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NATIONAL FILLING FACTORY No 5 QUEDGELEY

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Introduction

A major contributor to the national effort during the First World War was the Gloucester National Shell Filling Factory situated 3½ miles south of the city, at Quedgeley. It was an important link in a chain of 16 gun ammunition filling factories, 5 trench warfare filling factories and three chemical shell filling factories established throughout Britain from the summer of 1915.

Over 17 million shells and cartridges were filled at the factory until operations ceased in November 1918. Later the site was to form part of RAF Quedgeley.

Historical Background

Before the First World War, the whole of the army's gun ammunition requirements and about 50% of the navy's needs were supplied by the shell filling factories of the Royal Laboratory, Woolwich. The remaining naval shell (1) was supplied by the outlying factories at Chatham, Portsmouth and Plymouth. The relatively small number of trade or non-Government factories then in existence were engaged in fuse and other minor filling work.

Following Britain's entry into the war in August 1914 both the Royal Laboratory and the trade firms greatly expanded their operations but the huge increase in demand for shell soon led to a serious shortage. The 'munition scandal' as it became known led to the formation of a Ministry of Munitions on 9 June 1915 under the leadership of the Rt. Hon. David Lloyd George, MP, to organise and control industry on a war footing. The Ministry was composed mainly of eminent businessmen and it immediately proceeded to organise a network of national factories to produce war materials of every description. Lloyd George visited Bristol on 12 June 1915 and met the West of England Munitions Committee. This resulted in schemes for a national shell factory in Bristol to produce empty shell and a national shell filling factory near Gloucester. Lloyd George requested the chairman of the West of England Munitions Committee to nominate a suitable person to become the chairman of a directing board to organise the construction and operation of the filling factory. That person was J.J. Steinitz,(2) a member of the Munitions Committee and managing director of one of Gloucester's largest employers, Gloucester Railway Carriage and Wagon Company Ltd.

The appointment of John Julius Steinitz was approved by the Ministry on 25 August 1915 and he was subsequently joined by John Fielding of Fielding and Platt Ltd., Harley K. Butt, magistrate and head of J.M. Butt and Co., and J.H. Beach, secretary of Gloucester Railway Carriage and Wagon Co., Ltd. An advisory committee was then appointed which consisted of a number of well known Gloucester citizens (see appendix). The general manager was A. Glyn Watkins. He was awarded the MBE in 1918 and the following year he became general manager of Gloucester Railway Carriage and Wagon Co. Ltd.

Construction and Layout

By mid September 1915 a site for the Gloucester factory had been found and was being surveyed. The location was at Manor Farm, Quedgeley, situated immediately north of Naas Lane and due west of the Midland Railway and Great Western Railway main lines. Here were 298 acres of good quality arable and pasture land belonging to Lt. Col. J.F. Curtis Hayward (retired) of Quedgeley House, and within a few weeks 257 acres were taken

from him under the Defence of the Realm Act causing the tenant farmer to sell his stock and Col. Curtis Hayward to insist the whole farm be taken over.(3)

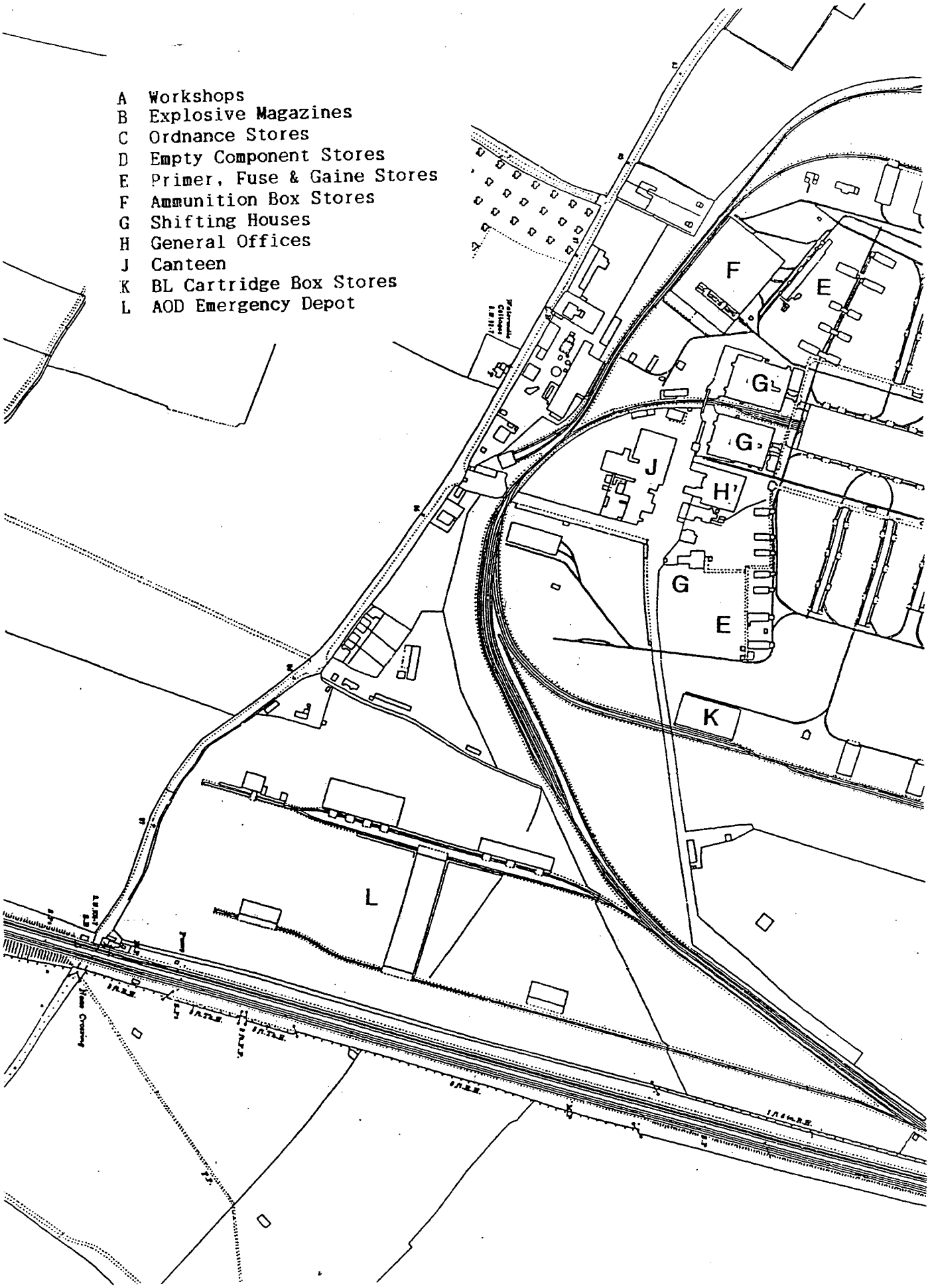
Now officially designated the National Filling Factory No 5, Gloucester, construction began on 20 October 1915 to a design by Herbert Read of the London architects Read and MacDonald.(4) This was based on Woolwich experience and one of four factories designed for the production of 40,000 rounds of quick-firing (Q.F.) ammunition and 250 tons of breech-loading (B.L.) cartridges weekly.(5) The Gloucester Constructionists Ltd were formed by the amalgamation of three Gloucester contractors to carry out the building work with a representative from His Majesty's Office of Works in attendance in an advisory capacity. (6)

Practically the whole construction was of wood. Rebated weather boarding was used for exteriors, match boarding for interiors and tongue and groove boarding for floors. The main exceptions were the power house (brick), gunpowder magazines (expanded metal) and a breech-loading cartridge box store (concrete) which was a later addition. The larger buildings supported curved roofs on Belfast roof trusses. (6)

The layout of the site is shown in Figure 1.(7) The factory was divided into danger and non-danger areas, the former to the north enclosing the main workshops and magazines and the latter to the south containing the women's and men's shifting houses (changing rooms), ammunition box stores, locomotive shed, general offices and canteen. (See Figure 2) The danger area was arranged symmetrically around a central 3-road railway siding about 470 yards in length running north to south which connected to the main line to the east via a 180 degree curve. Raised platforms extended almost the entire length of the central siding on each side on which was built the main storage capacity of the factory: To the south, two buildings 360 ft x 40 ft and 240 ft x40 ft for empty components, cartridge cases and shell cases and, to the north, the receiving houses for unloading explosives. (8) This central station was covered by a roof over the railway after the factory was complete. (5)

On each side of the central station beyond the empty component stores were the main workshops, again built on platforms: Ten workshops to the east and ten to the west measuring from 210 ft to 275 ft in length by 20 ft wide and comprising 6 or 7 rooms in each. Eight buildings (four each side) were allocated to QF ammunition production and 12 buildings (six each side) to BL cartridge filling. To the south were 16 buildings used for filling and storing primers, fuses and gaines.(9)

A total of 42 explosive magazines were provided: four 100-ton cordite (10) magazines, 80 ft x 40 ft and 20 22-ton cordite magazines, 26 ft x 21 ft; 16 TNT (11) magazines 26 ft x 21 ft and two 16-ton gunpowder magazines, the latter being made of


A Workshops
B Explosive Magazines
C Ordnance Stores
D Empty Component Stores
E Primer, Fuse & Gaine Stores
F Ammunition Box Stores
G Shifting Houses
H General Offices
J Canteen
K BL Cartridge Box Stores
L AOD Emergency Depot
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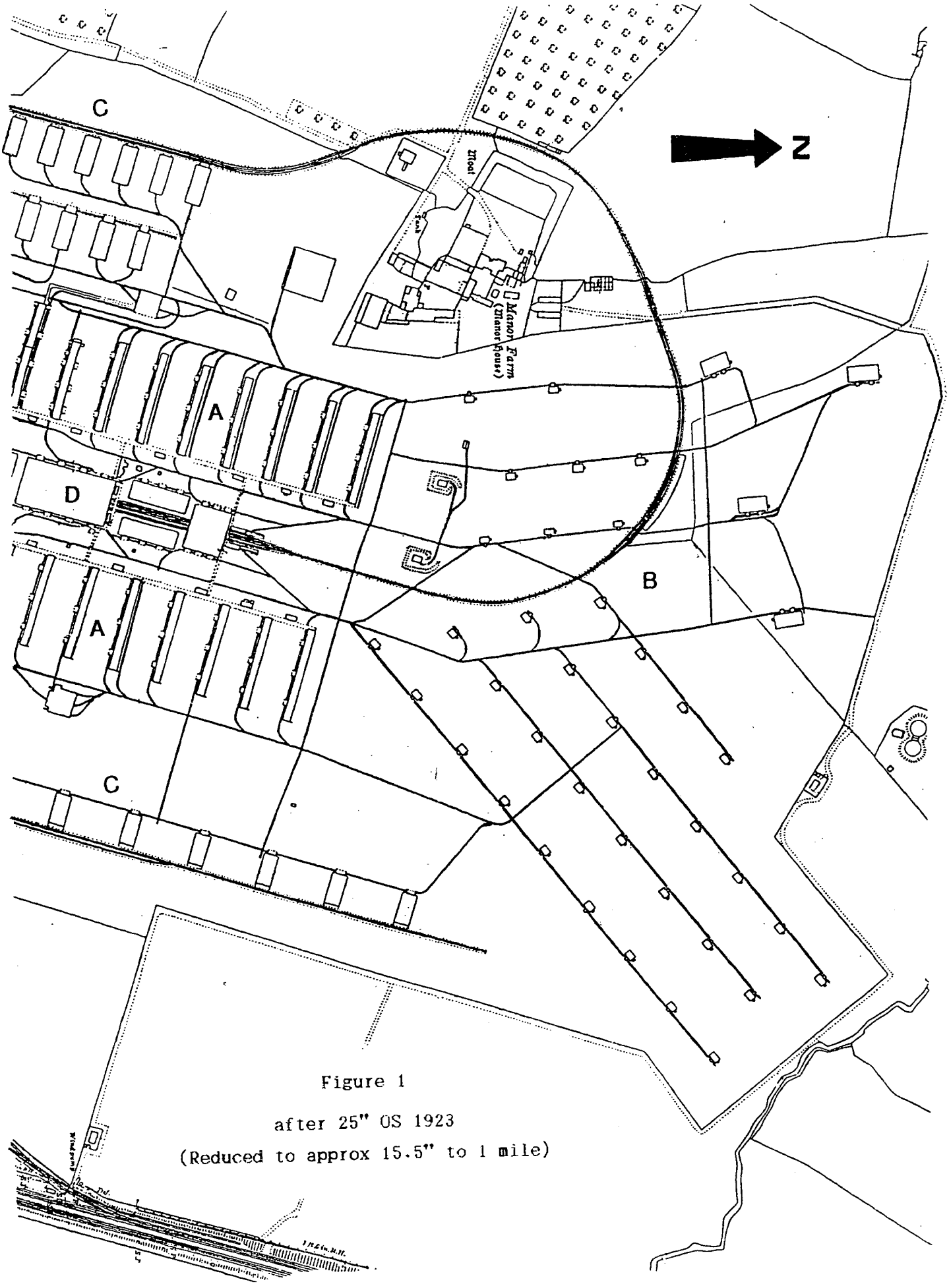

Figure 1

after 25" OS 1923

(Reduced to approx 15.5" to 1 mile)

expanded metal lined with asbestos sheets and surrounded by earth mounding as a precaution against explosion. (5,6,8)

Finished ammunition was stored pending shipment in magazines a short distance from the workshops. Eight 100-ton capacity buildings 80 ft x 40 ft were provided on the east side for BL cartridges, while on the west side 12 buildings 100 ft x 40 ft were provided for completed QF ammunition and filled BL shell.(6)

In November 1915, 400 men were at work on the construction of the 122 buildings, also railway, water, heating and drainage systems. Several weeks of wet weather and a shortage of men for platelaying resulted in the construction being delayed and the anticipated date of the factory commencing production was put back from 1 February to the 21 February 1916. During March more bad weather impeded progress but the number of men employed on construction increased to 1,100 and the total number of buildings to be erected now numbered 132, 58 of which were complete. The value of the work up to 1 April was £137,000.(12,13)

The filling factory was completed during the week ending 22 July 1916 and comprised of 156 buildings to a cost of approximately £200,000. About 170 men were retained for general maintenance work and extensions to the factory railway track which were carried out from August to October. (13)

Adjoining Naas Lane was the general manager's bungalow, an attractive residence with a verandah facing east which remains as 'Cotswold Lodge'. (SO813132) A short distance away was a laundry for workers' overalls and canteen linen. Latterly this formed two dwellings called 'Sunny Holm' and 'Kingston'. (SO815130) A former guard room later became a dwelling known as 'Hillcroft'. (SO816130) In 1993 both 'Kingston and 'Hillcroft' were demolished to make way for new housing. Accommodation for some essential personnel such as the chief fireman and factory police was built alongside Naas Lane and one such bungalow which survived until 1992 was situated east of the main factory entrance - now the exit from Needham Avenue. The bungalow was called 'Elsinore' from the early 1920s. (SO818129) A present day survivor now called 'Caversham' was originally the centre bungalow of a block of three. (SO818128) All these buildings were made of wood covered with a cement rendering in later years and having the distinctive factory-style windows frames. Another survivor is the former time office, now called 'Holmcroft' and the adjacent workshop, now a garage, both built in brick. (SO817131) Until 1915 the only buildings in Naas Lane were the Curtis Hayward's 'Manor Cottages' (SO815130) and 'Waterwells Cottages' (SO816129) now named 'Crofton'.

Railway Works

The construction and operation of the National Filling Factory was greatly facilitated by a connection with the Midland Railway main line running nearby. In the early weeks of construction, men and their equipment and materials came by road from the Gloucester area. However, progress was unacceptably slow until railway facilities were provided through the War Office and Railway Executive Committee.(12)

On 29 November 1915 the Midland Railway company submitted their plans for a double junction in the main line between Tuffley Junction and Naas Crossing to the Railway Department of the Board of Trade. Sanction to proceed was granted five days later but under arrangements then in force the Midland Railway Company had already commenced engineering work on Sunday 28 November, laying in points and crossings on the up line, erecting signal posts and commissioning a new signal box named 'Quedgeley' on the up side of the line. On the following Sunday the engineer again had possession of the line, laying in points and crossings on the down line and bringing signals into use on a new passenger platform line and sidings within the factory area. The workmen's platform was 700 feet long and of typical Midland Railway construction complete with lamp standards.(14,15) The Midland Railway reported to the Board of Trade that the railway works would be ready for inspection any time after 3 January 1916 although this did not take place until May. (14) A train service for construction workers commenced on Monday 13 December 1915 leaving Gloucester for Quedgeley platform at 7.30 am each day including Sundays, returning at 7.10 pm Mondays to Fridays and 5.00 pm Saturdays and Sundays.(16) Altogether 18 sets of switches and about 2,600 yards of bull-head standard gauge track were laid by the Midland to a point about 330 yards southwest of the workmen's platform.(7) Beyond was the responsibility of the factory to procure through the Ministry of Munitions and lay to plan.(8)

A 2-foot narrow gauge railway system was laid throughout the works. This was primarily intended for factory operations but some use was made of it when the factory was under construction.(17)

By the end of 1915 the factory had laid up to the south end of the central station and by mid February 1916 2 miles of the factory's 2¾ miles of standard gauge railway had been laid and 3 of the 7 miles of narrow gauge railway laid. It was not until June that both the narrow and standard gauge systems as planned were nearing completion. (12,18) By autumn 1916 further extensions to the Midland Railway sidings were completed in connection with the establishment of an Army Ordnance Department (AOD) emergency ammunition storage depot in the south-east corner of the site. (15) The factory's track terminating at the north end of the central station was joined about that time to the track alongside the QF ammunition

magazines by a loop of railway running behind Manor Farm buildings. (7) This undoubtedly simplified traffic movements around the factory and enabled the unloading of explosives to be undertaken at another platform away from the central station and workshops amongst the magazines. In July 1917 another siding was laid into the eastern half of the AOD depot. (15) In total, but excluding the aforementioned AOD sidings, a further mile of standard gauge track was laid bringing the factory's mileage to 3¾.

The 2-foot narrow gauge railway system was designed for hand hauled trolleys as the rules for operation of magazines had been interpreted as disallowing animal traction. (17,19) However, at least two other filling factories, at Leeds (20) and Glasgow, (21) made extensive use of pony haulage following a relaxation in the regulations in 1916 though no stabling was allowed.(22) All the materials necessary for production were transported by narrow gauge railway from the various stores and explosive magazines. Finished ammunition from the workshops was moved in the same way.(5) A large number of turntables were installed at places where lines crossed at right angles and at several locations where the line was crossed by a raised walkway, a counterbalanced lifting bridge was provided in the walkway.(8) At some time when the factory was operational a further 2 miles of narrow gauge track was laid making a final total of 9 miles.(7)

Employment

Shell and cartridge filling work at Quedgeley as at other filling factories was deemed unskilled, and apart from the necessity to employ only the steadiest and most careful persons, it meant that workers could be drawn from a wide field of experience.(23) Comparatively high wages were deemed to be necessary to attract sufficient labour(24) and women workers registered at the labour exchanges for munition work at Quedgeley with enthusiasm having previously been employed for example as domestic servants (the largest source of women workers), dress-makers, dairy-maids, factory and shop workers.(25) The first 70 women taken on were trained at Woolwich and the remainder on the shop floor, performing all the shell, cartridge and fuse work.(6)

Male labour accounted for about 20% of the workforce and consisted of young men under 18 and men too old or unfit for military service and also discharged or wounded soldiers. The men were mainly employed on maintenance work and trolley work on the narrow gauge railway.(6)

Production commenced in early March 1916 and by June 2,420 workers (2,113 women and 307 men) were on the factory's books and working.(26) Numbers steadily increased to 3,916 in September before falling to 3,212 in December (27) when a fear

of TNT poisoning was at its height.(23) An appeal in the local newspapers for women munition workers in 1917 (28,29) brought a recovery in numbers and continual expansion which peaked at 6,364 in March but again fell away to 4,459 in October only to recover again to 4,664 in January 1918 and by the following October the workers numbered 6,227 (5,070 women, 1,157 men).(23,27) The fluctuations in the numbers of employees can be attributed partly to the unpleasant nature of some of the work and as a result of variations in the gun ammunition programme. This was seasonal or otherwise as in April 1917 and over the following winter when a shortage of raw materials due to enemy submarine action caused reductions in output. Generally speaking, cuts in employee numbers were attained by natural wastage which, taken over the life of the filling factory, was in the order of 100%.(23)

At first workers came from Gloucester and villages in the immediate vicinity of the factory and arrived either by train, bicycle or on foot. Because of the possibility of local industry being affected if too great a number of people were lured from the Gloucester area to Quedgeley, an additional train service was run from Stroud to Gloucester Great Western station from August 1916 connecting with a Quedgeley train at the Midland's Eastgate station. Similarly, from February 1917 one of the Gloucester-Quedgeley trains was altered to start from Cheltenham Lansdown.(30,31) Until the end of the war there were five trains each way by day and two by night. A weekly munition worker's return rail ticket cost 2s. 2d. from either Cheltenham, Gloucester or Stroud and in this way no problems were encountered with the supply of labour.(32) It was originally anticipated that there would be a large influx of women workers from far afield - a hostel was specially provided for the purpose by the Ministry of Munitions at 59 and 61 Park Road Gloucester (now demolished), but the vast majority of workers came every day from their own homes.(6)

Employees engaged in the danger area were issued with special flannel overalls coloured to indicate their work area in khaki, grey, blue, brown and black. White indicated a TNT worker.(33) The overalls were originally intended to be fireproofed but on account of cost this was never carried out.(23) The women's suit consisted of a cap, coat and trousers without turnups or pockets.(33,34,35)

Rules applicable to ordnance factories before the war(19) were applied to all workers in the danger area which was accessible only through the shifting house. On entering the shifting house all operatives were required to remove their outer clothing and place it on a peg allotted to them in one half of the building. A physical barrier was then crossed into the other half of the building, the "clean" side, where there was another peg allotted to their special overalls. As matches, cigarettes, tobacco, pipes, other combustibles and articles of metal were prohibited from the danger area, searches were

frequently conducted and in spite of the obvious dangers at least 150 males and 3 three females were prosecuted, fined or jailed for contravening the regulations between June 1916 and November 1918.(36)

Production

The original planned weekly capacity of 40,000 rounds of QF ammunition and 250 tons of propellant made up into BL cartridges had been increased by January 1916 to 80,000 rounds of QF 18-pounder high explosives (HE) or shrapnel (S); 10,000 rounds of QF 4.5 inch HE; 200 tons of propellant into cartridges and 80,000 filled primers. This was to be achieved without any change from single shift operation.

Four working blocks on the west side were available to start work on 21 February 1916 but the production was delayed by a lack of complete components for the types of ammunition allocated to it.(12)

The complexity of a round of QF ammunition can be appreciated by the fact that the 18-pounder HE round, for example, consisted of 71 components, measured nearly 18 inches long, weighed 23 lbs when filled and assembled and had a diameter of 3.3 inches. The cartridge case of solid-drawn brass contained the propellant charge of cordite sticks tied in a bundle weighing about 1½ lbs and its means of ignition in the base, the primer. The forged steel shell case containing the bursting charge of amatol(37) was pressed into the mouth of the cartridge case by a vertical hand press and fixed together in a coning machine so forming a complete round for loading into the gun. Detonation was achieved by means of a fuse, either of a time or percussion type, which was first activated by the shock of discharge from the gun releasing the safety arrangements. In the case of a percussion fuse, when the forward velocity of the shell was checked a needle moved forward onto a detonator, the flash produced passed down into a steel tube called a gaine containing gunpowder and other sensitive explosive compounds such as CE(38) Compressed between the gaine and the bursting charge was an exploder bag containing about an ounce of TNT crystals. Thus a series of successive explosions detonated the filling of the shell.(39)

In BL ammunition the shell and cartridge was separate, the cartridge consisting of the propellant contained in a fabric bag. Ignition was achieved by "igniters" - a small pouch containing about one ounce of gunpowder, sewn onto each end of the cartridge and fired by a friction device in the breech of the gun.(40)

Work eventually commenced during the second week of March on making up 2.75 inch BL cartridges which were the first products to be dispatched by rail on 13 March. (6) Nearly 2,000 were

manufactured during the following week and by 25 March the factory was working on 2.75 inch, 6 inch and 9.2 inch BL cartridges and a start had been made on filling fuses and gaines. By 1 April the number of workshops available was unchanged at four, but the factory was working on seven of its allocations, now making up 2.75 inch, 4.5 inch, 6 inch, 8 inch and 9.2 inch cartridges, fuse and gaine assembly and filling incomplete 18-pounder HE shell from the USA. (41) The incomplete rounds consisted of the filled cartridge case fixed to the shell but requiring the bursting charge, fuse and gaine to be inserted at Quedgeley. Mid April saw 2 more workshops available and in May a total of 13 allocations were being worked on simultaneously including for the first time complete manufacture of 18-pounder ammunition. Over 10 million rounds of this ammunition alone would eventually leave the factory over the next 2½ years. In June the factory became self sufficient in the supply of primers.(42)

Such was the urgency for ammunition the filling factories were encouraged by the Ministry of Munitions to utilise any suitable building available for work with the result that at Quedgeley certain temporary so-called misoccupations were tolerated.(12) A shortage of magazine accommodation resulted in bulk explosives being stored in buildings which were adjacent to workshops and the filling of 60-pounder and 4.5 inch shrapnel shell was carried out in the small fuse and gaine stores. During a visit in June 1916 by an official committee appointed to investigate the safe storage of filled gun ammunition, it found a considerable quantity of filled BL shell and incomplete 18-pounder QF ammunition in the empty shell stores and in the explosives receiving house 26 girls were engaged in filling 60-pounder shrapnel shell contrary to the regulations, with 100lbs of gunpowder in the shop. As a temporary solution the amount of gunpowder in the shop was reduced to not more that 25 lbs at any one time. The committee also considered the use of six TNT magazines situated south of the farmhouse to very undesirable due to their proximity to workshops and ordnance stores. The magazines were subsequently re-located in the far north-east corner of the site. (43)

As the availability of buildings and worker efficiency improved the weeks and months ahead were ones of consolidation as the factory concentrated on completing its allocations of ammunition. A move in this direction was the reorganisation of the work in the shops. The whole of the western side was modified to handle QF ammunition and components while the eastern side was devoted to BL cartridges and TNT exploder bags. Inevitably some buildings became inadequate for the increasing numbers of workers and the volume of work passing through the shops. The ammunition box stores, primer factory, canteen and shifting houses were greatly enlarged. (6) Night working appears to have been introduced from early 1917(44) and a new BL cartridge box stores was brought into use in 1918 as

it had become necessary to stockpile both boxes and boxed ammunition in the open.(45)

Two freight trains came daily to Quedgeley sidings from the Midland Railway sidings at Gloucester with wagons from various parts of the country. A daily service also brought empty wagons from Bristol. Supplies of cordite came from a large propellant store established at Gossington near Slimbridge in 1916. Three daily ammunition trains left Quedgeley for Gloucester, destined for such places as Avonmouth, Newhaven or Richborough.(46)

Factory Security and Safety

When construction commenced in 1915 the directing board requested the Chief Constable to extend police protection to the buildings being erected at Quedgeley. Subsequently one sergeant and nine constables were quartered there at the expense of the Ministry of Munitions in a hut supplied by the contractors.(47) In January 1916 the Ministry considered 30 constables were necessary for effective external guarding(48) but with no more being available, guarding was taken over by a company of 2nd/5th South Lancashire Regiment from 5 February.(6,12) They were accommodated in Manor Farmhouse from 25 March and the number of police employed at the factory was then reduced to three.(49) Later, guarding was carried out by the 3rd Battalion Gloucester Volunteer Regiment(6) until at the request of the Ministry on 31 October 1917 the external guard was entirely abolished,(50) no attempt having been made by any "ill-intentioned person" against any factory or magazine. The internal civilian guard was, however, strengthened at this time to 60 watchmen sworn in as special constables.(45)

The factory fire brigade was originally stationed near the main gate in Naas Lane with a lookout on the water tower. It consisted of one superintendent, one assistant superintendent and 12 regular men on two shifts. In 1918 the fire station was re-located to the east of the central station and the lookout established on the roof of that station.(45) It was reported that the fire brigade dealt with over 80 outbreaks of fire, some of which were a serious threat to the factory.(51,52)

Accidents

It is remarkable given the fact that thousands of tons of explosives were manipulated by many thousands of Gloucester hands that nothing more than minor accidents occured.(51) This compares nationally with 137 males and 78 females killed by explosions in 12 of the national filling factories between March 1916 and October 1918.(53)

A most unfortunate fatality occurred on the Quedgeley factory railway on 1 August 1917. Samuel West a local platelayer, one of seven employed by His Majesty's Office of Works at the factory, was fatally injured when six rails fell on him from a wagon.(54)

Disputes

Early in the war Lloyd George was reported in the press as stating that munition workers would travel free to and from work.(55) This idea was not taken up at a number of factories including Quedgeley and in April 1916 the women workers were on the point of striking over the matter as the cost of rail fares and insurance left little to live on out of £1 per week. Fortunately tension was eased by an increase in wages and a retrospective payment (56,57) but then the male workers put forward a similar claim which was not satisfactorily resolved. Their hourly rate was increased by 1d. (about an extra 5s.6d. per week) but an hour a day allowed for travelling was disallowed. Though further wage increases and a war bonus were paid, the question of the payment of rail fares for male workers lingered on to 1919 when a petition was sent to the Ministry of Munitions but still nothing came of it.(55)

Holidays and Recreation

Nationally the 1916 Easter holiday period caused a serious reduction in the output of shells and as a result of the very urgent need for a continuous supply of munitions all holidays both local and statutory between Whit-Monday and August 1916 were voluntarily postponed by Royal Proclamation at the instance of the Ministry of Munitions. This applied in both munition and non-munition areas and it was suggested that anything in the nature of a holiday atmosphere should be avoided. When pressure for output lessened in August, a rest period was arranged to run for four consecutive days at the end of September and although there were no further postponements of holidays, the Minister of Munitions, by now Winston Churchill, made a special appeal to munitions workers in 1918 to continue working through the Easter holiday.(23)

Quedgeley filling factory held two successful sports days in June 1917(58) and 1918(59) at the Kingsholm football ground which attracted both a large number of entries and spectators. Proceeds from the 1917 event were shared between the Great Western Voluntary Aid Detachment Hospital and Gloucester Royal Infirmary, each receiving £193. 8s.(60) Both events were filmed by the Pathe Company and shown at the Gloucester Hippodrome.

A variety of clubs were organised including hockey, football, cricket, bowls and tennis and in 1918 a factory band was formed

though plans for a choral society were abandoned when peace was declared.(6)

End of Production

Six days before the end of the war the Ministry of Munitions requested that the factory reduce its output which would best be met if no more labour was taken on(61) and then on 12 November 1918 the filling factory received the following telegram:

> 'The Controller and Directors of the Gun Ammunition Filling Department desire to express their great appreciation of the part played by the staff and workers at National Filling Factory No5 Gloucester, in achieving such a glorious victory.'(62)

The total output from Quedgeley was nothing short of remarkable. Between 13 March 1916 and 21 November 1918 complete assembly and filling was as follows:(6)

18-pounder shell	10,279,557
4.5" shell	384,269
60-pounder shrapnel shell	17,400
Cartridges filled, 2.75", 4.5" 6", 8", 9.2"	7,005,746
TNT exploder bags and cartons filled	8,489,084
Fuses assembled, Nos 100, 101, 102, 103	2,511,275
Fuses filled, No 106	566,887
CE pellets compressed for fuse No 106	502,996
Primers filled	11,501,459

Demobilisation, Disposal and Removal

On the declaration of peace on 11 November 1918 all workers took three days holiday on full pay and during the following two weeks they were engaged in stock taking and thoroughly cleaning the factory. The Ministry suggested that working hours be reduced so that wages would not exceed 25/- per week.(62) By 23 November the number of workers had been reduced to about 2,000 and one week later 1,500 remained, 75% having been released.(63) The passenger train service continued to run until 30 August 1920.(64)

For the next four years occasional auctions of furniture, electrical and engineering equipment and the buildings comprising the Army Ordnance Depot took place for the Ministry and its successor the Disposal and Liquidation Commission.(65) In 1920 about 150 workers both male and female were engaged in breaking down ammunition for scrap.(66) In December 1921 the Disposal Board relinquished the northern portion of the factory

Figure No 2: National Filling Factory No. 5 Quedgeley, looking north-east in November 1924 showing the large canteen undergoing demolition with the general offices behind. On the far right, in the distance, is the men's shifting house.

and auctioned the small series of magazine buildings. About this time Col. Curtis Hayward sold this part of the site to Gloucestershire County Council.(3)

In 1922 the London firm of metal merchants, Messrs Cohen Sons and Co. were destroying detonators by detonation at the factory much to the annoyance of the local inhabitants who were experiencing damage to their properties, loss of incubator eggs and ewes due to the shock of explosions. A petition signed by 71 inhabitants of Whaddon, Tuffley and Lower Tuffley sent to Sir R. Ashton Lister, MP for the Stroud Division of Gloucestershire achieved results in a lessening of the force of the explosions.(67)

In November 1924 a Folkestone estate agent and auctioneer Hubert F. Finn-Kelcey purchased the southern half of the factory from the now Surplus Stores Department(3) and held auctions of plant and building materials monthly until January 1926.(68) Col. Curtis Hayward died in November 1923 and his estate passed to his nephew Reginald Curtis Hayward(69) of The Edge, Stroud, from whom Finn-Kelcey purchased in March 1925 the freehold of the land he was occupying for the auctions. In November of that year he approached Messrs Bruton, Knowles with a view to selling the land except the frontage to Naas Lane.(3)

In March and April 1926 the London Midland and Scottish Railway Company removed the signals and connections in the main line to Quedgeley sidings and Quedgeley signal box closed on 25 April 1926.(70)

In 1938, the Air Ministry purchased the site of the filling factory and additional land for an equipment depot.(71) This survives today but at the time of writing is under threat of closure.

Acknowledgements

British Library
Gloucester City Library, Gloucestershire Collection
Gloucestershire Record Office
National Railway Museum, York
Public Record Office, Kew
R.A.F. Quedgeley

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Appendix

Advisory Committee:

Sir James Bruton: Nine times Mayor of Gloucester until 1919. Son of Henry Bruton, JP, founder of Bruton Knowles and Company.

John Henry Croxford: Managing director of Price, Walker and Company Ltd, timber importers.

Abel Joseph Evans: District Secretary of the Dock, Wharf, Riverside and General Workers' Union. Originally one of the members of the Gloucester National Filling Factory directory board, leaving at the request of the Minister of Munitions because he was not an employer of labour.

Richard Gibbs Foster: Chairman of Gloucester Dock Company

Harry Godwin Chance: Editor of the Citizen and Gloucester Journal, he took a prominent part in public life in Gloucester.

George Sheffield Blakeway: Town Clerk of Gloucester for 44 years.

Charles Edward Gardner: Head of Messrs William Gardner and Sons, engineers.

Henry Knowles: Eldest son of William Knowles, co-founder of Bruton, Knowles and Co.

Notes and References

1 The term shell was used for the plural as well as the singular.

2 On 26 July 1917 Steinitz changed his name to Macgregor (his mother's maiden name). Gloucestershire Chronicle 28 July 1917. See also Gloucester Citizen 30 July 1917 and Gloucester Journal 4 August 1917. Gloucester Wagon Company annual meeting.

3 Gloucestershire Record Office (GRO): D2299/5399.

4 PRO MUN4/1397: National Filling Factories progress record.

5 PRO MUN4/1551: Correspondence between the architect and the Ministry of Munitions. The other factories were located near Leeds, Liverpool and Glasgow.

6 PRO MUN5/154/1122.3/43: Historical record of National Filling Factory, Gloucester.

7 Ordnance Survey 25" series Gloucestershire Sheets 33.10 and 33.14 3rd edition 1923 (Revised 1921).

8 PRO MUN4/4970: Architect's plan, November 1915.

9 A primer, consisting of a percussion cap and a small magazine of gunpowder screwed into the base of a cartridge case, is the means of igniting the propellant charge which expels the shell from the gun.

A fuse is the initial means of igniting the bursting charge in a shell by a detonator and is designed to act in flight, on impact or ricochet.

A gaine is a steel tube 3 inches long screwed to the fuse of some shells and contains gunpowder and other sensitive explosives compressed into pellets which communicates the flash from the fuse to the bursting charge in the shell.

10 Cordite: A propellant charge in cord, stick or tube form consisting of a mixture of gun-cotton, nitro-glycerine and mineral jelly. When the charge is fired, the high temperature propellant gasses discharge the projectile from the gun.

11 TNT: Tri-nitro-toluene: A high explosive used in the filling of shells derived from the distillation of coal tar with the addition of nitric and sulphuric acids.

12 PRO MUN4/1378: Ministry of Munitions inspector's report.

13 PRO MUN4/463, MUN5/155/1122.3/64: National Filling Factories progress reports.

14 PRO MT6/2423/3: Correspondence between the Midland Railway, Derby and the Board of Trade (Railway Department)

15 National Railway Museum, York: Midland Railway Weekly Notices.

16 PRO RAIL963/137: Midland Railway Excursion Time Table

17 PRO MUN4/1576: Ministry of Munitions inspector's report.

18 PRO MUN4/1565: National Filling Factories progress report.

19 PRO MUN5/122/900/11: Regulations for Magazines and Care of War Material (1913)

20 PRO MUN5/155/1122.3/54: How the Shells were Filled. The Story of Barnbow, by R.H. Gurnmer. Hunter and Sons, Leeds, 1919

21 PRO MUN5/154/1122.3/35: Official History of the Scottish Filling Factory, (No 4 National), Georgetown, Renfrewshire, 1919.

22 PRO MUN4/2044: Regulations of the Ammunition Factories Under The Ministry of Munitions (1916).

23 History of the Ministry of Munitions, 1920 (unpublished)

24 PRO MUN5/82/342/22: Second report on the question of women's wages in the filling factories, October 1915.

25 PRO MUN5/155/1122.3/70: Census of women workers, Gloucester National Filling Factory.

26 PRO MUN5/250: List of employees in Government establishments.

27 PRO MUN5/155/1122.3/70: Numbers of employees in National Filling Factories.

28 Gloucester City Library, Gloucestershire Collection (GCL) Gloucester Citizen 23 January 1917, Correspondence: 'To the Women of Gloucestershire - An Appeal for Service.'

29 GCL Gloucester Citizen 27 January 1917, Advertisement: 'Women Wanted at Once for Munition Work.'

30 PRO RAIL937/118: Great Western Service Time Tables Supplement, October 1916.

31 PRO RAIL963/109: Midland Railway Working Time Table. Notice for February 1917.

32 PRO MUN4/1674: Letter from the senior organising officer for women's employment in the south western division of the Ministry of Labour 17 May 1917.

33 PRO MUN3/371: Surplus Government Property Disposal Board list of property lying at Quedgeley depot, 13 July 1920.

34 PRO MUN5/155/1122.3/53: Rules and Regulations of the National Ammunition Filling Factories (1916).

35 PRO MUN5/94/346/35: Rules for Employees of the Ammunition Filling Factories under the Ministry of Munitions (1917)

36 GCL Gloucester County Petty Sessions Reports, Gloucester Citizen 24 June 1916 to 9 November 1918.

37 Amatol: A mixture of ammonium nitrate and TNT,

38 CE Exploding composition. Tetranitio-methylaniline.

39 PRO MUN5/180/1300/67: Notes on the Ammunition for QF 13-pr; QF 18-pr. Horse and Field Equipment. Ordnance College, 1917.

40 PRO MUN5/180/1300/68: Notes on the Ammunition for BL 60-pr. Ordnance College. 1916.

41 PRO MUN4/1411: Ministry of Munitions inspector's report.

42 PRO MUN4/1761: Summary of Filling done by NFF Gloucester.

43 PRO MUN4/4970: Minutes of the meeting of the Committee on Storage of Filled Gun Ammunition.

44 PRO RAIL 963/109: Midland Railway Working Time Table January, 1917.

45 PRO MUN4/4972: Minutes of the Committee on Fire Prevention and Fire Appliances at National Filling Factories and Munition Stores, 1918.

46 PRO RAIL963/110: Midland Railway Working Time Table, October, 1917.

47 GCL Gloucestershire Standing Joint Committee report, January 1916.

48 PRO MUN4/1441: Ministry of Munitions correspondence, 18 January 1916.

49 GCL Gloucestershire Standing Joint Committee report, 4 April 1916.

50 PRO MUN4/2031: Correspondence between Gloucester NFF and the Ministry of Munitions, 11 March, 1918.

51 GCL Gloucester Journal 28 December 1918 Local Retrospect, Filling Factory.

52 PRO MUN5/226: Minutes of the Committee on Fire Prevention and Fire Appliances at National Filling Factories and Munition Stores, January 1918.

53 PRO MUN5/155/122.3/59: Memorandum on Danger Building Practice in the National Filling Factories.

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63 PRO MUN2/17, MUN2/18: Ministry of Munitions Secret Weekly Reports, 1918.

64 PRO RAIL963/142: Midland Railway Excursion Time Table.

65 GCL Gloucester Journal 14 June 1919, 27 March, 1920, 27 November 1920, 17 September 1921, 4 January 1922.
Gloucester Citizen 15 April 1920, 5 July 1920.
Dursley Gazette 15 January 1921, 26 February 1921, 3 December 1921, 14 April 1923.

66 GCL Gloucester Citizen 22 April 1920, 23 April 1920, 24 April 1920.

67 PRO MUN4/6857: Correspondence regarding complaints of explosions at Quedgeley, 11 March 1922 to 5 May 1922.

68 GCL Gloucester Journal 22 November 1924 - 2 January 1926.

69 GCL Gloucester Journal 16 February 1924 Local Wills - Col. Curtis Hayward.

70 National Railway Museum, York. London Midland and Scottish Railway Weekly Notices.

71 GRO D2299/6471.