpowder Mills Group, and these have been granted Scheduled Monument Consent by English Heritage and appear to have been undertaken using sound archaeological principles.

- 4.5.7 High standards in the planning and carrying out of maintenance and repairs, in line with Conservation Principles, will minimise risks and retain the maximum of significant fabric, with its contained evidence and its authentic character. Where such fabric cannot be retained, it is essential that mitigation for its loss be applied to ensure an adequately detailed analysis and record of its evidential value.
- 4.5.8 **POLICY 3: Conservation practice should ensure that evidence for historic development contained in the fabric of the Gunpowder Mills is protected from loss by damaging change, repair or alteration or that adequate mitigation is ensured through appropriate investigation and recording. All the sub policies below would be subject to Scheduled Monuments Consent**
- 4.5.9 *Policy 3.1: Removal of historic fabric*
- 4.5.10 A cautious approach should be adopted to the removal of fabric; any proposal for the removal of fabric must be fully justified and preceded by an assessment of significance. There will always be a presumption of retaining original fabric rather than replacing it. Where significant fabric is to be removed it should be recorded in situ and, if practicable, retained in site collections.
- 4.5.11 *Policy 3.2: Replacement of historic fabric*
- 4.5.12 A minimum intervention approach should generally be adopted for repairs, doing only such work as is necessary for maintenance and to prevent decay. In cases where it is necessary to replace defective fabric, renewal should as far as possible be in the same material as that replaced, or in material with closely matching appearance.
- 4.5.13 *Policy 3.3: Precautions during archaeological works*
- 4.5.14 There is a general presumption in favour of the preservation in-situ of all archaeological remains at the site. All future intrusive archaeological investigations will be informed by research designs.
- 4.5.15 *Policy 3.4: Establishment of systems*
- 4.5.16 Systems should be set up to guarantee the quality of minor repairs.
- 4.5.17 *Policy 3.5: Opportunities for further understanding*
- 4.5.18 Full opportunities should be taken from planned or emergency repair works to investigate and record significant fabric and infrastructure, and should be identified in research agendas (see Policy 14.1) and repair specifications.
- 4.5.19 *Policy 3.6: Maintenance of records*
- 4.5.20 Explicit records should be made of interventions in the fabric of the site by means of written, drawn and photographic records, in accordance with English Heritage Guidelines (Understanding Historic Buildings: A Guide to Good Recording Practice 2006) and be incorporated in the secure site archive proposed in Policy 15.



Plate 16: Vegetation causing damage to remains

4.5.21 **PROTECTION OF HISTORIC FABRIC**

- 4.5.22 The protection of the scheduled historic fabric of the gunpowder mills forms a central part of this Conservation Management Plan. Since the works closed after the First World War the surviving structures have received very little in the way of repairs or maintenance and therefore there are many areas where the condition of the surviving structures is poor. There are many sections of wall which are on the point of collapse due to tree root damage or lack of consolidation.
- 4.5.23 The overgrown nature of the site has been cited, particularly in the questionnaire which formed a part of the current project, as one of its attractions but this has been a principal contributor to the poor condition of the remains and the woodland on the site will have to be more closely maintained and managed to protect the archaeological remains. This should include a programme of selective tree clearance to remove particular trees whose roots may be destabilising buried or surface remains or which threaten remains by overhanging them. The tree clearance will also aim to clear key views or historic transport routes at the site. The footprints of former buildings will be cleared both to protect the potential buried remains and provide visitors with a greater understanding of the location of former structures.
- 4.5.24 In addition to the poor basic structural condition of the remains there are also many important diagnostic features such as iron brackets projecting from walls which are vulnerable. These vulnerable features are of particular importance and they enhance the understanding of the historic form and function of the structures.

- 4.5.25 The gunpowder mills is a popular site with local people but it does not currently see a very heavy level of use and the remains do not appear to be compromised or suffer through visitor numbers. Due to the overgrown nature of the mills and the hidden nature of the remains visitors tend to stick closely to the few paths through the site and generally the remains do not appear to suffer from being climbed over or explored too closely.
- 4.5.26 The site also appears to experience relatively little vandalism. This may be largely due to the apparent profile of most visitors either being hikers on long-distance walks or local people who value and appreciate the site. There are aspects of the site, particularly the surviving expense magazines, which are highly vulnerable to vandalism and potentially arson.
- 4.5.27 **POLICY 4: Risks of damage to the fabric of the site from visitors, vegetation removal, archaeological works, routine maintenance, larger scale programmes of repair and vandalism should be minimised through management activity, vigilance and by taking appropriate precautions.**
- 4.5.28 *Policy 4.1: Visitor wear and tear*
- 4.5.29 Visitor wear and tear should be monitored, with the ability to amend and improve protection measures where necessary. The impact on the monument through visitor wear and tear should be incrementally reviewed following development works which increase visitor numbers, access to the remains and the visibility of remains.
- 4.5.30 *Policy 4.2 : Vulnerability to vandalism*
- 4.5.31 A thorough review of the vulnerability of the site to vandalism should be conducted possibly with the introduction of measures to prevent access into buildings (e.g. expense magazines), to deter vandalism and prevent fire. This should be incrementally reviewed after works which are likely to increase the visibility of remains and attract different groups to the site.
- 4.5.32 *Policy 4.3: Vulnerability to damage from vegetation*
- 4.5.33 A programme of selective tree and shrub clearance should be undertaken to protect both known buried remains from the damaging affect of tree roots and above-ground remains from the potential of falling trees. Appropriate precautions will be taken to ensure that the removal of trees will not in itself cause damage to remains.
- 4.5.34 **STATUTORY PROTECTION**
- 4.5.35 The remains of virtually the entire former Chilworth Gunpowder Mills are principally protected by the scheduled status of the site (No.31397). The one exception directly relevant to the current study is the West Lodge which is listed Grade 2. In addition the site also forms part of the Chilworth Gunpowder Mills Conservation Area and an AONB. The site is also within Green Belt land.

- 4.5.36 The current system of heritage protection is under review in part to ensure that it reflects changed value perceptions of the historic environment, including increased recognition of the significance of modern military archaeology. It is anticipated that under the proposed new legislation, the site and its structures will automatically become a Grade I Registered Historic Asset. The Gunpowder Mills site represents a good example of the type of complex site with related above and below ground archaeological fabric that the new system is designed to protect. In future, proposals for works to such places will require Historic Asset Consent.
- 4.5.37 **POLICY 5: Early opportunity should be taken to update and enhance the description and designations of Chilworth Gunpowder Mills under new heritage protection legislation, ensuring a clear statement of significance as the basis for proper understanding and management of change.**
- 4.5.38 *Policy 5.1: Retain West Lodge*
- 4.5.39 The West Lodge is a key part of the Gunpowder Mills and should remain a part of the site in order to promote the wider understanding of the complex as well as potentially providing a facility at the site.
- 4.5.40 **PROTECTION OF SETTING**
- 4.5.41 The setting and wider landscape of the Gunpowder Mills is of considerable significance and enhances the value of the site. The most important element of the wider setting which enhances the value of the GBC owned site is the survival of much of the rest of the historic gunpowder mills site which is now privately owned. The outline of almost the entire former complex, of which the council owned land only forms about a half, can be traced along the Tillingbourne valley. The council owned and privately owned parts of the site are integral to each other and although to some extent the areas to the east formed distinct late 19th-century factories one of the most significant features of the site is the survival of the entire works landscape. Therefore any inappropriate development in the privately owned parts of the site would directly affect the significance of the GBC owned land at Chilworth. Fortunately inappropriate development in these areas is unlikely because the wider works site is designated as a Scheduled Monument (as well as a Conservation Area) and it is on the edge of an Area of Outstanding Natural Beauty. Therefore development would be strictly controlled.
- 4.5.42 In addition to the direct setting of the rest of the former factory the broader setting is also of value to the gunpowder mills site. In particular the picturesque and rural nature of St Martha's Hill overlooking the site as well as the larger Surrey Hills Area of Outstanding Natural Beauty, and the beauty of the Tillingbourne valley enhance the aesthetic appeal an attractive nature of the site. Chilworth village also largely retains its historic character as well as a number of buildings which directly relate to the gunpowder works.
- 4.5.43 **Policy 6: The broad and immediate setting of the Gunpowder Mills site should be carefully protected from damaging or intrusive development based on the significance of the Mills site established in this Conservation Management**

Plan. This should be maintained through the local planning authority's understanding of the significance of the site.

4.5.44 **PROTECTION OF ARTEFACTS**

4.5.45 The scope and number of historic artefacts currently at the site, or known to relate to it, and requiring specialist conservation is currently limited. There are a number of semi-portable items at the site, such as pipes and stove pipes whose condition is slowly deteriorating. Some of these could in future be stored at the proposed visitors centre/site facility but benign neglect would probably be the most appropriate approach for many of these features.

4.5.46 **POLICY 7: Measures to reduce risk to vulnerable artefacts should be drawn up or implemented, based on good practice and English Heritage guidelines.**

4.6 **Policy Area C: SUSTAINABILITY**

4.6.1 **SUSTAINABLE USE OF RESOURCES IN CONSERVATION MANAGEMENT**

4.6.2 It is vital that a site as significant as Chilworth Gunpowder Mills is carefully safeguarded for the benefit of future generations, and that all arrangements for its care are therefore sustainable over the long term. In addition operations on the site should be sustainable in terms of minimal consumption of natural resources.

4.6.3 **POLICY 8: The programme of repair and maintenance should be sustainable. This should mean that future funding is sought to maintain the subject of the works in the long term, that measures for protection of the site against environmental change are adequate and appropriate, and that methods and materials employed contribute to the sustainable use of energy and resources.**

4.6.4 *Policy 8.1: Exposing remains*

4.6.5 A cautious approach will be adopted when exposing remains for archaeological investigation and it will only be undertaken with a Scheduled Monument Consent. Known sites where there are no visible surface remains will generally be left undisturbed as this affords them the greatest protection.

4.6.6 *Policy 8.2: Maintaining vegetation removal*

4.6.7 A sustainable programme of vegetation removal from areas which may threaten structures will be instigated and maintained.

4.6.8 *Policy 8.3: Sustainable access*

4.6.9 The use of sustainable, environmentally friendly methods of transport to the site, would be encouraged. This would particularly include bus routes, using Chilworth Railway Station and walkers on the Pilgrims Way.

4.7 **Policy Area D: PUBLIC INTEREST, ENHANCEMENT, LEGIBILITY AND ACCESS**



Plate 17: Vegetation growing on 1880s Incorporating Mill

4.7.1 ESTABLISHING WHO VALUES THE PLACE AND WHY

4.7.2 The small questionnaire included in the current project has confirmed that Chilworth Gunpowder Mills is currently an amenity which is valued and used by the local community in Chilworth. The value these users place on the site appears to be principally based on the natural, overgrown character of the site as well as the opportunity it provides for exercise and to a lesser extent for its historical and archaeological remains.

4.7.3 The site is also used, and presumably valued, by the many hikers who pass through on long distance walks, but it is unlikely that many people visit from Guildford or further afield specifically to come to this site. This is largely because the site is not currently promoted within the Borough Council as a potential attraction for visitors and the site is not provided with the facilities for large numbers of visitors such as toilets, car parking, boxes for information leaflets. It is probably fortunate that the number of visitors has been relatively small because the condition of the archaeological remains is so poor that they would almost certainly have suffered further by a higher number of visitors.

4.7.4 Since its formation the Chilworth Gunpowder Mills Group has run an annual open evening which is always well attended and this will have increased the sense of value that the local community feels towards the site. This provides news of developments at the site and the original volunteers for the CGMG were recruited from the audience of one such open evening.

- 4.7.5 Increasing visitor numbers is not a prime objective of the current plan but realising its educational potential, while also preserving the remains, is and such an increase should therefore be anticipated and welcomed. Many local people and visitors to the site are currently unaware of the significance of the gunpowder mills and it is anticipated that both the profile of visitor groups and the value placed on the site, will alter as steps are taken to enhance this awareness and appreciation. Increasing the appreciation will encourage further local people to join in programmes of voluntary maintenance at the site or other tasks such as constructing paths or assisting at the (potential) visitors centre.
- 4.7.6 In recent years there has been a general increase in the popularity of archaeology through programmes such as Time Team and industrial archaeology in particular has established itself as a respected element of the archaeological spectrum.
- 4.7.7 **POLICY 9: Further research should be undertaken into the current users of the site and potential new groups of visitors as well as the potential impact that new visitors would have on the site.**
- 4.7.8 *Policy 9.1: Enhancement of local appreciation of site*
- 4.7.9 Opportunities will be taken to enhance the local and regional appreciation of the significance of the gunpowder mills site through outreach events and interpretation.
- 4.7.10 **INTERPRETATION AND THE SHARING OF KNOWLEDGE**
- 4.7.11 Despite the national significance of the Gunpowder Mills site there is currently very little interpretation to explain the history of the works or the importance of the surviving remains. The only interpretation at the site are two panels, one adjacent to the entrances at each end, which are useful in providing some outline information but they are unable to do any more than scratch the surface of the site's interest. Greatly enhancing the interpretation of the powder mills in a series of ways will be an essential element in the development of the site as an educational facility with a broader interest to different visitor groups. This should dovetail closely with the conservation works and the proposals to increase access around the site.
- 4.7.12 The interpretation should aim to inform at a number of different levels from primary school children to adult life long learning and it should cover many of the different interests of the site. It will also use a variety of techniques so as to be able to communicate with different visitor groups such as people passing through with no prior knowledge of the site, non-computer literate people, the physically disabled and technologically sophisticated people. It is anticipated that there will be a small number of conventional interpretation panels and boards with boxes containing information leaflets but there will also be more high-tech approaches such as detailed descriptions of the site as MP3 downloads which could be accessed from the proposed project website. The website would also include self-guided walk leaflets which could be downloaded as well as extensive other information on the site. No doubt the website could also be used by researchers to upload new information.

- 4.7.13 The interpretation will include visible remains, potential buried remains, historical themes and ecological interest. Different aspects of the site's history will be covered but it will reflect the fact that the visible structures and current landscape are substantially those of the late 19th-century factory.
- 4.7.14 It is anticipated that the interpretation will be particularly concentrated in certain areas where there are groups of related structures which survival well, particularly if they demonstrate an important element (or number of elements) of the manufacturing process. In these areas it may be appropriate to undertake greater landscape 'repair' works to enhance the understanding so that for example parts of New Cut may be re-excavated particularly where the channel passes the existing expense magazine towards the western end of the site. This would better explain the relationship between New Cut and the magazine. Another larger area where interpretation should be focused is the eastern end around the 1885 Incorporating Mills and extending east to Lockner Lane. This contains a group of structures which survive well and visually striking which enhances their interpretation potential.
- 4.7.15 Interpreting the important earlier history of the site will be more challenging due to the fact that relatively little survives above ground from these periods. New Cut, which dates from the 1750s, is the one major visible feature which is known to be of pre 19th-century date so this should be utilised in this element of the interpretation and attempts should be made to locate or identify potential buried archaeological structures.



Plate 18: New Cut

- 4.7.16 Most buried structures are identifiable from field evidence and historic plans. In addition geophysics may also have some potential in localised areas for identifying structures. Each of these could also be utilised in the interpretation of buried features.
- 4.7.17 **POLICY 10: The interpretation of the Gunpowder Mills site should be developed within a clear and coherent interpretation plan. Intellectual access of the site should be developed to the benefit of current understanding and historical knowledge of its periods of operation in general.**
- 4.7.18 *Policy 10.1: Accuracy of information*
- 4.7.19 All interpretation will be based on factually correct information and based on a sound understanding of the history, operation and significance of the site.
- 4.7.20 *Policy 10.2: Ecological interpretation*
- 4.7.21 The themes of interpretation will include both the ecological interest of the site as well as the historical and archaeological remains.
- 4.7.22 *Policy 10.3: Scope of interpretation*
- 4.7.23 The interpretation will concentrate on the Guildford Borough Council land but also include related features visible from public rights of way which are now privately owned but which were historically part of the gunpowder mills site.
- 4.7.24 *Policy 10.4: Enhancing character*
- 4.7.25 To improve the historic character and visual qualities of the site, where appropriate by indicating lost features, restoring historic vistas and transport routes and removing intrusive elements.
- 4.7.26 *Policy 10.5: Sharing of knowledge and creation of website*
- 4.7.27 Current intellectual access to the Gunpowder Mills site should be improved, particularly through the creation of a website, which could also provide electronic access to this Conservation Management Plan and other reports on the site. This would also form links with other gunpowder mill sites and other organisations.
- 4.7.28 *Policy 10.6: Form links with other sites*
- 4.7.29 To promote Chilworth Gunpowder Mills with tourist trails and promotion. Link between other related historic sites (e.g. other historic sites locally and gunpowder mills nationally)
- 4.7.30 *Policy 10.7: Visitors centre*
- 4.7.31 There should be an aspiration to establish a permanent facility at the site with a number of functions including a small interpretation centre.

4.7.32 *EDUCATION*

- 4.7.33 Chilworth Gunpowder Mills has great potential for use as an educational resource, particularly for school children studying many areas of British history and society. This potential is currently almost completely untapped and other than from the school immediately adjacent to the site there are probably no organised school visits. The story of the site touches on numerous periods or historical events which could be covered by the national curriculum including the Civil War, the Industrial Revolution, the First World War, the Second World War, the Empire and Victorian society. When allied with appropriate interpretation seeing the remains of the gunpowder works should help children understand the events of which the mills were part and fire their imagination.
- 4.7.34 In key stage 2 history is taught up to 1930 with a focus on Victorian history, while the history of the World Wars is taught at key stages 3 and 4. World War II would be a secondary focus of interpretation but the pillboxes and dragons teeth could illustrate the home front and the fear of invasion.
- 4.7.35 At sites such as Waltham Abbey school groups form a key element of their visitors and although the potential for this at Chilworth is limited by logistical factors such as limited car parking and lack of buildings this still forms something of a model to follow.
- 4.7.36 Market research should be undertaken as a priority to inform the development of the educational strategy for the site. This should consult with schools in Guildford Borough to clarify the types of similar sites that schools currently visit and the potential for school groups to visit Chilworth.
- 4.7.37 The site also has potential to be utilised by other educational groups such as students of archaeology, industrial archaeology, social history and natural history.
- 4.7.38 **POLICY 11: The range of educational provision for school and other groups should be appropriately developed, following market research, as an important element in interpretation.**

4.7.39 *VISITOR SERVICES AND ACCESS*

- 4.7.40 The site is owned by Guildford Borough Council and it is both permanently open and freely accessible. However, the severely overgrown nature of the site, together with the network of watercourses, boggy areas (especially in winter) and health and safety hazards means that access within the site is limited. The information panels at each end of the site request that visitors stick to the main designated paths, which comprise one principal route through the site, a short branch which provides access to the footpath to St Martha's Church and a further short route adjacent to the 1885 incorporating mills. There are also a number of less official routes around the site, for example adjacent to New Cut, where a small number of visitors would explore but this is not encouraged. Therefore there are large areas of the site and many structures which are essentially inaccessible. There is great potential for increasing this access and this should be a principal aim of any proposed enhancement works at the site. New paths

should be laid out, whenever possible following historic paths or tramway routes in order to maintain or re-establish an historical link. The routes will be shown on self-guided walk leaflets available at the site in weatherproof information boxes.

- 4.7.41 If it is necessary access to low lying areas which are liable to flooding (particularly in the centre of the site) could be enabled through a boardwalk, although ideally this should be as subtle as possible and be constructed without side rails to limit visual intrusion. Improvements to routes into the site should also be undertaken, particularly the route from the south adjacent to the infant school which becomes a quagmire in winter.
- 4.7.42 It is proposed to create a zone of ecological sensitivity along the northern part of the site and new paths will not be created here. This area will be bounded to the south by the natural barrier of the Tillingbourne.
- 4.7.43 The Disability Discrimination Act (1995) with the additional requirements of the DDA 2005 requires that maximum access for the maximum number of people compatible with conservation should be an objective, which also carries through into presentation and education policies and into site management and improvement. A Disability Access Plan should be prepared for the site. Where appropriate boardwalks should be provided to enable wheelchair access around uneven parts of the site although the provision of new wheelchair-friendly tracks should be balanced against the potential impact on historical fabric and the character of the site. Colour coded walks should differentiate circular routes which are wheelchair friendly from more challenging walks.
- 4.7.44 A long term aspiration should be for GBC to acquire appropriate adjacent areas of the former Gunpowder Mills site if they should ever become available on the open market. Although there are significant areas of the former works to the west of Blacksmiths Lane this aspiration particularly relates to the large areas to the east which form the late 19th-century expansion to the site (Admiralty Cordite Factory and Smokeless Powder Factory). There is currently no evidence to suggest that these areas will become available but reuniting these areas with the GBC land would greatly enhance the visitor's understanding and appreciation of the former factory.
- 4.7.45 Potentially this policy could also apply to areas at the western end of the site which may offer an opportunity for the site to gain specific facilities such as a car park.
- 4.7.46 **POLICY 12: To encourage public understanding and enjoyment of the site and its setting, promoting a high degree of physical and intellectual access and meeting the needs of a broad variety of users.**
- 4.7.47 *Policy 12.1: New footpaths*
- 4.7.48 To enhance the visitor's understanding and appreciation of the site new paths will be created in currently inaccessible areas. When appropriate these paths will follow historic transport routes around the site.

4.7.49 *Policy 12.2: Ecology zone*

4.7.50 The location of the new paths will respect a band of ecological sensitivity along the northern part of the site where further access will be discouraged.

4.7.51 *Policy 12.3: Equal access*

4.7.52 Ensure opportunities for equal access for mobility impaired, and provision of other means of understanding where this is not possible.

4.7.53 *Policy 12.4: Expansion of site*

4.7.54 If areas which were historically part of the Gunpowder Mills site, but which are outside the current Borough Council land, become available on the open market, Guildford Borough Council should, when appropriate, consider acquiring these, or offering to manage them. This would particularly relate to the large area immediately to the east of the council land which is privately owned but which formed an important part of the works in the late 19th and early 20th centuries.

4.8 **Policy Area E: RESOLUTION OF CONFLICT**

4.8.1 ***RESOLVING CONFLICT BETWEEN CONSERVATION AND OTHER PUBLIC BENEFIT***

4.8.2 Conflicts between preservation and presentation are common to all monuments, where the theoretical ideal of maximum conservation with minimal visitor impact has to be balanced against the claims of the communal ownership of heritage assets, and reasonable rights of access to common cultural property. There will always be potential for conflict between the economic and social necessities of managing a public site and the aspirations for conservation and sustainability. On a purely practical level, there will be necessary activities that conflict with the curatorial requirement for minimal intervention in historic fabric.

4.8.3 There may also be conflict between different approaches such as for example the desire to increase access to an area, which may then deteriorate through visitor wear and tear and there may be conflict in the interpretation of the site between the perceived significance of different periods or aspects of the site. Such actions may be based on lack of understanding regarding the significance of periods, highlighting the conflicts between available knowledge, conservation and interpretation.

4.8.4 There is potential for conflict at Chilworth between the desire to archaeologically investigate the buried remains and the conservation needs which would usually be best served through leaving the remains buried. There is also particular potential for conflict between the desire to permanently expose and interpret remains which are currently buried and the purely conservation needs of those remains. As the site is a Scheduled Ancient Monument the presumption should be against intrusive excavation.

4.8.5 At Chilworth there is likely to be conflict between the interpretation aspiration to

limit the number of modern additions which alter the character of the site and the requirement to ensure that the site is safe to visit. For example there are numerous watercourses at the site and significant drops which may require a handrail or barrier. This will alter the character but options should be explored to limit the extent of that alteration.

- 4.8.6 There is also likely to be conflict between the requirements of the archaeological remains and the ecological value of the site. The overgrown and ‘natural’ character of the site is known to be valued by many people who frequently visit the site for exercise and relaxation but it will be necessary to at least modify this character to protect the archaeology.
- 4.8.7 Another area where the interests of different aspects of the site may conflict is the presence of badger setts in parts of the site and their potential impact on the scheduled monument. Badgers often prefer man-made mounds and there are believed to be setts in at least two of the protective earth banks around former processing buildings on the northern part of the site. The surrounding ground in this area is often boggy and the raised mounds provide a good habitat for the badgers. Badgers are a protected species but the setts may be damaging the Chilworth mounds, which are an important and distinctive element of the site. The setts and potential damage should be monitored and an assessment undertaken under a Natural England licence.
- 4.8.8 There is also potential for dispute between GBC and the owners of parts of the former gunpowder mills site which are now privately owned. This particularly relates to the areas to the east of the GBC site which retain significant buildings. A public footpath passes close to this area and provides good views of some surviving works buildings and it is recommended that the interpretation of the site includes features visible from this footpath. If the method of this interpretation is insensitive or if it is progressed without consultation with the owner of this land then there would be potential for dispute. For example the interpretation would have to make very clear that this area was private land and no public access was possible. The interpretation of this area should also respect the fact that although there are a number of works houses of interest from former foremen these are still occupied dwellings.
- 4.8.9 The gunpowder mills would benefit from having a management trust or friends group, formed from the main interests at the site, which meets periodically to consider relevant issues as well as undertaking agreed maintenance. It may be most appropriate for the existing Chilworth Gunpowder Mills Group, which already performs some of this function, to be expanded into such a trust.
- 4.8.10 A new Trust or ‘Friends of Chilworth Gunpowder Mills Group’ should be developed and among the various roles which this body could undertake would be to address the concerns of local people or local landowners.
- 4.8.11 **POLICY 13: Conflicts between different aspects of the site or different approaches to its management should be resolved on the basis of available knowledge and understanding of comparative significance. Such conflict may arise between the ecological and archaeological interest, health and safety and**

interpretation concerns or when considering the benefits and drawbacks of exposing buried remains.

4.8.12 *Policy 13.1: Health and Safety*

4.8.13 The Gunpowder Mills present particular health and safety issues, resulting from the nature of the site. A health and safety audit of the site will be undertaken. This will include an acknowledgement that where there is direct conflict health and safety concerns will over-ride archaeological or ecological interests but that in such situations attempts will be made to resolve safety issues without compromising the heritage of the site.

4.8.14 *Policy 13.2: Local people and relevant landowners*

4.8.15 Local people with an interest in the site will be kept fully informed of developments at the site. The views of individuals who own other parts of the scheduled Gunpowder Mills site will be sought when appropriate when planning future developments at the site.

4.8.16 *Policy 13.3: Friends of Chilworth Gunpowder Mills*

4.8.17 Consideration will be given to expanding the role of the Chilworth Gunpowder Mills Group, forming a management trust and/or Friends of Chilworth Gunpowder Mills.

4.9 **Policy Area F: UNDERSTANDING, RECORDING AND RESEARCH**

4.9.1 English Heritage guidance on studying historic sites and preparing Conservation strategies places *Understanding* at the forefront of the investigation and as the initial policy area from which all the others would follow. However, as Chilworth has already been extensively investigated there is already sufficient research on which to base a Conservation Plan and interpretation strategy. The principal area for further investigation is the post-gunpowder works history of the site and particularly Tin Town.

4.9.2 **ARCHAEOLOGICAL AND RESEARCH POTENTIAL**

4.9.3 The history of the Chilworth Gunpowder Mills has been subject to considerable documentary research since the 1970s by individuals including DW Warner, Keith Fairclough and Glenys and Alan Crocker. Much of this research concentrated on the earlier history of the site, particularly in the 17th century, but extensive further research has since been undertaken on the Chilworth Gunpowder Company and the great expansion of the site in the late 19th century.

4.9.4 Despite this research the site still retains potential for further documentary study which would enhance our understanding of the mills. Particular areas for further investigation would include the re-use of the site in the 20th century (Tin Town) as well as the period in the 18th and earlier 19th century, when the relative importance of the site appears to have declined, which is not so well understood.

- 4.9.5 The investigation of the Tin Town period could be a central focus of an oral and social history exercise which would aim to preserve people's memories of the site. There is great potential for a number of local people to have memories of tin town, either visiting this area or even having lived there, and also to have photographs of the site from the mid 20th century.
- 4.9.6 A research agenda for the site should be drawn up identifying the principal areas of potential study. This should tie into other relevant research agendas such as the Surrey Archaeological Research Framework (SARF) and the South East Research Framework.
- 4.9.7 The Surrey Archaeological Research Framework has been produced by Surrey County Council and Surrey Archaeological Society and it provides a resource assessment as well as a list of gaps in current knowledge and an assessment of priorities for research. The Framework is an organic undertaking which will gradually evolve and the document which was issued in 2006, and which is available on the Surrey County Council Website, identifies Chilworth Gunpowder Mills as having a number of buildings that the Surrey Industrial History Group hopes will be recording in the coming years.
- 4.9.8 The South East Research Framework is a similar undertaking on a wider, regional scale and a public seminar was held on the Post-Medieval and Modern Periods, and Industry on 1 December 2007. At this seminar Wayne Cocroft spoke on the Gunpowder Industry and identified Chilworth as providing a good example of the challenges for curation of gunpowder works.
- 4.9.9 The significance of the site would also benefit greatly from a comparative study (or values study) which would aim to place the site within the national and international context of gunpowder manufacture. This would establish with greater clarity what is particularly significant about Chilworth in a wider context.
- 4.9.10 In addition to desk-based analysis and oral history further site investigation of the Gunpowder Mills has great potential to increase the understanding of their historical and archaeological significance. The site was subject to a detailed non-intrusive investigation as part of the English Heritage Survey and this considerably enhanced understanding but this survey was non-intrusive so much remains to be learned regarding the surviving buried structures at the site. In addition although the English Heritage survey identified every surviving visible structure (and known potentially buried former structures) it did not include a detailed record of each feature. A comprehensive archive record of each structure should be compiled and this can be added to as intrusive works are undertaken across the site. The creation of this detailed record has been started by various individuals and groups including English Heritage (on specific features as part of their survey), the Chilworth Gunpowder Mills Group (on various areas as part of investigations undertaken in recent years) and by other individuals such as the Glenys and Alan Crocker.

- 4.9.11 The research will include the study of the ecological significance of the site.
- 4.9.12 **POLICY 14: To promote understanding of Chilworth Gunpowder Mills through developing existing knowledge, further recording and research, and making knowledge available in an accessible form, in order to ensure their preservation.**
- 4.9.13 *Policy 14.1: Research Agenda*
- 4.9.14 A research agenda should be drawn up for the site which should indicate questions to be pursued, with the possible means of answering them through planned research. This should be incrementally reviewed and should be prepared in consultation with both the Surrey Research Agenda and the South East Research Framework. The agenda may include the following topics for further investigation:
- The re-use of the site as Tin-Town after the closure of the works
 - Family history of employees and residents of tin town and descendants
 - The 18th and early 19th century history of the works
 - History of the site during the Second World War.
- 4.9.15 *Policy 14.2: Investigations of the historic fabric*
- 4.9.16 Long term programmes of archaeological and building recording should be continued to further understanding. This will provide a base layer of information for any future works to the site, which may compromise the historic fabric. All works which may reveal archaeological evidence will incorporate an appropriate archaeological element. Such as an evaluation, a monitoring watching brief or an excavation.
- 4.9.17 *Policy 14.3: Maintenance of records*
- 4.9.18 Explicit records should be made during or before all interventions in the fabric of the site by means of written, drawn and photographic records, in accordance with English Heritage Guidelines (EH 2006).
- 4.9.19 *Policy 14.4: Further research*
- 4.9.20 To promote future research on the site with a planned agenda for investigations and an ability to respond to opportunities.
- Carry out further investigation in historical and archive sources
 - Seek opportunities for further non-intrusive investigations at the site
 - Carry out a Values Study to establish the relative significance of the Gunpowder Mills site, compared to other similar sites in the UK and internationally
 - Undertake an oral history project to record for posterity people's memories of the site.

- 4.9.21 *Policy 14.5: Ecological survey*
- 4.9.22 A comprehensive ecological habitat survey (particularly of bats and other protected species) should be commissioned, to ensure that the site's ecological significance is fully considered as a basis for future planning.
- 4.9.23 **A SITE ARCHIVE**
- 4.9.24 As indicated above various programmes of research and investigation have been undertaken previously at Chilworth and this material currently forms the basis of a dispersed site archive.
- 4.9.25 The scattered body of material is held by various individuals and organisations including the Chilworth Gunpowder Mills Group who hold records of its limited archaeological investigations undertaken at the site in recent years, by Guildford Borough Council who particularly hold archives created through planning condition recording, by English Heritage who hold material created through the detailed site survey by Alan and Glenys Crocker and by other individuals who have undertaken personal studies. There are also many other plans and documents relating to the site contained in other formal archives and no doubt many valuable photographs contained in peoples family albums and personal collections. Further studies such as programmes of oral history should also be added to the site archive.
- 4.9.26 Gathering this material into a single site archive should be a prime objective of any future development at Chilworth.
- 4.9.27 Archives such as this require specialist archivally-stable environments and both the safest and most practical solution for the Chilworth Archive would be for it to be run in partnership with one of the many excellent archives already operating in Surrey. These include the Surrey History Centre, Guildford Library Archives, Guildford Museum and the Surrey Archaeological Society. Material from the archive could be taken to site for temporary displays in the proposed education facility (West Lodge) or open days. The material would also be made available through the website.
- 4.9.28 Similarly a partnership should also be formed with an appropriate local facility to hold the artefacts which have been (and will continue to be) found at the site. This is likely to be with Guildford Museum, Surrey History Centre or the County Museums Service.
- 4.9.29 **POLICY 15: A pro-active formal site archive and information base should be developed for the Gunpowder Mills site. Such an archive would be of value in informing the planning of conservation works as well as a resource for interpretation and public access.**
- 4.9.30 *Policy 15.1: Collection of archive material*
- 4.9.31 All information relating to the site should be collected, organised and stored in a single central archive. This should include historic documentation, maps,

photographs, site records, oral history accounts and reports. This should include material relating to the whole Gunpowder Mills site rather than just the Borough Council owned element covered by this Management Plan. This would provide an easily accessible resource for site management, interpretation and educational work.

4.9.32 *Policy 15.2: An artefact storage facility*

4.9.33 A partnership should be formed with an appropriate local museum or storage facility to house all the artefacts gathered from the site in a single location.

CHILWORTH
GUNPOWDER MILLS
CONSERVATION
MANAGEMENT PLAN
BIBLIOGRAPHY AND
SOURCES

APPENDIX 1 BIBLIOGRAPHY

SELECT PUBLISHED WORKS

- Cocroft WD *Dangerous Energy: The archaeology of gunpowder and military explosives manufacture* (2000)
- Cocroft WD 'Oare Gunpowder Works, Faversham, Kent' *Faversham Papers* No39 (1994)
- Cocroft WD *et al* 'The Development of the Chilworth Gunpowder Works, Surrey from the Mid 19th-Century' *Industrial Archaeology Review* XXVII (2005)
- Crocker A 'The Tramway at the Chilworth Gunpowder Works' *Surrey Archaeological Collections*, 82 (1994)
- Crocker G *A Guide to the Chilworth Gunpowder Mills* (1985)
- Crocker G & Fairclough KR 'The introduction of edge runner incorporating mills in the British gunpowder industry' *Industrial Archaeology Review* Vol XX (1998)
- Crocker G & A *Damnable Inventions* (2000)
- Crocker G *The Gunpowder Industry* (2002)
- English Heritage *Understanding Historic Buildings: a Guide to Good Recording Practice* (2006)
- English Heritage *Conservation Principles Policies and Guidance: For the Sustainable Management of the Historic Environment* (2008)
- English Heritage *Making the Most of Your Local Heritage: A Guide for Overview and Scrutiny Committees* (2008)
- English Heritage *Managing Historic Assets* (2009)
- Fairclough KR 'The East India Company and gunpowder production in England 1625-1636' *Surrey Archaeological Collections* 87 (2000)
- Fairclough KR 'The Cordwell Family: gunpowder producers at Chilworth, 1636-1650' *Surrey Archaeological Collections* 87 (2000)
- Foot W *Beaches, fields, streets and hills: the anti-invasion landscapes of England 1940* (2006)
- Foreman S 'Nitro-glycerine washing house, South Site, Waltham Abbey Royal Gunpowder Factory, Essex' *Industrial Archaeology Review* XXIII (2001)

- Lowry B (ed) *et al* *20th century Defences in Britain: an Introductory Guide* (CBA Practical Handbooks in Archaeology No. 12) (1995)
- Malden HE (ed) *The Victoria History of the County of Surrey* Vol 2 (1905)
- Patterson EM ‘Gunpowder Terminology and Incorporation’ *Faversham Papers* No.27 (1986)
- Surrey County Council *Surrey Archaeological Research Framework* (2006)
- Warner DW ‘The early history of gunpowder manufacture at Chilworth,’ *Surrey History*, 1.3 (1975)
- Wyman’s *Wyman’s Commercial Encyclopedia* (1887)
- Notes on the South East Research Framework Public Seminar on the Post-Medieval and Modern Periods, and Industry (1/12/07)

UNPUBLISHED REPORTS

- English Heritage *Chilworth Gunpowder Works Surrey: Survey Report* (2003)
- English Heritage *The Royal Gunpowder Factory, Waltham Abbey, Essex An RCHME Survey* (1993)
- Guildford Borough Council *Chilworth Gunpowder Mills Conservation Area Appraisal 1st draft*
- Guildford Borough Council *Chilworth Gunpowder Mills Woodland Management Plan* (April 2007)
- Nexus Heritage Chilworth: Archaeological Impact Assessment January 2010

MAPS

- Ordnance Survey 1871 25 inch: 1 mile 1st edition
- Ordnance Survey 1986 25 inch: 1 mile 2nd edition
- Ordnance Survey 1916 25 inch: 1 mile
- Ordnance Survey 1920 25 inch: 1 mile



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