

TRANSACTION RE

06-JUN-94 MON 08:18

FOR: BOB WATTS WSA

SEND

DATE	START	RECEIVER	TIME	NOTE
06-JUN	08:16	0712116382	13:59"	OK

TO: Dept of National Heritage

FROM: Adam Ford

COMPANY:

FAX NUMBER: 071-211 6382

DATE: 3.6.94

National Monument No. 21567

LOCATION: W/Abbey

REFERENCE: Waltham Abbey R.G.P.F.

NO. OF PAGES INC TOP SHEET:

**SUBJECT:**

1/ Enquiry concerning consent to erect security fencing adjacent to the Grand Magazine on former Royal Gunpowder factory.

2/ Notification of works of Health and Safety priority to support collapsing road within the Scheduled area.

**ADAM FORD B.A. (HONS) A.I.F.A.**  
**Archaeological Consultant**

**C/o British Aerospace Defence Ltd**  
**Royal Ordnance Division**  
**Sewardstone Road**  
**Waltham Abbey**  
**Essex EN9 1AY**

**Telephone (0992) 651611**  
**Facsimile (0992) 651611**

**FACSIMILE TRANSMISSION**

**TO:** Dept of National Heritage

**FROM:** Adam Ford

**COMPANY:**

**FAX NUMBER:** 071-211 6382

**Date:** 3.6.94

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National  
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**SUBJECT:**

1/ Enquiry concerning consent to erect security fencing adjacent to the Grand Magazine on former Royal Gunpowder factory.

2/ Notification of works of Health and Safety priority to support collapsing road within the Scheduled area.

**ROYAL GUNPOWDER FACTORY, WALTHAM ABBEY**  
**NATIONAL MONUMENT N° 21567**

1) An SMC application for erection of security fencing on the eastern perimeter of the site within the Grand Magazine compound, was submitted around 23rd March 1994. Has the consent been granted ? If so would it be possible to have the consent forms duplicated to me on site as well as to Mr.David Stanners.

2) A temporary road which skirts the edge of a recently excavated canal has started to collapse. The road well used by the construction traffic on site and this development obviously puts road users at risk. It is proposed to drive temporary sheet piles along the edge of the canal where the road is collapsing. This proposed work is not covered by any previous SMC's but is considered to be necessary for Health and Safety. Deborah Priddy, ancient monuments inspector overseeing the site has been informed. Work will begin as soon as possible as the road is in constant use.

Please contact me if there are any problems.

See attached photocopy for location of works.



Adam Ford  
Consultant Archaeologist

CC. Ms.D.Pridy - E.H.



detoured roadway

street piling

recently excavated canal.

530

54

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59

TRANSACTION REPORT

02-JUN-94 THU 12:02

FOR: BOB WATTS WSA 0992651611

SEND

DATE	START	RECEIVER	PAGES	TIME	NOTE
02-JUN	12:02	0719733001	1	51"	OK

TO: Deborah Priddy  
 COMPANY: English Heritage (Anglice Team)  
 D. E: 2/6/94  
 REFERENCE: Waltham Abbey RGPF

FROM: Adamford  
 FAX NUMBER: 071973 3001  
 LOCATION: W/Abbey  
 NO.OF PAGES INC TOP SHEET:

SUBJECT:

Deborah,  
 The temporary road which skirts around the recently exposed canal associated with S90 (G.P. drying stove) which is inside the SMT, is collapsing into the canal. This represents quite a serious risk to road users. Bob would like to drive some sheet piles into the side of the canal where the road is collapsing. Does this come under the Health + Safety exemption? or do we need to obtain consent? Obviously the road is collapsing at the moment so there is some urgency on this decision. I'll phone on Monday if that's ok.

Regards  
 Adam.

**ADAM FORD B.A. (HONS) A.I.F.A.**  
**Archaeological Consultant**

**C/o British Aerospace Defence Ltd**  
**Royal Ordnance Division**  
**Sewardstone Road**  
**Waltham Abbey**  
**Essex EN9 1AY**

**Telephone (0992) 651611**  
**Facsimile (0992) 651611**

**FACSIMILE TRANSMISSION**

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**TO:** Deborah Priddy  
**COMPANY:** English Heritage (Anglica Team)  
**D. &:** 2/8/94  
**REFERENCE:** Waltham Abbey RGPF

**FROM:** Adam Ford  
**FAX NUMBER:** 071973 3001  
**LOCATION:** W/Abbey  
**NO. OF PAGES INC TOP SHEET:**

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**SUBJECT:**

Deborah,  
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Regards  
Adam.

SECURITY CLASSIFICATION : Unclassified / Restricted

FACSIMILE TRANSMISSION COVER SHEET

MINISTRY OF DEFENCE

Defence Lands Service

FROM:

NAME: D. STANNERS

ADDRESS: MINISTRY OF DEFENCE  
Defence Lands Service  
Government Buildings  
Leatherhead Road  
CHESSINGTON  
Surrey KT9 2LU

FAX NO. : (081) 391 - 3634

OUR REF. : MOD/DLS 3

DATE SENT: AS PDST/MAR 1993

TO:

NAME: R. WATTS/A. FORD

ADDRESS: \_\_\_\_\_

FAX NO. : \_\_\_\_\_

YOUR REF. : \_\_\_\_\_

NO. OF PAGES TRANSMITTED

including this cover sheet : 2.

AUTHORISED BY:

Name: DLM Stanners

Room No.: C2/10 Ext: 3502

BRIEF MESSAGE:

New Fax N° in coming  
3576  
from 28/3

If you do not receive all the pages or have any other queries regarding this transmission please ring the Facsimile Controller on (081) 391 - ~~3634~~ 3150

SECURITY CLASSIFICATION : Unclassified / Restricted



# English Heritage

Fortress House 23 Savile Row London W1X 1AB Telephone 071-973 3000 Fax 071-973 3001  
Direct dial: 071-973-3274

Room 332

*Adam, This is different, an interim acknowledgement.*  
*[Signature]*

Mr D Stanners  
Defence Land Service 3  
Central Disposals Unit,  
Ministry of Defence  
Room C2/11  
Leatherhead Road  
Chessington  
Surrey KT9 2LU

Our ref: SMC/247/93  
AA/43684/2-1

Date: 21 March 1994

Dear Mr Stanners

**ANCIENT MONUMENTS AND ARCHAEOLOGICAL AREAS ACT 1979  
SECTION 2: CONTROL OF WORKS  
APPLICATION FOR SCHEDULED MONUMENT CONSENT IN RESPECT OF GUNPOWDER  
MILLS AND ROYAL GUNPOWDER FACTORY, WALTHAM ABBEY, ESSEX  
NATIONAL MONUMENT NUMBER 21567**

I refer to your applications to the Secretary of State for National Heritage dated 8 February and 17 March 1994 for scheduled monument consent to undertake works at the above scheduled monument.

As you may already know, the Secretary of State is required to consult the Historic Buildings and Monuments Commission for England (better known as English Heritage) before deciding whether or not to grant scheduled monument consent. I am writing to let you know that we have now advised the Secretary of State on your application, and you should be hearing from the Department of National Heritage shortly.

Any further correspondence regarding your applications should be addressed to:

Heritage Division (HD3)  
Department of National Heritage  
2-4 Cockspur Street  
London SW1Y 5DH

Telephone: 071-211-6355 (Mr Humphries)

Yours sincerely

LOUISE CLARK  
CONSERVATION GROUP: Anglia Team

CDU CHESSINGTON  
23 MAR 1994  
DEFENCE LAND SERVICES 3

*DLMS*



**Adam Ford**  
**Consultant Archaeologist**  
**C/o British Aerospace Defence Ltd**  
**Royal Ordnance Division**  
**Sewardstone Road**  
**Waltham Abbey**  
**Essex EN9 1AY**

Mr. D. Humphries  
Dept. of National Heritage,  
2-4 Cockspur Street,  
London SW1Y 5DH

*Telephone (0992) 651611*  
*Facsimile (0992) 651611*

18th January 1994

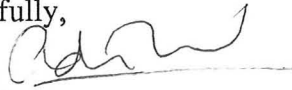
Dear Mr Humphries,

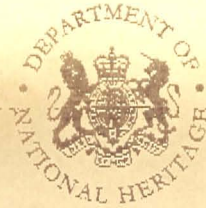
Re. correspondence concerning the Royal Gunpowder Factory, Waltham Abbey  
County National Monument No. 21567.

Would it be possible to arrange for all correspondence concerning the Scheduled Ancient Monument to be copied to myself at the above address as well as to the land owner's representative, Mr D. Stanners.? I am responsible for compiling the SMC's for the above site and I would be most grateful for you responses.

Yours faithfully,

Adam Ford.





2/4 Cockspur Street  
 London SW1Y 5DH  
 Telephone: 071-211 6359  
 Facsimile: 071-211 6382

Mr. David Stanners  
 Defence Lands Service 3  
 Central Disposals Unit  
 Ministry of Defence  
 Leatherhead Road  
 Chessington, Surrey  
 KT9 2LU



Our Ref :- HSD/9/2/3130(Pt-3)

4th January 1994

Dear Sir,

**ANCIENT MONUMENTS AND ARCHAEOLOGICAL AREAS ACT 1979 (AS AMENDED) - SECTION 2.**

1. I refer to your application for scheduled monument consent dated 7th December 1993 for proposed works at:

**GUNPOWDER MILLS, ROYAL GUNPOWDER FACTORY, WALTHAM ABBEY, ESSEX.**

**COUNTY NATIONAL MONUMENT NO :- 21567**

**PROPOSED WORK :- EXCAVATION OF EXPLORATORY TEST PITTS INTO THE SIDES OF TWO BLAST MOUND ADJACENT TO NEWTONS POOL..**

2. In accordance with the requirements of Schedule 1 of the 1979 Act (as amended) the Secretary of State is required to consult with the Historic Building and Monuments Commission for England before determining whether to grant consent. I am writing to inform you that a copy of the application has been sent to them for their advice, and we will write to you again once that advice has been received.

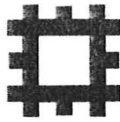
3. Should you have any queries about the application in general, the officer dealing with this application is **Mr. D. Humphries**, who can be contacted on **071 211 6355**.

Your Faithfully,

*U. Patel*

**URVASHI PATEL(Mrs.)  
 HERITAGE 2**

*DLMS*



# English Heritage

Fortress House 23 Savile Row London W1X 1AB Telephone 071-973 3000 Fax 071-973 3001

The Ministry of Defence  
FAO: Defence Lands Service DLS 3  
Room C2/11  
Leatherhead Road  
Chessington  
Surrey  
KT9 2LU

Ref. : MPP16/ AA 53709/1

Date : 7th December 1993

MONUMENT NAME : Waltham Abbey Royal Gunpowder Factory  
DISTRICT : EPPING FOREST  
COUNTY : ESSEX  
MONUMENT NUMBER : 21567

Dear Sir/Madam

ANCIENT MONUMENTS AND ARCHAEOLOGICAL AREAS ACT 1979, AS AMENDED

I refer to our earlier letter which outlined a proposal to include the above-named monument in the Schedule compiled and maintained by the Secretary of State under Section 1 of the Ancient Monuments and Archaeological Areas Act 1979, as amended.

I can now report that the Secretary of State, having considered the proposal in consultation with English Heritage, has decided that the monument should be scheduled.

Accordingly I am requested by the Secretary of State to inform you that he has included the monument in the Schedule. A copy of the schedule entry is enclosed. The area of the monument is shown outlined in black and highlighted in red on the enclosed 'Scheduled Monument' map extract.

The entry in the Schedule relating to the monument will be registered as a local land charge. As an additional precaution, however, we should be grateful if you would be good enough to draw the attention of any future owner, tenant or occupier to the existence of the monument and to its inclusion in the Schedule.

The monument will in due course be added to the published list of the monuments which have been included in the Schedule.

ACKNOWLEDGEMENT OF RECEIPT OF SCHEDULE ENTRY

I should be grateful if you would complete and return the enclosed acknowledgement of receipt form. If you have not already supplied the information, would you please confirm on the form your ownership/occupation of the monument and, if your interest is confined to part of the monument, would you please return the map extract attached to the form indicating the extent of your interest. Where appropriate would you also be kind enough to let me know the name and address of anyone whom you know, or believe, to own or occupy a part of the monument, so that we may inform them of the scheduling also.



DZMS

I enclose a guide covering the main provisions of the Act. You will note that it is an offence under Section 2 of the Act to carry out, or to cause or permit anyone else to carry out, any of the following works:

- a. any works resulting in the demolition or destruction of, or any damage to, a scheduled monument;
- b. any works for the purpose of removing, repairing, or making any alteration or addition to a scheduled monument or any part of it;
- c. any flooding or tipping operations on land in, on or under which there is a scheduled monument;

except in accordance with the consent of the Secretary of State. Failure to obtain such consent before works start can lead to prosecution, rendering the offender liable to a fine or, in extreme circumstances, to imprisonment. However, works which are urgently necessary for reasons of safety or health may be carried out without prior consent, provided that notice in writing of the need for the works is given to the Secretary of State, as soon as is reasonably practicable.

A form of 'standing consent' has been granted for, among other things, the continuation of agricultural, horticultural or forestry works of the same kind as those carried out in the same place within the period of five years prior to 9th October 1981. This consent does not include subsoiling, drainage works, the planting or uprooting of trees, hedges or shrubs or any other works likely to disturb the soil below normal ploughing depths. From time to time this consent may be revised or cancelled, and if there is any doubt over whether or not proposed works require specific Scheduled Monument Consent, advice may be obtained from English Heritage.

Full details explaining how to apply for Scheduled Monument Consent are available from this office. You should note that the granting of planning or any other permission (including permitted development rights) for any development on the site of the monument does not remove the need to obtain Scheduled Monument Consent for any works or operations affecting the monument: nor may archaeological investigation be carried out on the site of the monument (unless it is undertaken by or on behalf of the Secretary of State) unless such consent has been obtained.

Your attention is also drawn to Section 42 of the Act which prohibits the use of a metal detector on the site of a scheduled monument and the removal from such a site of any object of archaeological or historical interest which has been discovered by the use of a metal detector, without the written consent of English Heritage. Your co-operation would be welcome in ensuring that anyone who asks your permission to use a metal detector on your land is aware of these provisions of the Act and of the fact that the monument has been scheduled. In addition, it would be appreciated if you could warn anyone entering your land for such a purpose of the existence of the monument, pointing out the site on the ground as it is shown on the map extract attached to the enclosed copy of the entry in the Schedule.

Finally, I should explain that English Heritage has at its disposal a number of architects, archaeologists and other experts trained in the execution of works on all types of monuments. Subject to the availability of staff and resources, English Heritage is willing to give whatever help and advice it can concerning the condition and beneficial management of scheduled monuments to their owners and occupiers. Such advice may also be available from a number of other sources, including private consultants, universities, and county

councils. By their nature and protected status, scheduled monuments need special care when proposals for works are being considered, or even during routine maintenance, and we would therefore encourage you to seek professional advice at as early a stage as possible.

Please do not hesitate to contact me if I can be of any assistance.

Yours faithfully

*Sharon Williams*

Scheduling Section  
English Heritage

Encs: Schedule entry, 'Scheduled Monument' map extract, Guide for owners and occupiers, receipt/ownership form, pre-paid envelope

## GUIDE FOR OWNERS AND OCCUPIERS OF SCHEDULED MONUMENTS

1. The monument on your land is scheduled under Section 1 of the Ancient Monuments and Archaeological Areas Act 1979, as amended, and is protected as part of this country's heritage. This guide attempts to summarise the main provisions of that Act as it may affect you: it is not a comprehensive interpretation of the Act, and is for guidance only. If you are unsure about any aspect of scheduled monument controls then it would always be prudent to consult English Heritage or to seek other professional advice.

2. Under the Act, you are required to submit an application to the Secretary of State for National Heritage for Scheduled Monument Consent before you carry out any work which will have the effect of:-

- demolishing
- destroying
- damaging
- removing
- pairing
- altering
- adding to
- flooding, or
- tipping material onto the monument

3. Consent is also required for archaeological excavation. Application forms for Scheduled Monument Consent are obtainable from either English Heritage or the Department of National Heritage at the addresses given below. Applicants are also required to complete a certificate of ownership, or notify part owners, and in some cases an Inspector of monuments will visit to discuss the application. The Secretary of State may advertise the application in any way he thinks fit and may hold a public inquiry into it.

4. If you farm the area of the monument you need not apply for consent if the agricultural work involved is the same as has been carried out in that location for five years or more prior to 9 October 1981. However, you do need consent for ploughing at a greater depth, subsoiling, drainage, the planting and uprooting of trees and other works below the previous plough depth. Extending the area of agricultural activity beyond that used in the five years prior to 9 October 1981 would require scheduled monument consent.

5. Normal gardening activities of a kind previously carried out in the same location for five years or more prior to 9 October 1981 may be carried out without consent but prior written consent IS required for such gardening and horticultural activities as the planting and uprooting of trees, hedges and shrubs, landscaping, drainage, terracing and the creation of swimming pools, ponds, tennis courts and the construction of garden buildings, fencing etc which would disturb the subsoil. The felling of trees does not require consent provided it does not cause ground disturbance or other damage to the monument (eg the grubbing out of roots).

6. Consent is not needed for works urgently necessary in the interests of health and safety, provided you advise the Department of National Heritage as soon as possible that you intend carrying out the works or, in cases of particular urgency, that you have carried them out. Advice on applications for Scheduled Monument Consent is available from the addresses given at the end of this guide.

7. The obtaining of planning permission to develop land or any other consent or authorisation does not remove the need to obtain Scheduled Monument Consent when it is required.

8. In some cases compensation may be available if consent is refused, or granted subject to onerous conditions.

#### HELP FOR CARE AND MAINTENANCE

9. You are not required to undertake any additional maintenance of the monument, but if you should choose to do so English Heritage may be able to offer some advice and assistance.

10. You are not obliged to give the public access to the monument. Accredited representatives of English Heritage have the authority to obtain entry, but your permission will normally be sought first.

11. Regular visits are made to scheduled monuments by locally based Field Monument Wardens, who will seek permission from owners and occupiers first. The wardens will be able to advise about the history and answer questions on the management of scheduled monuments.

#### PROTECTION AND PENALTIES

12. The carrying out of any unauthorised works to a scheduled monument is a criminal offence. In addition it is an offence for anyone to use a metal detector on a monument without English Heritage's consent. A further, more serious offence is to remove, without permission, an object found by a metal detector on a monument. Any damage caused to a monument in removing a 'find' may also constitute a further offence. If you encounter trespassers with metal detectors on the monument, please do what you can to obtain their names, addresses or car numbers, and let the police know.

13. Enquiries should be addressed to:

English Heritage  
Fortress House  
23 Savile Row  
London W1X 1AB

Application forms for Scheduled Monument Consent are available from:

Scheduled Monument Consent Branch  
The Department of National Heritage  
Heritage 3  
3rd Floor  
2-4 Cockspur Street  
London SW1Y 5DH

Issued by  
English Heritage

SCHEDULE ENTRY COPY

ENTRY IN THE SCHEDULE OF MONUMENTS COMPILED AND MAINTAINED BY THE SECRETARY OF STATE UNDER SECTION 1 OF THE ANCIENT MONUMENTS AND ARCHAEOLOGICAL AREAS ACT 1979 AS AMENDED.

MONUMENT: Waltham Abbey Royal Gunpowder Factory

PARISH: WALTHAM ABBEY

COUNTY: ESSEX

DISTRICT: EPPING FOREST

NATIONAL MONUMENT NO: 21567

NATIONAL GRID REFERENCE(S): TL37640177  
TL37670059

DESCRIPTION OF THE MONUMENT

The monument is situated on the northern outskirts of Waltham Abbey and includes intact buildings, ruins, earthworks and buried remains of parts of the Royal Armament Research and Development Establishment, formerly known as the Royal Gunpowder Factory. The remains are associated with the manufacture of gunpowder, guncotton, nitroglycerine, cordite paste and tetryl, and include a number of ancillary buildings and structures associated with these manufacturing processes. Intact buildings, ruins, earthworks and buried remains of parts of a complex concerned with producing and testing modern high explosives, parts of an extensive water management system and parts of an associated tramway and railway network are also included. The scheduling occupies two separate areas.

The site is set within and around a series of watercourses, most of which are man-made and channel the River Lea as it flows from N to S. Although the manufacture of gunpowder in the Waltham Abbey area dates back to the 1560s, there is no documentary evidence for production at this site before the mid-17th century. Between 1702 and 1787 the site was in the possession of the Walton family who developed many improvements to the gunpowder manufacturing process here. Cartographic evidence from this period indicates that these early works occupied the area known as Millhead to the W of Middle Road and Powdermill Way in the southern part of the main constraint area. Here the mills and other buildings were set on either side of a large leat fed by a branch of the Lea. Water from this leat (the Millhead Stream) was drawn off at regular intervals along its course to power the mills and was returned to the river by means of two parallel tailraces either side of the leat. These mills included stamping mills which blended the raw materials of saltpetre, sulphur and charcoal, a corning house and a glazing house, and a number of stoves for drying the finished product. There were also associated ancillary buildings, including powder magazines.

Some of these early mills were horse-powered and, in 1963, construction work in the Millhead area recovered the remains of at least two horse mills surviving beneath the ground surface. An engraving of the site in 1735 indicates that, by this date, water-powered mills either side of Millhead Stream were already in use, but water-power did not entirely replace horse-power until 1814. A number of mills along Millhead Stream, including Smeaton's Mill and Head Mills, have been located during excavation work and recent ground clearance. These remains indicate structures with a complex history

(Continued ..)

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SIGNED BY: C Edwards

On behalf of the Secretary of State for National Heritage.



## DESCRIPTION OF THE MONUMENT (Continued)

retaining evidence for several phases of construction. The remains of Smeaton's Mill were found to include the brick foundations of a mill building which also forms the inner edge of the tailrace situated to the E of Millhead Stream. Within this mill a central wheelpit is visible, although rubble-filled. Irregular scarps on the platform between the E tailrace and Millhead Stream indicate the presence of further building remains beneath the ground surface. The remains of the mill buildings in the Millhead area are also visible above ground. The Dusting House, for example, in use between the early 18th and mid-20th century, shows a number of alterations and rebuilding phases and is represented by brick foundations either side of a central wheelpit. The wheel was powered by water from Millhead Stream and its flow was regulated by a sluice gate. The Dusting House was latterly provided with a concrete traverse (blast wall). Traverses, both standing structures and foundations, are present throughout much of the site and are constructed from a number of different materials, including brick, earth, and corrugated iron. They served an important function in minimising the damage caused to buildings by explosions elsewhere on the site. A number of roofed buildings also survive within the Millhead area, including the 18th century offices, a powder and barrel store, and washing house. These buildings are of exceptionally rare types and are intrinsic to the site's history and development. They are not, however, included in the scheduling but are protected as Listed Buildings. An important surviving group of steam-powered incorporating mills, the earliest dating from 1857, is situated to the E and SE of the area of the scheduling. This part of the site also includes associated expense magazines, ancillary structures and two accumulator towers. These buildings are Listed Grade II, II\* and I and are not included in the scheduling.

In 1787 the site was purchased by the government who implemented an extensive programme of modernisation. Map evidence indicates that by the early 19th century the site had expanded northwards and eastwards, but the Millhead area continued to play an active role in gunpowder manufacture. In the N part of the site, served by an extension to the canal system, horse-powered corning houses were constructed. In the NE part of the site an oval, battered brick traverse, present on an 1806 map, remains standing. It was originally associated with a gunpowder corning mill that fell into disuse by c.1827. The mill was re-equipped with a water-powered hydraulic pump and a gunpowder press in the mid-19th century. The structures associated with this press include a single storey brick building which retains its water-driven hydraulic pump and its cast-iron water-wheel attached to the external S wall. To the N of this structure are the foundations of the press house, which retains its cast-iron gunpowder press in situ.

At the N extremity of the site, well away from other danger buildings and served by the canal, the finished powder was stored in the Grand Magazine. The final building on this site was of brick and is now partly ruined.

The saltpetre refinery which served the mills is situated approximately 265m to the S of the Millhead area in a separate constraint area N of Highbridge Street; map evidence indicates that refinery buildings were present at the site by the 1780s. Here, the saltpetre was prepared, concentrated and crystallised ready for incorporation with the other raw materials. The buried remains of the refinery survive beneath the ground surface and are included in the scheduling.

In the early 19th century, after the sale of its factories in Faversham and Ireland, the Royal Gunpowder Factory at Waltham Abbey became the only government owned gunpowder manufacturing site in the country.

By the middle of the 19th century there was a growing interest in two new

(Continued ..)

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SIGNED BY: C Edwards

On behalf of the Secretary of State for National Heritage.

## DESCRIPTION OF THE MONUMENT (Continued)

explosives, guncotton and nitroglycerine, and in 1863 an experimental plant for the production of guncotton was set up at the site. Cartographic evidence indicates that this plant was situated on the site of the original saltpetre refinery and included a guncotton processing building. It is thought that some of the buildings associated with the saltpetre process were also adapted and reused.

The production of guncotton increased dramatically and in 1885 a new site was acquired at Quinton Hill to the south of Waltham Abbey for a larger capacity plant for the production of guncotton and nitroglycerine, a liquid explosive. In 1891 the manufacture of cordite, a mixture of guncotton and nitroglycerine, was introduced at the main site. The importance of the role of gunpowder, both as an explosive and as a propellant declined with these new innovations and, as a result, a number of buildings formerly used for gunpowder manufacture were adapted and new buildings erected, for the production of cordite.

In 1895-6 a nitroglycerine factory was also built in the northern part of the site to cater for the increased demand for cordite. The manufactured guncotton from Quinton Hill was transported by barge to the main site where it was dried on stoves, mixed with nitroglycerine and washed to produce cordite.

The remains of this process survive right across the site, particularly in the N and NE. Some of the most prominent features are the standing and earthwork remains of the guncotton drying stoves. These stoves typically survive as circular brick or concrete walls revetted with an earthen traverse. A timber round-house was originally located within the centre of these traverses where the wet guncotton was dried on racks for a period of approximately eight days. The concrete platform upon which the round-houses were sited is visible within a number of the stoves and several retain their metal drying racks. In 1936 a rectangular stove with 18 bays was erected for the drying of guncotton. Known as the Quinan Stove, it replaced an earlier circular stove and is thought to be the only surviving example of its type. The drying stoves were heated by hot, dry air and, in most cases, pairs of stoves were connected by cast-iron pipes to an associated engine or fan house. This system of pipework survives in parts and its remains are included in the scheduling. In several parts of the site the pipes are carried over canals by bridges which are also included in the scheduling. Many of the fan houses survive in the form of concrete floor slabs and sandstone blocks which retain vertical mounting bolts. The system of canals was extended to serve the early guncotton drying stoves, to transport the wet guncotton to the stoves and to move the dried guncotton to the mixing houses. These canals survive as partly infilled earthworks and as buried features. The guncotton stoves, which are aligned NW-SE and lie adjacent to Cornmill Stream, were also served by a narrow gauge railway network.

The 1895-6 nitroglycerine factory at the site includes the nitrator, where the nitroglycerine was produced, washing houses, a wash water settling house, mixing house and their associated traverses. A number of the support stanchions for the lead-lined gutters which carried the nitroglycerine from one process building to the next remain in situ. The nitroglycerine was moved by gravity and, therefore, the nitrator is situated on one of the highest points of the factory. In 1941, due to increased demand for explosives during World War II, a second nitroglycerine factory was constructed in the E part of the site, known as New Hill. The remains of this factory are similar in layout and construction to the 1895-6 plant, but it is thought that this second factory never became operational.

In 1910 a small plant was established at the site for the small-scale manufacture of tetryl, a booster explosive. The visible remains of this plant

(Continued ..)

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SIGNED BY: C Edwards

On behalf of the Secretary of State for National Heritage.

## DESCRIPTION OF THE MONUMENT (Continued)

include two pairs of rectangular drying stoves which were built in 1940 and are situated in the E part of the site, to the S of New Hill. These pairs of stoves survive as standing buildings separated by breeze-block traverses. The storage lockers where the tetryl was dried remain within the buildings. The stoves were served by the light railway network. Other standing and earthwork remains of the tetryl plant include cleaning houses and a corning house. Part of the tetryl plant was situated to the NW of the area of the scheduling and immediately to the W of the site's 1895-6 nitroglycerine plant. These buildings have been demolished and, as there are not thought to be any distinctive buried remains of this part of the plant, this area is not included in the scheduling.

In the early years of World War II, the Royal Gunpowder Factory was in the forefront of explosives production, but the erection of new larger factories during this period led to a gradual transfer of production. The contribution of the Waltham Abbey site declined, with the high explosive RDX and tetryl remaining as its principal products. The Royal Gunpowder Factory closed in 1945, but reopened in the following year as an experimental station for the research and testing of modern high explosives and propellants. A number of existing buildings at the site were adapted and reused for these experiments and some new construction work also occurred. Evidence for these activities remains visible throughout the N part of the site, particularly at the New Hill nitroglycerine factory and within several of the 19th and early 20th century engine houses. Firing points were established within these structures and the steel plating, to minimise the consequent damage, survives within several buildings. The internal walls of these buildings are marked as a result of explosives testing.

Seven powder barges and three punts, which transported both the raw materials and the finished products around the site, survive in the canal beds. These barges, built of timber, copper and leather, are rare survivals in context and are included in the scheduling.

Some of the electricity insulators at the site are thought to date from c.1890 and indicate that electricity was being produced at the site prior to the construction of the central power house in 1914-15. These insulators and the poles upon which they are located provide important evidence for the early introduction of electricity at the Waltham Abbey site and they are, therefore, included in the scheduling.

The library and lecture theatre building, built in the 1960s, the late 18th century superintendent's office and the contemporary mixing house and saltpetre mill building which all occupy part of the Millhead area; the old police gatehouse and the old gas meter building, both situated on the site of the original saltpetre refinery; the lamp posts, fence posts, railings, sign posts, fire hydrants and the surfaces of all roads and pathways are excluded from the scheduling, but the ground beneath all these features is included.

ASSESSMENT OF IMPORTANCE

Gunpowder was the only explosive available for military use and for blasting in mines and quarries until the mid-19th century. Water-powered manufacturing mills were established in England from the mid-16th century, although powder had been prepared by hand for at least 200 years. The industry expanded until the late 19th century when high explosives began to replace gunpowder. Its manufacture declined dramatically after World War I with British production ceasing in 1976.

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On behalf of the Secretary of State for National Heritage.

## ASSESSMENT OF IMPORTANCE (Continued)

The technology of gunpowder manufacture became increasingly complex through time with the gradual mechanisation of what were essentially hand worked operations. Waterwheels were introduced in the 16th century, and steam engines and water turbines from the 19th century. Pressing and corning were also introduced between the 16th and 19th centuries to improve the powders. Pressing improved the explosive power of the mill cake and corning broke the pressed cake into different sizes and graded it with respect to its fineness. Additional techniques were developed throughout the 17th, 18th and 19th centuries to improve the quality and consistency of the finished product, and this in turn resulted in a variety of types of powders; ranging from large coarse grained blasting powders (used in mines and quarries) to fine varieties (used, for example, in sporting guns).

Gunpowder manufacturing sites are a comparatively rare class of monument with around 60 examples known nationally. Demand for gunpowder centred on the London area (for military supply), other ports (for trade) and the main metal-mining areas. Most gunpowder production was, therefore, in Cumbria, the south west, and the south east, around the Thames estuary. The south east of England is perhaps the most important of these areas. The first water-powered mills were established here from the mid-16th century onwards and many of the major technological improvements were pioneered in the mills at Waltham Abbey and Faversham. All sites of gunpowder production which retain significant archaeological remains and survive well will normally be identified as nationally important.

The Waltham Abbey gunpowder mills are important for three main reasons: because many of the processes used in this international industry were invented and developed at Waltham, because the works survive in a remarkably complete state and because many of the structures themselves are rare nationally and internationally.

Most of the structures on the site survive in a remarkably complete state, in several cases only the matchwood components of the buildings are absent. Unusually a sequence of complete transport and power systems which connect the structures also survives in a complete condition. Although some similar structures are known at other sites, the Waltham examples are all in a much more complete state than elsewhere and quite a number (such as the press house and the Quinan Stove, for example) are thought to be unique survivals. Not only do the structures survive well, but several of them (like Smeaton's Mill, for example) were the prototypes for technologies which subsequently became standard and were exported around the world. Since the site survives so completely it is possible to trace the entire history of the gunpowder industry through the alterations and adaptations made to the structures here.

For an industrial site there is also a remarkable collection of documentary information which, most unusually, allows the functions of the various buildings and structures to be understood in great detail.

The Waltham Abbey site is further distinguished from others by the quality of the surviving remains of the guncotton, nitroglycerine and cordite industries, which replaced gunpowder for most military purposes at the turn of the 19th century. Again the structures of these related industries survive in a near complete condition. Many of them are thought to be unique to this site (the drying kilns of the late 1870s, for example) and, as with the gunpowder industry remains, there are several structures which were the earliest examples in the world, within which the whole industry was invented and developed. These structures also have accompanying documentation which adds to the significance of the surviving remains.

Finally, the site at Waltham has several other features of interest such as

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On behalf of the Secretary of State for National Heritage.

Continued from previous page ..

NATIONAL MONUMENT NO: 21567

ASSESSMENT OF IMPORTANCE (Continued)

the unique surviving components of the tetryl works and the interesting adaptations undertaken to the site during the initial years of the British rocketry programme.

MAP EXTRACT

The site of the monument is shown on the attached map extract outlined in black and highlighted in red.

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MONUMENT INCLUDED IN THE SCHEDULE ON 26th November 1993

SIGNED BY: C Edwards

On behalf of the Secretary of State for National Heritage.

21567

MPP45/ AA 53709/1

ACKNOWLEDGEMENT OF RECEIPT OF SCHEDULE ENTRY

Please help us by completing the following and returning it to English Heritage using the pre-paid envelope provided.

I acknowledge receipt of notification of scheduling.

I hereby confirm that

I am the owner  
occupier

(please delete if not applicable)

of the whole of the area of the monument indicated on the attached  
map extract

of that part of the area of the monument which I have indicated on  
the attached map extract

Signed

Name

Address

Date

DETAILS OF OTHER PART OWNERS/OCCUPIERS

(PLEASE IGNORE THIS PART OF THE FORM IF IT IS INAPPROPRIATE OR IF YOU HAVE  
ALREADY SUPPLIED US WITH THE INFORMATION)

Name

Address

Name

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Address



SM 21567 /01

SM 21567 /02

WALTHAM ABBEY

Town Mead

