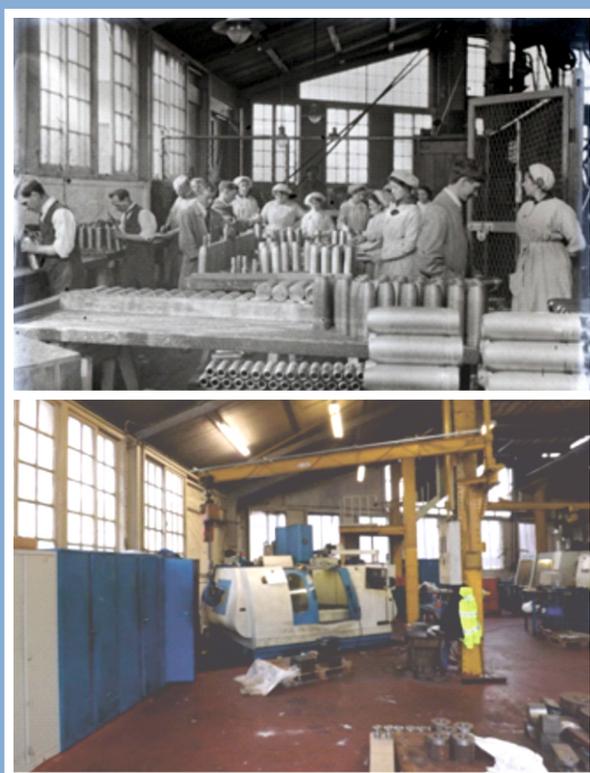


# GGAT 130: The Sinews of War: South East Wales Industry and The First World War

**March 2015**

A report for Cadw  
by Johnny Crawford BSc MA PIfA

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## Contents

<b>SUMMARY .....</b>	<b>6</b>
Acknowledgements.....	7
<b>1. INTRODUCTION .....</b>	<b>8</b>
Aim.....	8
Objectives.....	8
<b>2. METHODOLOGY .....</b>	<b>9</b>
2.1 Methodology and theoretical framework .....	9
2.2 Sources and data.....	10
<b>3. BACKGROUND.....</b>	<b>11</b>
3.1 The Ministry of Munitions.....	11
<b>4. RESULTS .....</b>	<b>14</b>
4.1 The iron, steel and metals industry.....	14
4.2 The munitions industry .....	53
4.3 Tube works.....	94
4.4 Great Western Railway and the Welsh Railways .....	99
4.5 Docks.....	102
4.6 The Coal industry .....	103
4.7 Gas and Coke manufacturing (extraction of chemicals).....	112
4.8 Shipping and ship repair .....	132
4.9 Aircraft production.....	155
4.10 Miscellaneous industries.....	162
<b>5. CONCLUSIONS.....</b>	<b>169</b>
<b>7. BIBLIOGRAPHY AND REFERENCES .....</b>	<b>174</b>

<b>Plates</b>	<b>Page</b>
Plate 1. Re-building of the Dowlais Cardiff iron and steel works in 1934 (07486m). Remodelling on this scale destroyed the First World War era works. ....	23
Plate 2. View to the north of Dowlais iron and steel works in 1929. This is the form the works had during the First World War. ....	29
Plate 3. General view to the south of the east elevation of the Neptune Engineering works, Newport. The glass and concrete building to the upper left sits on the footprint of the former Cork Wharf, whilst the extensive timber framing is the remains of the former fuel wharf. The red brick buildings date to the major expansion of the Neptune Works undertaken in the 1920s and visible on cartographic sources (GGAT/Cadw). ....	37
Plate 4. The expanded Albion Steelworks, Briton Ferry in 1934, view to the north. ....	39
Plate 5. GKN's Patent Nut and Bolt Plant (10778g) in 1930. ....	43
Plate 6. Swansea Vale Spelter Works (07932w), known at the time as the National Spelter Works as seen in an aerial photograph of 1933. The redundant British Metals Extraction Company plant (07483w) can be seen at the centre bottom of the image. ....	52
Plate 7. Aerial view of the National Cartridge and Box Repair Factory, Newport (10612g) in 1930. The building, located on the South Dock to the east of the sea lock, was used as a general warehouse at this time. ....	58
Plate 8. Contemporary view inside one of the warehouse spaces (Newport Library qM000 380.5) ....	58
Plate 9. Contemporary view of the north east elevation of the National Cartridge and Box Repair Factory (Newport Library qM000 380.5).....	59
Plate 10. West elevation of a surviving building from the National Cartridge and Box Repair Factory, Newport (10612g). The gable end has been re-modelled from its original appearance and the ventilation chimneys are a later feature.....	59
Plate 11. The Munitions Crèche (10274g), Alexandra Road Newport on the day of its opening on 3rd December 1917. ....	61
Plate 12. The Munitions Crèche (10274g) building in 2014. ....	61
Plate 13. South elevation of the former Uskside National Works, view to the north west. ....	65
Plate 14. Photograph dated 1917 and believed to have been taken at the Newport National Shell Factory (10613g), of the forging on No.1 Forge of steel billets used in the production of 60lb shells. One billet is chalked with the slogan "For Willie 1917" and the press, similar to a Watson Stillman hydraulic press, is chalked with the slogan "Presents for Fritz" (National Waterfront Museum). ....	70
Plate 15. North west corner of the historic Lovells works, at the junction of Albany and Alderney Streets, view looking down Alderney Street. (GGAT/Cadw) ....	73
Plate 16. West range of the historic Lovells works showing the blocked entrance to a rear courtyard and the adjoining later extension (red brick). View to the north east. (GGAT/Cadw).....	74
Plate 17. The west range, fronting onto Albany Street, was extended after the First World War, the new buildings being more ornate in nature. View to north east. (GGAT).....	75
Plate 18. Frontage of the former Tyne Engine Works (10779g) on Mill Parade, Newport taken before the First World War (Johns Newport Directory 1911). Note the brick and stone keying just visible on the extreme left of the photograph (Newport Past photo 106). ....	79
Plate 19. Surviving portion of the south west curtilage wall of the former Tyne Engine Works on Mill Parade, Newport (10779g). Note the comparison with the distinctive stone and brick keying just visible on Plate 17 (GGAT/Cadw). ....	80
Plate 20. South west curtilage wall of the former Tyne Engine Works(10779g) (GGAT/Cadw).....	80
Plate 21. Interior of the machine shop in 1917, view to north (DD/Tay/7-11) ....	90
Plate 22. Interior of the Taylor and Sons machine shop 2014, view to north (GGAT/Cadw) ....	90
Plate 23. Interior of the Taylor and Sons machine shop 1917, view to east (DD/Tay/7-9) ....	91
Plate 24. Taylor and Sons machine shop in 2014, view to east (GGAT/Cadw).....	91
Plate 25. North west corner of the Taylor and Sons machine shop 1917 (DD/Tay/7-10).....	92
Plate 26. North west corner of the Taylor and Sons machine shop in 2014 with original window frames, roofing and door(GGAT/Cadw).....	92
Plate 27. Surviving drive shaft to provide power to belt driven machinery, note original roof construction, Taylor and Sons machine shop (GGAT/Cadw).....	93
Plate 28. Abutment of the Taylor and Sons machine shop (left) to the earliest part of the premises, which probably dates to 1862. Note original roof construction (GGAT/Cadw).....	93
Plate 29. Aerial photograph dated 1939 of the Pilkington Brothers glass works, Pontymoile, looking to the north. The footprint of the First World War Admiralty Sidings (10688g) is visible top left of the Pilkington Warehouse buildings. Only a single rail track remained in use at this time. ....	101
Plate 30. Contemporary photographs of the Coedely by-product plant (Gas World Coking Section).....	121
Plate 31. Contemporary view of the Risca by-product facility in operation during the First World War. (Gas World Coke Section). The building closest the camera in the upper photograph is the crude benzol plant whilst the	

upright tanks are the gas scrubber units. The wall at the bottom of the photograph still exists. ....	124
Plate 32: South West Gable end of the machine shop (10698g) looking north (GGAT/Cadw) .....	136
Plate 33: View of the shipyard in 1919 showing the machine shop 10698g and slipways (10692g) with vessels under construction (Claire Fields Collection) .....	136
Plate 34. Interior of the former machine shop at National Shipyard No.1(GGAT/Cadw).....	137
Plate 35. Section of dividing wall between slipways showing constructional fittings (GGAT/Cadw) .....	140
Plate 36. Concrete keel support on the banks of the river close to the slipways. Identical keel supports can be seen in a First World War photograph held by Chepstow Museum (GGAT/Cadw).....	141
Plate 37. Concrete crane bases at the former National Shipyard No. 1, Chepstow, with 1m scale rods (GGAT/Cadw).....	141
Plate 38. Keel marker on a slipway, one of a number of surviving fixtures and fittings at the National Shipyard (GGAT/Cadw).....	142
Plate 39. Former entrance into Bulwark military camp (10691g), view to the north west from the junction of Camp Road and Alpha Road, Chepstow (GGAT/Cadw).....	145
Plate 40. General view the north of the Hardwick Village estate (10620g) showing the workers housing fronting onto Portwall Street (top), Green Street (middle) and Caird Street (lower) (GGAT/Cadw).....	147
Plate 41. Workers housing at the eastern end of Alpha Road, part of the Bulwark housing estate (10621g), view to the south west (GGAT/Cadw).....	149
Plate 42. Building associated with the CH Walker Shipyard (08935g) adjacent to the west perimeter wall. View to north (GGAT/Cadw) .....	152
Plate 43. Concrete keel supports near the remains of the CH Walker slipways, Sudbrook. Note the strong similarity with those seen at the National Shipyard No.1, Chepstow (Plate 28) (GGAT/Cadw).....	153
Plate 44. Remains of the north slipways at CH Walker's Sudbrook shipyard (08935g), view to south west (GGAT/Cadw).....	153

## Tables

Table 1. Iron, steel metal working sites identified in the study. ....	14
Table 2. Sites associated with munitions production within Glamorgan and Gwent.....	54
Table 3. Table of identified tube works .....	94
Table 4. Table of identified railway expansions.....	99
Table 5. Table of coal pits making identified during the study.....	103
Table 6. Table of gas works and coke ovens modified for war output .....	112
Table 7. Table of sites of ship building identified during the study .....	132
Table 8. Table of sites of aircraft manufacture. ....	155
Table 9. Table of miscellaneous industries identified in the study .....	162
Table 10. Combined Table of Industrial sites.....	176

## Figures

Figure 1: Spot distribution map of identified military/industrial sites within the Glamorgan-Gwent area.....	13
Figure 2. Dowlais Cardiff iron and steel works, East Moors Cardiff (07486m) as it appeared on the Third edition OS map of 1917. ....	23
Figure 3. The Castle steel works (10680g) as depicted on the Third edition OS map of 1921. The works were destroyed by the construction of the Northern Aluminium Company plant in the 1930s, which itself has now been destroyed.....	25
Figure 4. Cordes (Dos) Nail works (09529g) in Newport as depicted on the Third edition OS map of 1920.....	27
Figure 5. The original Neptune Works as depicted on the Third Edition OS map of 1921. This is the form the works would have taken during the First World War. Note the range of buildings projecting from the north west corner, which survives in the current works. ....	35
Figure 6. The expanded Neptune Works as depicted on the OS Fourth edition map of 1937. The works had absorbed both previous buildings (red) although the projecting range of buildings remained intact.....	36
Figure 7. Aerial photograph of the Neptune Engineering Works, Newport, taken in 1928, view to the South east. Note the fuel wharf at the bottom left of the shot, the supports for which are still in situ.....	36
Figure 8. The historic core of the Albion Steelworks (07306w), Briton Ferry, as it appears on the 1918 Third edition OS map. The works subsequently expanded, almost doubling in size. The Albion works (red) is flanked to the south east by the Whitford Sheet Steel and Galvanising Works and to the north by the Baglan Bay Tinsplate Company Works. Although no documentary evidence has been located, it is almost certain that both these other firms would have contributed to the war effort.....	39
Figure 9. Pontardawe Tinsplate works as shown on the 1918 Third edition OS map. The works have been extended north and east in comparison to the Second edition OS map, which is likely to indicate the extent of the First World War expansion. ....	41

Figure 10. The Patent Nut and Bolt Works (10778g), Cwmbran as depicted on the Third edition OS map of 1920.	43
Figure 11. Imperial Mills wire works in Newport (10602w) owned by GKN, as it appeared on the Third edition OS map of 1921.	45
Figure 12. The JC Hill wire works (10712g) as shown on the Third edition OS map of 1921	47
Figure 13. The British Metals Extraction Company(07483w) zinc plant at Llansamlet as depicted on the Third edition OS map of 1917.	50
Figure 14. Swansea Vale Spelter Works (07932w) as depicted on the Third edition OS map of 1917.	52
Figure 15. The National Cartridge and Box Repair Factory (10612g) at Newport South Dock as depicted on the Third edition OS map of 1921. It is believed the raised platforms were used to support a conveyor system for moving newly unloaded shell cases and ammunition boxes into the factory complex.	57
Figure 16. Uskside Iron Works (red), Newport (Uskside National Works (10615g) from 1915 to 1920) as depicted on the Third edition OS map of 1921. In this form, the works was essentially an amalgamation of two separate iron works. Most of this phase of buildings is extant although much modernised.	65
Figure 17. The Great Western Railway Engine sheds at Maesglas (10613g), as depicted on the Third edition OS map of 1921. The sheds were used as the National Shell Factory from 1915 to 191, with the pressing operations most likely taking place in the 'L' shaped building at the east of the complex.	69
Figure 18. Footprint of the Lovells Confectionery works (red) as shown on the Third edition OS map of 1920. This shows the building as it would have been during its use for war work during the First World War.	73
Figure 19. Lovells Confectionery works as depicted on the Fourth edition OS map of 1937. The footprint of the original buildings (red) is shown to highlight the extent of the post-First World War expansion.	74
Figure 20. Possible location of the Cork Wharf munitions works (10277g) depicted on the Third edition OS map of 1921 and which was subsequently absorbed into the Neptune Engineering works.	77
Figure 21. Location of the Tyne Engine Works (CH Bailey) 10779g on Mill Parade, Newport as depicted on the Third edition OS map of 1921.	79
Figure 22. The Cardiff Rope Works (blue) site was selected as the location for the Cardiff National Shell Factory (05070s) and expanded during the course of the war (red).	82
Figure 23. Currans Metals and Munitions works (05056s) were located in the former Bute Shipbuilding and Engineering Works. Currans would become one of the key firms in the British re-armament programme of the late 1930s.	84
Figure 24. Swansea National Shell Factory (07379w) as depicted on the Third edition OS map of 1919 was established in the Swansea Haematite works owned by Baldwins.	86
Figure 25. Taylor and Sons, Briton Ferry (07318w) as shown on the Third edition OS map of 1918. The machine shop, where shells were manufactured is located at the north of the site.	89
Figure 26. Surviving elements (Blue) of Taylor and Sons, Briton Ferry(07318w)	89
Figure 27. The British Mannesmann Tube Works, Newport (03674g)	96
Figure 28. The British Mannesmann Tube Works, Landore, Swansea (10272g) as seen on the Third edition OS map of 1921	98
Figure 29. Admiralty sidings, Pontymoile (10688g) as depicted on the Third edition OS map of 1920	100
Figure 30. The GKN owned Cwmbran colliery (10777g) as depicted on the Third edition OS map of 1920.	107
Figure 31. Newport Gas Works as depicted on the Third edition OS map of 1920.	114
Figure 32. The by-product coke ovens at the Victoria foundry, Ebbw Vale (10740g) as depicted on the Third edition OS map of 1921.	116
Figure 33. Plan of the southern part of the Ebbw Vale coke ovens (10740g) from a 1915 publication (Gas World Coke Section)	116
Figure 34. Plan of the by-product plant at the Victoria coke ovens, Ebbw Vale (10740g) in 1915 (Gas World Coke Section)	117
Figure 35. Coedely coke ovens as depicted on the Third edition OS map of 1921. Nothing visible remains of the site.	119
Figure 36. Contemporary elevation drawing of the Coedely by-product plant (Gas World Coking Section 1915) showing the coke ovens (left) and coal washery and crusher (right)	119
Figure 37. Contemporary sectional drawing of the Coedely coke oven and by-product plant showing the coal crusher and washery (right), coke oven and ram (centre) and by-product plant (left) (Gas World Coking Section 1915)	120
Figure 38. Contemporary sectional an elevation plans of Coedely coke ovens and by-product plant showing coal washery, coke oven and benzol factory (right to left, top drawing) and the gas scrubber units and boiler (left to right, lower drawing) (Gas World Coking Section) 1915)	120
Figure 39. Risca by-product oven (07580m) at the North Risca Black Vein Colliery as depicted on the Third edition OS map of 1920. The crude benzol plant is the rectangular building at the bottom left of the red outlined area.	123
Figure 40. GKN's government sponsored Cwmbran coke works (10650g) as depicted on the Third edition OS map of 1920. Note the series of circular structures south east of the main coke oven; these are probably gas	

scrubber units used to extract compounds from waste coking gasses.....	126
Figure 41. Llwynpia coke ovens and storage facility as depicted on the Third edition OS map of 1920.....	128
Figure 42. Location of Bargoed coke ovens and by-product plants.....	130
Figure 43. Bargoed colliery coke ovens and by-product plant north range .....	131
Figure 44. Bargoed colliery coke ovens and by-product plant south range .....	131
Figure 45: Location of the machine shop 10698g .....	137
Figure 46 Location of slipways (10692g) and machine shop (10698g, red dot) .....	140
Figure 47. Bulwark military camp (10691g) as depicted on the Third edition OS map of 1921. Nothing of the camp remains although the modern industrial estate which now occupies the site retains much of the road layout. ....	144
Figure 48. Bulwark village (10621g) as depicted on the 1921 Third edition OS map. Note the roads laid out for the houses which were subsequently completed.....	149
Figure 49. CH Walkers shipyard (08935g) at Sudbrook as depicted on the Third edition OS map of 1920 .....	152
Figure 50. The Cambrian Aircraft Constructors site (05053s) at 18 Station Road Penarth as depicted on the Third edition OS map of 1920 .....	157
Figure 51. The site of the Cambrian Aircraft Constructors works in Tyndall Street, Cardiff as depicted on the Third edition OS map of 1920 .....	159
Figure 52. The American Skating Rink, Westgate Street, which was used as the location for the Willows Balloon Company (05055s) in 1918. ....	161
Figure 53. Henllis Fire Brick and Retort works (10830g) as shown on the Third edition OS map of 1921.....	166
Figure 54. Uskside Chemical works, Newport was as depicted on the Third edition OS map of 1921.....	168

## Summary

*Through detailed examination of sites identified by an initial scoping report (Crawford 2014), it has been possible to identify within the modern counties of Glamorgan and Gwent a wide range of sites of archaeological interest connected with the industrial response to the outbreak and conduct of the First World War. The present report has identified surviving sites that contain significant archaeological remains from this period and has sought to contextualise and assess the significance of those remains. Out of 65 sites identified as part of the study, only five include significant surviving physical remains, fewer than 8%. However, the surviving elements are representative of a range of differing industrial reactions engendered by the war.*

*There are essentially three archaeologically identifiable industrial responses in Glamorgan and Gwent to the outbreak and prosecution of the First World War, as identified by this study. These responses are not necessarily sequential and indeed multiple responses can apply to a single site but they are broadly reactive to changing battlefield and strategic circumstances and to technological and administrative advances made during the course of the war.*

*The initial response was for existing firms to continue production of their pre-war products, albeit at a boosted rate and for a single client (the government). This type of response was the most common on the outbreak of war, when the prevailing belief held was that the fighting would not last long. The war was viewed as a temporary aberration before life returned to normal. Thus we see from the Taylor and Sons site at Briton Ferry (07318w) which is substantially intact as a site that, whilst there was early and enthusiastic conversion to munitions production, no great change of infrastructure/buildings was required, the biggest difference probably being the layout of lathes and other plant to ensure smooth running of the various 'Operations' in the chain of munitions manufacture.*

*The second response and the most common one was the adaption of pre-existing sites to accommodate increased or altered production regimes. This is the response that most sites exhibited in the years after 1915, when the war proved to be of a magnitude and duration as yet unseen, and after the formation of the Ministry of Munitions introduced varying degrees of control and compulsion in industrial output. Archaeologically, this can be seen in the construction of additional benzol plants at coke works, the addition of furnaces at existing iron and steel producing sites and, in the case of a surviving example, Lovells Confectionary Works in Newport (09547g), the conversion from producing one product (confectionary) to another (ammunition boxes and mine sinkers).*

*The final response was the construction of specific facilities to meet particular requirements as set out by the Ministry of Munitions or other government departments. This response includes the National Box and Cartridge Repair Factory in Newport (10612g) and National Shipyard No.1 in Chepstow (10884g).*

*National Shipyard No.1 is a potentially nationally unique site, in an unusually good state of preservation and it is recommended that it be considered for statutory protection. The Taylor and Sons engineering works in Briton Ferry is, in the context of First World War industrial remains in Glamorgan and Gwent, unique in the extent and condition of its survival, with many elements in the building unchanged since 1917. It is recommended that the Taylor and Sons site be considered for some form of enhanced statutory protection of the remains, not only for its documented relevance to the First World War but also for the wider context of Welsh industrial heritage.*

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## **1. INTRODUCTION**

### **1.1 Project Background**

#### **Introduction**

2014 is the centenary of the outbreak of the First World War, one of the seminal events of modern world history. A great many projects and initiatives are being undertaken in order to mark this event, the majority of which have an historical focus rather than an archaeological one. Indeed, although the First World War has been the subject of archaeological interest for a number of years, the majority of previous work has focussed on battlefield archaeology in France and Belgium (*e.g.* Saunders 2009, Brown and Osgood 2009).

The physical impact of the First World War on the home front, and therefore the archaeological legacy, has been poorly understood until recently. Cadw provided grant aid funding for a scoping study in 2013 to establish a baseline of information concerning the survival of archaeological sites relating to the First World War period (Crawford 2014).

This project has been commissioned to examine the significance of industry to the home front of the First World War in Glamorgan and Gwent and to undertake archaeological recording of key sites where appropriate. This will allow the remains from this crucial period of Welsh history to be placed in an appropriate archaeological and historical context and permit informed decisions to be made concerning the future management of those sites.

#### **Project Aims and Objectives**

##### **Aim**

The aim of the project is to examine the physical impact the national war effort had on the creation and adaption of South Wales's industrial infrastructure. The project will assess the preservation of any surviving remains, with a specific focus on factories, transport and industry.

##### **Objectives**

In order to achieve this aim, the following objectives have been identified:

- In-depth documentary research of sites previously identified from the scoping study
- Identification of sites that have survived in some form
- Make recommendations for statutory protection or further work as suitable

## 2. Methodology

One of the original objectives of the project was the involvement of volunteer groups or individuals in the identification and recording of surviving archaeological remains. However, it became apparent that despite massive media coverage of events surrounding the centenary of the First World War, there was a very low level of public engagement with the Trust concerning the industrial aspects of the war on the Home Front. The decision was reluctantly taken to therefore undertake a more conventional archaeological assessment of the remains

### 2.1 Methodology and theoretical framework

The study of industrial archaeology has undergone a change in the last 30 years, moving away from a technology centric approach of processual archaeology to something akin to Ian Hodder's 'contextual archaeology' (Palmer and Neaverson 1998), in which 'the full and detailed description of the total context as the whole network of associations is followed through' (Hodder 1986). In other words, sites do not and can never exist in isolation and they must be examined in context with other, not necessarily archaeological themes. Such a concept meshes well with a later theory borrowed from sociological studies, that of Actor Network Theory (ANT) (Latour 2008). ANT, in a modified form, ascribes agency to objects and indeed places and can be used to explore wider issues associated with the original object or site. As an example, a soldier's helmet on one level is merely an object; but by using ANT, wider questions are raised that place that object into a meaningful context; where was it made and where did the steel used in its construction come from, how did it get out of the factory where it was made, has it been personalised, does it have a symbolic as well as functional use?

However, by logical extension, it can be fairly said that by using ANT, almost everything is connected. This is perhaps more true of industrial processes than other areas, where acquisition of raw materials, management of labour, energy and resources, and development of means of communication and transport are intimately connected, forming complex 'chaîne opératoire' as described by the works of Maus, Hadricourt and others (Darvill 2010). Virtually every industry in Glamorgan and Gwent was affected by the war and could therefore claim a place in the following report. The Official History of the Ministry of Munitions itself struggles to define how many or even what types of industry could claim to form part of the 'Munitions' industry, and their difficulty is worth quoting at length:

"The term 'Munitions' has never been strictly defined, and it may be taken in the narrower sense to cover the manufacture of destructive munitions only, or it may be taken to include all industries subsidiary and essential to the production of destructive munitions, such as the iron and steel trades, the manufacture of machine tools etc. In its widest sense even, it may be taken to cover all occupations, over which the control of the Ministry of Munitions was exercised, and even coalmining, transport, etc., including thus every kind of work essential to the needs of war." (Official History of the Ministry of Munitions Vol. VI Manpower and Dilution Part IV p48)

However, for reasons of space if nothing else, only the firms with proven documentary references to war work have been included. Of those sites, it has been necessary to concentrate on those for which the most evidence survives or which are more significant in their contribution than others.

It is with this framework and highlighted caveats in mind that the author has approached the current work. The sites described within this report must not be seen in isolation; they are part of a vast network harnessed and developed to meet the needs of an unprecedented conflict. It is however a sad reality that time and space restricts a fuller analysis of the sites and therefore artificial boundaries have had to be introduced to make the work achievable.

## 2.2 Sources and data

The information contained within this report has come from a multitude of sources. Of primary utility was information held by the regional archives located in Ebbw Vale, Cardiff and Swansea. The use of primary documents has been invaluable in identifying and enhancing sites with strong connection with the First World War and the archives are often the only locations that contain references to a firm's activity during the First World War, generally in the form of correspondence with the Ministry of Munitions. Such information is relatively thin on detail that would be useful to an archaeologist, with very few plans and drawings being located. The minutes of council meetings are useful in identifying locations, based either on the requirements for increased utilities (borough electrical engineering records are particularly useful) and for developing a sense of time and place with which to contextualise the sites themselves. Records kept by the firms themselves, where available, have been useful. Documents such as letter books and correspondence files are especially useful but considerable time must be spent examining them in order to garner the required information.

The Official History of the Ministry of Munitions (HMSO 1920), re-published by the Imperial War Museum, whilst certainly weighty, provides a wealth of actual and contextual detail about the British industrial contribution to the War as well as providing detail regarding the official record of industry in Wales. Indeed, no study of the industry of First World War Wales can be undertaken without reference to the 'Official History' as it underpinned all war industry activity undertaken within the Principality.

As was identified from the scoping report during the first year, secondary sources were of much less utility in gathering detailed information; the relative lack of interest in wartime industry has resulted in a dearth of published material. Local history studies were of some assistance as they frequently contain passing references to locations and people, which can be useful in identifying sites, but very little of it is directly useful to the archaeologist. The Glamorgan County History (Barber and Thomas 1980) and Volume 5 of the Gwent County History (Williams and Croll (eds.) 2013) were consulted but other than some minor detail regarding output figures, and occasional passing references, these works appear concerned with comparisons of pre and post war economies, and were of less utility in the study of individual sites. This lack of detail concerning the home front in Glamorgan and Gwent during the First World War, even in very recent secondary sources, is indicative of the relative lack of research that has been undertaken on this topic.

The data generated for each site has been placed into an individual record for this report and which has been used to enhance the Glamorgan and Gwent Historic Environment Record. Furthermore, each site in this report has been assigned a significance rating based on its perceived value as an archaeological site. These three ratings are Local, Regional and National and are based on an assessment of a combination of rarity and surviving condition set within the context of First World War era remains. Thus, whilst a site such as the Ynysfach ironworks (01263m/GM331) may contain a Scheduled Ancient Monument in the form of the blast furnaces, it was out of use during the First World War, being useful only for the quantity of scrap iron it provided and consequently its value is assessed for this report only as 'Local'.

### 3. Background

In many ways, the effects of the First World War on the landscape of Glamorgan and Gwent are ephemeral. No section of society was untouched and parts of the landscape itself were subordinated to the requirements of the conflict, whether in the form of training areas, allotments for increased food output or purpose built factories. There is, however, no overtly militarised landscape of the type that would be more common during the Second World War and Cold Wars. Many of the military facilities constructed during the First World War were always intended to be temporary in nature and have left few archaeological traces. To a certain extent, the same can be said of the effects of the war on the industries of Glamorgan and Gwent.

South East Wales has historically been a powerhouse of industrial activity and contributed in no small measure to the success of Britain and the British Empire on the world stage. It is fair to say however that these same industries experienced a general decline in fortune in the first decade of the 20th century, burdened with older technology and facing increasing competition from overseas, particularly from Germany and the United States of America.

The industrial contribution of Glamorgan and Gwent to the First World War was dynamic, shifting from a pre-war continuation of a 'business as usual' attitude through to the imposition of a 'command economy' by the Ministry of Munitions, with its varying degrees of incentives and compulsion. The various archaeologically visible industrial responses will be discussed in later sections of the report.

#### 3.1 The Ministry of Munitions

The Ministry of Munitions was a government department, founded in May 1915 under the leadership of the then Chancellor David Lloyd George, in order to develop and co-ordinate Britain's wartime military/industrial economy. Whilst the initial impetus for the organisation was the crisis in the production of munitions of war, the actual definition of munitions was somewhat loose and the means of producing those munitions involved virtually every industrial process and firm within the United Kingdom. As a consequence, the Ministry of Munitions was involved to a greater or lesser degree with every industry in South Wales as the 'command economy' evolved to meet the requirements of waging industrial war on an unprecedented scale.

The command economy, more closely associated today with authoritarian regimes, was one in which the government dictated what and how much should be produced, depending on the perceived requirements of the national interest. In order to regulate production, strategically important firms such as those producing iron, steel and chemicals were designated as Controlled Establishments under the Munitions of War Act 1915, effectively bringing them under the direct control of the Ministry of Munitions. Not only did the Ministry control the products, it also dictated wages, employment conditions and hours of work, which in many ways were more enlightened than those that had existed pre-war and those that would be re-imposed post-war. More unpopular measures (at least with firm owners) were caps on profits for Controlled Establishments, which were believed to offer unfair advantages to uncontrolled firms which were free to make as much profit as they wished, subject to taxation.

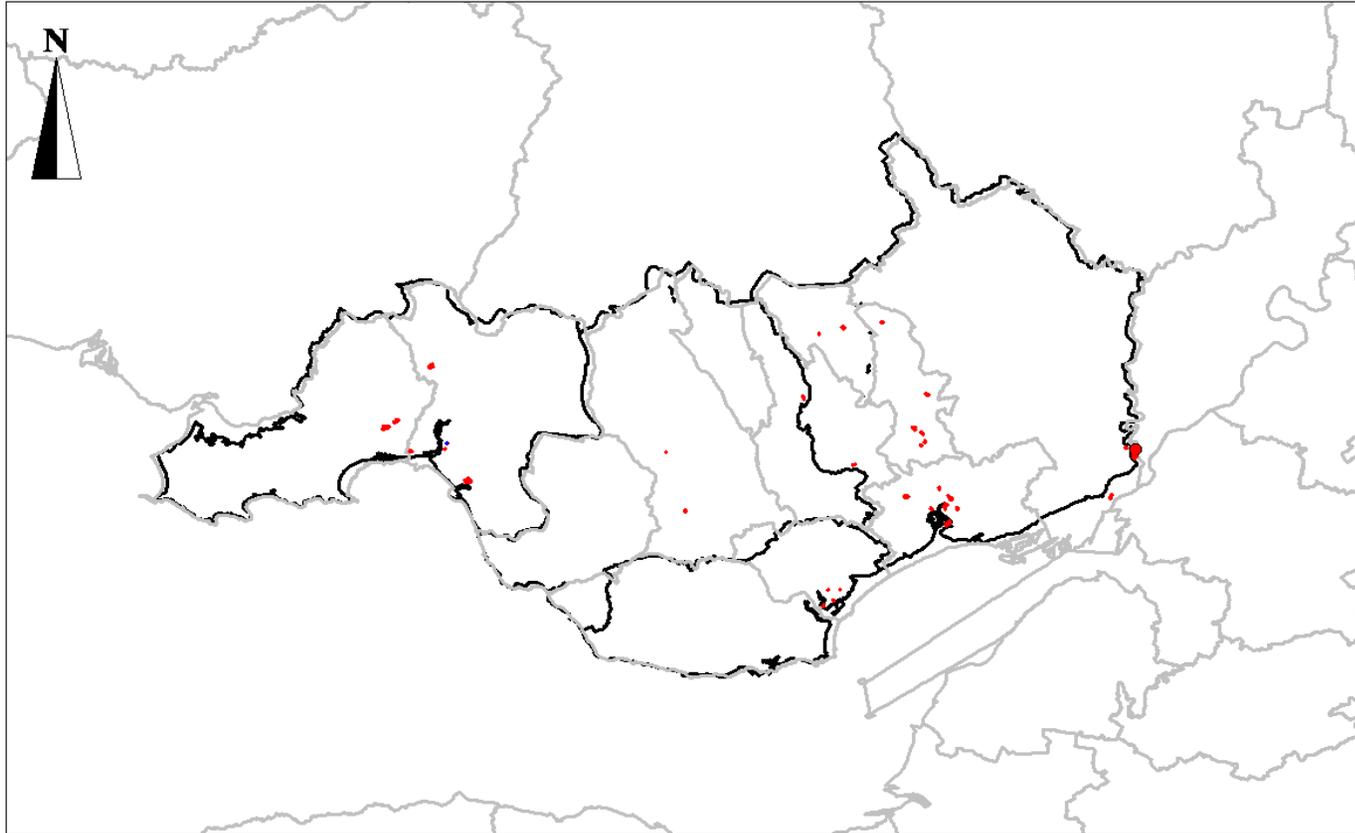
The far reaching influence of the Ministry of Munitions meant that many firms were requested to expand or modify their factories in order to meet specific requirements. For example, additional buildings were constructed on the premises of Uskside National Works (Previously Uskside Engineering (10615g) to specifically accommodate a production line for 6 inch

howitzer shells. Other purpose built facilities included a women's cloakroom, tool storage areas and a paint shop, although identifying these extensions by cartographic means can be problematic. These expansions were either directly subsidised, or more commonly, the cost of the installations was off-set against tax returns. An example of this is the installation of a new furnace at the Gilbertson owned Pontardawe Tinsplate Works (01161w) in 1917, incentivised by the promise of tax relief and relaxation of the Excess Profits tax (West Glamorgan Archive D/D Gil 1/10).

The difficulty of identifying wartime expansions has been highlighted but the Ministry of Munitions did commission purpose built facilities which are more easily identified. Within Glamorgan and Gwent, two such sites survive to a greater or lesser degree, these being National Shipyard No.1 (10884g) and the National Box and Cartridge Repair Factory in Newport (10612g). Both were constructed for particular roles as a direct response to events on the battlefield and survive as they have remained more or less in continuous use since the period of their construction.

Regardless of the category into which the sites fall, government responsibility for them was relinquished as soon as possible after the cessation of hostilities, lest the financial burden on the state become untenable. In practice, this often meant that government owned machinery and buildings were disposed of for a fraction of the true value simply to remove it from the ledgers. This included sites, such as the National Shipyard, that had required massive investment to construct and which could undoubtedly have been put to greater national use had there been greater foresight. It is arguable that the lack of planning for peace within the Ministry of Munitions, coupled with the fall in prices created by the enormous glut of heavy industrial products caused by over development of the means of production during the war, helped to fuel the deep recession that occurred in the early 1920s. The recognition of the incredible waste caused by the acquisition and subsequent disposal of assets by the Ministry of Munitions resulted in much greater planning with regard to the military/industrial requirements of the United Kingdom prior to and during the Second World War (Protheroe Jones pers. comm. 2014).

The enormous industrial effort required by the First World War has left an archaeological signature that has been largely ignored until recently. It is hoped that this report will begin to address that imbalance and bring into focus the vast organisational and industrial effort of those times.



*Figure 1: Spot distribution map of identified military/industrial sites within the Glamorgan-Gwent area.*

## 4. Results

### 4.1 The iron, steel and metals industry

Iron and steel was the basic material required by war industry. The ubiquity of its use meant that it was an essential strategic resource whose production was to be increased by any means and the measures taken to boost output ranged from the expansion of existing iron and steel plants to the erection of purpose built facilities. Equally significant was the production of spelter (brass) that was required for the munitions industry. Swansea had been a centre of spelter production in Britain but its dominance had faded before the outbreak of the First World War due to competition from Germany and the United States. The following sites have been identified that shed light on the range of responses engendered by the insatiable demand for iron, steel and allied metals industries.

**Table 1.** Iron, steel metal working sites identified in the study.

Site name	PRN	Condition	Purpose
Cyfarthfa ironworks, Merthyr Tydfil	01169m/GM425	Near destroyed	Pig iron production, shell steel producer
Ynysfach Ironworks, Merthyr Tydfil	01263m/GM331	Near destroyed	Source of scrap iron
Whitehead and Company, Tredegar	10619g	Destroyed	Steel rolling mill
Orb Steelworks, Newport	09210g	Damaged	Steel mill, rolling of brass and zinc
Port Talbot steel works	07340w	Near destroyed	Steel works
Cardiff-Dowlais iron works, Cardiff	07486m/NPRN305757	Near destroyed	Iron and steel works
Castle steel works, Rogerstone	10680g	Destroyed	Steel works
Cordes (Dos) nail works, Newport	09529g	Destroyed	Producer of steel bars, rails, nails
Dowlais iron and steel works, Merthyr Tydfil	01615m	Destroyed	Iron and steel works
Port Talbot iron and steel company general offices, Port Talbot	07931w/NPRN23152	Altered	General office
Blaenavon iron and steel company, Blaenavon	02221g	Near destroyed	Expanded to produce shell steel
Blaina iron works, Blaina	09038g	Destroyed	Source of scrap iron
Braithwaites Neptune Engineering works, Newport	10885g/NPRN415172	Altered	Producer of trench plates, water tanks, ships plating
Briton Ferry steel works (Albion), Briton Ferry	07306w	Destroyed	Steel works
Pontardawe tinplate works, Pontardawe	01161w	Near destroyed	Steel producer and tinplate works

GKN Patent Nut and Bolt works, Cwmbran	10778g	Dear destroyed	Steel and munitions producer
Imperial Mills (Wire works), Newport	10682w	Destroyed	Iron and steel wire works
J C Hill and Company, Oakfield, Cwmbran	10712g	Destroyed	Wire works
British Metals Extraction Company, Llansamlet	07483w/06131w	Destroyed	Zinc smelter
Swansea Vale Spelter Company, Llansamlet	07932w	Destroyed	Spelter (brass) producer

**Cyfarthfa Ironworks Crawshay Brothers, Cyfarthfa, Merthyr Tydfil**

Site name	Cyfarthfa Ironworks Crawshay Brothers, Cyfarthfa, Merthyr Tydfil
NGR	SO 038 069
PRN(s)/NPRN(s)	01169m/GM425
Site type and description	<p>The Crawshay Brothers Cyfarthfa Ironworks initially appeared on a list of GKN owned Controlled Establishments but was removed when it was pointed out to the Ministry of Munitions that they had ceased producing iron and steel some years previous to the war, having switched to the supply of coal to the Admiralty (Jones 1987). Much of the works was redundant before the war, having closed in 1909 and it is clear the site contained a large quantity of unused machinery. A letter dated 31st August 1917 from Alex Walker, Director of Scrap, Ministry of Munitions is held by the Glamorgan Archives stating that his attention had been drawn to the great quantity of scrap iron and steel lying around the Cyfarthfa works and the Ynysfach works, which contained a large amount of iron tonnage in the form of plant. He wanted it put to use for the war effort and one James Clements of Newport was appointed a Scrap Superintendent (Glamorgan Archives DG/C/1/24). Parts of the Cyfarthfa works were however put back into operation for the war effort. On the 19th March 1916 Castle Mill, Cyfarthfa re-opened to roll shell steel produced in the Western Group of war production firms. The mill had been closed for years and when Ministry of Munitions inspectors visited in early 1916, rabbits were seen in the engine house. By February 1916, new boilers and re-heating furnaces had been installed and an output of 1,500 tons of shell steel billets per week was commenced, all for an investment cost of £33572 (Nicholson 1919). On 28th October 1917, No. 3 Furnace at Cyfarthfa re-opened for pig iron production, over the objections of GKN, who by that time owned the site and were probably wary of further investment at the virtually moribund works. The furnaces produced over 1,400 tons per week of iron for turning into steel. The works is also known to have re-processed surplus 12 inch and 9.2 inch howitzer shells originally manufactured in America into 18lb shell billets. The total number of employees at the blast furnaces, rolling mill and engineering shops was 904, of which less than 1% were women. The details of the refurbishments of the furnaces and associated works at this time are unknown.</p>
Community	Merthyr Tydfil
County	Merthyr
References	<p>Official History of the Ministry of Munitions, Volume VIII</p> <p>Nicholson 1919: Wales: its part in the War</p> <p>Jones, E, 1987, A History of GKN: Innovation and Enterprise 1759-1918, London, Macmillan</p>
Map details	SO00NW
Significance rating	Regional for First World War
Any current management	The blast furnaces are a Scheduled Ancient Monument (GM 425)

**Ynysfach Ironworks, Merthyr Tydfil**

Site name Ynysfach Ironworks, Merthyr Tydfil

NGR SO 04549 06051

PRN(s)/NPRN(s) 01263m/GM331

Site type and description Ynysfach iron works was an old works, established as a subsidiary to the Cyfarthfa iron works in 1801 by the Crawshay family. It had gone out of use before the outbreak of the First World War and was identified as a source of valuable scrap metal by the Ministry of Munitions in 1917 (Glamorgan Archives DG/C/1/24). It saw no further use during the war.

The remains of the early blast furnaces are a Scheduled Ancient Monument but the majority of the works have been destroyed.

Community Merthyr Tydfil

County Merthyr Tydfil

References Glamorgan Archives DG/C/1/24

Map details SO00NW

Significance rating N/A

Any current management The portion of the site not scheduled is now the location for a college of higher education.

**Whitehead and Company, Tredegar**

Site name Whitehead and Company, Tredegar

NGR SO 14344 08953

PRN(s)/NPRN(s) 10619g

Site type and description Whiteheads was a pre-war rolling mill founded on the site of the former Tredegar Ironworks. It was one of the companies forming part of the Eastern Group of firms organised under the Ministry of Munitions (Nicholson 1919) making a significant contribution to the war effort. The products were largely the same as pre-war ones, i.e. sheet steel, bars, rails etc. that had been rolled using their very modern continuous strip rolling mill that had been imported from America immediately prior to the war. The works were closed in 1931 with operations focusing on the mills at Newport and Cwmbran. Very little trace of the former rolling mill exists although there is a strong possibility for the survival of buried structures.

Community Tredegar

County Blaenau Gwent

References Nicholson, 1919 Wales: its part in the War  
Third edition OS map of 1921

Map details SO10NW

Significance rating Local

Any current management The area of the former rolling mill has been left as waste ground for a number of years but has recently been selected as the site of re-development as a business park.

**Orb Steelworks (J Lysaghts Ltd), Newport**

Site name Orb Steelworks (J Lysaghts Ltd), Newport

NGR ST 32602 86479

PRN(s)/NPRN(s) 09210g

Site type and description The Orb Works opened in 1897 as an ironworks under the management of William Lysaght. Built on farmland of Pill farm, the farmhouse of which became the main offices. A goods only branch of the Great Western Railway was opened in 1898 and the works used this as well as a private wharf on the river to transport materials and goods. By 1913 the work employed c. 3000 workers. In 1936 a gatehouse complex was added and later Air Raid Protection shelters were built. After the war the complex became part of the British Steel Company, later becoming part of the Corus Group specialising in the production of high grade electrical steel and sheet steel (Morriss, R. K. 2008).The works produced steel plate was used extensively in munitions manufacture and for the production of trench plates (Davis 1998).

During the First World War it was one of the companies forming part of the Eastern Group of firms organised under the Ministry of Munitions (Nicholson 1919) making a significant contribution to the war effort. The works had to adapt to the rolling of brass and zinc for war purposes due to the excess of rolling mills already working with steel. William Lysaght became a key figure in the Ministry of Munitions for his insights into the steel and spelter industry.

No structures or features can be specifically dated to the First World War period with the exception of the former works office (09212g). The office was built in the early 20th century as one of a series of extensions to the original works office situated in the former farmhouse of Pill Farm (09211g). The southern elevation of the office has a narrow recessed entrance flanked by projecting wings with tall gables and has a timber-framed doorway and cross-mullioned window with leaded light glazing. Both wings feature modern windows and remains of faux timber framing on the gables. The building has a slate roof and the interior has some elements that could be original, including a panelled boardroom (Morriss, R. K. 2008).

A war memorial to the employees of the Orb Works, Newport and the company's Wolverhampton Works who were lost during the First and Second World Wars was located near to the main works office. A square memorial faced with ashlar stone, raised on plain steps. The monument is topped with a moulded plinth and cornice beneath a blocking course and the west and east sides feature projecting shallow buttresses with moulded tops (Morriss 2008).

The memorial has now been moved elsewhere within the works site. As for the remainder of the works, these consist of a large industrial building still standing on the footprint of the Orb works. Whilst there may

certainly be historic elements, the current structures are re-clad with modern materials it is probable that little of the original works survive, with a major refurbishment of the site having occurred in the early 21st century.

Community	Newport
County	Newport
References	Official History of the Ministry of Munitions, Volume VIII Davis 1998, History of the Borough of Newport Morriss, RK, 2008, The Orb Works, Newport, Gwent: An Architectural and Archaeological Analysis.
Map details	ST38NW
Significance rating	Local
Any current management	The site is still an active producer of electrical steels.

**Port Talbot Steelworks (Baldwins) Ltd., Port Talbot**

Site name	Port Talbot Steelworks (Baldwins) Ltd., Port Talbot
NGR	SS 76172 89742
PRN(s)/NPRN(s)	07340w
Site type and description	<p>Port Talbot Steelworks was a pre-war works owned by Baldwins, who also operated works at Landore, Panteg and Gowerton. The works was part of the Western Group of firms formed in early 1916 and administered by the Ministry of Munitions in order to efficiently operate works producing vital war material (Nicholson 1919). The works, which were reputed to have the finest plate mill in the United Kingdom, were adapted to manufacture shell steel billets up to 12 inches in diameter, blooms, boiler plates, high tensile (armour plating) plates, rails and ship plates. Two large basic furnaces were added in 1917 to the open hearth furnace. At the same time, the construction of the large, purpose built and self-contained steelworks that would become Margam Steelworks, was commenced. This included the construction of by-product coke ovens, blast furnaces and open hearth plant as well as mixers and rolling mills. The works have almost been destroyed and it is not possible to assess the survival of any features dating to the First World War.</p>
Community	Port Talbot
County	Neath Port Talbot
References	Official History of the Ministry of Munitions, Volume VIII
Map details	SS78NW
Significance rating	Local
Any current management	<p>The works have been substantially destroyed but the extent of the survival of First World War period features is unknown. A number of industrial buildings are located on the site, which appear to be in various states of dereliction.</p>

**Cardiff-Dowlais iron works, Cardiff**

Site name Cardiff-Dowlais iron works, Cardiff

NGR ST 19739 75857

PRN(s)/NPRN(s) 07486m/NPRN305757

Site type and description The East Moors iron and steel works was built by Guest, Keen and Nettlefolds (GKN) in Cardiff in 1890 in order to provide a works with convenient access to the sea. The East Moors works became a manufacturer of plate for ships. Soon after the outbreak of the war and in common with the remainder of GKN's holdings, the Dowlais Cardiff site was taken over by the government as a Controlled Establishment. These works had government contracts and were controlled to maximise output, eliminate wasteful duplication, and keep profits down in the face of desperate need and shortage. Two additional 60 ton open furnaces were installed 1917 at the request of the Ministry of Munitions to increase production (Jones 1998). The works were re built and expanded in the 1930s, which destroyed the layout that had been in operation during the First World War. Both the original and later buildings have been destroyed, with significant re-development having occurred. The majority of the former site now lies beneath modern industrial estate buildings.

Community Splott

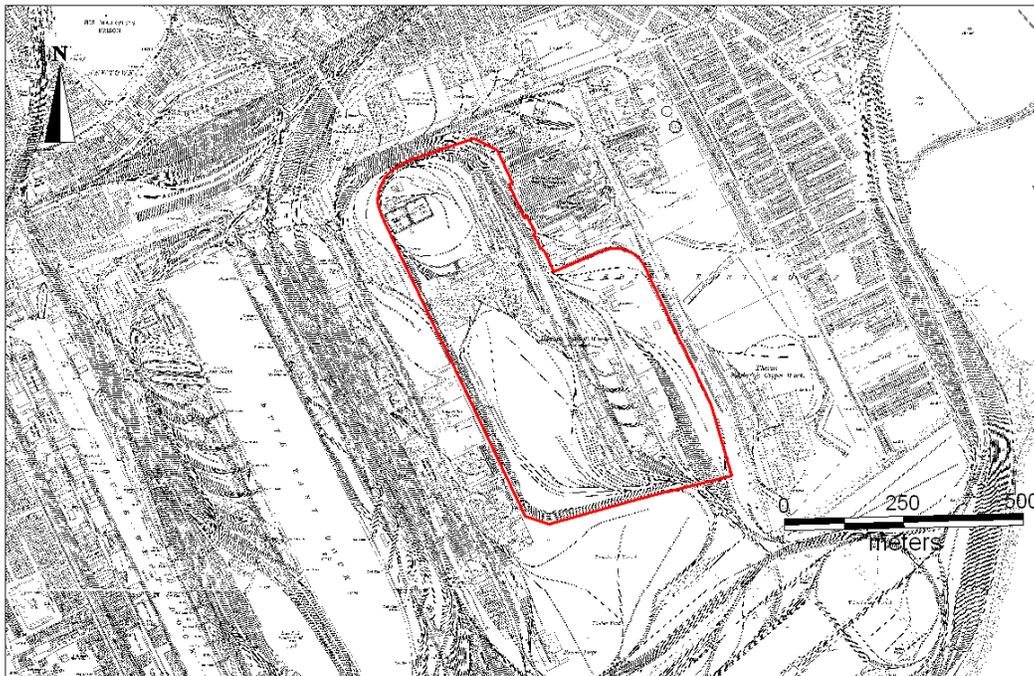
County Cardiff

References Second edition OS map of 1901  
Third edition OS map of 1919  
Fourth edition OS map of 1942  
Jones, E, 1987, *A History of GKN: Innovation and Enterprise 1759-1918*

Map details ST17SE

Significance rating Local

Any current management The site is currently an industrial estate.



*Figure 2. Dowlais Cardiff iron and steel works, East Moors Cardiff (07486m) as it appeared on the Third edition OS map of 1917.*

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*Plate 1. Re-building of the Dowlais Cardiff iron and steel works in 1934 (07486m). Remodelling on this scale destroyed the First World War era works.*

**Castle Steelworks, Rogerston, Newport**

Site name Castle Steelworks, Rogerston, Newport

NGR ST 27147 87606

PRN(s)/NPRN(s) 10680g

Site type and description The Castle works was a Guest, Keen and Nettlefolds (GKN) iron works appearing on a list of Controlled Establishments in 1915. The works had its origins in the late 1800s and became part of the GKN empire in 1903. The works were extended for increased production in 1916 (Jones 1998). These works had government contracts and were controlled to maximise output, eliminate wasteful duplication, and keep profits down in the face of desperate need and shortage. The Castle steel works are shown as having expanded to the north of the site between the Second and Third Edition O.S. maps, the expansion most likely having taken place during the war. The steelworks was largely demolished and much of the site of the original Castle works was buried beneath the Alcan Aluminium works in the mid-20th century. The Alcan works themselves have now been destroyed and the site is undergoing re-development.

Community Rogerstone

County Blaenau Gwent

References Second edition OS map of 1901

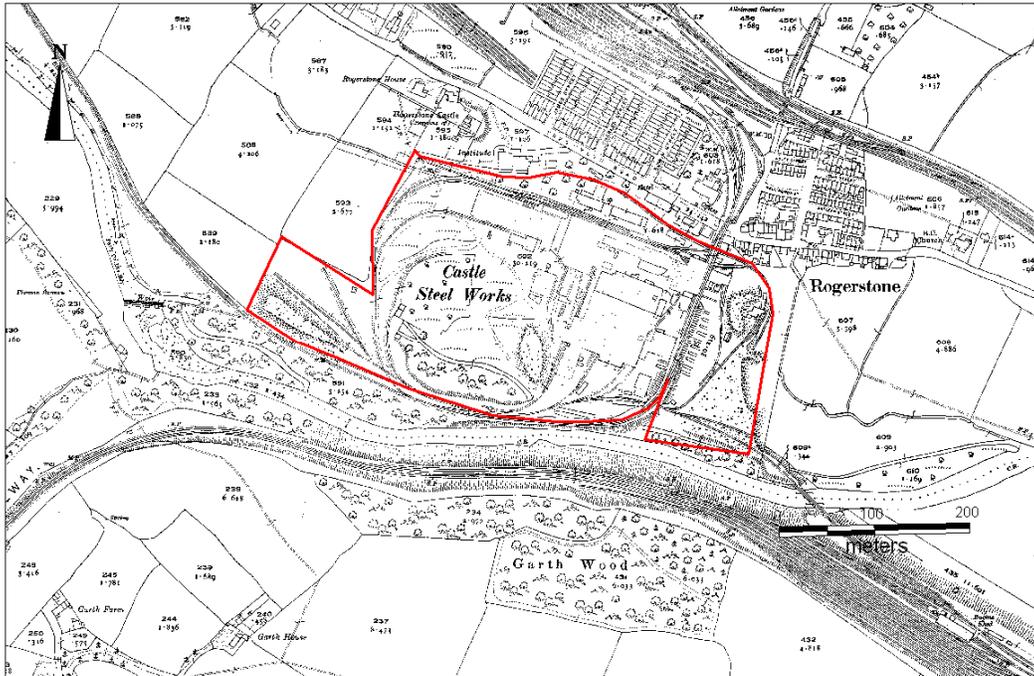
Third edition OS map of 1920

Jones, E, 1987, *A History of GKN: Innovation and Enterprise 1759-1918*

Map details ST28NW

Significance rating Local

Any current management The Castle works was overbuilt by an aluminium production plant in the 1930s. This plant itself (the former Alcan plant) has now been demolished and the site has been allocated for re-development as housing. It is possible that some remains from the Castle steel works survive beneath the ground but successive development on the site has most likely severely truncated them.



*Figure 3. The Castle steel works (10680g) as depicted on the Third edition OS map of 1921. The works were destroyed by the construction of the Northern Aluminium Company plant in the 1930s, which itself has now been destroyed.*

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**Cordes (Dos works) Nailworks, Newport**

Site name	Cordes (Dos works) Nailworks, Newport
NGR	ST 30966 88717
PRN(s)/NPRN(s)	09529g
Site type and description	<p>The Dos works originated in around 1857 and was the first large local factory in Newport. The owner, J J Cordes was of Spanish - American origin and the works was called 'Dos' (Spanish for the number two) as it was the second plant he opened. The firm of J J Cordes Ltd. Went into liquidation in 1903, its assets being acquired by the Cordes (Dos) Works Ltd. The factory closed in 1961. During the First World War, the Dos works was one of the companies forming part of the Eastern Group of firms organised under the Ministry of Munitions (Nicholson 1919) making a significant contribution to the war effort. The products were largely the same as pre-war ones, i.e. sheet steel, bars, rails, steel arches etc. as well as wire for use in springs and nails.</p> <p>The works appear on the First to Fourth edition OS maps and retain essentially the same form, this being a broadly rectangular complex made up of separate buildings and warehouse spaces located immediately west of the Monmouthshire Canal and adjacent railway line. An open space west of the works is shown as containing allotment gardens on the Third edition map, a development almost certainly brought about by the First World War food shortages. The allotments can be seen on an aerial photograph dating to 1929 (RCAHMW image WPW029307). Nothing upstanding remains of the former works but there is a possibility that buried remains survive in the vicinity.</p>
Community	Allt yr Yn
County	Newport
References	<p>Nicholson, I, 1919, Wales: its part in the War</p> <p>First edition OS map of</p> <p>Second edition OS map of</p> <p>Third edition OS map of 1920</p>
Map details	ST38NW
Significance rating	Local
Any current management	The site is currently occupied by a housing estate. It is possible that buried remains associated with the former works survive in the area.

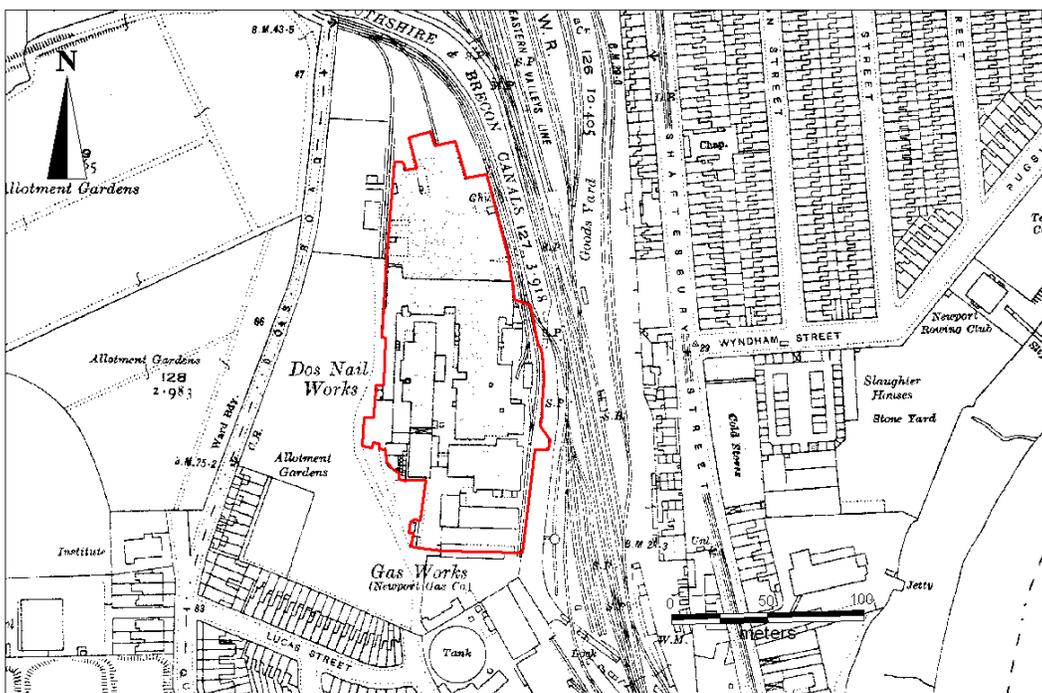


Figure 4. Cordes (Dos) Nail works (09529g) in Newport as depicted on the Third edition OS map of 1920.

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**Dowlais Iron works, Dowlais, Merthyr Tydfil**

Site name Dowlais Iron works, Dowlais, Merthyr Tydfil  
 NGR SO 06955 07645  
 PRN(s)/NPRN(s) 01615m

Site type and description Founded in 1759, the Dowlais Ironworks is an important ironwork site of nationally and internationally significant historic, technological, and artistic associations with surviving standing structures and buried remains. The main surviving industrial structure in the area is the red brick Blast Engine House of 1909 (Listed Grade II 11,491). The furnace bases and other potential features are thought to survive under massive banks of reclaimed soil, however their current condition is unknown. The area includes the site of Dowlais House re-built 1818 for JJ Guest, the Dowlais Ironworks Offices (88,063), the site of industrial workers terraced housing at 28-33 Cae Harris, Pond Street (0893m) and the extensive lines of the Dowlais Iron Company Railway and tramroad. Dowlais expanded through the early part of the 19th century, partly thanks to entry into the wrought iron rail trade. By 1845 it was the largest ironworks in the world, with many foreign orders for rails; in particular Dowlais had a large contract with Russia. Diversifying into steel in the 1870s, work continued at Dowlais until 1930 (Roberts 2005).

During the First World War, the Ministry of Munitions commissioned the dismantling of old plant in February 1918 at the Cyfarthfa and Dowlais works in an effort to re-cycle scrap metal. The Old Works at Ivor and Old Works at Dowlais were scheduled for clearance. It is unclear as to which Old works are referred to in the reference document but No.1 Furnace Blowing engine, No.1 Blast furnace, comprising furnace, furnace lift, One hot blast stove, tubes etc. were on the Bute freehold and not subject to the government request. The rest of the works were eligible to be dismantled. After realising they had to carry out the work themselves, GKN hoped to retain all the derived materials for their own purposes, rather than accede to the Ministry's request for scrap. They also told the Ministry to stay out of the matter in their correspondence with them, something that perhaps betrays the strain and hostility which the board of GKN probably harboured towards the Ministry of Munitions, which had effectively nationalised the company in 1915. GKN dragged their feet on dismantling the works until March 1918 either due to bureaucracy or lack of will. The excuse was made that they did not have an account to audit the dismantling; it is quite likely however that by this date, the board of GKN had simply become exasperated by government interference.

Community Dowlais

County Merthyr Tydfil

References	Glamorgan Archives DG/C/1/24 Jones, E, 1987, <i>A History of GKN: Innovation and Enterprise 1759-1918</i> First edition OS map of 1882 Second edition OS map of 1901 Third edition OS map of 1920
Map details	SO00NE
Significance rating	Local
Any current management	The Dowlais works have been destroyed, being replaced with mixed residential and commercial buildings. However, it is believed that significant multi-period remains associated with the former works survive beneath re-claimed ground.



*Plate 2. View to the north of Dowlais iron and steel works in 1929. This is the form the works had during the First World War.*

**Port Talbot Steel Company General Offices, Port Talbot**

Site name Port Talbot Steel Company General Offices, Port Talbot

NGR SS 76687 89519

PRN(s)/NPRN(s) 07931w/NPRN23152

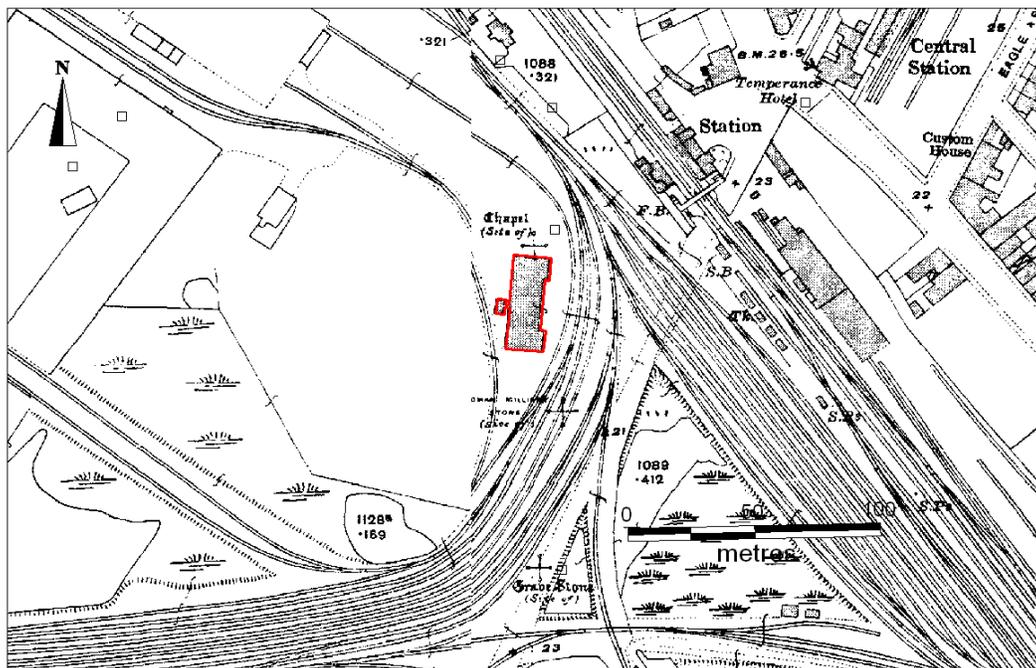
Site type and description

This large red brick and Portland stone building is the only upstanding remains belonging to the former Port Talbot Steelworks (also confusingly known as Baldwins and at one time as the Margam Steelworks), which was a works purpose built for war production during the First World War. The building was built in Neo Georgian style as the General Offices of the Port Talbot Steel Company in 1917. The offices are shown on the Ordnance Survey of 1917 surrounded by steelworks buildings. It is little altered from that time except that the south wing was single-storey with parapets, and there was a cupola above the entrance along with some chimney stacks. The boardroom is said to have been downstairs to the left of the entrance. The main range has end wings which are advanced to the front. The building is constructed of red brick in stretcher bond, suggesting double skin construction. It has pale stone dressings including plinth and rusticated quoin strips to the wings. Hipped tiled roofs with swept eaves, with individual roofs to the main range and each wing. The front of the main range is 7-window while the wings are 3-window. Horned multi-pane sash windows throughout with stone sills and flat gauged brick heads with keystones. Central bay with doorway and stairlight above, flanked by narrow 4-over-4-pane sash windows, under a raised segmental pediment. Doorcase with tapering pilasters, moulded capitals and wide flat cornice, containing double panelled doors with overlight. This supports a pronounced stone tablet which rises to the sill of the stairlight above and reads 'Port Talbot / Magistrates Court.' The round-headed stairlight has a moulded stone surround with ears and large inverted volutes against the jambs. A large fluted and scrolled keystone supports a keyed oculus in the pediment which has moulded stone drops to the sides. The windows flanking the central bay are 8-over-8-pane sashes, except for the outer ground floor windows which are paired 4-pane sashes. The front elevations of the wings are symmetrical with 8-over-8-pane sashes flanked by 6-over-6-pane sashes, all the windows openings with aprons. Added range to the left, with large catslide section and no openings. The north side of the north wing is also 3-window with 8-over-8-pane sashes, but those to the lower storey are not aligned with those above. The left and central lower windows have aprons beneath. The rear is rendered and altered. Flat roofed projection behind main range with lean-to to the right. Mainly UPVC windows, irregularly spaced. The added bay to the South end is similar, with flat-roofed projection to rear, probably a staircase bay, and irregular windows. (Cadw listing information).

Community Port Talbot

County Neath Port Talbot

References	Coflein Third edition OS map of 1917 Fourth edition OS map of 1939
Map details	SS78NW
Significance rating	Currently listed
Ownership details	Ministry of Justice
Any current management	Currently used as a magistrates court.



The general office of the Port Talbot Iron Steel works as depicted on the 1917 Third edition OS map.

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**Blaenavon Iron and Steel Works, Blaenavon**

Site name                    Blaenavon Iron and Steel Works, Blaenavon

NGR                            SO 24074 68862

PRN(s)/NPRN(s)        02221g

Site type and description        The Iron and Steel Departments of the Blaenavon Company limited became a 'Controlled Establishment' on November 8th 1915. Extensions were made to the works, at government request, to boost output and reduce wastage. The Government partially covered the cost of the works. The nature of these extensions included enlargement of the open hearth steel plant, and extensions connected with the blast furnaces and coke oven by product plants (Nicholson 1919). A shell factory was established at the works to produce artillery projectiles but it has not been possible to specifically identify the location within the works. The majority of the works has been destroyed and it is likely that all traces of the shell factory have also been destroyed.

Community                Blaenavon

County                      Torfaen

References                Nicholson, I, 1919, Wales: its Part in the War

Map details                SO20NW

Significance rating        Local

Any current management        The majority of the later Blaenavon works has been destroyed and it is likely that the wartime extension has been destroyed.

**Blaina Iron works, Blaina**

Site name Blaina Ironworks, Blaina, Gwent

NGR SO 19862 08334

PRN(s)/NPRN(s) 09038g

Site type and description The furnaces and engines at Blaina dismantled by Henry Parfitt, Boilermaker and Engineer at Merthyr (a controlled establishment under the Munitions of War Act 1915) in Jan 1918. Work must have commenced in late 1917 as part of a general scheme to utilise scrap for the war effort. The site has been destroyed and replaced by a housing estate.

Community Blaina

County Blaenau Gwent

References Glamorgan Archives DG/C/1/24

Map details SO10NE

Significance rating Local

Any current management The site of the works is now a housing estate

**Braithwaite and Company Ltd, Newport**

Site name Braithwaite and Company Ltd, Newport

NGR ST 31656 86005

PRN(s)/NPRN(s) 10885g/NPRN415172

Site type and description

Braithwaites was a pre-war engineering firm that produced ‘trench covers’, railway points, water tanks and skin and deck plating for ships (Davis 1998) during the First World War and who owned the Neptune Engineering works, Newport. The Neptune Works were established in the early 20th century and soon after became Braithwaite & Co, Neptune Works as a subsidiary of Braithwaite & Co Engineers Limited (U.K.), which had been established in 1913 for undertaking fabrication of Structural Steel Works. Braithwaite & Co Engineers Ltd became part of the Rowecord Group in the 1960's.

The original Neptune Works is first depicted on the Third edition OS map of 1921 as a rectangular building, close to Cork Wharf in Newport, and well supplied with transport links in the form of rail tracks that merge with Cork Road immediately to the west. Also depicted on the map is a patent fuel works and associated wharf, located to the north of the Neptune site, and which in later years was absorbed into the Braithwaites works. A building located just south east of the Neptune Works has been identified as the site of a First World War munitions works (10277g) but its relationship with the larger works has not been ascertained. A range of buildings projects from the north west corner of the main works, parallel to the line of rail tracks and this row of buildings survives as part of the modern works.

By the time of the 1937 Fourth edition OS map, the original Neptune Works had expanded significantly into a rectangular structure that absorbed both the previous structures into its footprint. This is the form of the works that can be seen in aerial photographs of the site dating to 1928 held by the Royal Commission for Ancient and Historical Sites in Wales (image C878722).

Community Pillgwenlly

County Newport

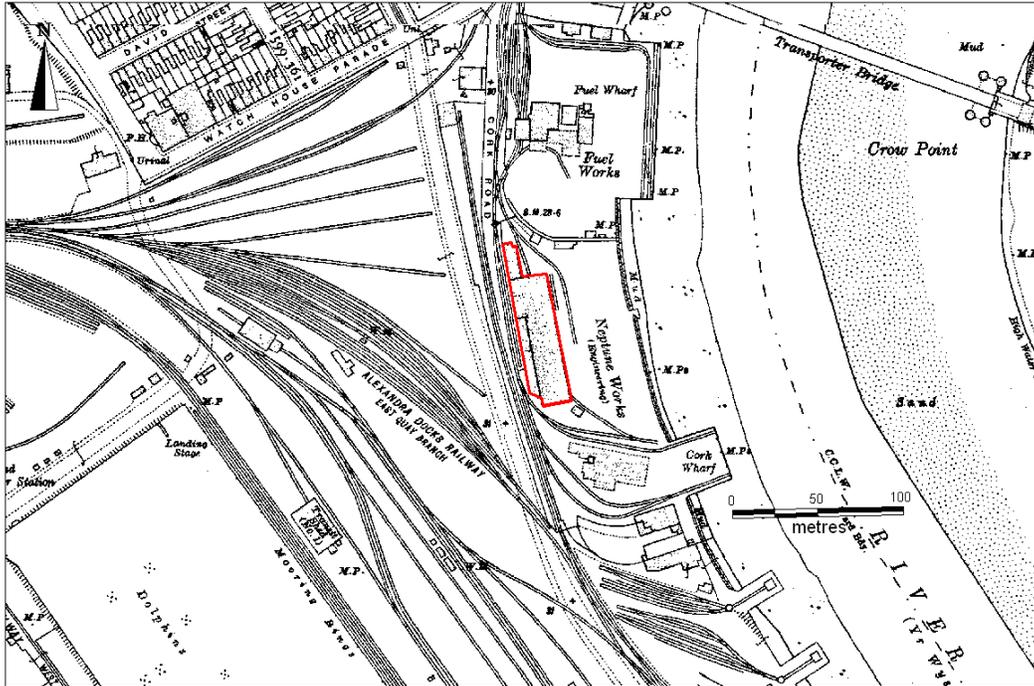
References Davis, H, 1998, History of the Borough of Newport  
Third edition OS map of 1921  
Fourth edition OS map of 1937

Map details ST38SE

Significance rating Local

Any current  
management

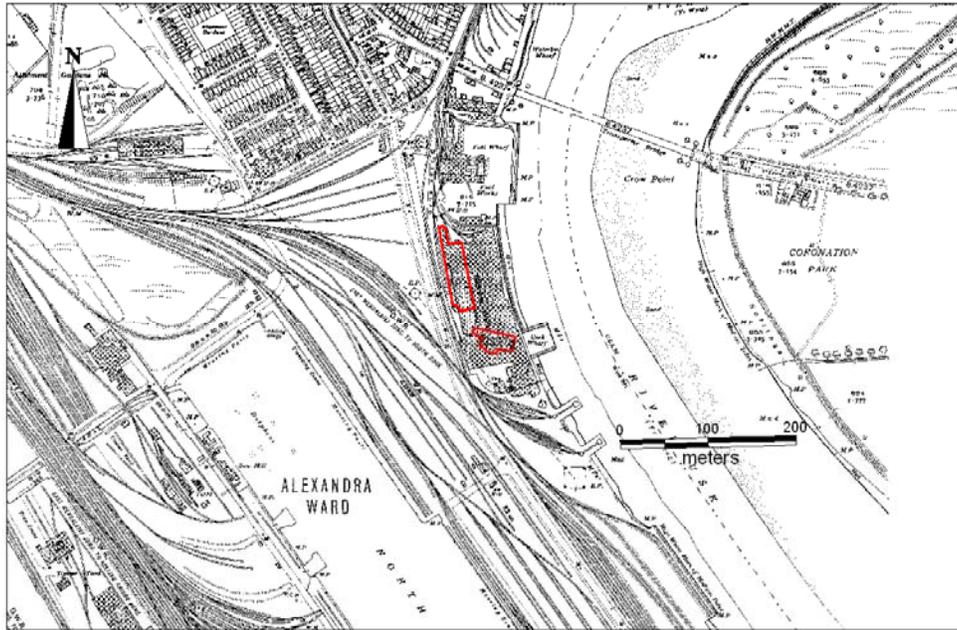
Currently is still an active engineering site



*Figure 5. The original Neptune Works as depicted on the Third Edition OS map of 1921. This is the form the works would have taken during the First World War. Note the range of buildings projecting from the north west corner, which survives in the current works.*

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*Figure 6. The expanded Neptune Works as depicted on the OS Fourth edition map of 1937. The works had absorbed both previous buildings (red) although the projecting range of buildings remained intact.*

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*Figure 7. Aerial photograph of the Neptune Engineering Works, Newport, taken in 1928, view to the South east. Note the fuel wharf at the bottom left of the shot, the supports for which are still in situ.*



*Plate 3. General view to the south of the east elevation of the Neptune Engineering works, Newport. The glass and concrete building to the upper left sits on the footprint of the former Cork Wharf, whilst the extensive timber framing is the remains of the former fuel wharf. The red brick buildings date to the major expansion of the Neptune Works undertaken in the 1920s and visible on cartographic sources (GGAT/Cadw).*

**Briton Ferry Steelworks (Albion), Briton Ferry**

Site name	Briton Ferry Steelworks (Albion Works), Briton Ferry
NGR	SS 73635 93865
PRN(s)/NPRN(s)	07306w
Site type and description	The Albion Steelworks was a pre-war firm located in Briton Ferry. It was one of the firms forming part of the Western Group of producers organised under the Ministry of Munitions in early 1916 for essential war production (Nicholson 1919). It was noted for the excellent quality of output of shell steel and contributed to a group of firms that met a French contract for the supply of 4,000 tons of shell and gaine steel (part of an artillery shell) per week (ibid.). The works has been destroyed, with part of the raised M4 traversing the site.
Community	Briton Ferry
County	Neath Port Talbot
References	Nicholson, I, 1919, Wales: its part in the War
Map details	SS79SE
Significance rating	N/A
Any current management	The site of the former Albion Works now consists of derelict ground upon which a section of the Briton Ferry M4 bridge has been built. It is highly likely that buried remains of this once extensive works survive in the area.

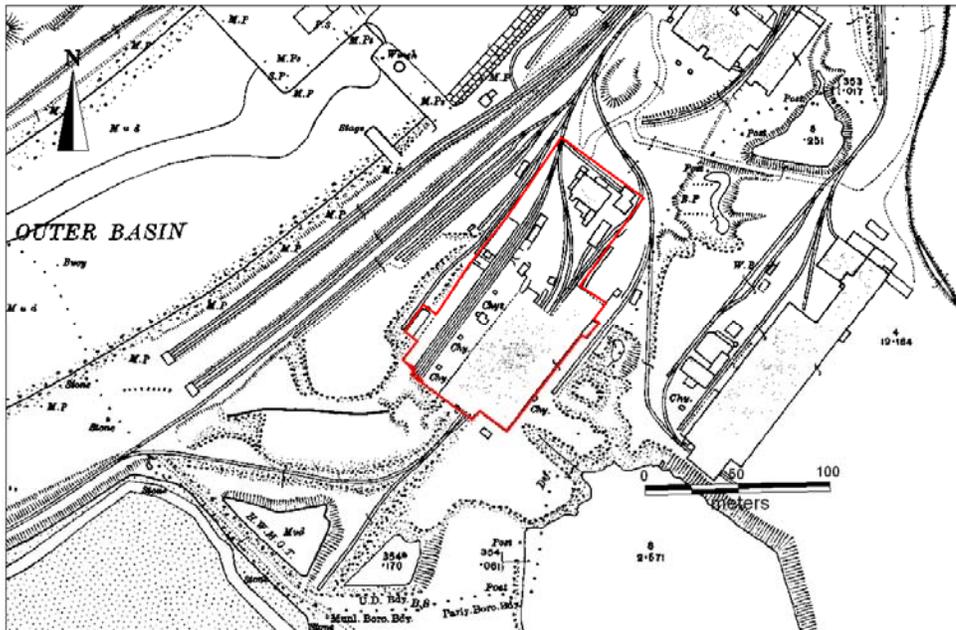


Figure 8. The historic core of the Albion Steelworks (07306w), Briton Ferry, as it appears on the 1918 Third edition OS map. The works subsequently expanded, almost doubling in size. The Albion works (red) is flanked to the south east by the Whitford Sheet Steel and Galvanising Works and to the north by the Baglan Bay Tinplate Company Works. Although no documentary evidence has been located, it is almost certain that both these other firms would have contributed to the war effort.

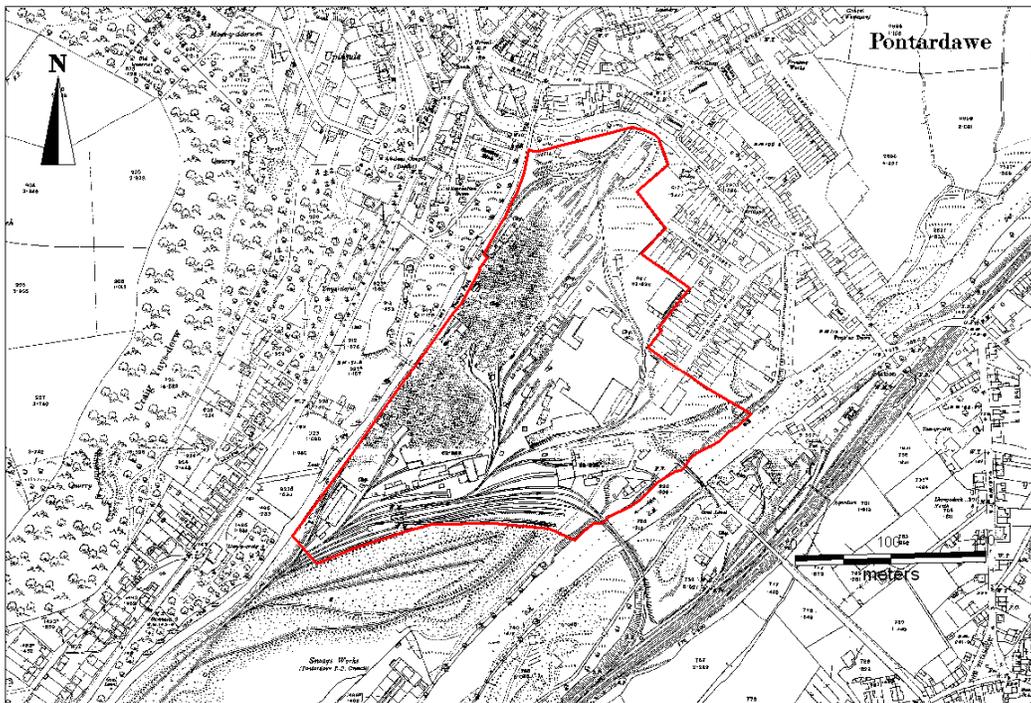
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Plate 4. The expanded Albion Steelworks, Briton Ferry in 1934, view to the north

**Pontardawe Tinplate Works (Gilbertsons), Pontardawe**

Site name	Pontardawe Tinplate Works, Pontardawe
NGR	SN 7220 0364
PRN(s)/NPRN(s)	01161w
Site type and description	The site comprises a pre-First World War tinplate works which was greatly expanded to the north, south and east over the course of the First World War. In 1914, the works were advertising themselves as manufacturers of Siemens steel, specialising in tin-plates, terne plates, aluminium coated plates, galvanized sheets, high carbon and soft steel billets and bars, basic slag meal. All these products would be in great demand for the war effort and coupled with an enthusiastic patriotism on the part of Mr Gilbertson, the firm was well placed to become an important contributor in the South Wales area. The firm voluntarily took on the manufacture of unfamiliar types of high quality steel for munitions manufacture during the First World War and developed an expertise that encouraged them to expand, supported by finance from the Ministry of Munitions. The eventual aim in late 1917 was to produce high quality materials for the aircraft and automotive industry but development of the specific plant that would have enabled this was vetoed by Sir John Hunter, head of steel production at the Ministry of Munitions, for unknown reasons. Instead, works were undertaken that helped to produce more of the types of steel they had begun producing earlier in the war.
Community	Pontardawe
County	Neath Port Talbot
References	West Glamorgan Archives Gilbertson's letterbook 1915-1929 (D/D Gil 1/10) Graces Guide [Online] <a href="http://www.gracesguide.co.uk/W._Gilbertson_and_Co">http://www.gracesguide.co.uk/W._Gilbertson_and_Co</a> Second edition OS map of 1898 Third edition OS map of 1918
Map details	SN70SW
Significance rating	Local
Any current management	The former tinplate works has been destroyed and the site is now occupied by housing.



*Figure 9. Pontardawe Tinplate works as shown on the 1918 Third edition OS map. The works have been extended north and east in comparison to the Second edition OS map, which is likely to indicate the extent of the First World War expansion.*

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**GKN Patent Nut and Bolt Works, Cwmbran,**

Site name	GKN Patent Nut and Bolt Works, Cwmbran,
NGR	ST 29005 95428
PRN(s)/NPRN(s)	10778g
Site type and description	The Patent Nut and Bolt Works in Cwmbran were centred on an iron foundry constructed in 1800. It became known as the Patent Nut and Bolt Company in 1864 upon the formation of that company and was acquired by Guest, Keen and Nettlefolds (GKN) in 1900 (Gwent Archives). The works appeared on a GKN list of Controlled Establishments in 1915. A crude Benzol plant was constructed within the works on the instructions of the government and parts of the works were turned over to munitions production. The works underwent some expansion between the Second and Third edition OS maps but no record has been found associating the expansion with the Ministry of Munitions. The foundry was retained in use until 1960 with the works being largely destroyed. A survey of 1980 noted the survival of a stack base and part of a wall near Clomendy Road (02513g) which are likely to be associated with the works.
Community	Cwmbran
County	Blaenau Gwent
References	Gwent Archives GB0218.D409 Jones, E, 1987, <i>A History of GKN: Innovation and Enterprise 1759-1918</i> Second edition OS map of 1901 Third edition OS map of 1920
Map details	ST29NE
Significance rating	Local
Any current management	The works has been destroyed but there is a strong possibility that buried remains associated with the works survive in the vicinity.

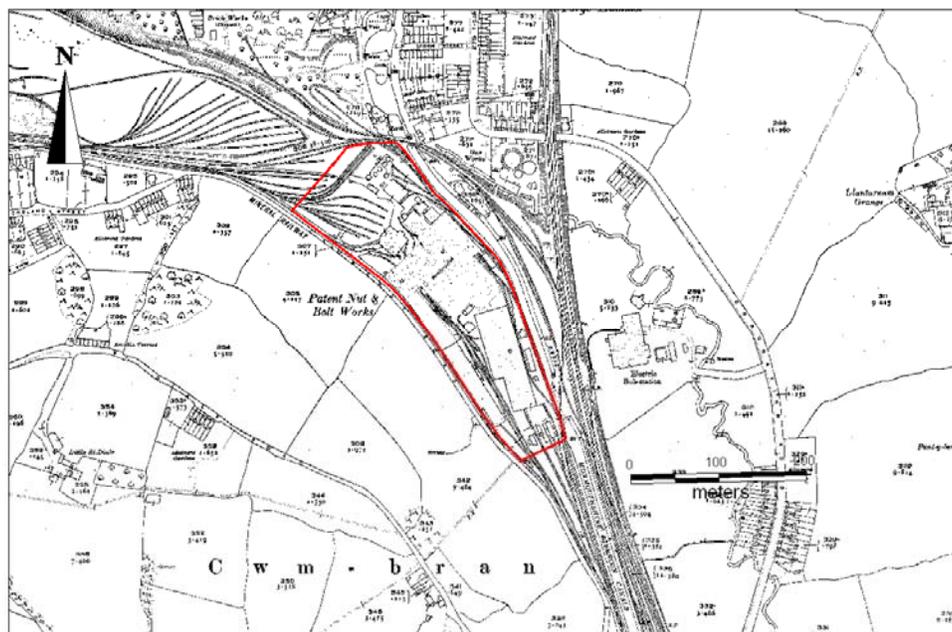


Figure 10. The Patent Nut and Bolt Works (10778g), Cwmbran as depicted on the Third edition OS map of 1920.

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Plate 5. GKN's Patent Nut and Bolt Plant (10778g) in 1930.

**Imperial Mills (Wireworks), Coverack Road, Newport**

Site name	Imperial Mills (Wireworks), Coverack Road, Newport
NGR	ST 32078 87668
PRN(s)/NPRN(s)	10682w
Site type and description	A Guest, Keen and Nettlefolds (GKN) owned wireworks were opened on Coverack Road in the early 1900s. The mill appeared on a list of Controlled Establishments in 1915. GKN said the government could build a shell factory adjacent to it (Jones 1998) but this may not have taken place as the Newport National Shell Factory is known to have been established in the GWR Workshops in Maesglas. These works had government contracts and were controlled to maximise output, eliminate wasteful duplication, and keep profits down in the face of desperate need and shortage. The main products of the plant are likely to have been wire for springs and other items requiring long lengths of steel and iron although no records of specific war related products have been located. The mill has been destroyed and the site is now covered by a modern housing estate. The Mill as depicted on the Third edition OS map of 1921 consists of two main blocks of works buildings with ancillary buildings and storage tanks located north of these. The site was served by a rail head and a wharf fronting onto the River Usk.
Community	Victoria
County	Newport
References	Jones, E, 1987, <i>A History of GKN: Innovation and Enterprise 1759-1918</i> Third edition OS map of 1921
Map details	ST38NW
Significance rating	Local
Any current management	The wire works have been destroyed and replaced by a housing estate.

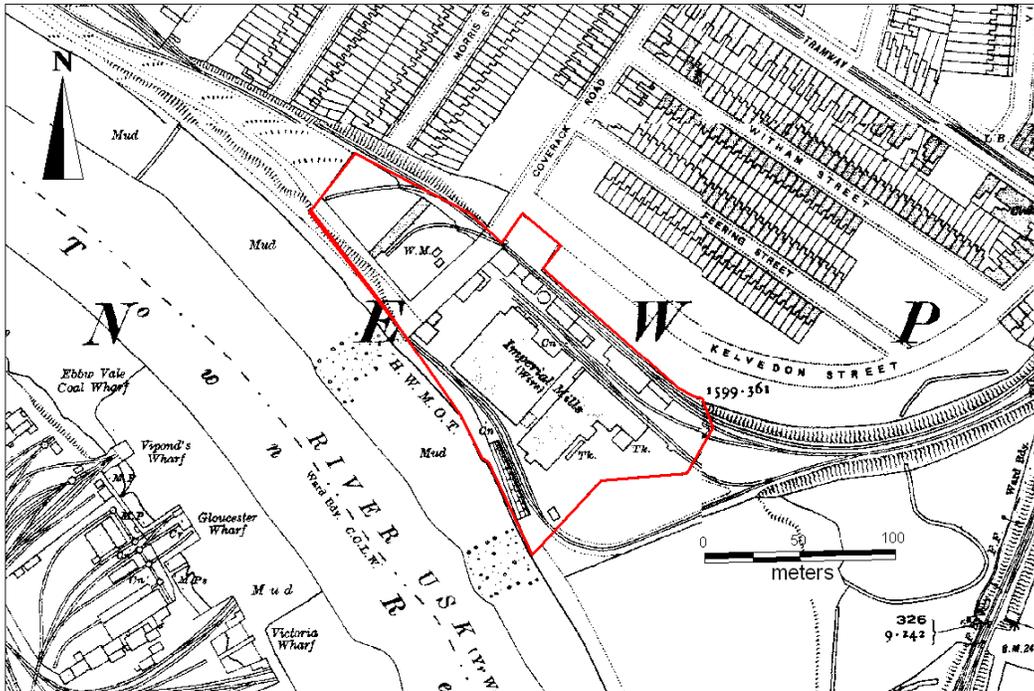


Figure 11. Imperial Mills wire works in Newport (10602w) owned by GKN, as it appeared on the Third edition OS map of 1921

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**J C Hill and Company Ltd., Oakfield, Cwmbran**

Site name	J C Hill and Company Ltd., Oakfield, Cwmbran
NGR	ST 29233 94320
PRN(s)/NPRN(s)	10712g
Site type and description	JC Hill and Company Limited was a firm specialising in the production of wire products opened in 1857. It was one of the companies forming part of the Eastern Group of firms organised under the Ministry of Munitions (Nicholson 1919) making a significant contribution to the war effort of the First World War. The products were largely the same as pre-war ones, i.e. sheet steel, bars, rails, wire etc. The firm would almost certainly have produced barbed wire used during the war. The works has been destroyed and a modern industrial park is located on the site.
Community	Oakfield
County	Cwmbran
References	Nicholson 1919, Wales: its part in the War Second Edition OS map of 1920
Map details	ST29SW
Significance rating	Local
Any current management	The works has been destroyed and is now covered by an industrial estate. There is a possibility that buried remains survive within the vicinity.

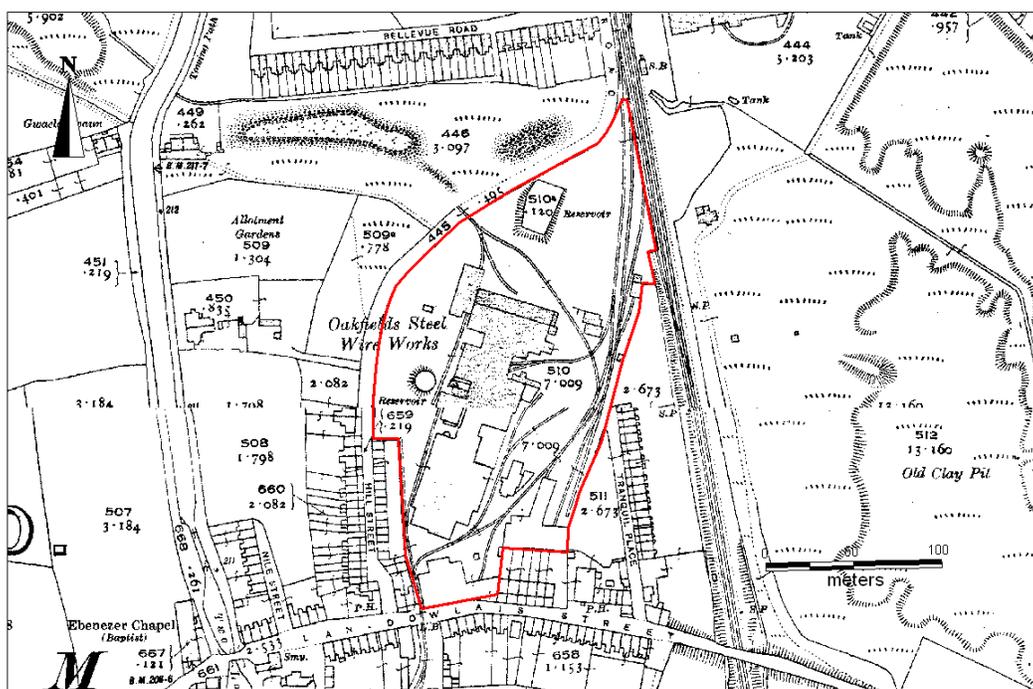


Figure 12. The JC Hill wire works (10712g) as shown on the Third edition OS map of 1921

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**British Metals Extraction Company, Llansamlet, Swansea**

Site name                    British Metals Extraction Company, Llansamlet, Swansea  
 NGR                            SS 67781 96560  
 PRN(s)/NPRN(s)        07483w (06131w in Villiers phase)

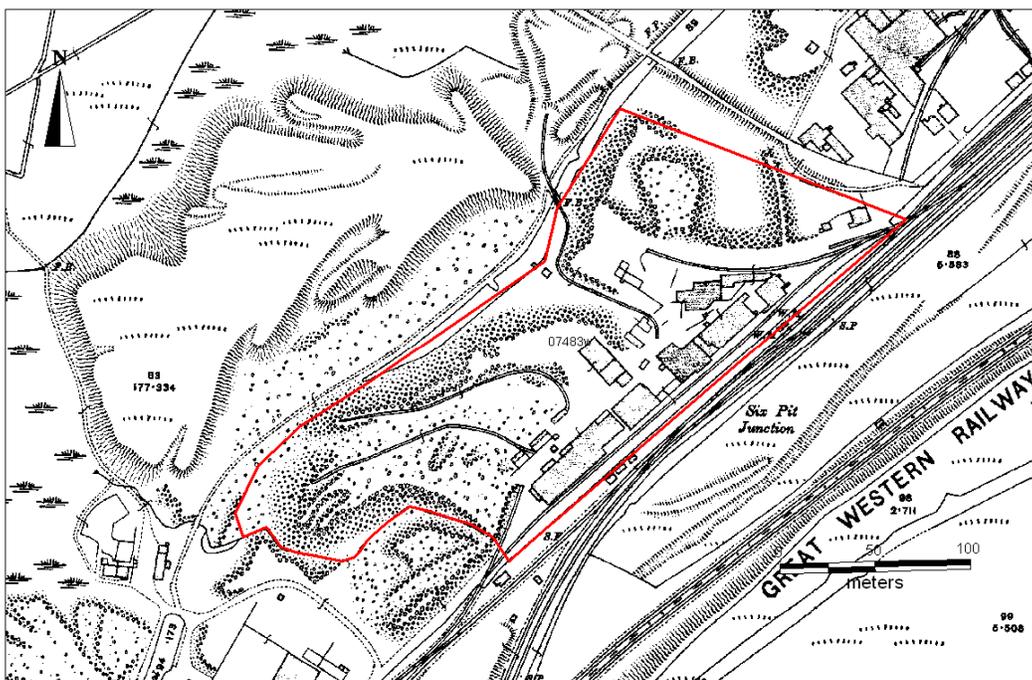
Site type and description        The British Metals Extraction Company (formerly the Villiers Smelting Company) was a pre-First World War plant in the lower Swansea Valley used to roast zinc ores. Zinc was an important strategic component of war industry, being particularly useful as an additional ingredient in the numerous munitions applications, particularly in the production of brass ammunition casings and galvanised steel sheeting (Masters 2014) and the majority of the British zinc industry was based in the Swansea area. The Villiers plant opened in 1873 but the British zinc industry was in decline prior to the outbreak of the First World War as it could not compete with American and German production. The outbreak of the war and the realisation that the country could no longer rely on foreign imports of zinc caused the government to attempt to revive the industry and maximise the output from its already antiquated plants.

The drive to increase productivity came at a price in terms of the damage done to the local environment. West Glamorgan Archives contains a report (D/D LSV 2/1) on a visit by the Ministry of Munitions to Llansamlet to assess alleged damage to crops and other vegetation by fumes from the British Metals Extraction Company Ltd. The report, dated 28th Sept 1918, notes acute levels of industrial pollution in the Swansea Borough as far back as the 1880's with 1912, 1913 and 1914 being particularly bad. The chief polluter was stated to be Swansea Vale Chemical Works but they installed a condensing plant, which much reduced the problem. The pollution from the British Metals Extraction works appears to have increased in 1917, initiating the Ministry of Munitions and Board of Agriculture enquiry. Local residents strongly believed the British Metals Extraction Company to be responsible, a claim substantiated by the enquiry, even allowing for some "unintended exaggeration". Witnesses describe smoke from the chimneys beating down upon fields and gardens and the death of crops in a few days, the damage extending 1.5 miles from the works. Smoke also came from Dillwyns (located to the south west of the plant in question) and the Vivians Hafod works. Pollution allegedly killed four horses in 1917, the year of worst pollution. This corresponds to an increase in the roasting of zinc blende for munitions production (average 103 tons per week, up from pre-war levels of 53 tons per week although it is likely much more ore was roasted on occasions). Sulphur dioxide is the main gas given off during the process, which if allowed to escape, is a highly toxic substance injurious to plants and animals. The committee concluded the company was responsible and that unless it was for urgent war production, they not be allowed again to increase roasting capacity without trapping the waste sulphur, which in any case they regarded as extremely wasteful of an important by-product. The works was closed in 1919. An accompanying report gives a history of the works in contributing to pollution but also mentions that the "Baldwins Factory", Landore as a wartime bomb factory (National Shell Factory 07379w)

emitting iron oxide fumes, which were acknowledged as less dangerous.

The British Metals Extraction Company closed soon after the end of the First World War, never having recovered from the restrictions placed on it by the Ministry of Munitions; the plant re-opened in the early 1920s under the Villiers name once more, only to finally close in 1924 as part of the general demise of the British zinc industry (Masters 2014).

Community	Lansamlet
County	Swansea
References	Third Edition OS map of 1921 West Glamorgan Archives D/D LSV 2/1 Masters, J, 2014 The speltermen of Swansea, MA dissertation submitted to Trinity St Davids
Map details	SS69NW
Significance rating	Local
Any current management	The works closed in 1924 and have been demolished. The site is now occupied by mixed residential and commercial buildings. There is the possibility that buried remains survive in the vicinity.



*Figure 13. The British Metals Extraction Company(07483w) zinc plant at Llansamlet as depicted on the Third edition OS map of 1917.*

**Swansea Vale Spelter Company, Llansamlet**

Site name	Swansea Vale Spelter Company, Llansamlet
NGR	SS 68179 96988
PRN(s)/NPRN(s)	07932w
Site type and description	<p>The Swansea Vale Spelter Company was a pre-First World War zinc producing firm founded in 1876 based in Llansamlet, Swansea. Zinc (known as spelter before 1930) was an important strategic component of war industry, being particularly useful as an additional ingredient in the numerous munitions applications, particularly in the production of brass ammunition casings and galvanised steel sheeting (Masters 2014) and the majority of the British zinc industry was based in the Swansea area. The British government belatedly came to recognise the importance of the domestic zinc industry to the war effort and as a result encouraged greater output. Unlike the iron and steel industries however, only one of the Swansea based spelter works was given significant government financial support, this being the Swansea Vale works. The company was given large tax incentives to modernise and much of the works was re-built by Belgian refugees with experience of working in the Belgian zinc industry. The construction of a new plant of eight Belgian style furnaces and the replacement of four existing furnaces was carried out and these modernisations enabled it to withstand the general slump in the industry in the 1920s.</p> <p>The plant is first shown on the Second edition OS map of 1899 as an essentially rectangular complex of buildings sandwiched between Smith's Canal and the Great Western train line in Llansamlet. By the time of the Third edition OS map of 1917, the works has significantly expanded, with the original buildings having been demolished and the majority of the land between the canal and rail line having been used for the construction of buildings. It is unclear to what extent this re-building was carried out by the Belgians.</p> <p>The Swansea Vale Spelter Company was the longest surviving spelter company in Swansea, finally closing in 1971, some forty years after the generally recognised demise of the Swansea zinc industry.</p>
Community	Llansamlet
County	Swansea
References	Masters, J, 2014, <i>The speltermen of Swansea</i> , MA dissertation submitted to Trinity St David' University,
Map details	SS69NW
Significance rating	Local
Any current management	The works closed in 1971 and have been demolished. The site is now occupied by mixed residential and commercial buildings. There is the possibility that buried remains survive in the vicinity.

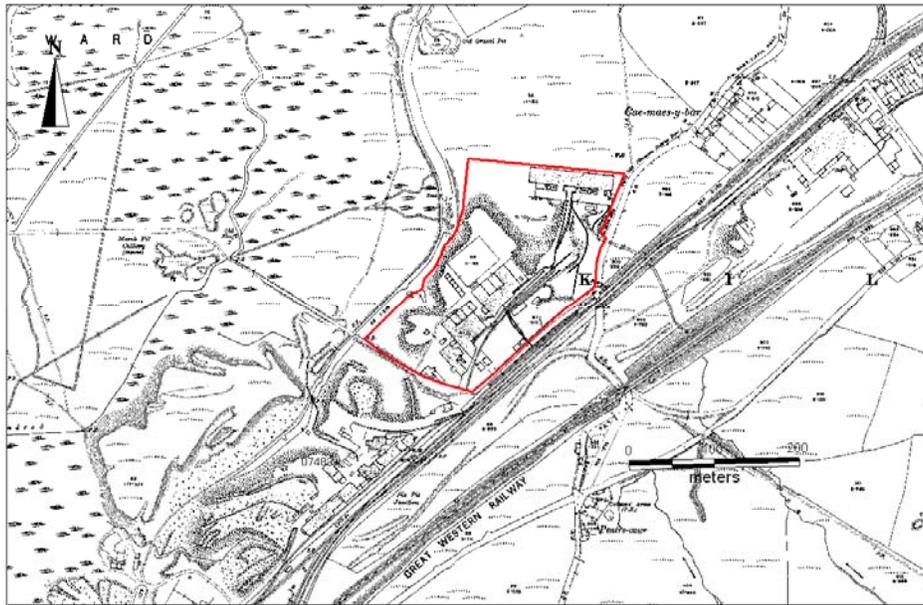


Figure 14. Swansea Vale Spelter Works (07932w) as depicted on the Third edition OS map of 1917.

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Plate 6. Swansea Vale Spelter Works (07932w), known at the time as the National Spelter Works as seen in an aerial photograph of 1933. The redundant British Metals Extraction Company plant (07483w) can be seen at the centre bottom of the image.

## 4.2 The munitions industry

Soon after the outbreak of war, it became obvious that the pattern of fighting that was evolving on the Western Front was resulting in the consumption of far more ammunition, particularly artillery ammunition, than had hitherto been envisaged. The shift from mobile to static warfare meant that commanders were using artillery to a much greater extent, with a greater emphasis on the use of high explosive shells of heavy calibre to prepare the way for infantry assault. Pre-war stockpiles were rapidly exhausted and production of new shells simply could not keep up with demand, with the majority of actual production being of shrapnel shell, which was proving to be comparatively ineffective. In early 1915, a lack of artillery shells, especially of the high explosive variety, was widely perceived to have been a significant contributor to the failure of the British Army on the battlefield. The tipping point was open criticism of the government's efforts following the failure of the British attack on Aubers Ridge on 9th May 1915, where the lack of high explosive shells was directly linked to high casualties.

The resulting political scandal provided the impetus for the formation of the Ministry of Munitions and the introduction through Parliament of the Munitions of War Act (1915) which brought private companies supplying the armed forces under the tight control of the created Ministry, which regulated wages, hours of work and employment conditions. It was a penal offence for a worker to leave his current job at such a "Controlled Establishment" without the consent of his employer, which in practice was "almost impossible". Thus, the munitions industry (amongst others) was effectively nationalised under the auspices of the dynamic Welsh Liberal MP David Lloyd George and his Ministry of Munitions.

In reality, measures for the increase of artillery shell production had already been taken in South Wales, albeit on a small scale. The Newport Chamber of Commerce had been in negotiations with the government and had elected a committee to co-ordinate the commencement of shell production: a number of Cardiff engineering firms had indicated they were willing and able to commence production and the Ebbw Vale Iron and Steel Company had received a trial order for 18lbr shells in January 1915 (Official History of the Ministry of Munitions Vol II/2).

On the 21st May 1915, Lord Kitchener asked Lord Plymouth, the Lord Lieutenant of Monmouthshire, to summon a meeting to determine whether the engineering firms of the county possessed enough spare machinery and space to establish a National Factory in Wales. The resulting conference was held in Cardiff Town Hall on 27<sup>th</sup> May 1915, with the result that a Munitions Committee for South Wales was established. Monmouthshire however decided to form their own committee on 31<sup>st</sup> May 1915 (the Monmouthshire War Committee) based on their pre-existing suitability for producing munitions but also based on the strength of local feeling (*ibid.*)

Various schemes for establishing national factories were suggested, with the chief constraint being the lack of suitable machinery. Lloyd George visited the Munitions Committee for South Wales in June 1915, by which time, negotiations for the establishment of National Factories at Ebbw Vale and the Uskside Engineering works were in progress. The parochial nature of South Wales industry was evident in the resistance of some committee members to supplying the works at Ebbw Vale and Uskside with machinery from Cardiff and the eventual decision to divide the South Wales area into three districts, (Western, Central and Eastern) with their own sub-committees. Such a division appeased the Monmouthshire War Committee which was simply re-named the Eastern district. From 1916, each of these districts became, in effect, self-contained, co-operative national shell factories, each containing dedicated 'official' factories supplemented by numerous smaller firms (*Ibid.*).

The key to the establishment of the factories was speed and therefore it was in general found expedient to adapt existing premises rather than wait for purpose built factories. The buildings had to accommodate significant quantities of plant, which had to be placed close together, and difficulties in the efficient layout of machinery could cost production time, such as occurred at Landore, Swansea (see below).

The following table contains identified sites associated with munitions production within Glamorgan and Gwent.

**Table 2.** Sites associated with munitions production within Glamorgan and Gwent

Site name	PRN	Condition	Purpose
National Cartridge and Box Repair Factory, Newport	10612g	Damaged	Salvage of ammunition boxes and artillery shell cases
Munitions Crèche, Newport	10274g	Near intact	Crèche for the children of munitions workers
Uskside National Works, Newport	10615g	Altered	Munitions and general war industry producer
Ebbw Vale National Shell Factory	10738g	Destroyed	Munitions producer
Newport National Shell Factory	10613g	Destroyed	Munitions producer
Lovells Confectionary works, Newport	09547g	Near intact	Producer of ammunition boxes and other war products
Cork Wharf Munitions works	10277g	Unknown	Munitions producer
Tyne Engineering Works, Newport	10778g	Near destroyed	Munitions producer
Cardiff National Shell Factory	05070s	Destroyed	Munitions producer
Currans Metals and Munitions, Cardiff	05056s	Destroyed	Munitions producer
Swansea National Shell Factory, Landore	07379w	Near destroyed	Munitions producer
Taylor and Son, Briton Ferry	07318w	Near intact	Munitions producer

## The Eastern Division

### National Cartridge and Box Repair Factory, Newport

Site name                      National Cartridge and Box Repair Factory, Newport

NGR                                ST3193084260

PRN(s)/NPRN(s)            10612g

Site type and  
description

This was a factory established in early 1917 to repair 18lbr and 4.5inch shell cases and ammunition boxes and sited adjacent to the newly constructed sea lock in the South Dock of Newport Docks. It was one of two National factories established specifically for the salvage and repair of ammunition and ammunition boxes, the other being located in Dagenham, England.

A dedicated line of ships was established to bring back shell cases and boxes from France to Newport, where a line of conveyors took the material into the factory. The ammunition boxes and brass cases were repaired, or 'rectified' in the parlance of the day, by an extensive array of specially installed equipment. The boxes and cases were subsequently transported by the GWR to National Shell Filling Factories outside the Glamorgan and Gwent area, with many millions of items being handled by the factory. The actual factory was a 13 acre site employing between 3,000 and 4,000 people with as many as 3,500 employees being women and girls. By the spring of 1917, the two factories combined could repair 650,000 18lbr shell cases, 100,000 4.5-inch shell cases and over 175,000 ammunition boxes per week.

The Newport factory consisted of a brick built warehouse with internal iron framing: the roof comprised an 11 apex warehouse range provided with skylights and a rectangular window and hangar type doors in the gable ends. The site was vacant by 1935 and was advertised as having a 422,000 square feet capacity (Newport Library qM000 380.5). Davis (1998) states that the factory was constructed to sort and salvage ammunition boxes and shell cases, with 85% of its workforce being female. It was known colloquially as the 'Box Factory' regardless of what went on there. The majority of the warehouse has been demolished, the northern part of the site now being occupied by a coal storage area.

The surviving portion of the factory consists of five long warehouse spaces on a north east/south west axis, which formed part of the original eleven apex warehouse complex. The extant warehouses are grouped into three distinct blocks, although it is possible that this is a later re-modelling of the original layout. The structure is brick built and contemporary photographs show it as possessing an iron frame with an iron trussed roof. The visible section of the north facing elevation of the building contains numerous brick blocking of arches and doorways that would originally have internally linked different parts of the warehouse. There are also a number of blocked ducts in the north elevation that possibly once housed ventilation equipment or similar: ducting is visible inside the warehouse on contemporary photographs. The current roof

appears to retain the series of industrial skylights seen on aerial photographs of the 1920s and 1930s although it is possible the actual roof has been renewed over the years. Raised platforms were originally built to the south west of the warehouse; it is believed these supported a conveyor system for the movement of cargo that had been unloaded from the ships. These features appear to be absent in an aerial photograph dated 1930 (Plate 6) and suggest that the conveyor system had been dismantled after the First World War. An aerial photograph dated 1947 (<http://www.britainfromabove.org.uk/image/waw010873?search=Newport%20Wales&ref=163>) shows that the rail lines located north east of the warehouses appear to be out of use at this time. Comparison of historic aerial photography demonstrates that the surviving section of the factory has undergone structural re-modelling between the end of the Second World War and the present day. Specifically it appears that the south western gable end has been re-modelled and three of the warehouse spaces have been divided to create separate facilities, with additional buildings added at both the south west and north east.

A number of ancillary buildings are depicted on the cartographic sources south west of the warehouse complex and these can be seen on aerial photographs dating to the 1930s. The buildings themselves have the appearance of a double row of terraced houses but it is unclear whether these are in fact dwellings for workers or whether they are offices. It is possible that they are in fact houses for docks employees working in the electric power station that powered the sea lock gates and are unconnected with the National factory. Whatever their origin, they had been demolished by the 1940s, and a large portion of the area occupied by Nissen type structures, which were almost certainly associated with use of the facility during the Second World War. The site of the Nissen structures is now occupied by a large concrete turning bay and modern warehouse buildings but the site of the former possible terrace is unoccupied and the buried remains of the former buildings almost certainly survive in this area.

Four transit sheds and a trackway for travelling cranes are depicted on the mapping, but, with the exception of one transit shed (shown as Transit shed No.5 on the Third edition mapping) these have been destroyed. Transit shed number 5 is still in use and has been augmented by a newer modern structure.

The conclusion is that whilst significant modification of the buildings has occurred, there is an historic core to the surviving buildings, which would benefit from a recording programme if access was possible. There is also the strong possibility that buried remains survive both to the south west of the warehouses and to the north, in the area now occupied by the coal storage area.

Community	Pillgwenlly
County	Newport
References	Davies, H, 1991, History of the Borough of Newport Third edition OS map of 1921 Aerofilms

HMSO Official History of the Ministry of Munitions

Newport Library qM000 380.5

Map details ST38SE

Significance rating National

Any current management The remaining portions of the building are used as a packaging factory.

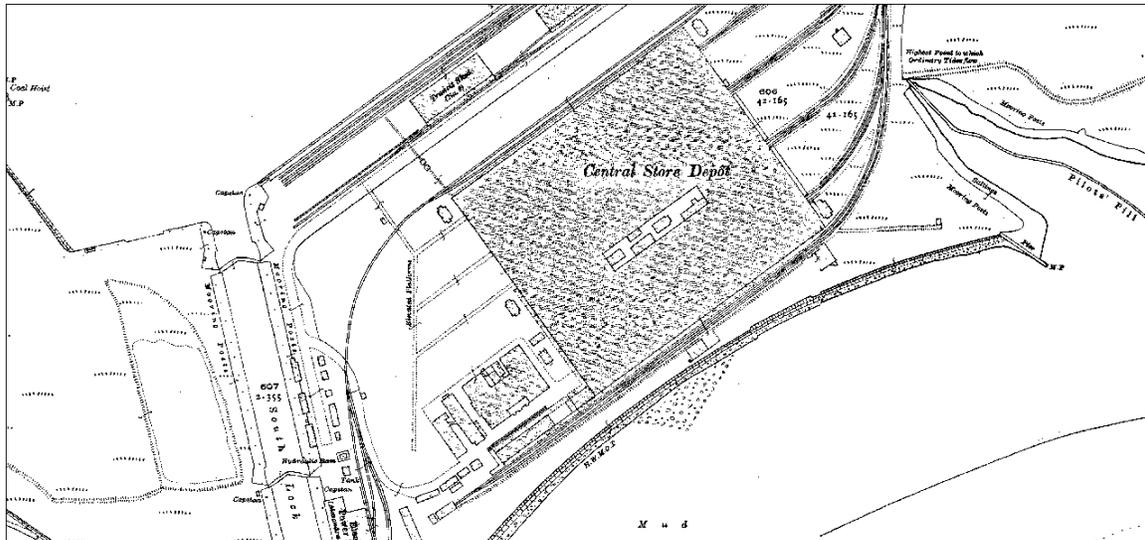


Figure 15. The National Cartridge and Box Repair Factory (10612g) at Newport South Dock as depicted on the Third edition OS map of 1921. It is believed the raised platforms were used to support a conveyor system for moving newly unloaded shell cases and ammunition boxes into the factory complex.

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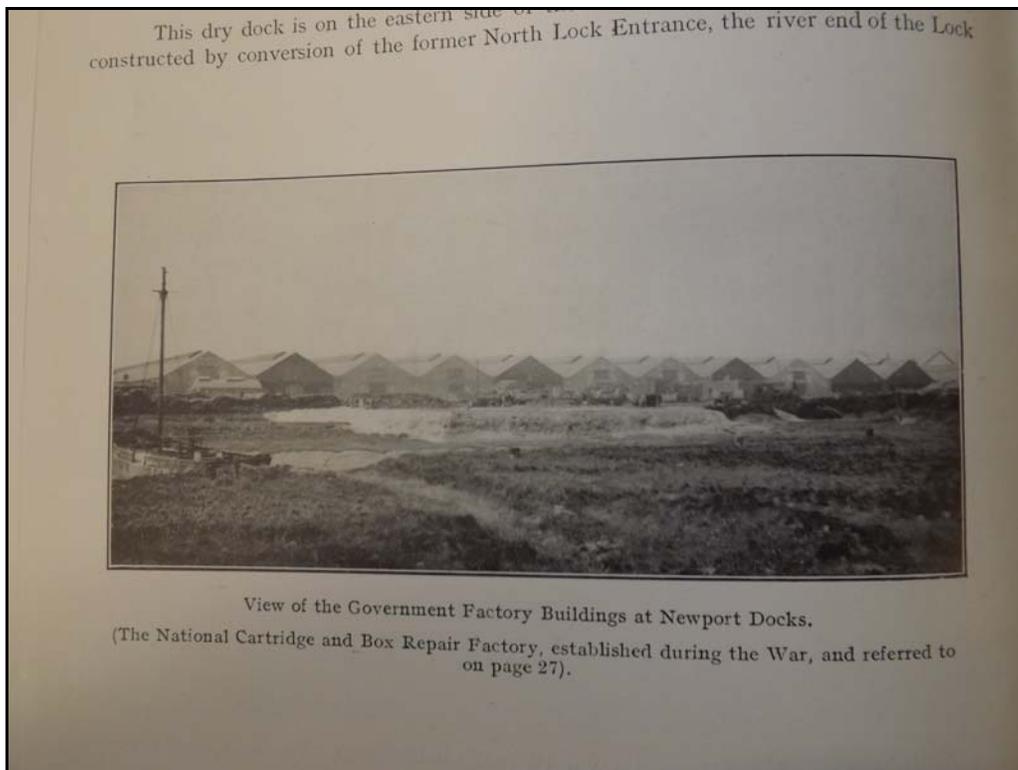


*Plate 7. Aerial view of the National Cartridge and Box Repair Factory, Newport (10612g) in 1930. The building, located on the South Dock to the east of the sea lock, was used as a general warehouse at this time.*



**Interior of large Warehouse, South Dock Extension.**

*Plate 8. Contemporary view inside one of the warehouse spaces (Newport Library qM000 380.5)*



*Plate 9. Contemporary view of the north east elevation of the National Cartridge and Box Repair Factory (Newport Library qM000 380.5)*



*Plate 10. West elevation of a surviving building from the National Cartridge and Box Repair Factory, Newport (10612g). The gable end has been re-modelled from its original appearance and the ventilation chimneys are a later feature.*

**Munitions Crèche**

Site name The Munitions Crèche, 50 Alexandra Road, Newport

NGR ST4146886428

PRN(s)/NPRN(s) 10274g

Site type and description The Munitions crèche was housed in a large private house on Alexandra Road and was opened on 3rd December 1917 and run by Mrs C H Bailey, wife of a prominent Newport Ship repairer and wartime munitions manufacturer. It was used by the children of munitions workers employed by the Newport National Shell Factory (10613g) and probably other government establishments such as the Uskside National Works and National Cartridge and Box Repair Factory. The building is still extant although the original entrance has been blocked up.

Community Pilgewnllly

County Newport

References Newport Past [Online]

Map details ST38NW

Significance rating Regional

Any current management The property is currently used as private housing



*Plate 11. The Munitions Crèche (10274g), Alexandra Road Newport on the day of its opening on 3rd December 1917*



*Plate 12. The Munitions Crèche (10274g) building in 2014*

	<b>Uskside National Works, Newport</b>
Site name	Uskside National Works, Church Street, Newport
NGR	ST 31911 86725
PRN(s)/NPRN(s)	10615g
Site type and description	<p>The Uskside Works were established in 1827 as the Uskside Iron Foundry and had previous munitions links, having produced cannon for the Crimean War. By May 1915, it was already producing proof shot for naval guns and 18lbr shells. The Uskside works occupied an excellent position on the west bank of the Usk and possessed two entrances connected to sidings that joined with the Great Western Railway, with branch lines to each department within the works. It was suggested as the site for one of the Welsh National Factories but instead it was acquired as a going concern by the Ministry of Munitions for the duration of the war and the transfer agreement was made on 1<sup>st</sup> July 1915, with the rent paid being £460 per calendar month; the works were managed by a Board of Management composed of the former directors of the company plus a nominee from the Ministry of Munitions.</p> <p>In addition to proof shot, 18lbr and 6-inch shells, the works also manufactured pedestals for naval guns, gun carriage forgings, breach pieces for trench mortars and ships' forgings such as shaftings and rudder mechanisms, making it something of a general purpose factory. During the war it also continued to undertake urgent repair work for collieries. By July 1915 230 women were engaged in the manufacture of shells (Davis 1998). Final production figures for the Uskside National Works include the manufacture of 24,500 18lbr shells, 16,100 4.5-inch shells and 119,700 6-inch shells (Official History of the Ministry of Munitions Vol. VII).</p> <p>A new erecting shop for 6-inch shells was built in 1915, before the government acquired the works. This shop was fitted with the latest equipment to reduce handling to a minimum, including bench conveyors which kept the shells at the same level as the lathes from start to finish and therefore made it possible to employ a greater number of women in the shop. In October 1918, the workforce consisted of 471 people, 46% of whom were women. The YMCA canteen was opened in August 1915 and was assisted by voluntary workers as well as YMCA employees.</p> <p>The Gwent Archive contains an insight into operations at the Uskside National Works during the First World War in the form of lists of facilities and equipment bought or acquired by the Ministry during its tenure. The lists were created to assess the depreciation in value of the assets in preparation for the return of the works to private ownership after the war.</p> <p>Gwent Archives D3642.4.6 is a value comparison of stocks of plant etc. covering the period 1914-1920, that were taken over by the Ministry of Munitions by an agreement signed on 28<sup>th</sup> June 1915 and handed over to the Ministry of Munitions on 30<sup>th</sup> June 1915. New erecting works were constructed, the expenditure incurred by the National Works after 1<sup>st</sup> July 1916 costing £282.11.8. It is clear from the accompanying notes that the owners of Uskside did not contemplate the lease of the works would last more than one year at the time of the government takeover and this probably reflects the general sense amongst industry that the war would not last as long as it did.</p>

The installation of overhead gear (shafts and wheels and driving bands *etc.* for powering lathes) costing £69.11.11 was already war related work in progress on 30<sup>th</sup> June 1915, anticipating government requirements. Subsequent additions included the installation of a variety of machines, office furniture and some small temporary buildings during the early days of the war. The existing pattern shop and stores buildings were utilised for munitions purposes, alteration of which involved the loss of standard patterns, jigs and templates associated with pre-war work.

The sections of the works taken back from the Ministry of Munitions included a workmen's washhouse and tool room, the pattern shop, a switch room (electrical gear room), and a scrap shed, heating apparatus, a gas engine, offices, a canteen, a press room together with furniture and movable fittings. These items were assessed as having a total value of £9712.0.3. A concrete floor was built by the Ministry but was removed from costings.

The board of the Uskside works also considered requesting that £10,000 should be paid by the Ministry of Munitions "as some little reparation for the loss of prestige and moral and intellectual damage sustained during the past 5 years". Whilst this only appears once in draft form, it indicates perhaps that the civilian managers were less than content with the way the firm had been managed by the Ministry of Munitions.

The document also explicitly states that temporary alterations to the buildings were made for the purposes of shell work but these "have now disappeared" further, that some expenditure on roads and railways had been made during the war "necessitated by shell making for the greater part, and has [sic] now disappeared". Together with acquisition of rolling stock, transportation equipment and canteen equipment, a number of temporary buildings were constructed at the works including a tool shed, cloakroom, varnish and bond room, sand blast room, women's cloakroom, examining room, new press room, motor shed, workmen's wash house and a tool room. The only temporary buildings considered worth taking over were the Workmen's Wash house and the Tool room, suggesting the remainder were dismantled or demolished.

It is possible therefore that the physical traces of munitions production were removed or heavily modified soon after the war and that this in turn will impact on the archaeological record. The works reverted to the control of Uskside Engineering on 31<sup>st</sup> March 1920.

The Uskside Works is depicted on the Third edition OS map of 1921 as a single, large irregular building that appears to be an expanded amalgam of two separate iron works depicted on the Second Edition map.

The buildings relating to the Uskside Works appear to be mostly intact, retaining the footprint depicted on the Third edition OS map of 1921 with the exception of a large structure to the north of the works which had been demolished. The buildings appear to have been constructed in a number of phases, as shows on the differences between the Second and Third edition OS mapping, but this is less evident from the south facing elevation, which has been so heavily rendered as to effectively disguise the sequencing. The

multi-phase nature of the works is more evident from the rear of the site, where there has been little attempt at rendering. However, the majority of the former works is now used as a commercial storage facility and office suite and most of the buildings have been re-roofed and re-clad in recent times. A watercolour painting by Falcon Hildred held by the National Library of Wales shows the southern and eastern elevations of the works in 1988 and comparison with the building today demonstrates the extensive nature of the refurbishment that has occurred.

Whilst the northern building has been destroyed, the outline of the structures and the tram rails that served it are visible on modern aerial photography, suggesting the survival of substantial ground level features. This is an area of the works that underwent considerable consolidation between the Second and Third edition OS maps and it is possible that it is the area designated for use as the 6 inch shell facility.

Community	Newport
County	Borough of Newport, Gwent
References	Gwent Archives D342.4.6 Gwent Archives D3642.4.7 Davis, H, 1991 History of the Borough of Newport Official History of the Ministry of Munitions Vol. VIII, Control of Industrial Capacity and Equipment
Map details	ST38NE
Significance rating	Regional
Any current management	The site is currently used as a commercial storage facility and offices.

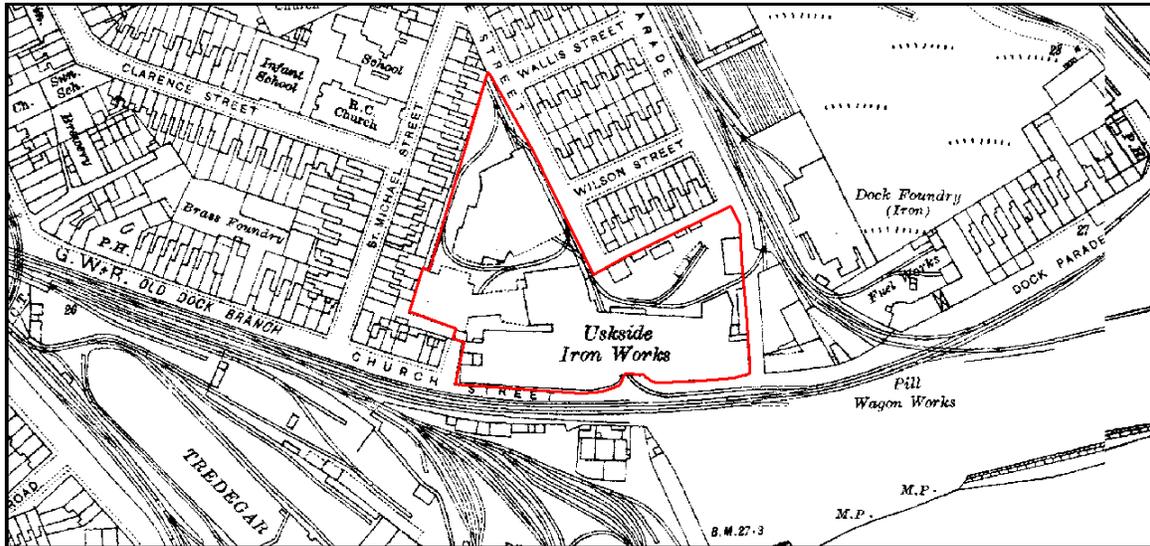


Figure 16. Uskside Iron Works (red), Newport (Uskside National Works (10615g) from 1915 to 1920) as depicted on the Third edition OS map of 1921. In this form, the works was essentially an amalgamation of two separate iron works. Most of this phase of buildings is extant although much modernised.

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Plate 13. South elevation of the former Uskside National Works, view to the north west.

**Ebbw Vale National Shell Factory, Ebbw Vale Iron and Steel Company, Ebbw Vale**

Site name Ebbw Vale National Shell Factory, Ebbw Vale Iron and Steel Company, Ebbw Vale

NGR SO1719807712

PRN(s)/NPRN(s) 10738g

Site type and description The Ebbw Vale Iron and Steel Company was a long established firm that already supplied dockyard material such as cranes, rails and railway wheels *etc.* to the Admiralty at the outbreak of war. The firm had received an order for the production of 1000 18lbr shells from the War Office in April 1915 and had constructed a shop specifically for the contract, possibly in the newly constructed fitting shops in Victoria. The firm subsequently offered the shop rent free, no doubt to secure further orders. The government accepted the offer and a Board of Management for munitions output was established in June 1915 and the Ebbw Vale National Shell Factory was the first in the country to commence output, producing approximately 120 shells per week by 21st July 1915. A further extension of the works was authorised in order to establish a 60lbr shell factory with the aim of producing 5000 shells per week.

The Ebbw Vale National Shell Factory was not considered a success. Ebbw Vale's comparative isolation, technical deficiencies (especially in varnishing shells), a congested rail network and the high cost of importing skilled labour resulted in low output at very high cost. The company also refused to allow significant levels of what was termed 'dilution' or the introduction of women in the workforce, as they claimed they were training male labour for the projected 60lbr factory. These facts contributed to the decision to close the dedicated National Shell Factory in July 1916. The 60lbr shell factory, which had already been built, was switched to assisting with the production of 8-inch shells. Total 18lbr shell production from Ebbw Vale was 90,400.

New plant was installed in the By-Products Departments to produce Benzol and other chemicals used in the manufacture of high explosives. In 1915, the Victoria works was producing 1000 tons of heavy galvanised sheet steel, all of which was bought by the army. The works became a Controlled Establishment in November 1915, with a military detachment brought in to guard the works.

By 1916, virtually all the Company's assets had been acquired by the War Office and Ministry of Munitions and four fifths of its coal output was being supplied to the railways, the Royal Navy and to continental Allies. The company's collieries came under government control in December 1916. Two new large blast furnaces were ordered by the government but the war ended nearly two years before these came into production. A wooden canteen had been erected by the Y.M.C.A. and manned by volunteers to serve food to the munitions workers: when the munitions works became a fitting shop once again, the Company took it over and built a permanent canteen on the site (Ebbw-Vale Iron and Steel Company Museum unpublished manuscript).

Given the nature of how munitions work was carried out within generally pre-existing buildings, it has proved impossible to specifically identify the site of the Ebbw Vale National Shell Factory within the wider works; neither has it been possible to identify the purpose built 60lb shell facility as a distinct structure.

Community	Ebbw Vale
County	Blaenau Gwent
References	Ebbw-Vale Iron and Steel Company Museum unpublished manuscript Official History of the Ministry of Munitions Vol. VIII Third edition OS map 1921
Map details	SO10NW
Significance rating	Regional
Any current management	The Ebbw Vale works have been demolished almost entirely. However there is a possibility that sub surface remains survive, including those associated with the former munitions works.

**National Shell Factory Maesglas, Newport**

Site name Newport National Shell Factory, GWR Engine Sheds, Maesglas, Newport  
 NGR ST 30056 86155  
 PRN(s)/NPRN(s) 10613g

Site type and description The Newport National Shell Factory was initially established in October 1915, making use of the newly constructed Great Western Railway fitting shops in the Maesglas area of Newport, which, although suitable as premises, were two miles outside the town centre, and had to be provided with a special 'motor trains' to transport workers. All the machinery for shell production was new, and furthermore, required modifications to be made to the electricity supply for the factory, this being discussed by the local Borough Council on 20th December 1915. The resulting delays meant that the first output did not commence until June 1916. The primary product was 60lbr shell and a number of photographs believed to have been taken within the Maesglas National Shell Factory in 1917, show the initial pressing of iron billets in the production of these items (National Waterfront Museum).

Women employees worked three eight hour shifts, whilst the men worked two 12 hour shifts for further processing. The ratio of women to men increased dramatically during the course of the war, and by October 1918, the 974 strong work force contained 74.3% women.

Some of the munitions products, most likely 9.2-inch shell nose bushes, were further conveyed to Messrs. Bailey's Tyne Engine works on Mill Parade (GWSC 244 (A/110/M /23 Newport Borough Council Minute book 1915-1916). Some industrial unrest was experienced in March 1918 following re-organisation of the workforce after the introduction of a new mark of shell, resulting in changes to shift patterns and a requirement for fewer workers. All the male employees (around 1200 men) were made redundant and then re-employed as required on new terms, causing considerable dissatisfaction. A report on welfare supervision at the National Factory between September 1916 and May 1919 is held by the National Archives in Kew (MUN 5/92/346/27) together with records of an Arbitration Award between the Management of the Maesglas National Shell Factory [sic] and the National Union of General Workers (LAB 2/425/IC237/1918); these point to unusually difficult labour relations at the works. Total output of the Newport National Shell Factory amounted to 601,200 60lbr shells. The works reverted to their original use as railway sheds after the war.

All traces of the former works have been destroyed and the site is now occupied by a housing estate.

Community Newport

County Newport





*Plate 14. Photograph dated 1917 and believed to have been taken at the Newport National Shell Factory (10613g), of the forging on No.1 Forge of steel billets used in the production of 60lb shells. One billet is chalked with the slogan "For Willie 1917" and the press, similar to a Watson Stillman hydraulic press, is chalked with the slogan "Presents for Fritz" (National Waterfront Museum).*

**Lovells Confectionary Works, Alderney Street, Newport**

Site name Lovells Confectionary Works, Alderney Street, Newport  
 NGR ST 31225 89405  
 PRN(s)/NPRN(s) 09547g

## Site type and description

Lovells confectionary works, founded in the late 19<sup>th</sup> century was turned over in large part to war production during the First World War due to the shortage of sugar and other raw materials. They subsequently manufactured mine sinkers, tank track links, and repaired over 6000 ammunition boxes per week (Davis 1998). Such was the requirement for war work that extra premises had to be found and the company acquired the site of the recently vacated Newport Taxi Company. The firm became the subject of an official report as an exemplar of good wartime labour relations (Newport Past) but it has not been possible to trace the report. Lovells reverted to confectionary manufacture after the war, although a contemporary source (*ibid.*) claims that parts of the works were retained as a motor repair facility; this is possibly the former Taxi firm site, which may have been located adjacent to the confectionary works and subsequently built over.

The buildings forming the historic core of the Lovells works are extant, being situated at the corner of Alderney Street and Albany Street. They consist of a heavily rendered brick built industrial building in two floors, which originally had large Crittal type windows to both floors. The windows in the west elevation were boarded up although some in the north elevation upper floor were intact, and are likely to be original, having twelve panes in total with a four pane vent in the upper central position. The majority of the original north elevation contains windows that were not of Crittal type and are clearly more modern additions to the building. There are large blocked entrances in both the north and west elevations that correspond to archways depicted on the Third edition OS map of 1920 and which would originally have allowed access to a pair of open courtyards within the building complex. There is no evidence on either the west elevation or north elevation of an administrative area until the erection of a later extension along Albany Street, although it is possible that such facilities were contained at the rear of the building.

The original core of the building was extended, along Albany Street, by construction of a red brick building of a more ornate style, and which included a probable office block and a range of garage style openings that may have been used as warehousing. This is the extension to the works first depicted on the Fourth edition OS map of 1937 and therefore post-dates the First World War. Two ranges of buildings shown inside the original works on the Third edition map were either demolished or entirely incorporated into the later extensions. A third was retained and was itself extended. Further extension appears to have been made to the north east of the original works but these are not as extensive as those to the south. Access to the rear and inside of the building was not possible. Substantial parts of the original Lovells works were boarded up at the

time of the site visit, including the whole of the west range. Part of the north range (the section with the modern window frames) appears to be in use as an appliance spares outlet and a school of dance.

No features were observed that could be associated with its use during the First World War and although there appears to have been significant extension and possible re-modelling of the interiors, it is clear that a substantial part of the historic core of the Lovells works survives. The buildings clearly have much more relevance to the history of confectionary than the First World War but they are a relatively rare (within Glamorgan and Gwent) example of a surviving building that was used for First World War munitions production and as such should be considered for a programme of building recording.

Community	Crindau
County	Newport
References	Davis, H, 1998, History of the Borough of Newport Who's Who in Newport 1920 (Newport Past Website) Second edition OS map of 1901 Third edition OS map of 1920
Map details	ST38NW
Significance rating	Local
Any current management	Partly unused, other sections of the building are used as a school of dance, an appliance spare parts outlet. Parts of the later extension of the works are used as a garage for the repair of motor vehicles.

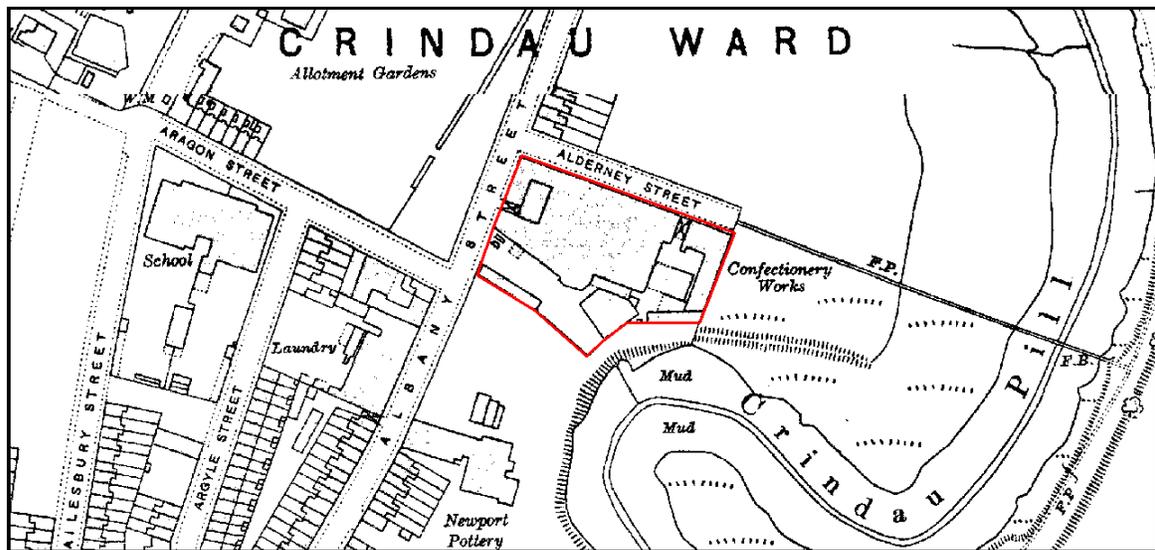


Figure 18. Footprint of the Lovells Confectionery works (red) as shown on the Third edition OS map of 1920. This shows the building as it would have been during its use for war work during the First World War.

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Plate 15. North west corner of the historic Lovells works, at the junction of Albany and Alderney Streets, view looking down Alderney Street. (GGAT/Cadw)



Plate 16. West range of the historic Lovells works showing the blocked entrance to a rear courtyard and the adjoining later extension (red brick). View to the north east. (GGAT/Cadw)

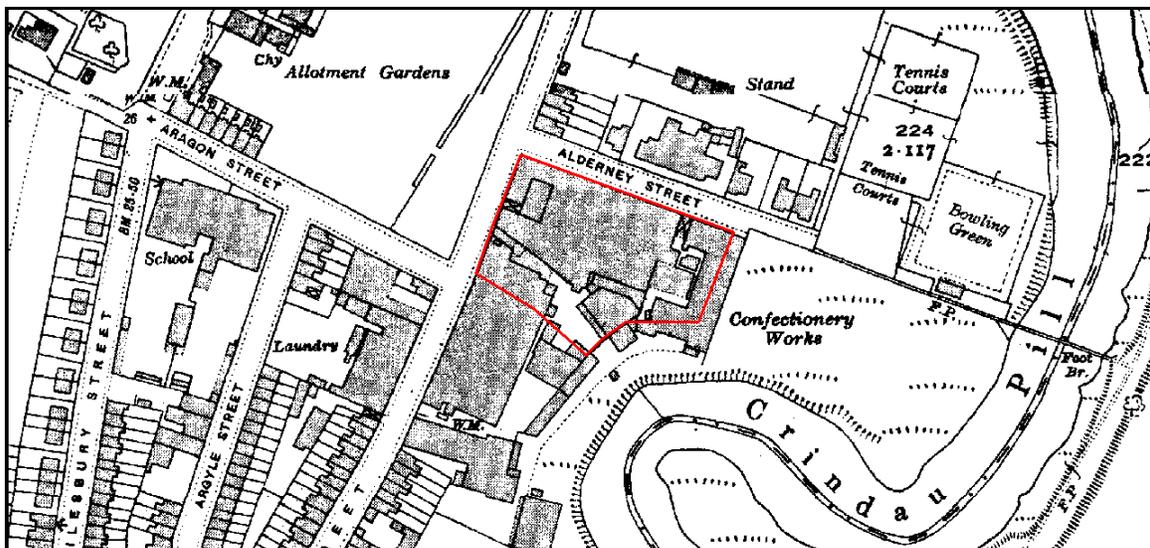


Figure 19. Lovells Confectionery works as depicted on the Fourth edition OS map of 1937. The footprint of the original buildings (red) is shown to highlight the extent of the post-First World War expansion.

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*Plate 17.* The west range, fronting onto Albany Street, was extended after the First World War, the new buildings being more ornate in nature. View to north east. (GGAT)

**Munitions works at Cork Wharf, Newport**

Site name	Munitions works at Cork Wharf, Newport
NGR	ST 31661 85962
PRN(s)/NPRN(s)	10277g
Site type and description	A single contemporary reference dated 1915 was located in the minute books of Newport Borough Council about the establishment of a munitions works at Cork Wharf (A110/M/23). No other information has come to light about this facility but it is clear that firms with light engineering experience often became involved in the production of munitions during the First World War. An irregular rectangular building was built on Cork Wharf between 1901 and 1921 (as compared on the Second and Third edition OS maps although it is unclear whether the building was built specifically for the production of munitions. The building was subsequently absorbed into a large building constructed for the Neptune Engineering Company (Braithwaites) works which expanded from the north. No other record of this munitions works has been located but it is possible that it produced 18lbr shells on lathes. The Braithwaites building is extant but there is no trace of the building that formerly stood on the site.
Community	Pillgwenlly
County	Newport
References	Newport Library A110/M/23 Second edition OS map 1901 Third edition OS map 1921
Map details	ST38SE
Significance rating	Local
Any current management	The site is still an active engineering site that produces structural steelwork.

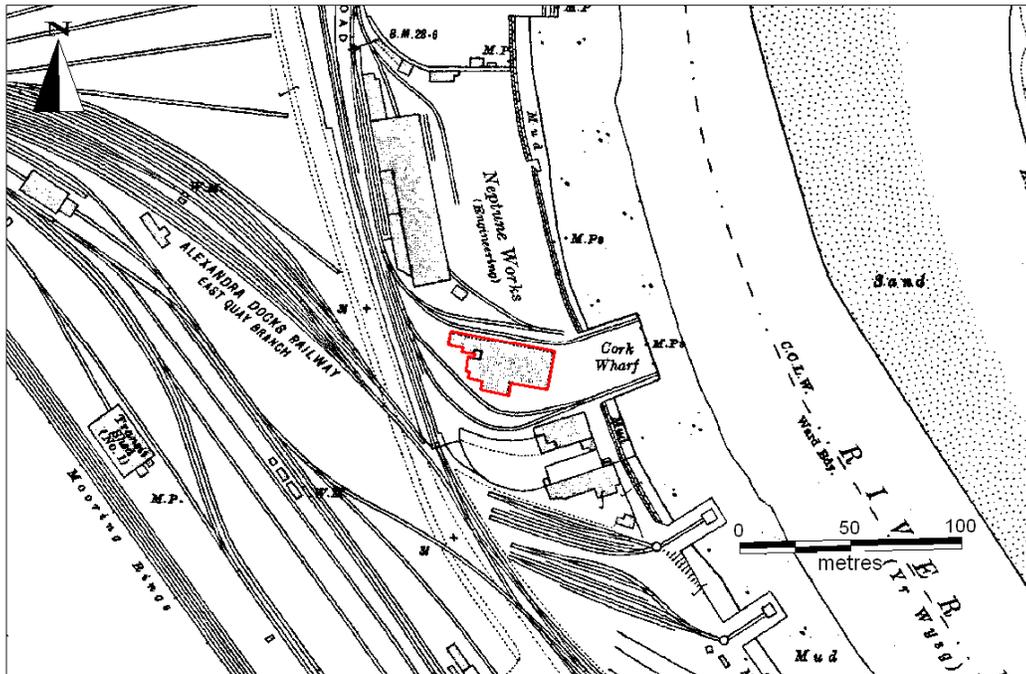


Figure 20. Possible location of the Cork Wharf munitions works (10277g) depicted on the Third edition OS map of 1921 and which was subsequently absorbed into the Neptune Engineering works.

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**Tyne Engine Works (C.H. Bailey), Mill Parade, Newport**

Site name	Tyne Engine Works, Mill Parade, Newport
NGR	ST 31681 86537
PRN(s)/NPRN(s)	10779g
Site type and description	<p>The Tyne Engine works was a ship repair specialist that utilised small corners of the yards for the manufacture of shell parts (Davis 1998). It is probably no coincidence that it was chosen as an auxiliary shop for the Newport National Shell Factory as it was located close to the Uskside National Works (10615g). The firm, together with Uskside National Works, advertised for munitions workers on 16 May 1916. There is apparent consolidation of the works between the Second and Third Edition O.S. maps but it is not possible to assess whether this was as a result of the war or pre-war expansion. It is highly likely that the firm continued with its marine engineering operations in parallel with munitions work but no further information regarding this period has been located.</p> <p>The works has been destroyed and the site is now occupied by a modern industrial building. The former curtilage wall surrounding the works has survived in a damaged state as it continues to act as the boundary between the site and the adjoining properties, with certain identification possible due to distinctive keying of red brick and sandstone visible on an historic photograph.</p>
Community	Pillgwenlly
County	Newport
References	<p>Davis, H, 1991, History of the borough of Newport</p> <p>Second edition OS map 1901</p> <p>Third Edition OS map 1921</p>
Map details	ST38NE
Significance rating	Local
Any current management	The site is now occupied by an office and warehouse building. The former curtilage wall survives in a damaged state.

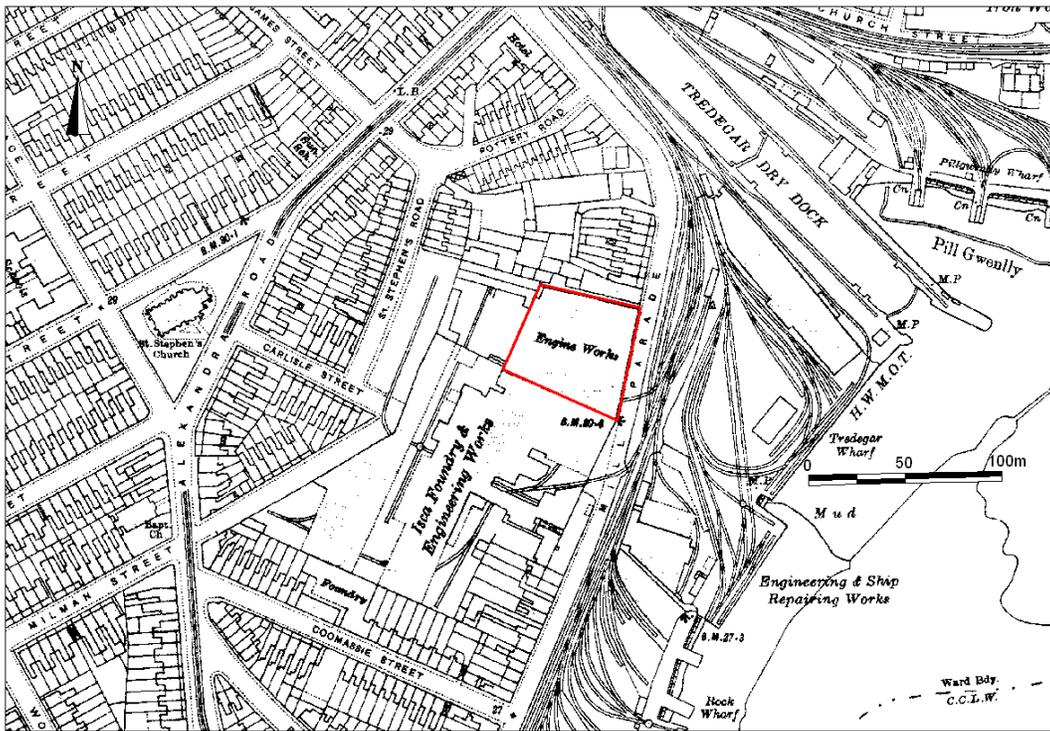


Figure 21. Location of the Tyne Engine Works (CH Bailey) 10779g on Mill Parade, Newport as depicted on the Third edition OS map of 1921.



Plate 18. Frontage of the former Tyne Engine Works (10779g) on Mill Parade, Newport taken before the First World War (Johns Newport Directory 1911). Note the brick and stone keying just visible on the extreme left of the photograph (Newport Past photo 106).



*Plate 19. Surviving portion of the south west curtilage wall of the former Tyne Engine Works on Mill Parade, Newport (10779g). Note the comparison with the distinctive stone and brick keying just visible on Plate 17 (GGAT/Cadw).*



*Plate 20. South west curtilage wall of the former Tyne Engine Works(10779g) (GGAT/Cadw)*

## The Central Division

### Cardiff National Shell Factory, Ferry Road, Grangetown

Site name Cardiff National Shell Factory, Ferry Road, Grangetown

NGR ST 17388 74408

PRN(s)/NPRN(s) 05070s

Site type and description Representatives of Cardiff engineering firms were keen to ensure that all the machinery suitable for shell production in the Cardiff area should be concentrated in a Shell Factory within Cardiff and a Board of Management formed on 30 June 1915 set about the organisation of a National Factory in premises specifically rented for the purpose. The location chosen was that of the Cardiff Rope Works on Ferry Road, Grangetown. The factory commenced production of 18lbr shell although shortage of suitable machinery hindered the output initially. The Official History hints at serious difficulties in labour relations within the Cardiff engineering community stemming from the perception that the repetitive nature of shell manufacture was demeaning to skilled engineering workers and suggests that there was hostility to the introduction of women in the workforce: despite the fact that the factory eventually employed 87% female labour, they were not permitted to work in the tool room, which was considered "...so small as to make it inadvisable to force the question in face of local prejudice". (Official History of the Ministry of Munitions Volume II/2 p.114).

The National Shell Factory was established in June 1915, its first output being in late 1915. The factory manufactured 18lbr, 60lbr, shell heads and 6" proof shot. The factory was initially designed for a weekly output of 1000 18lbr shells, rising to 5,000 shells per week by the summer of 1916. Extensive alterations and adaptations of machinery were undertaken after mid-1916 to produce heads for 60lbr shells; however the factory (along with many others) had to revert to 18lbr production following renewed demand.

The factory was established in the brick built Cardiff Rope Works factory at the western end of Ferry Road, close to the gas works. Temporary buildings were added for inspection, bond and storage purposes on the adjacent Taff Railway Company site. The factory had good tramway access for workers but a new railway siding had to be added in 1916 as hitherto access had been poor. Comparison of the Second and Third edition OS maps demonstrates expansion of the site in the intervening period, including expansion of the rope walk, which may have occurred prior to the war. As in virtually all cases, it is impossible to ascribe particular functions to individual buildings based on the available cartographic data.

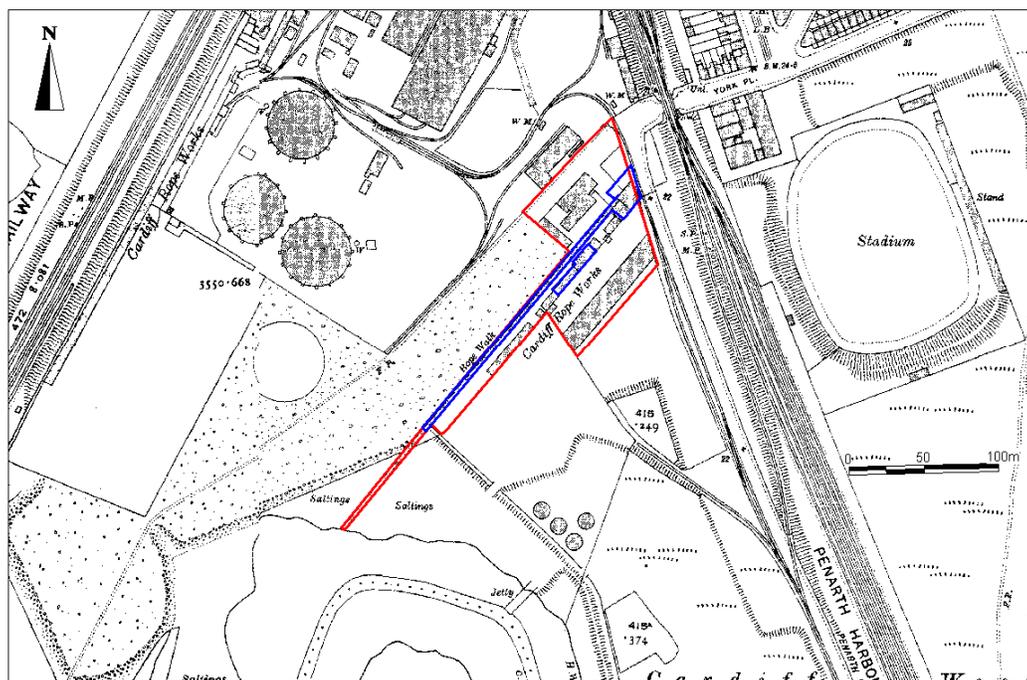
No visible traces of the former Cardiff Rope Works site remain.

Community Grangetown

County Cardiff

References Official History of the Ministry of Munitions, Volume II/2 p.114

	Second edition OS map of 1902
	Third edition OS map of 1920
Map details	ST17SW
Significance rating	Local
Any current management	Currently the site is used for car parking and retail units. There is a possibility of the survival of buried remains.



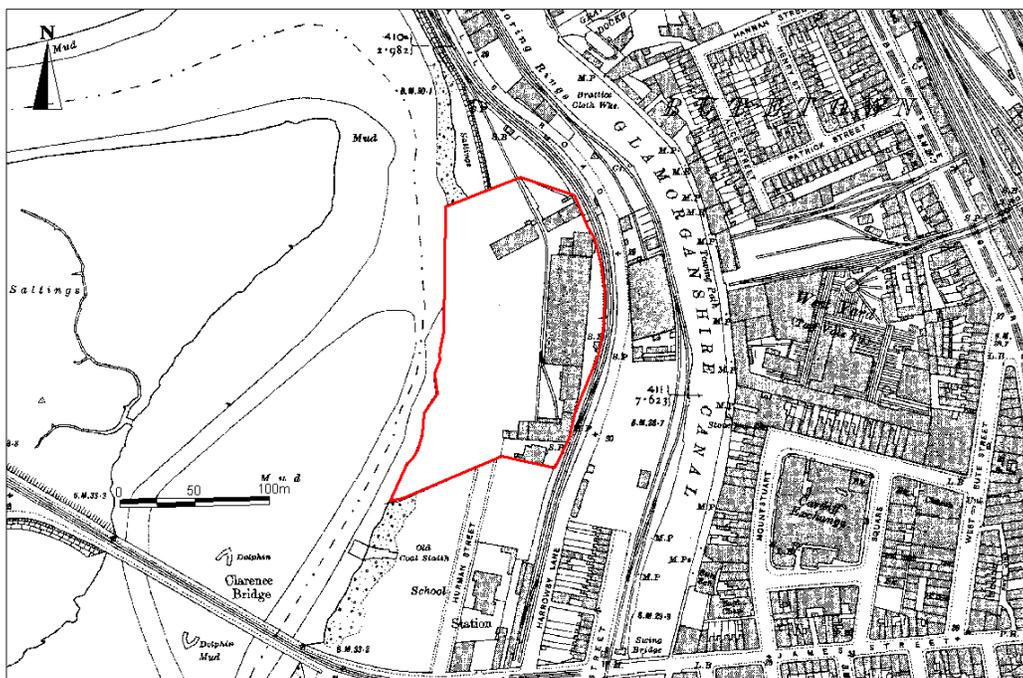
*Figure 22. The Cardiff Rope Works (blue) site was selected as the location for the Cardiff National Shell Factory (05070s) and expanded during the course of the war (red)*

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**Messrs Curran's Metals and Munitions, Hurman Street, Cardiff**

Site name	Messrs Curran's Metals and Munitions, Hurman Street, Cardiff
NGR	ST 18775 74831
PRN(s)/NPRN(s)	05056s
Site type and description	<p>Curran's was a Cardiff based firm initially specialising in the production of furnaces for the annealing of metals. Immediately prior to the outbreak of the First World War the firm had supplied a number of annealing furnaces to the Royal Ordnance Factory Woolwich and had constructed a major munitions plant at Ward End, Birmingham. Following Lloyd George's appeal for the increase in munitions production in 1915, Curran's offered to convert a redundant building adjacent to their Hurman Street iron foundry into a shell case manufacturing plant. The building, which originally had a packed earth floor, was re-conditioned and enlarged, with concrete flooring and platforms laid for the heavy presses and plant required. Accommodation for stores, canteens and offices was also created. Production of brass 4.5" howitzer cases commenced in spring 1916 and continued uninterrupted to the end of the war. A total of over 7 million 4.5" shell cases were produced during this period. After the war, production switched to enamelled ware, utilising much of the munitions making plant and staff. As a result, the Curran's Muniton Factory went on to play a significant part in British re-armament in the late 1930's as it was virtually the only firm with significant munitions manufacturing machinery and experience still in place.</p>
Community	Butetown
County	Cardiff
References	<p>Cardiff Library Ref 948.2 (544.913) "The War Effort at the Curran Works")  Cardiff Library Ref 948.2 (544.913) Cur. "The Edward Curran Companies"  Third edition OS map of 1920</p>
Map details	ST17SE
Significance rating	Regional
Any current management	The original Curran works on Hurman Street have been destroyed and replaced with housing. It is possible however that buried remains associated with the works survive.



*Figure 23. Currans Metals and Munitions works (05056s) were located in the former Bute Shipbuilding and Engineering Works. Currans would become one of the key firms in the British re-armament programme of the late 1930s.*

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## The Western Division

Llanelli National Shell Factory formed part of the Western Division but as it is located within Dyfed, it falls outside the scope of this project.

### Swansea National Shell Factory (Baldwins), Landore, Swansea.

Site name Swansea National Shell Factory, Landore, Swansea

NGR SS 6677196266

PRN(s)/NPRN(s) 07379w

Site type and description

A National Shell Factory was established in the Baldwin works, Landore, in June 1915 following formation of a Board of Management on 28<sup>th</sup> June 1915. It appears to have been established in a pre-existing factory, formerly the Swansea Haematite Works, which had been acquired by Baldwins prior to the war. The factory was initially slow to begin production as machinery intended for Swansea was diverted to Llanelli and matters were further complicated by an incompetent manager which necessitated the reconstruction of the layout of machinery in October 1915 (Official History of the Ministry of Munitions Vol. VIII). Additional facilities such as cloakrooms and tool rooms were constructed at government expense. The first output was in late 1915, and by mid 1917, the factory was turning out 4,000 4.5-inch shells and 2,500 18lb shells per week. The factory became so efficient that the costs of manufacturing the shells were the lowest of any of the National Shell Factories. The Swansea Board of Management also supervised a group of smaller firms producing shells in the local area such as Taylors in Briton Ferry. The Third edition OS map of 1919 depicts a complex of industrial buildings, coke ovens, rail tracks and associated ancillary buildings.

Community Landore

County Swansea

References Official History of the Ministry of munitions Volume VIII

Map details SS69NE

Significance rating Local

Any current management The site currently comprises a mixture of light industrial units, car parking and scrub wasteland. There is a potential for the survival of buried remains.



**Taylor and Sons, Briton Ferry**

Site name Taylor and Sons Ltd., Briton Ferry, Glamorgan  
 NGR SS 73947 94210  
 PRN(s)/NPRN(s) 07318w

Site type and description Briton Ferry Engineering Works (Messrs. Taylor and Sons Ltd.) was established in 1875 and acquired the former Briton Ferry Foundry site in the 1882. They specialised in engineering, manufacturing items such as pickling machines of the steel industry, and also had an iron and brass foundry. On the outbreak of the First World War, the firm became interested in the manufacture of artillery shells and sought advice of representatives from Messrs Armstrong, Whitworth and Company, a well-known munitions manufacturer based in the north east of England. As a result of these contacts, Taylor and Sons became the first private firm in South Wales to commence production of artillery shells, possibly in late 1914 or early 1915. The munitions side of the business was certainly well established by 1917, when a series of photographs held by West Glamorgan Archives were taken, showing various processes and personnel producing 18lbr shells (West Glamorgan Archive D/D Tay PLA 7/1-14). It appears that Taylor and Sons also made 4.5 inch howitzer shells as two surviving examples are held by the firm, dated to 1917.

The oldest surviving parts of the current works, depicted on First edition OS mapping of 1882, are the pattern shop at the south of the site which is a well preserved and listed industrial building (LB 82715) and a large warehouse type of structure at the north of the site which has been used as an engineering workshop but which may well be associated with the establishment of the Briton Ferry Foundry in 1862. A large foundry building depicted on the OS mapping in the centre of the site was destroyed and replaced with a modern structure after the Second World War, although it appears to make use of the earlier building's footprint. At some point between the Second and Third edition OS maps *i.e.* between 1899 and 1917, the northern structure was expanded to provide additional engineering space and it is this expansion which can be seen in the photographs of shell manufacture and which survives substantially intact to the present day. It is unclear as to whether the expansion was carried out pre- First World War or whether it was stimulated by the requirement for shell production but it was certainly well established by the date of the photographs (1917).

The part of the works associated with shell production consists of a brick skinned building with iron internal framing and a largely timber and iron clad roof. The internal portion of the roof used timber planks as a covering and comparison with surviving remains and the 1917 photographs suggests that the original roofing survives intact. The more substantial structural iron beams were used to support various items of engineering equipment such as gantry cranes and the drive shafts for power trains, and partial elements of these features still survive. A mezzanine floor above the machine shop

provides access to the original iron beam roof structure and houses a surviving drive shaft. The windows originally sited on the east side of the building have been blocked up but a number of window frames and doors located in the north west corner of the machine shop appear to be original. Narrow gauge rail tracks used to transport trollies around the workshop survive buried beneath a concrete floor: the original brick floor is also believed to survive beneath the new floor. The supervisor's office consists of a timber and glass open topped structure built onto a platform in the south east corner of the extension. Whilst the current structure is not original, it used the same footprint as the one that can just be seen on one of the 1917 photographs. The plant used in the manufacture of the shells has long gone although the workshop contains a slotting machine (for machining slots) dating to 1914 which may have been in use in the machine shop during the First World War. In conclusion, substantial portions of the Taylor and Son's machine shop, where munitions manufacture was carried out, survive in a virtually unchanged condition, making this structure a unique survivor of South Wales munitions production from the First World War.

Community	Briton Ferry
County	Glamorgan
References	West Glamorgan Archive D/D Tay PLA 7/1-14 Cadw Listing information <a href="http://www.britishlistedbuildings.co.uk/wa-82715-workshops-stores-and-office-at-briton-fer">http://www.britishlistedbuildings.co.uk/wa-82715-workshops-stores-and-office-at-briton-fer</a> Third edition OS map of 1918
Map details	SS79SW
Significance rating	Regional
Any current management	The site is currently an active engineering site

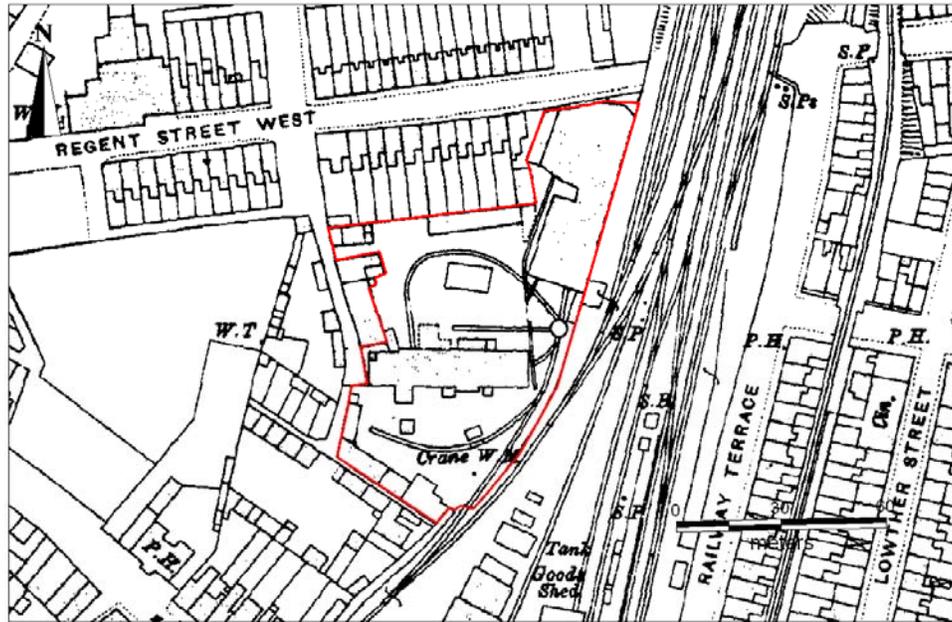


Figure 25. Taylor and Sons, Briton Ferry (07318w) as shown on the Third edition OS map of 1918. The machine shop, where shells were manufactured is located at the north of the site.

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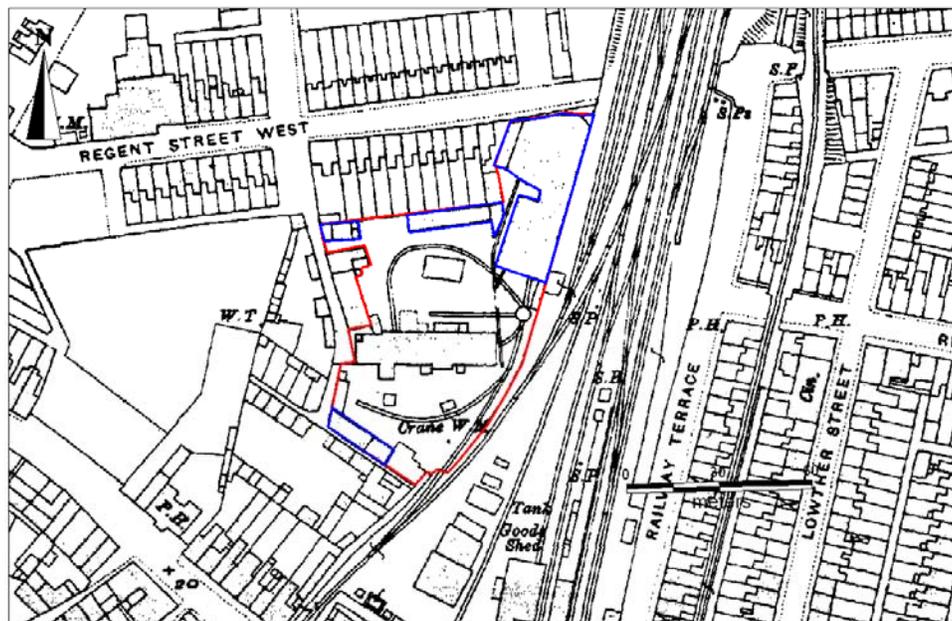


Figure 26. Surviving elements (Blue) of Taylor and Sons, Briton Ferry(07318w)

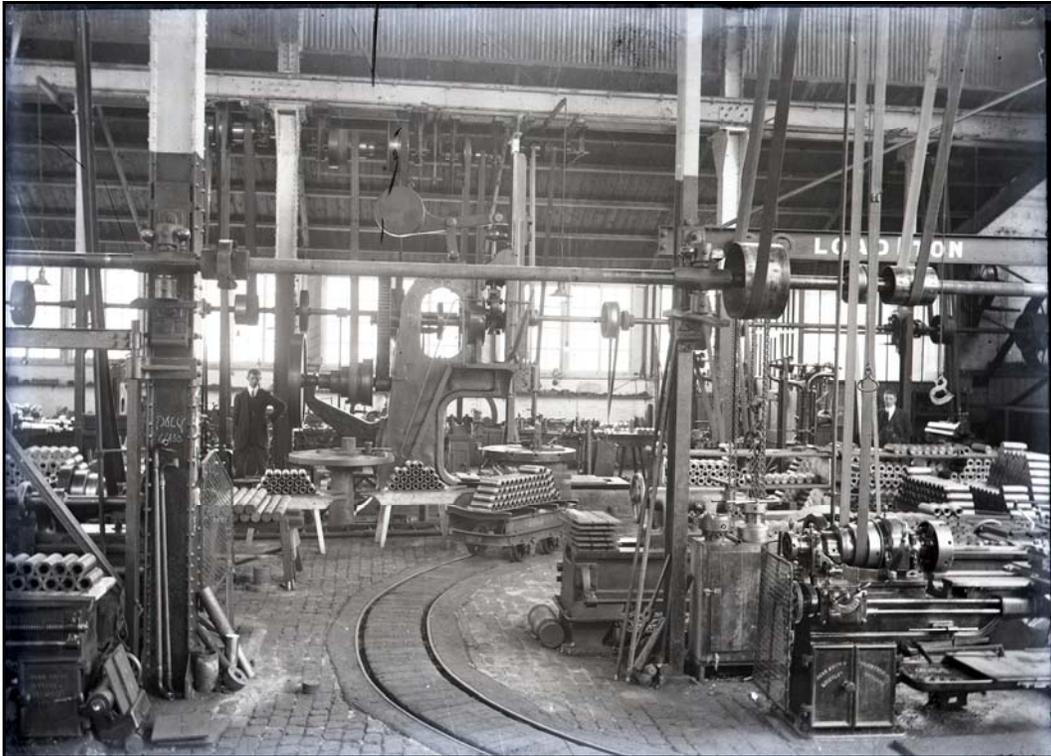
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*Plate 21. Interior of the machine shop in 1917, view to north (DD/Tay/7-11)*



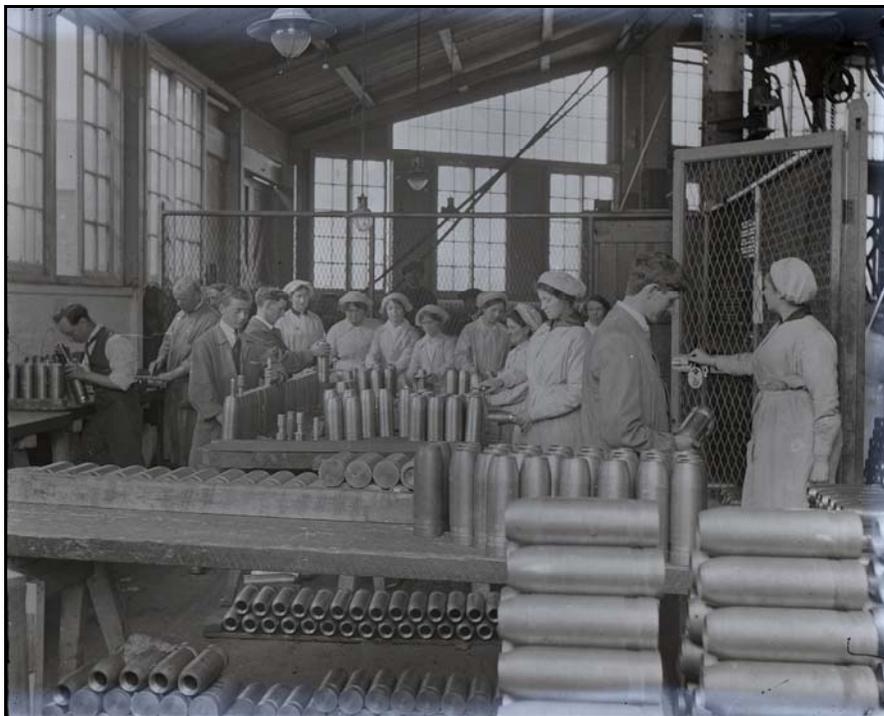
*Plate 22. Interior of the Taylor and Sons machine shop 2014, view to north (GGAT/Cadw)*



*Plate 23. Interior of the Taylor and Sons machine shop 1917, view to east (DD/Tay/7-9)*



*Plate 24. Taylor and Sons machine shop in 2014, view to east (GGAT/Cadw)*



*Plate 25. North west corner of the Taylor and Sons machine shop 1917 (DD/Tay/7-10)*



*Plate 26. North west corner of the Taylor and Sons machine shop in 2014 with original window frames, roofing and door(GGAT/Cadw)*



*Plate 27. Surviving drive shaft to provide power to belt driven machinery, note original roof construction, Taylor and Sons machine shop (GGAT/Cadw)*



*Plate 28. Abutment of the Taylor and Sons machine shop (left) to the earliest part of the premises, which probably dates to 1862. Note original roof construction (GGAT/Cadw)*

### 4.3 Tube works

The ability to manufacture high quality tubular steel was crucial to the war effort. Such products were used for everything from high pressure steam pipes, to gas cylinders, tubular products used in aircraft manufacture and for water pipes. The Admiralty was the prime user of steel tubes during the war (Official History of the Ministry of Munitions Vol. VII) and considered them such a vital product that they proposed taking over the tube manufacturing industry in late 1915. In the event, this did not occur although a very close control was kept on output. Nationally, the tube industry managed an output of 316,700tons of tubing during the war with a combined length of 235 million feet.

The following table lists the tube works that have been identified through specific references in the sources. Other tube manufacturers were in operation at the time but no specific information has been located for their activity during the First World War.

**Table 3.** Table of identified tube works

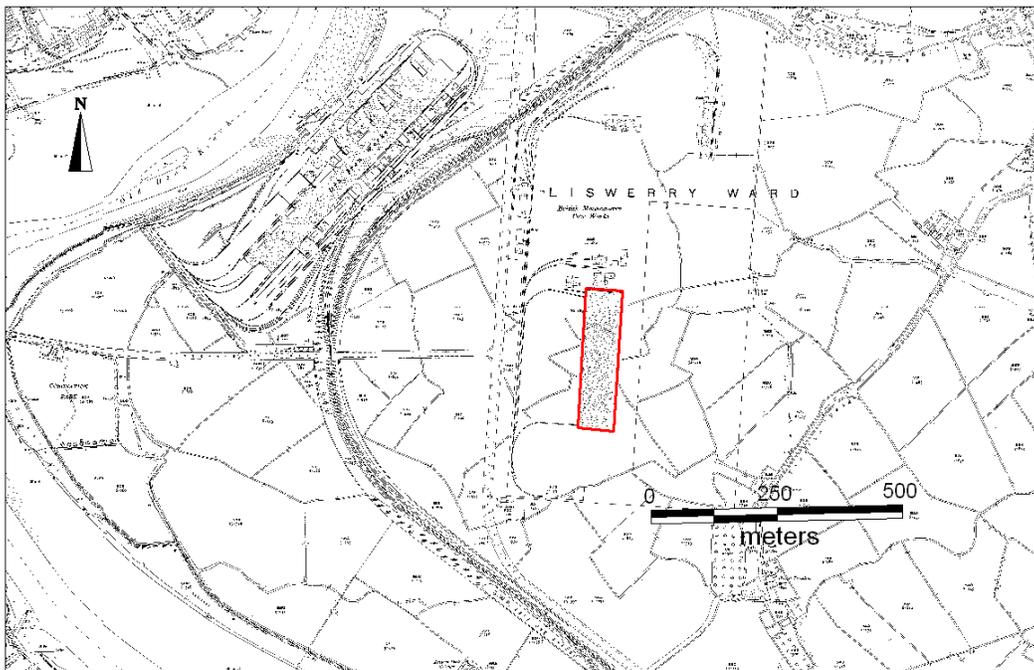
Site name	PRN	Condition	Purpose
British Mannesmann Tube works, Newport	03674g	Damaged	Steel tube and pipe producers
British Mannesmann Tube works, Swansea	10272g	Near destroyed	Steel tube and pipe producers

**British Mannesmann Tube Works Limited, Corporation Road, Newport**

Site name	British Mannesmann Tube Works Limited, Corporation Road, Newport
NGR	ST3309685998
PRN(s)/NPRN(s)	03674g
Site type and description	<p>The British Mannesmann Tube works in Newport had been planned before the outbreak of the First World War with work commencing in early 1914, the works themselves being constructed just east of the Orb Steelworks (09210g). A contemporary newspaper report from New Zealand (Colonist, Volume LVI, Issue 13922, 2 February 1914, Page 6) recorded that the works were planned to cost £750,000 pounds and were intended to employ 3000 people. It is unclear whether the works operated during the First World War although an official source states that the factory opened in March 1916 for the manufacture of steel and iron tubes (Official History of the Ministry of Munitions Volume VII: The Control of Materials). Certainly, the works as depicted on the 1921 OS map appear to be well established and it is probable that work had commenced at the site in 1916: its first products were forgings for shells and gas cylinders (Davis 1998). Extensions to the plant were authorised by Engineer Captain Richards R.N. and were in progress or planned at the plant by May 1916 (Official History of the Ministry of Munitions Volume VII: The Control of Materials). As an Austro-German owned firm, it was taken over by The Custodian of Enemy Property and was not returned to the ownership of the Mannesmann family until 1926.</p> <p>The works continued to produce tubes until 1972.</p> <p>The original main works building appears to have been extended to the south and the whole site has been re-modelled, now containing larger warehouse type buildings. The ancillary buildings associated with the works that are visible on the Third edition OS map have all been destroyed.</p>
Community	Liswerry
County	Newport
References	<p>Official History of the Ministry of Munitions Volume VII: The Control of Materials</p> <p>The Colonist (Papers Past website <a href="http://paperspast.natlib.govt.nz/cgi-bin/paperspast?a=d&amp;d=TC19140202.2.47">http://paperspast.natlib.govt.nz/cgi-bin/paperspast?a=d&amp;d=TC19140202.2.47</a>)</p> <p>Third edition OS map of 1921</p>
Map details	ST38SW
Significance rating	Local
Any current	The site of the old tube works is occupied by large industrial buildings and

management

warehouses. There is likely to be an historic core to some of the structures but they appear to have been extensively re-modelled in recent times.



*Figure 27. The British Mannesmann Tube Works, Newport (03674g)  
as it appears of the Third edition OS map of 1921*

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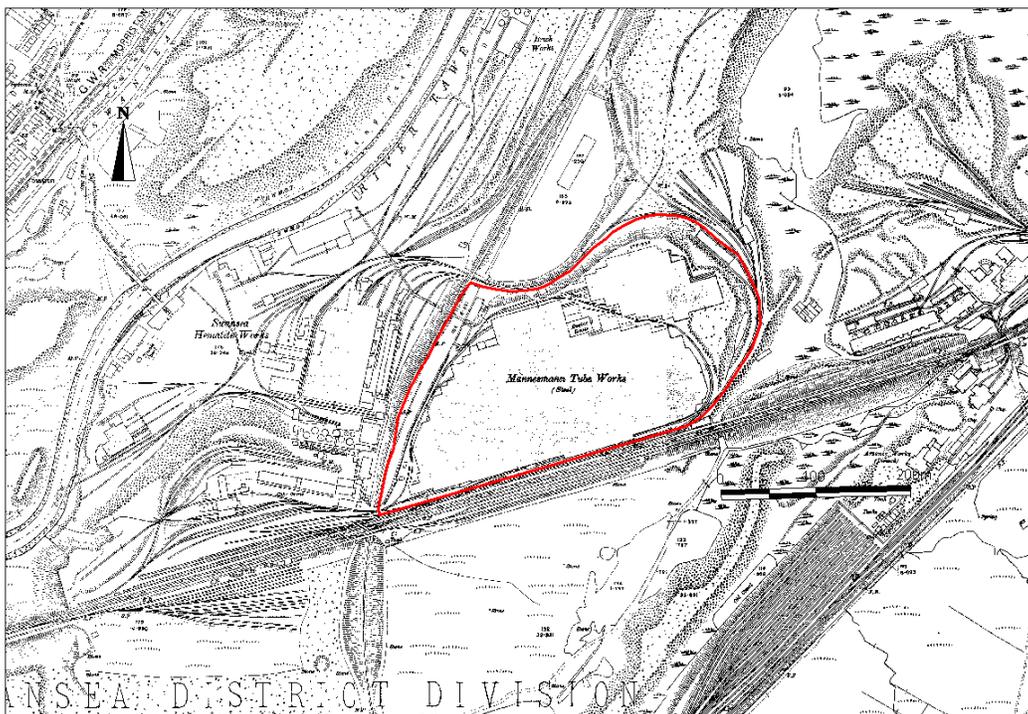
**British Mannesmann Tube Works Limited, Swansea**

Site name	British Mannesmann Tube Works Limited, Swansea
NGR	SS 67023 96111
PRN(s)/NPRN(s)	10272g
Site type and description	<p>The Mannesmann Tube works in Landore was a large industrial plant specialising in the production of seamless steel tubes. Landore Siemens Steelworks was opened as an experimental plant in the converted buildings of the Landore Silver and Spelter Works (NPRN 301167) in 1867-69. The site was developed by William Siemens (1823-1883), who German by birth, came to Britain in 1843 and subsequently developed the open-hearth method of steel production. By 1870 Landore Siemens Steelworks was producing steel rails.</p> <p>In 1871 a second works was opened to the east of the River Tawe, with two blast furnaces and extensive mills. By 1873 it was one of the four largest steelworks in the world, although it closed in 1888. Siemens steel was used to construct warships at Pembroke Dock and the Forth Bridge. The Mannesmann Tube Company converted large areas of the mills into production lines for seamless steel tubes. The blast furnaces and steel making plant were taken over by the Swansea Hematite Company in 1899. The site operated as a foundry until 1980 although tube production ceased in 1961 (Hughes and Reynolds 1989). As an Austro-German owned firm, it was taken over by The Custodian of Enemy Property and continued to produce materials for the war effort. The works was not returned after hostilities ceased. Extensions to the plant were authorised by Engineer Captain Richards (Royal Navy) and were in progress or planned at the plant by May 1916 (Official History of the Ministry of Munitions Volume VII: The Control of Materials). The concrete foundations of a structure from the works were noted during a walkover survey. They consisting of a 12m by 21m central concrete structure with internal foundation pillars bounded by an external low brick wall 'skin' (06124w, Gerard, C and Sherman, A, 2008). The site is now occupied by office units and car parking but there is a possibility for the survival of buried structures.</p>
Community	Landore
County	Swansea
References	<p>Hughes, S and Reynolds P, 1989, A Guide to the Industrial Archaeology of the Swansea Region", Association for Industrial Archaeology, 2nd Edition</p> <p>Gerard, C and Sherman, A, 2008 Lower Swansea Valley, Swansea : archaeological desk based assessment, GGAT Report 2008/031</p> <p>First Edition OS map of 1881</p> <p>Second edition OS map of 1899</p> <p>Third edition OS map of 1917</p>

Map details SS69NW

Significance rating Local

Any current management The site is currently occupied by office units and car parking facilities



*Figure 28. The British Mannesmann Tube Works, Landore, Swansea (10272g) as seen on the Third edition OS map of 1921*

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#### 4.4 Great Western Railway and the Welsh Railways

Rail transportation was vital to the war effort nationally and within Glamorgan and Gwent. The most significant of the rail companies operating in the study area was the Great Western Company, although a number of smaller firms, such as the Cardiff Railway and Taff Vale Railway Company were highly active in the traffic of goods around the region. The Great Western Railway constructed extra track to support the very heavy demands made on the service during the war but identification of these features is difficult. Only one certain example of wartime extension has been found, that of the Admiralty sidings in Pontymoile.

**Table 4.** Table of identified railway expansions

Site name	PRN	Condition	Purpose
Admiralty sidings, Pontymoile	10688g	Destroyed	Marshalling of Royal Navy coal convoys

##### **Admiralty Siding, Pontymoile, Pontypool**

Site name Admiralty Siding, Pontymoile, Pontypool

NGR SO 29479 00215

PRN(s)/NPRN(s) 10688g

Site type and description

This was a spur of the rail network linking Pontypool Railway station with the north east side of Lower Mills Sheet works and the Phoenix Galvanising works. The sidings belonged to the Great Western Railway (GWR) but the name suggests Admiralty involvement: firms around the Pontypool area are known to have held contracts for the Royal Navy to produce forgings, chains and other equipment. However, these sidings are believed to have been used to assemble convoys of steam coal from Quakers Yard for transportation to Royal Navy bases in Scotland. The convoys were known as ‘Jellicoe Specials’ and during the course of the war facilitated the movement of some five and a half million tons of Welsh steam coal specifically for Royal Navy. These sidings were therefore vital in the forming up of the rail convoys and their smooth dispatch to the north.

The sidings consisted of an arc of four rail lines, with a combined length of approximately 1.64km joining with the main GWR line close to the Pontypool Road Station (at NGR SO 29890 00255).

The sidings appear to have been destroyed in the inter-war period, as an aerial photograph dated 1939 shows much of the land close to the sidings occupied by the Pilkington Glass works. The photograph shows that just one rail track remained in use, with the original footprint of the Admiralty sidings being revealed by a parch mark.

The Pilkington Glass works themselves have been destroyed and the site is

	now occupied by a housing estate.
Community	Pontymoile
County	Torfaen
References	Third edition OS map of 1920
Map details	SO20SE
Significance rating	Regional
Ownership details	N/A
Any current management	The sidings have been removed and the location is now the site of a housing estate.

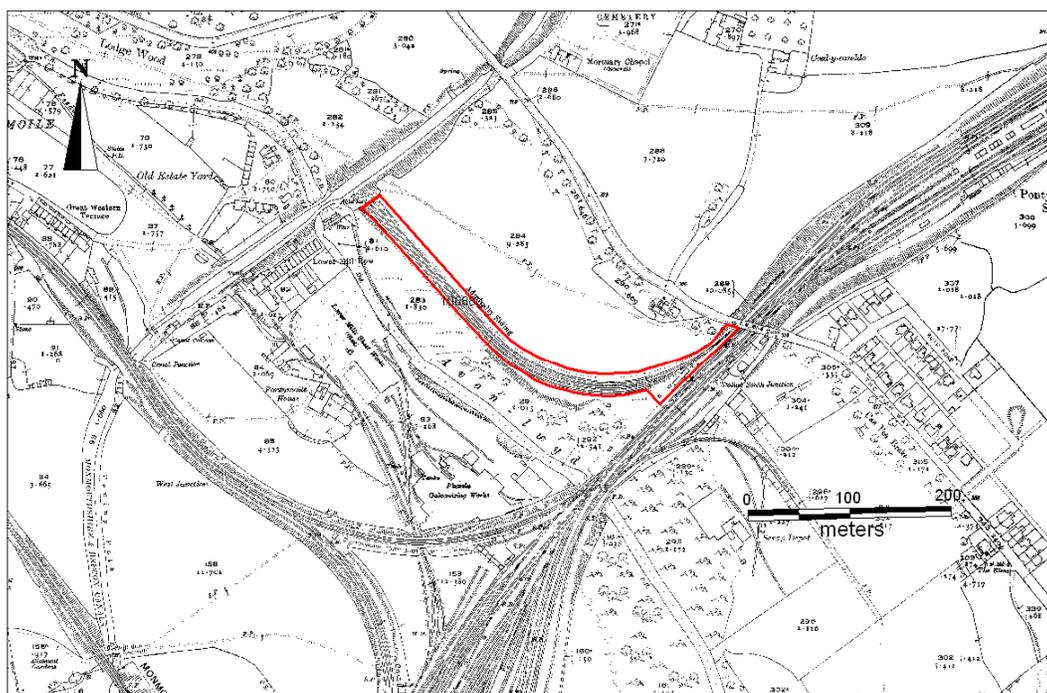


Figure 29. Admiralty sidings, Pontymoile (10688g) as depicted on the Third edition OS map of 1920

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*Plate 29. Aerial photograph dated 1939 of the Pilkington Brothers glass works, Pontymoile, looking to the north. The footprint of the First World War Admiralty Sidings (10688g) is visible top left of the Pilkington Warehouse buildings. Only a single rail track remained in use at this time.*

## 4.5 Docks

The docks of the South Wales coast assumed a far greater significance during the First World War due to their relative immunity from hostile military action. Until the advent of unrestricted submarine warfare in 1917, vessels using the ports were comparatively safe and as a result, vast quantities of cargo were shipped in and out, and goods formally shipped from East Coast ports were diverted to the Western ones. Unfortunately, clear sources for information on docks are relatively rare, and there is a clear requirement for further study of the wartime role of the Swansea, Cardiff and Newport Docks.

### Newport Docks

The sea lock to the south dock at Alexandra Docks in Newport was formally opened just three weeks prior to the outbreak of the First World War. It was thus fortuitous that Newport's new facility, which at that time was the largest sea lock in the world, permitted the loading and unloading of the largest of cargo vessels at exactly the right time to be utilised by the government. Newport docks was the place of transshipment of millions of tons of South Wales coal for the vessels of the Royal Navy whilst facilitating the importation of over 2 million tons of iron ore over the course of the war for use in munitions and other purposes. Between March 1916 and December 1918, 197,000 tons of sodium nitrate, a vital component in explosives, passed through the docks. Extensive transit sheds were erected specifically for government traffic, with the Great Western Railway and the Alexandra Docks and Railway Company responsible for all rail traffic (Pratt 1921).

In addition to the handling of main bulk cargoes such as ore, coal, pitwood and sodium nitrate, many thousands of tons of war materials were shipped from Newport docks for the war effort. These items included tanks, aircraft, locomotives, motor vehicles, guns, ammunition, railway wagons, rails and sleepers, hutments, corrugated iron for trenches, hospital stores, clothing, barges and motor boats. At the same time, thousands of tons of imported foodstuffs such as fruit, meat, grain and sugar were transhipped at Newport, including 44,000 barrels of grapes that arrived in a single shipment (*ibid.*). The docks were also used for the disembarkation of American troops such as the 1500 personnel that arrived on the *S.S. Miltiades* in 1918.

No detailed information concerning the wartime use of the Swansea and Cardiff docks was located as part of this project.

## 4.6 The Coal industry

The Welsh coal industry during the First World War occupied a peculiar place within the industrial organisation of the region during the First World War. Coal was clearly a vital strategic asset and the smooth running of the industry was in the government's interest. Yet despite a history of poor industrial relations, and the consequent risk to coal supply, the Ministry of Munitions allowed the industry a surprising degree of self-governance until November 1916, when coal effectively became nationalised. The one exception of note encountered during the course of this study were the mines owned by Guest Keen and Nettlefolds (GKN), which became Controlled Establishments in late 1915 when GKN as a going concern was nationalised.

It seems the government were initially content to let mine owners manage the output from their collieries but continued poor worker/owner relations, militancy amongst miners and a growing suspicion of profiteering by mine owners eventually resulted in the government taking control of the pits.

Whilst the majority of coal mines would have produced coal for both domestic and government contracts, the following sites have been included as they are known to have been of particular significance in the production of steam coal for the Royal Navy.

The following table contains the coal pits identified as having made a specific contribution to the war effort.

**Table 5.** Table of coal pits making identified during the study.

Site name	PRN	Condition	Purpose
Britannic colliery, Evanstown	07565m	Near destroyed	Supply of coal to the Royal Navy and industry
Cambrian colliery, Clydach Vale	07560m	Near destroyed	Supply of coal to the Royal Navy and industry
Cwmbran colliery, Cwmbran	10777g	Near destroyed	Supply of coal for government contracts. Subject to early government control
Dowlais-Cardiff colliery (Abercynon colliery)	NPRN33442	Near destroyed	Supply of coal for government contracts. Subject to early government control
Glamorgan colliery, Llwynpia	01457m	Near destroyed	Supply of coal to the Royal Navy and industry
Naval colliery, Tonypandy	07530m	Near destroyed	Supply of coal to the Royal Navy and industry
Viaduct colliery, Pontnewydd	10304g	Near destroyed	Supply of fire clay and coal for government contracts. Subject to early government control

**Britannic Colliery, Evanstown, Rhondda Cynon Taff**

Site name                    Britannic Colliery, Evanstown, Rhondda Cynon Taff

NGR                            SS 97879 90367

PRN(s)/NPRN(s)        07565m

Site type and description        Colliery supplying coal to the Royal Navy and included on the Naval List of official suppliers to the Admiralty. The mine was sunk in 1868 and remained open until 1960. It was noted for the quality of its steam coal and has been included in the study due to its known links with supplying the Royal Navy.

Community                Evanstown

County                      Rhondda Cynon Taff

References                Welsh Coal Mines [Online]  
<http://www.welshcoalmines.co.uk/GlamWest/Britannic.htm>  
 Third edition OS map of 1921

Map details                SS99SE

Significance rating        Local

Any current management        The site has been destroyed and now consists of waste ground. It is highly likely that buried remains survive in the area.

**Cambrian Colliery, Clydach Vale**

Site name Cambrian Colliery, Clydach Vale

NGR SS 96963 92658

PRN(s)/NPRN(s) 07560m

Site type and description The Cambrian Colliery was a major producer of steam coal for the Royal Navy and was included on the Naval List of official suppliers to the Admiralty. It was known for producing Cambrian Navigation Smokeless Steam Coal, which was regarded as a superior type of fuel. As such, the mine could be considered a strategic asset within the context of the First World War, which probably helps to explain the fact that the coal industry was nationalised by the government in November 1916 after it lost confidence in the ability of mine owners to effectively manage their output in the face of very difficult labour relations. The Cambrian Colliery was initially sunk in 1872 and by 1918 it employed 4033 people. The colliery was at the centre of the 1910 Tonypandy Riots and suffered a string of disasters over the time it was open. The Cambrian Colliery was finally closed in 1965.

Community Clydach Vale

County Rhondda Cynon Taff

References Welsh Coal Mines [Online]

Map details SS99SE

Significance rating Local

Any current management The mine has been destroyed and the site is now waste ground. Significant buried remains are likely to survive in the vicinity.

**Cwmbran Colliery, Cwmbran**

Site name	Cwm-Bran Colliery, Cwmbran
NGR	ST 28129 96136
PRN(s)/NPRN(s)	10777g
Site type and description	Cwmbran colliery was acquired by Guest, Keen and Nettlefolds (GKN) in 1908, having been a well-established mine operating since at least 1811. The colliery appeared on a GKN list of Controlled Establishments in 1915 (Jones, 1998) when the whole of the GKN empire was virtually nationalised by the government to aid the war effort. It is possible that this was done to ensure its supply of materials to the Cwmbran ironworks (02513g) but the Cwmbran colliery was one of the earliest taken under government management, something that did not happen in the rest of the coal industry until November 1916. The colliery is depicted as developing and expanding throughout the First, Second and Third editions of the OS mapping available, consisting of a gradually expanding network of rail tracks and ancillary buildings serving a level in the north west corner of the site. The mine ceased production in 1927.
Community	Cwmbran
County	Blaenau Gwent
References	Jones, E, 1987, <i>A History of GKN: Innovation and Enterprise 1759-1918</i> First edition OS map of 1882 Second edition OS map of 1901 Third edition OS map of 1920 Welsh Coal Mines [Online] available at <a href="http://www.welshcoalmines.co.uk/Gwent/Cwmbran.htm">http://www.welshcoalmines.co.uk/Gwent/Cwmbran.htm</a>
Map details	ST29NW
Significance rating	Local
Any current management	The mine has been destroyed and the site re-greened. It is highly likely that some buried structures remain.

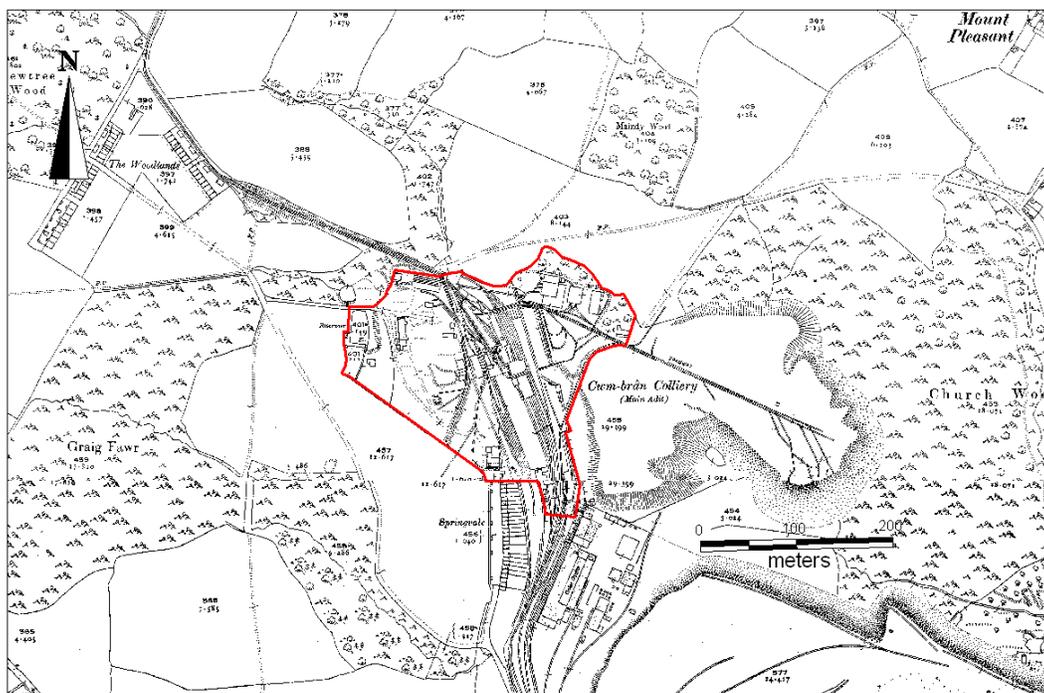


Figure 30. The GKN owned Cwmbran colliery (10777g) as depicted on the Third edition OS map of 1920

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**Dowlais-Cardiff Colliery**

Site name	Dowlais-Cardiff Colliery (also known as Abercynon colliery)
NGR	ST 08214 94410
PRN(s)/NPRN(s)	NPRN33442
Site type and description	This colliery was sunk between 1886 and 1889 specifically to supply the Dowlais Cardiff steel works in East Moors (07486m). It appeared on a Guest, Keen and Nettlefolds (who had gained control in 1903) list of Controlled Establishments in 1915, becoming effectively nationalised as part of the imposition of government control over GKN and in contrast to other parts of the coal industry which were not nationalised until November 1916. In 1923, 2,974 men were recorded as being employed by the mine, working on three seams of coal. The mine shut in 1988 and the site is now occupied by a small business park.
Community	Abercynon
County	Rhondda Cynon Taff
References	Jones, E, 1987, <i>A History of GKN: Innovation and Enterprise 1759-1918</i> Welsh coal mines [Online] available at <a href="http://www.welshcoalmines.co.uk/GlamEast/Abercynon.htm">http://www.welshcoalmines.co.uk/GlamEast/Abercynon.htm</a> Second edition OS map of 1900 Third edition OS map of 1919
Map details	ST09NE
Significance rating	None
Any current management	The colliery has been destroyed and the site is now occupied by office units and car parking. It is highly likely that buried remains associated with the colliery survive in the vicinity.

**Glamorgan Colliery, Llwynpia**

Site name	Glamorgan Colliery, Llwynpia
NGR	SS 99428 93394
PRN(s)/NPRN(s)	01457m
Site type and description	Sunk between 1861 and 1862, the Glamorgan Colliery (also known as Llwynpia Colliery or Scotch Colliery) supplied high quality steam coal to the Royal Navy both before and after the First World War and was included on the Naval List of official suppliers to the Admiralty. In addition to being noted for its steam coal, the clay mined in one of the shafts was made into bricks, with some 10,000 per day being produced (Welsh Coal Mines 2014). The mine became part of the Cambrian Coal Combine in 1910-1911 and was the scene of violent clashes during the Tonypandy Riots of 1911 which poisoned industrial relations for many years. In 1918 3156 people were employed at the mine. It finally closed in 1945 but was kept open for pumping until 1966.
Community	Llwynpia
County	Rhondda Cynon Taff
References	Third edition OS map of 1920 Welsh Coal Mines [Online] available at <a href="http://www.welshcoalmines.co.uk/GlamEast/llwynypia.htm">http://www.welshcoalmines.co.uk/GlamEast/llwynypia.htm</a>
Map details	SS99SW
Significance rating	Local
Any current management	The pit has been largely destroyed but there is a strong possibility of the survival of buried remains in the vicinity.

**Naval Colliery, Tonypandy**

Site name	Naval Colliery, Tonypandy
NGR	SS 99890 92015
PRN(s)/NPRN(s)	07530m
Site type and description	Colliery supplying coal to the Royal Navy and included on the Naval List of official suppliers to the Admiralty. The Naval Colliery was actually a group of four pits in close proximity and consisted of the Pandy and Anthony pits, the Nantgwyn pit and the Ely pit. They were sunk between 1879 and 1908 and as the name suggests, their chief product was steam coal for the navy. By 1918, the pits employed 2358 people. By 1945, only Anthony and Pandy were still in production and the Naval colliery closed in 1958 (Welsh Coalmines).
Community	Tonypandy
County	Rhondda Cynnon Taff
References	Third edition OS map of 1920 Welsh Coalmines <a href="http://www.welshcoalmines.co.uk/GlamEast/Naval.htm">http://www.welshcoalmines.co.uk/GlamEast/Naval.htm</a>
Map details	SS99SE
Significance rating	Local
Any current management	The colliery has been destroyed but it is likely that sub-surface remains survive.

**Viaduct Colliery, Pontnewydd**

Site name	Viaduct Colliery, Pontnewydd
NGR	SO 26362 01877
PRN(s)/NPRN(s)	10304g
Site type and description	A colliery owned and operated by Guest, Keen and Nettlefolds (GKN), opened in 1900 and acquired by GKN in 1903 and first appearing on the 3rd Edition OS map of 1921. This colliery appeared on a GKN list of Controlled Establishments in 1915. The colliery became a Controlled Establishment at relatively early date (the coal industry was generally retained in private ownership until December 1916) due to the virtual nationalisation of the entire GKN firm. It is believed that the mine produced more fire clay than coal. These works had government contracts and were controlled to maximise output, eliminate wasteful duplication, and keep profits down in the face of desperate need and shortage.
Community	Pontypool
County	Torfaen
References	Jones, E, 1987, <i>A History of GKN: Innovation and Enterprise 1759-1918</i> Third edition OS map of 1921
Map details	SO20SW
Significance rating	Local
Any current management	There is no obvious surviving evidence of the mine although there is a possibility that elements are hidden in woodland that now covers the site.

#### 4.7 Gas and Coke manufacturing (extraction of chemicals)

Traditionally, the variety of coke oven employed in the industries of South Wales had been of the non-recovery type (Paul Jackson, pers. comm. 2014). This was wasteful of vitally important chemicals, particularly of toluol and benzol, both of which were necessary for the production of high explosives. As a result, plant was often installed at the less efficient coke works or in gas works. Those coke ovens that did operate by-product recovery systems were often expanded with additional plant.

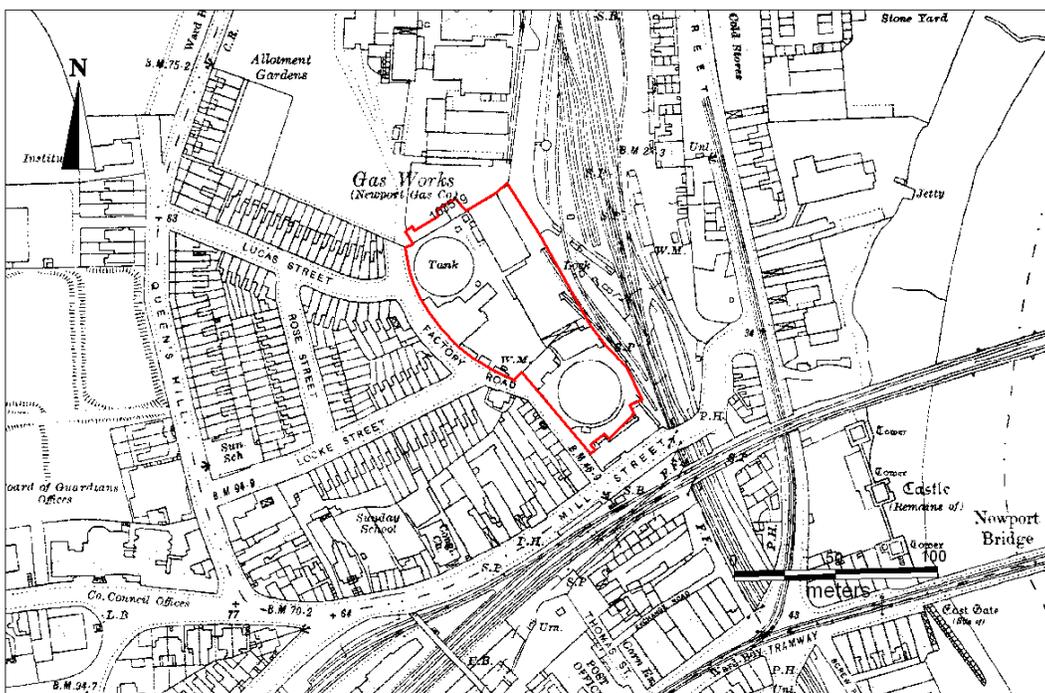
The following table lists gas works and coke ovens known to have been modified to capture by-product chemicals for war use.

**Table 6.** Table of gas works and coke ovens modified for war output

Site name	PRN	Condition	Purpose
Newport gas works	10351g	Near destroyed	Converted to capture by-product chemicals
Ebbw Vale coke and benzol plant, Victoria works, Ebbw Vale	10740g	Near destroyed	Expanded to increase by-product output
Coedely by-product coke oven, Coedely	07579m	Near destroyed	Expanded to increase by-product output
Risca coke and benzol works, Risca	07580m	Near destroyed	Expanded to increase by-product output
GKN by-product plant, Cwmbran	10650g	Near destroyed	Expanded to increase by-product output. Subject to early government control
Llwynpia colliery coke ovens	07557m	Near destroyed	Expanded to increase by-product output
Bargoed coke and benzol plant, Bargoed	07553m	Near destroyed	Expanded to increase by-product output

**Newport Gas Works, Newport**

Site name	Newport Gas Works, Newport
NGR	ST 31001 88538
PRN(s)/NPRN(s)	10351g
Site type and description	Newport Gas works were a well-established facility by the time of the First World War and were first depicted on the First edition OS map of 1883. Little had appeared to change in the layout by the time of the war and there is little discernible change between 1883 and the publication of the Third edition OS map in 1920. The facility consisted of two circular gas holding tanks and a number of ancillary buildings. However, plant was installed during the war to produce toluene as a by-product at the gas plant. The toluene was a vital ingredient in manufacture of the explosive TNT (trinitrotoluene). The Newport plant additionally produced large quantities of benzol, carbolic acid, benzene, ammonia, sulphur, and naphtha (Davis 1998) although none of the installed plant is visible either on cartographic sources or inter-war aerial photographs. It is probable that such plant as was installed could be relatively easily be accommodated within the existing ground plan or else was of a quite temporary nature and therefore removed at the end of the war. It is equally probable that the majority of gas works in the country were modified in order to harness any chemicals that might otherwise have gone to waste.
Community	Newport
County	Newport
References	Davis, H. 1998, History of the Borough of Newport Third edition OS map of 1920
Map details	ST38NW
Significance rating	Local
Any current management	The majority of the site is currently used as a Royal Mail parcel depot housed in modern buildings. It is probable that significant remains will be found beneath the ground.



*Figure 31. Newport Gas Works as depicted on the Third edition OS map of 1920*

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**Ebbw Vale coke and benzol plant, Victoria Works, Ebbw Vale**

NGR	SO 17076 07563
PRN(s)/NPRN(s)	10740g
Site type and description	<p>A reference contained in a "Wales: its part in the war" (Nicholson 1919) indicates that a coke and benzol by product oven in Ebbw Vale was modified to increase output of by-product chemicals for explosives manufacture. This plant was almost certainly part of the Ebbw Vale Iron and Steel Company premises and is likely to be the Koppers Coke Oven and by-product plant depicted on the Third Edition O.S. map as part of the Victoria works which was planned for before the war but it is clear from the contemporary source that the war was the stimulus for the work. It began operations in the spring of 1915 and was believed to be the most advanced of its type in Europe at the time. The plant has been destroyed.</p> <p>A battery of coke ovens capable of extracting benzol and toluol as part of the coking process. This battery was one of a number built during the war in order to create by-products that could have been used in the manufacture of explosives. It consisted of a rectangular battery built to the west of the Victoria works blast furnaces and connected to it by rail tracks. The by-product oven was described in a contemporary book as one of the most efficient in Wales (Nicholson 1919). Coke was also supplied extensively to France and other Allies.</p>
Community	Ebbw Vale
County	Blaenau Gwent
References	<p>Nicholson and Lloyd Williams, R 1919, <i>Wales: its part in the war</i> Hodder and Stoughton, London</p> <p>Third edition OS map 1921</p> <p>Coke Oven Managers Association</p>
Map details	SO10SE
Significance rating	Local
Any current management	The site of the coke works is now covered by a public highway and a light industrial building. There is a possibility however that buried remains survive in the vicinity.

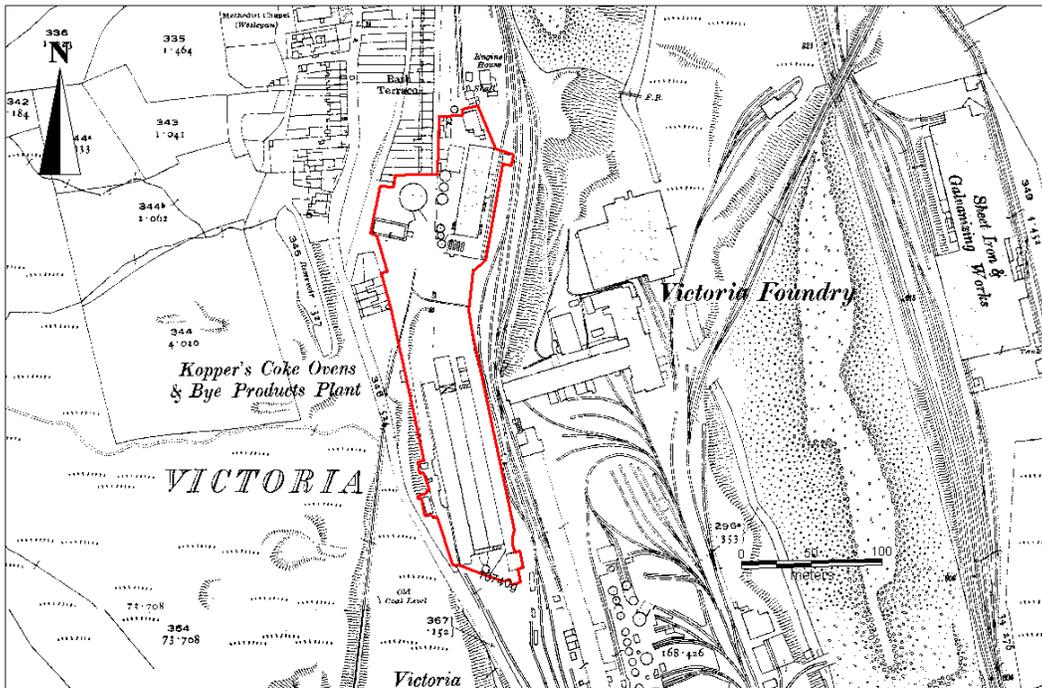


Figure 32. The by-product coke ovens at the Victoria foundry, Ebbw Vale (10740g) as depicted on the Third edition OS map of 1921.

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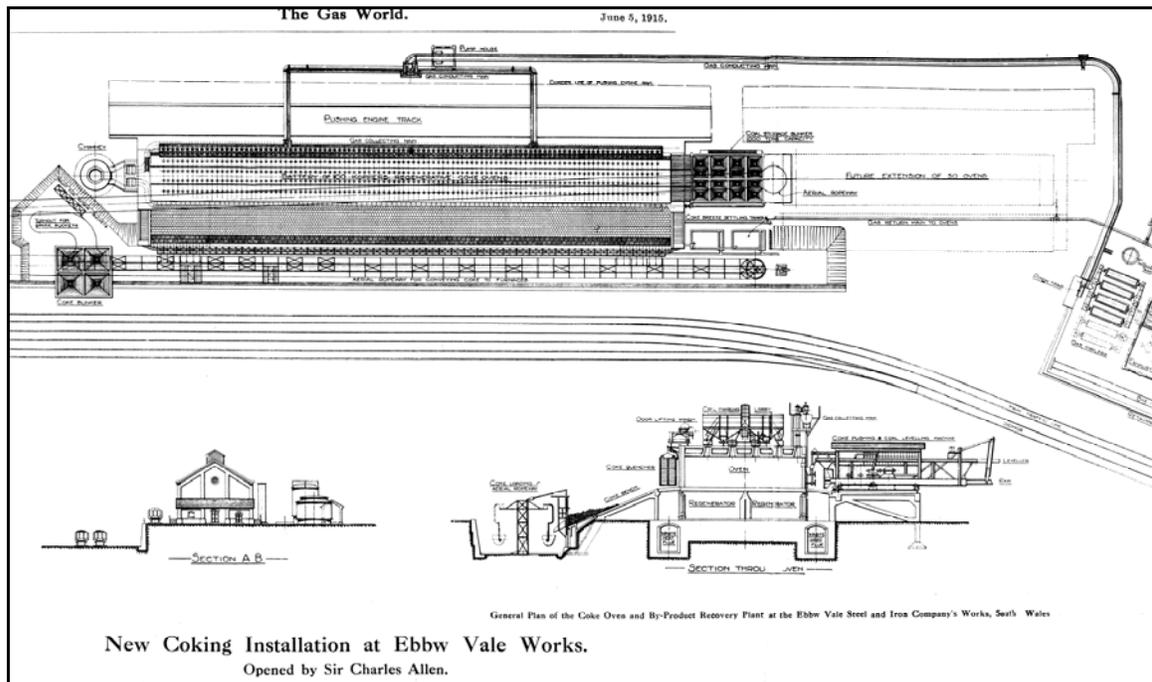


Figure 33. Plan of the southern part of the Ebbw Vale coke ovens (10740g) from a 1915 publication (*Gas World Coke Section*)



**Coedely by-product coke oven**

Site name	Coedely by product coke oven, Coedely
NGR	ST 01592 85914
PRN(s)/NPRN(s)	07579m
Site type and description	A reference is contained in "Wales: its part in the war" (Nicholson 1919) to a coke and benzol by product oven in Coedely. This plant is almost certainly the same one depicted first on the Third edition O.S. map of 1920 and consisted of a long rectangular range of ovens together with ancillary buildings, connected to the Ely Valley branch of the Great Western Railway. Coedely colliery was sunk in 1901 with the first coal being produced in 1906. The first coke ovens were probably constructed at this time and it is difficult to isolate any phasing from the cartographic sources. However, examination of employment figures (Welsh Coal Mines) reveals that between 1908 and 1918, the workforce increased from 231 to 1,450, suggesting a significant increase in activity during the war years. The coke oven and by-product plant appears to have contributed to the war effort and may have been improved in order to boost efficiency. Although the plans and photographs show an essentially pre-war facility, this is exactly the appearance of the plant during the First World War. Nothing remains of the plant or the adjacent colliery, and the area is now waste ground.
Community	Coedely
County	Rhondda Cynnon Taff
References	Nicholson, I, 1919, Wales: its part in the War Welsh Coal Mines [Online] <a href="http://www.welshcoalmines.co.uk/GlamEast/Coedely.htm">http://www.welshcoalmines.co.uk/GlamEast/Coedely.htm</a> Third edition OS map of 1921 "Coppee Coke Oven Plant at Coed Ely" – Gas World Coke Section 2 Jan 1915 pp 15-22
Map details	ST08SW
Significance rating	Local
Any current management	The site has been destroyed and is currently levelled waste ground. There is the possibility that substantial buried remains survive in the vicinity.

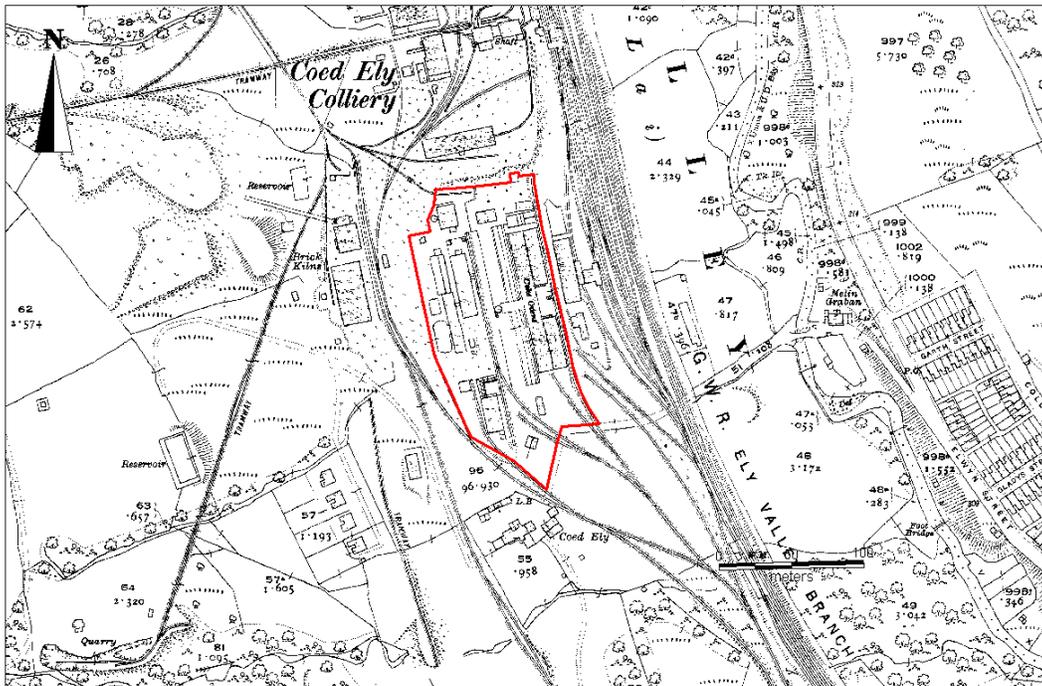


Figure 35. Coedely coke ovens as depicted on the Third edition OS map of 1921. Nothing visible remains of the site.

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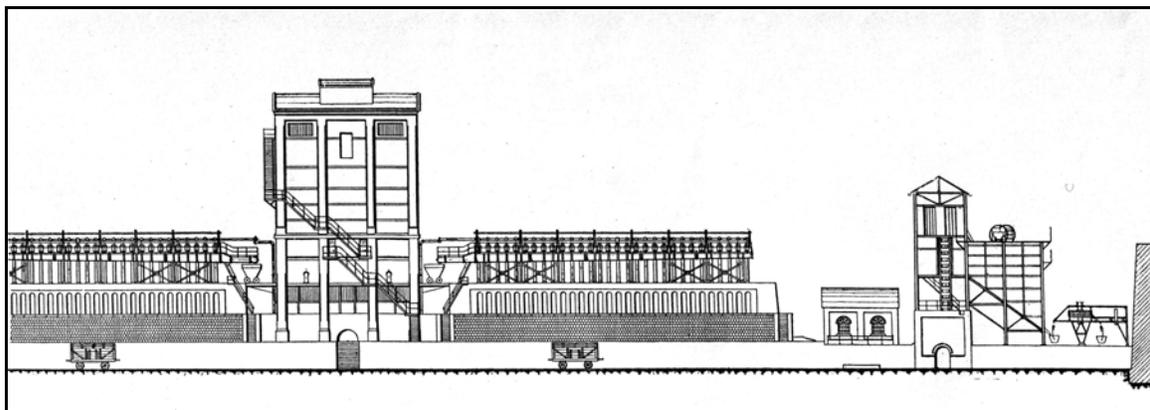
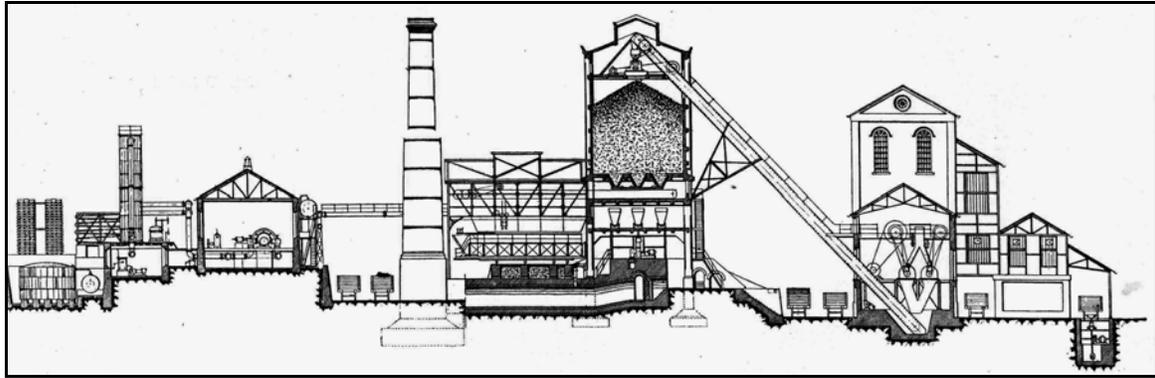
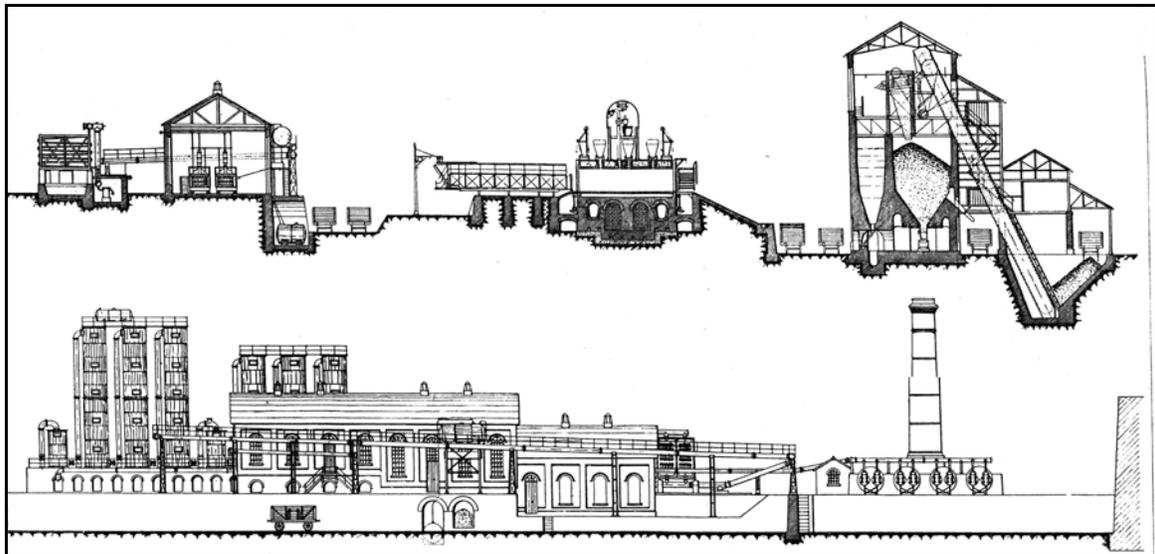


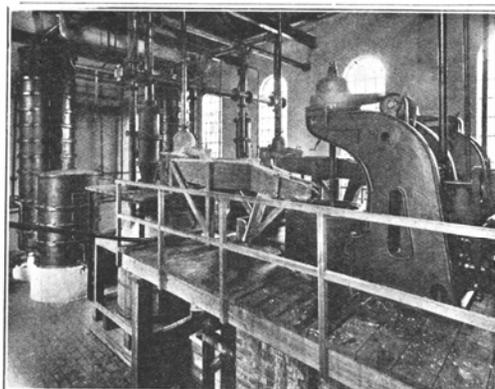
Figure 36. Contemporary elevation drawing of the Coedely by-product plant (Gas World Coking Section 1915) showing the coke ovens (left) and coal washery and crusher (right)



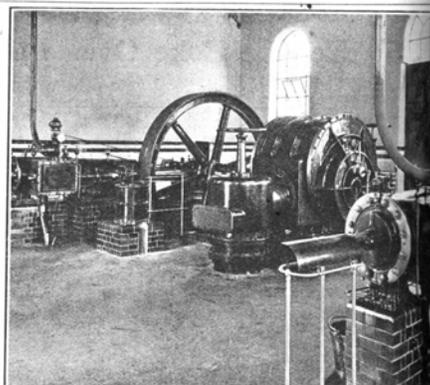
*Figure 37. Contemporary sectional drawing of the Coedely coke oven and by-product plant showing the coal crusher and washery (right), coke oven and ram (centre) and by-product plant (left) (Gas World Coking Section 1915)*



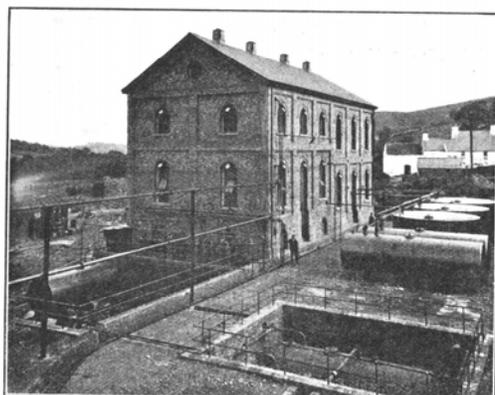
*Figure 38. Contemporary sectional and elevation plans of Coedely coke ovens and by-product plant showing coal washery, coke oven and benzol factory (right to left, top drawing) and the gas scrubber units and boiler (left to right, lower drawing) (Gas World Coking Section) 1915)*



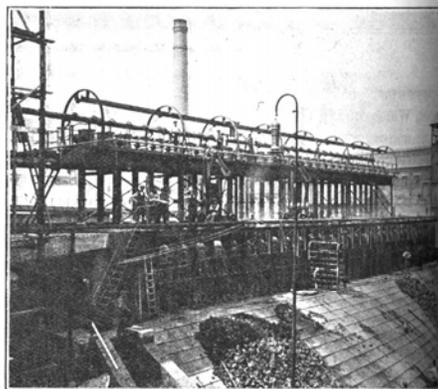
Sulphate Factory.



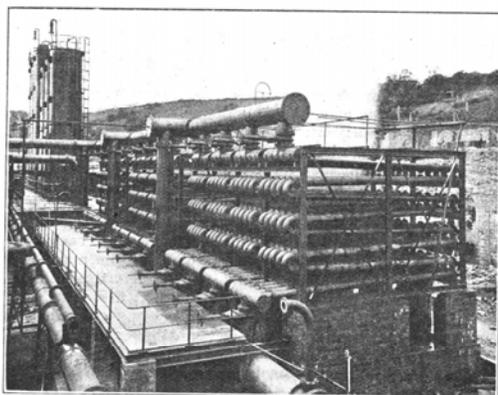
Exhauster House.



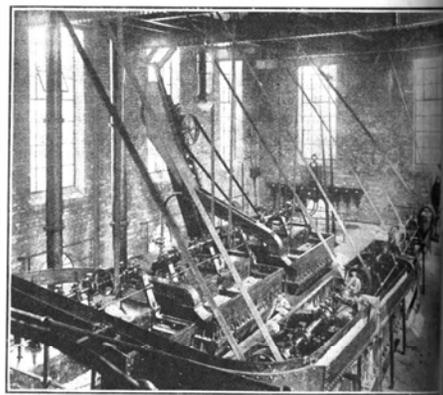
Benzol Factory.



View of One Battery of Ovens.



Gas Coolers with Scrubbers in the Distance.



Interior of Washery.

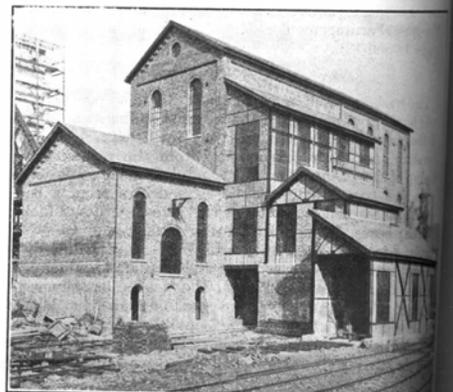
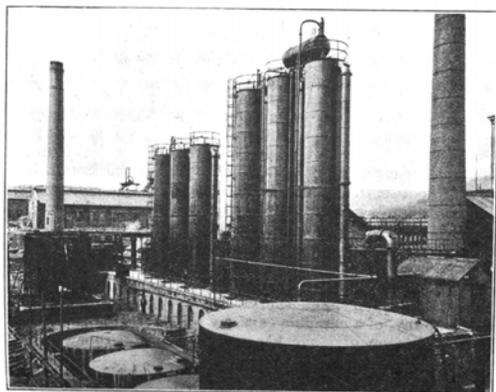
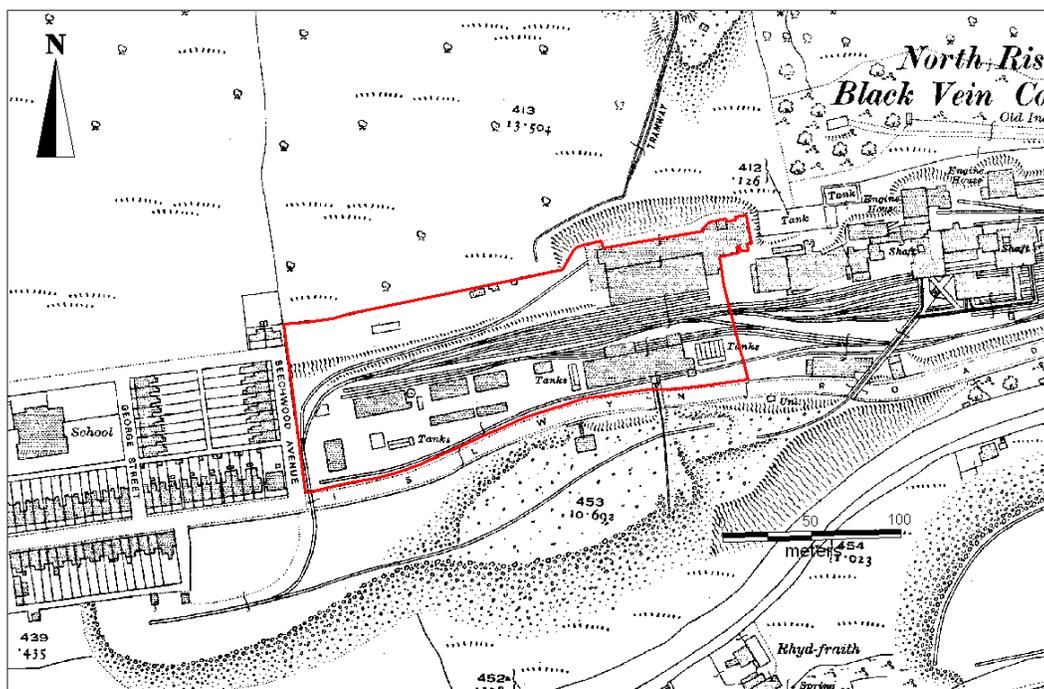


Plate 30. Contemporary photographs of the Coedely by-product plant (Gas World Coking Section)

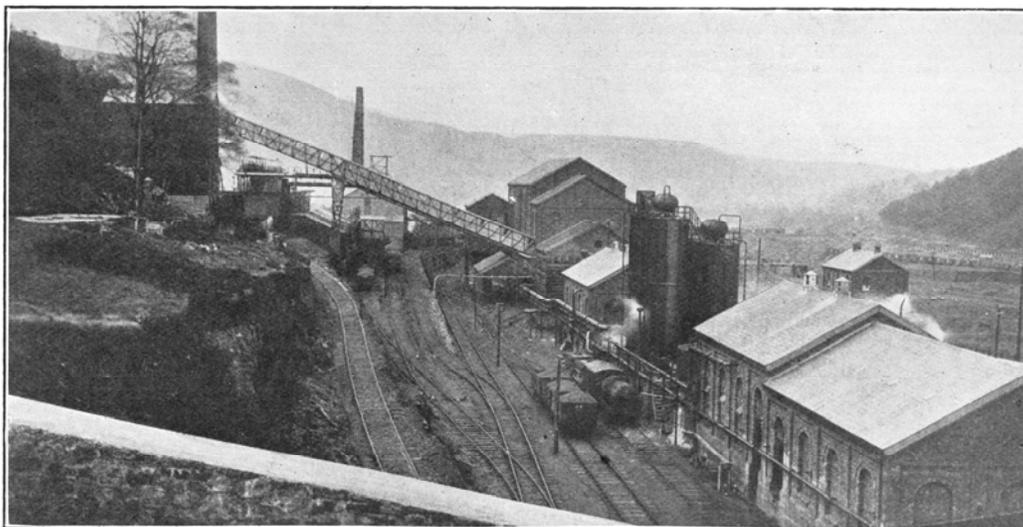
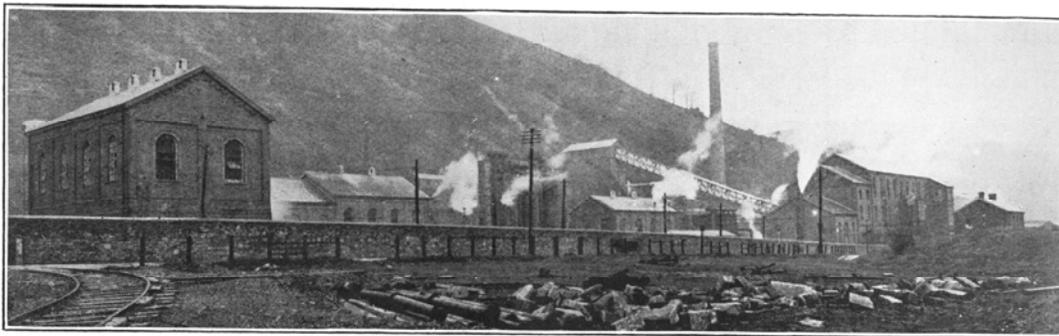
**Risca coke and benzol works, Risca**

Site name	Risca coke and benzol works, Risca
NGR	ST21169154
PRN(s)/NPRN(s)	07580m
Site type and description	A reference is contained in "Wales: its part in the war" (Nicholson 1919) to a particularly efficient coke and benzol by product oven in Risca. There are contemporary records of a crude benzol plant being constructed at the Black Vein Colliery in 1913 (London Times) although it appears that the plant did not become operational until the autumn of 1916 (Jackson pers. comm.). The plant has been identified as the one located at the North Blackvein Colliery, Risca and is first depicted on the Third edition OS map of 1920 and operated by the United National Collieries Ltd. The plant consists of a number of separate buildings and storage tanks although it is not labelled as a coke works on the map. A detailed description with accompanying drawings and photographs of the coke works and by-product plant at this site is contained in an issue of the Gas World Coke Section publication of 1915. This information has allowed the identification of particular structures on the OS mapping including the crude benzol plant, storage tanks, gas scrubbers, coal washery, crusher and coke ovens. There is an apparent divergence of the plan as submitted in the article in the Coke Oven Managers Association publication with the actual layout seen in the photographs and OS mapping, in that the western extension of the coke ovens appears never to have been built.
Community	Risca
County	Caerphilly
References	Nicholson, I, 1919, Wales: its part in the War Third edition OS map of 1921 The London Times, Monday December 1 <sup>st</sup> 1913 [Online] <a href="http://www.newspapers.com/newspage/33250048/">http://www.newspapers.com/newspage/33250048/</a>
Map details	ST29SW
Significance rating	Local
Any current management	The site of the by-product plant has been destroyed and is now occupied by a steel re-cycling centre and other light industrial buildings. It is probable that buried remains survive in the vicinity.



*Figure 39. Risca by-product oven (07580m) at the North Risca Black Vein Colliery as depicted on the Third edition OS map of 1920. The crude benzol plant is the rectangular building at the bottom left of the red outlined area.*

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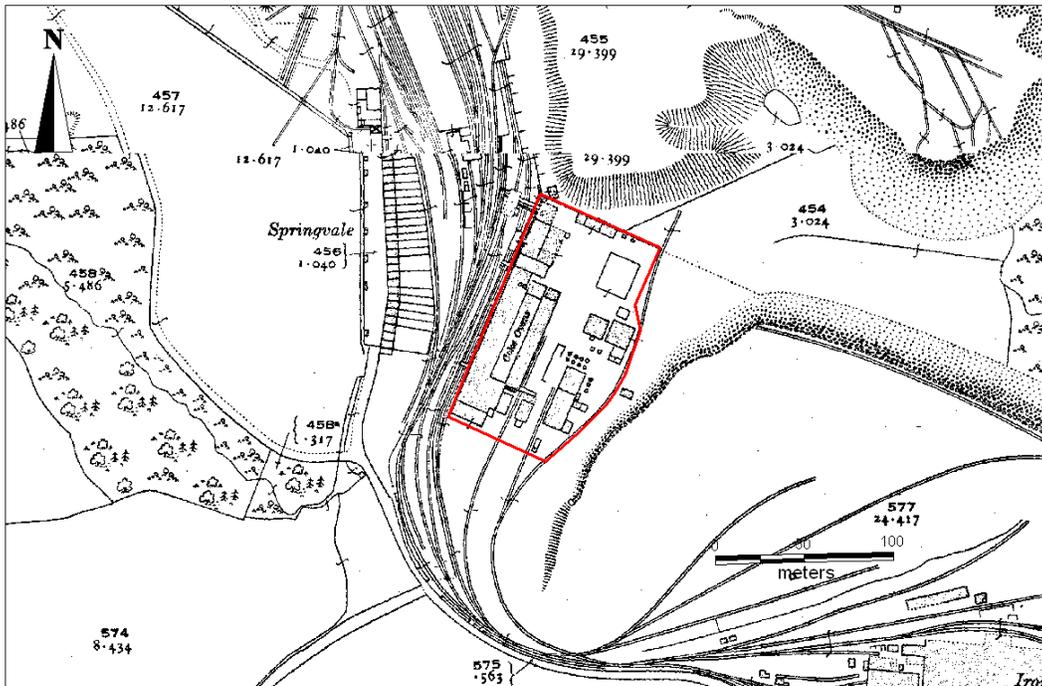


Two General Views of Coppée By-Product Coking Plant at Risca, Mon.

*Plate 31. Contemporary view of the Risca by-product facility in operation during the First World War. (Gas World Coke Section). The building closest the camera in the upper photograph is the crude benzol plant whilst the upright tanks are the gas scrubber units. The wall at the bottom of the photograph still exists.*

**GKN by-product plant, Cwmbran**

Site name	GKN by-product plant, Cwmbran Colliery
NGR	ST 28160 95842
PRN(s)/NPRN(s)	10650g
Site type and description	This site was the location of a basic benzol plant to utilise extracts from coking at Guest, Keen and Nettlefold's (GKN) Cwmbran plant. The first enquiries regarding government use of the facility were made in February 1915 with the government offering to pay for the plant and subsequently offering to purchase the entire output as benzol was a key component in the manufacture of high explosives. The plant was built close to the Cwmbran Colliery, owned by GKN: the Third Edition OS map shows a coke works and associated structures located north west of the GKN Iron Foundry and immediately south of Cwmbran Colliery. The coke ovens consist of a rectangular complex of structures, with ancillary buildings, including upright circular structures, located to the east. An aerial photograph dating to 1930 (RCAHMW image WPW032472) suggests that these circular structures may be gas scrubber units rather than chimneys although the photograph is of insufficient quality to be absolutely sure. This supports the hypothesis that the coke works adjacent to the colliery is the one taken under government control during the First World War.
Community	Cwmbran
County	Torfaen
References	Jones, E, 1987, <i>A History of GKN: Innovation and Enterprise 1759-1918</i> , London, Macmillan OS Third edition 1921
Map details	ST29SW
Significance rating	Local
Any current management	The site is currently occupied by a recycling facility but there is a possibility of the survival of buried remains in the vicinity.



*Figure 40. GKN's government sponsored Cwmbran coke works (10650g) as depicted on the Third edition OS map of 1920. Note the series of circular structures south east of the main coke oven; these are probably gas scrubber units used to extract compounds from waste coking gasses.*

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**Llwynpia Colliery coke ovens, Llwynpia**

Site name	Llwynpia Colliery coke ovens and by-product plant, Llwynpia
NGR	SS99369314
PRN(s)/NPRN(s)	07557m
Site type and description	Llwynpia colliery had 50 Koppers ovens already in existence at the outbreak of the First World War but a crude benzol plant was constructed at the request of the government (Cardiff Development Company 1920). The Second Edition OS map of 1901 shows that Llwynpia colliery had a long double battery of coke ovens which appear to have been replaced by the time of the Third Edition of 1921 by a single battery set of ovens together with ancillary buildings and storage tanks. This is possibly the benzol plant constructed at government request. However, the sole surviving part of the colliery, an engine house (PRN 01457m) appears on the Third Edition at the same time and this is known to date to 1905. The later history of the site suggests that the coke works were demolished to make way for two round storage tanks, the bases of which can still be seen. The site of the former ovens now contains an electricity sub-station and modern light industrial buildings.
Community	Llwynpia
County	Rhondda Cynon Taff
References	Cardiff Development Company Yearbook 1920 Second edition OS map of 1900 Third edition OS map of 1920
Map details	SS99SW
Significance rating	Local
Any current management	The site of the former coke ovens is currently derelict ground and much overgrown. There is a strong possibility of the survival of buried remains in the vicinity.

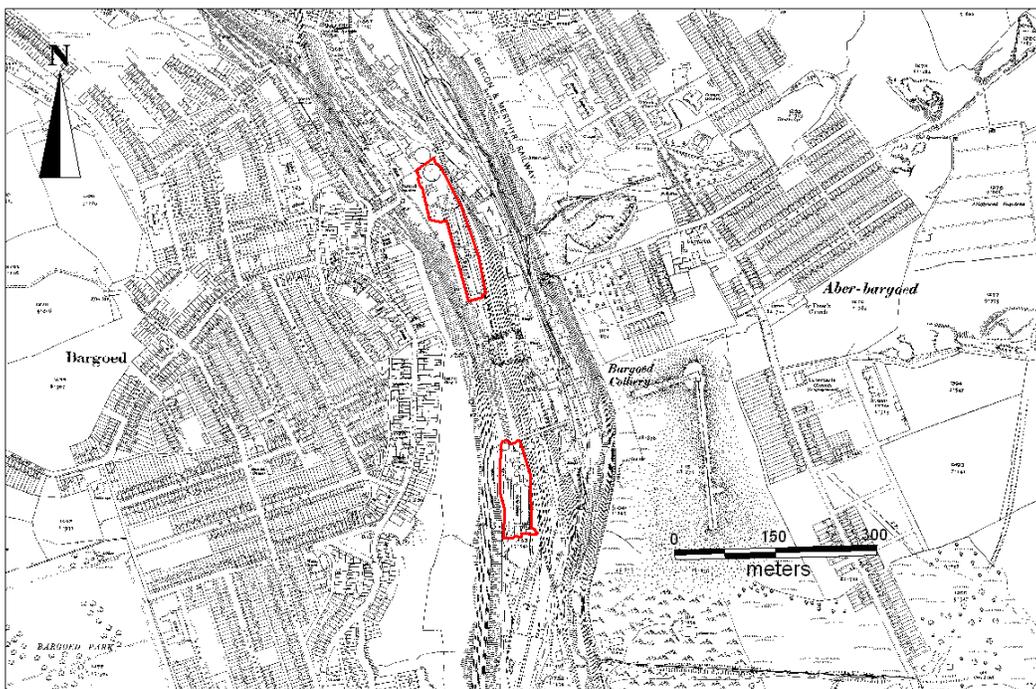


**Bargoed Coke and Benzol Works, Bargoed Colliery, Bargoed**

Site name	Bargoed Coke and Benzol Works, Bargoed, Glamorgan
NGR	ST 15154 99680
PRN(s)/NPRN(s)	07553m
Site type and description	<p>Bargoed colliery contained a number of coke ovens and by-product plants, as depicted on the Third edition OS map of 1920. At least one of these plants was specifically constructed during the First World War (Nicholson 1919) in order to produce by-product chemicals for use in explosives manufacture although it is difficult to identify which of the potentially two batteries of coke ovens this is. The site has been destroyed and is now open waste ground. Both sets of coke ovens include a by-product plant located to the north of the battery, a somewhat unusual arrangement as most by-product plants were built parallel to the ovens. Whilst function is difficult to identify from the OS mapping, an aerial photograph dating to 1930 suggests that both by-product plants were equipped with gas scrubbers, and storage tanks, with the northernmost plant possibly being equipped with gas coolers. The Glamorgan Archive contains extensive correspondence between the Bargoed coke works laboratory and the Ministry of Munitions (DPD/2/7/3-7). This archive includes details of plant construction, production and transport of chemicals and details of the day to day running of the facility. It demonstrates the absolute level of control imposed upon such works by the Ministry of Munitions in trying to meet the national requirements for chemicals for high explosives and other uses.</p> <p>A description of the adjacent Bargoed colliery from 1911 (Welsh Coal Mines) states that the coke works consisted of 100 Koppers bye-product ovens.</p> <p>There are a series of coke ovens depicted on the Third edition OS mapping labelled as Coke Ovens and unfortunately it is not possible at present to distinguish the original 100 Koppers ovens from those known to have been built during the war.</p>
Community	Bargoed
County	Glamorgan
References	<p>Glamorgan Archives DPD/2/7/3-7</p> <p>Nicholson, I, 1919, Wales: its part in the War</p> <p>Third edition OS map of 1920</p>
Map details	ST19NW
Significance rating	Local

Any current management

The ground is currently cleared and used as a recreational park. There is a strong possibility that buried remains associated with the former ovens and by-product plant survives.



*Figure 42. Location of Bargoed coke ovens and by-product plants.*

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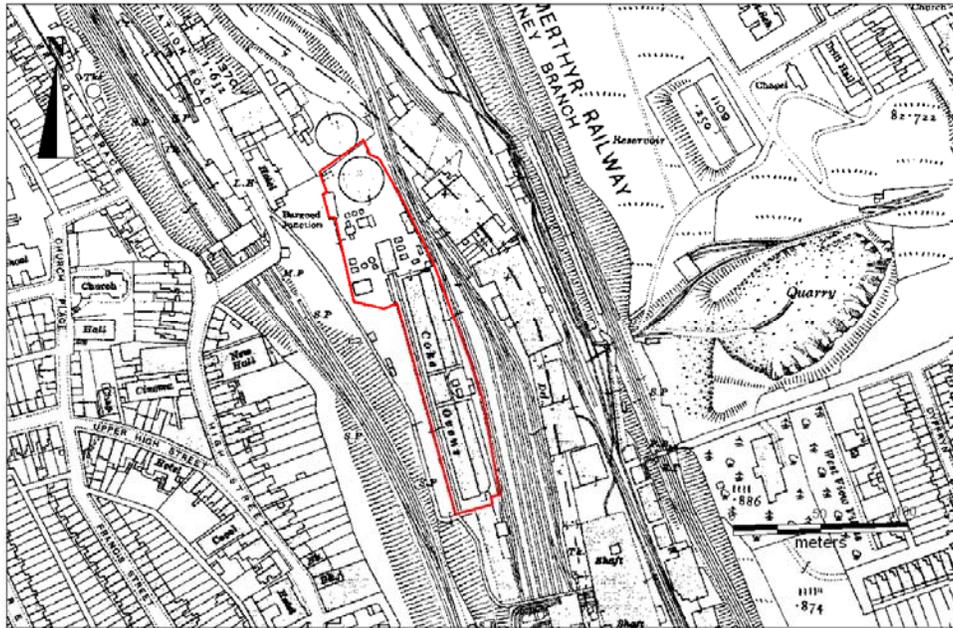


Figure 43. Bargoed colliery coke ovens and by-product plant north range

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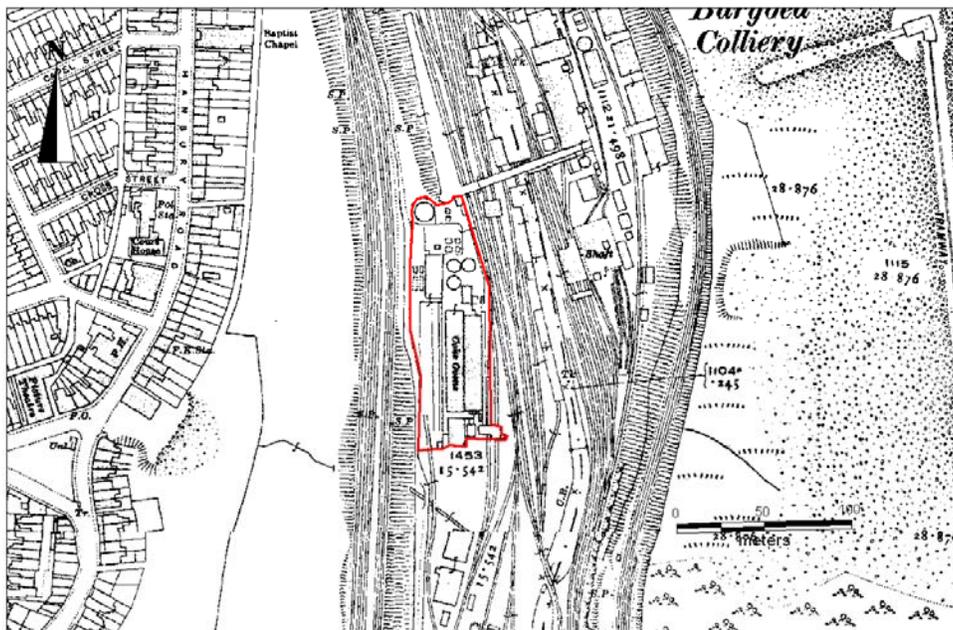


Figure 44. Bargoed colliery coke ovens and by-product plant south range

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## 4.8 Shipping and ship repair

The South Wales ports had traditionally possessed a strong ship repair industry and this assumed an even greater degree of significance with the shift of much of the merchant fleet to the west of the United Kingdom during the First World War. Not only were ships repaired but they were re-fitted with armament and anti-mine equipment to make them suitable for wartime work. However, the secrecy imposed by wartime conditions and the virtual disappearance of the industry means that very little information has been located concerning the First World War.

The following table contains sites for which information has been located.

**Table 7.** Table of sites of ship building identified during the study

Site name	PRN	Condition	Purpose
National Shipyard No.1, Chepstow	10884g	Near intact	Mass assembly of mercantile shipping
Machine shop at National shipyard No.1	10698g	Near intact	Used in mass assembly of mercantile shipping
Slipways at National Shipyard No.1, Chepstow	10692g	Near intact	Used in mass assembly of mercantile shipping
Bulwark Camp, Chepstow	10691g	Near destroyed	Used to house military workers at National Shipyard No.1.
Hardwick Village Chepstow	10620g	Near intact	Dedicated workers housing for National Shipyard No1.
Bulwark Village, Chepstow	10621g	Near intact	Dedicated workers housing for National Shipyard No1.
Dowlais Wharf, Roath Dock, Cardiff	05059s	Near intact	Wharf used by GKN under government control
CH Walker, shipyard, Sudbrook	08935g	Damaged	Producer of minor mercantile vessels
Tredegar Dry Dock and Wharf	NPRN408353	Damaged	Dry dock used for ship repair and munitions work

### **National Shipyard No.1, Chepstow (10884g)**

Millions of tons of merchant shipping were sunk during the course of the First World War, particularly after the introduction of unrestricted submarine warfare by the Germans in 1917. So concerned were the British by these losses that in 1917 they decided to begin a process of mass-producing merchant shipping. The Deputy Controller of Auxiliary Shipping conceived of a plan to use German prisoners of war as unskilled labour in the project but they would have been unable to work alongside ordinary British workers at a conventional shipyard. It therefore became necessary to develop a number of government-owned shipyards for the project.

The Bristol Channel area was selected as the location as it was close to suitable steel works, with three National Shipyards planned for construction on the banks of the Severn, at Chepstow, Beachley and Portbury. The three yards would have 38 slipways and were intended to be able to produce 78 ships per year, each of 10,500 tdw (tdw = Deadweight tonnage i.e. the total capacity in weight of the cargo vessel). The Chepstow yard, known as National Shipyard No.1, was established south of the Edward Finch & Co. (1916) Ltd. shipyard, which was a wartime consortium that was already manufacturing vessels on a small scale, and which was eventually commandeered by the National Yard under the provisions of the Defence of the Realm Act. The new National shipyard was subject to a massive expansion costing £2,500,000 (a sum equivalent to £150 million today).

By April 1918, two slipways had been completed, with six more under construction but there was much criticism of the shipyards even at the time. Questions were asked in Parliament about the slow progress of output: the first keel was laid on an incomplete slipway in October 1918, perhaps as a direct response to political pressure. The war ended on 11<sup>th</sup> November without a single vessel having been launched from any of the National Shipyards. During the period of government control from August 1917 to November 1918, there had been six separate Commanding Officers and contemporary reports stated that the project was plagued by “all the evils of military plus civilian control, which means controllers all round and no responsible officials, reigned supreme” (Mitchell and Sawyer 1968). The management of the shipyards was further complicated by the unnatural amalgam of military, civilian and prisoner of war workforces.

Men from Tyneside and the Clyde came to work at the yard, being accommodated in specifically constructed 'Garden Cities' in Hardwick, Bulwark and Pennsylvania in Sedbury. These garden cities still survive in a largely intact street plan.

The large military encampment near Bulwark has been destroyed and replaced by an industrial estate but it survives in the name of one of the original approach roads: Camp Road. The concrete blocks used to construct the houses were produced by possibly up to 2000 German prisoners of war held at a prison camp at Beachley on the other side of the Wye. Other buildings were constructed for the yards including workshops, a power station and hospital (Mount Pleasant Hospital).

In 1925 Fairfield Shipbuilding and Engineering Ltd controversially bought the shipyard for a mere £600,000 (equivalent to £30 million) and later largely dismantled it, although it is clear that substantial portions of the site remain. The six large slipways are certainly First World War in origin, the original construction being recorded by the authorities, the photographs and film being held by both Chepstow Museum and the Imperial War Museum. National Shipyard No. 1 was the only one that actually produced vessels, launching a total of 22 significant ships between 1917 and 1925, amongst them six, 6500 ton 'N' Type merchant vessels, though none of the prefabricated designs intended for mass production was launched before the end of the war. Neither of the other two National Shipyards launched a single vessel within the same timeframe, despite similar levels of investment (Firth 2012). The site is currently occupied by Fan engineering firm specialising in the construction of modular bridges.

The National shipyard site has been earmarked for development as housing, a development plan that will involve the demolition of all current industrial buildings, including the only remaining First World War era building on the site, a former machine shop. This building is still in use and whilst some minor modification has taken place, it remains substantially intact as a rare example of a wartime building. The slipways have been re-surfaced but their original retaining walls survive. A number of features original to the slipways, such as timber and iron revetting and a number of square concrete bases for the positioning of cranes still survive. A length of iron rail track, originally running parallel to the machine shop and serving the slipways, survives incorporated into the current ground surface.

### **Machine Shop, National Shipyard No. 1, Chepstow**

Site name                      Machine shop

NGR                                ST 53737 93514

PRN(s)/NPRN(s)    10698g

Site type and                      Machine shop  
description

HER description

This building was originally constructed as a machine shop for the shipyard and measures 130m by 20m in plan and is oriented north east/south west; it is located just north of the contemporary slipways constructed in 1917. The building is rectangular in form and was constructed from concrete blocks that are likely to have been cast on site. The shed originally contained 14 entrances, each 3m wide, along the length of the south east elevation, and a similar number along the north west elevation. The doors, each consisting of two sliding panels, were suspended by rollers from an iron runner, the whole mechanism being protected from the weather by a riveted iron awning. Whilst a number of these doorways have been blocked up, a number of door mechanisms and awnings are intact, likewise the doors on the north west and may all potentially be original. There are no doorways or windows in either gable end. The roof of the south west end of the building was originally constructed slightly higher than the remaining length of shed. The stepped nature of the original roof can be traced in the unusual shape of the gable ends, whose appearance has been exaggerated by the reduction in the height of the modern roof. The reason for the height difference is unclear. The guttering and associated down-pipes are not original but are in their original locations, as seen on contemporary photographs. The internal iron framing supporting the roof is likely to be original. A concrete base at the north east corner of the building that contains the remains of iron pipes is likely to be the foundation of an ablutions block or similar that can be seen on contemporary photographs.

Community                      Chepstow

County                              Monmouthshire

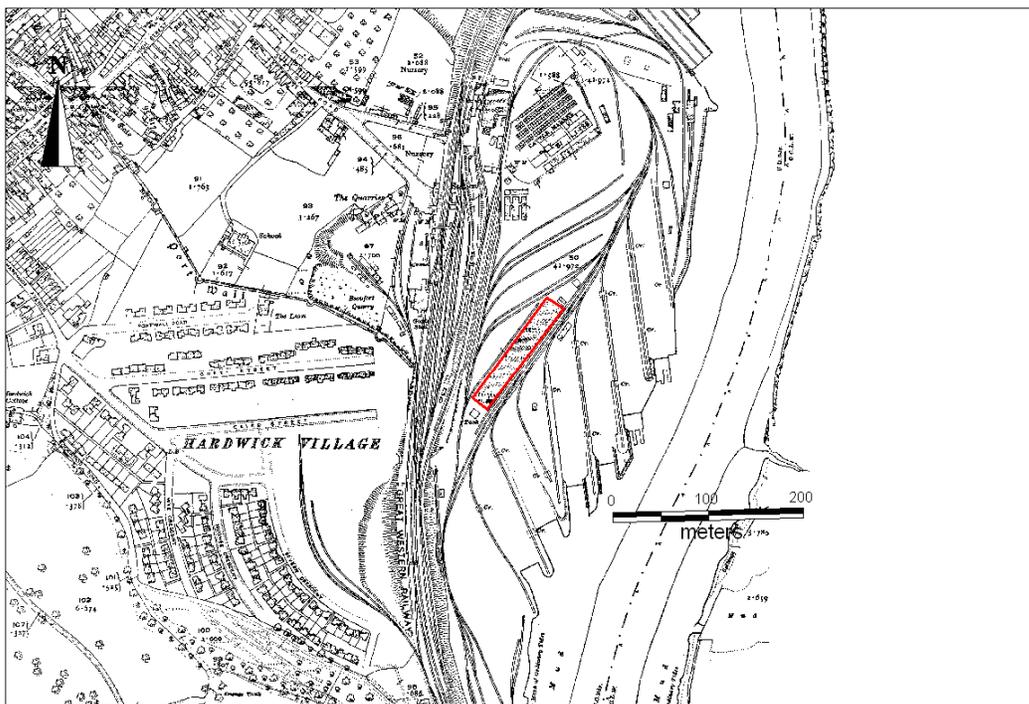
References	<p>Crawford, J. 2014 First World War Scoping Project Report No. 2014/25 (Unpublished GGAT Report)</p> <p>Firth, N. 2012 Chepstow Ships of World War 1 in Burton, A., M. (Ed.) <i>The Monmouthshire Antiquary Proceedings of the Monmouthshire Antiquarian Society</i>, 4word, Bristol.</p> <p>Booth, G. 2014, Pers. Comm.</p> <p>Field, C. 2014, Pers. Comm.</p> <p>Firth, N. 2014, Pers. Comm.</p> <p>Leitch, A. 2014, Pers. Comm.</p>
Map details	ST 59 SW
Significance rating	National
Any current management schemes	Currently used by an engineering firm. The building is due to be recorded and subsequently demolished as part of a housing development.



*Plate 32: South West Gable end of the machine shop (10698g) looking north (GGAT/Cadw)*

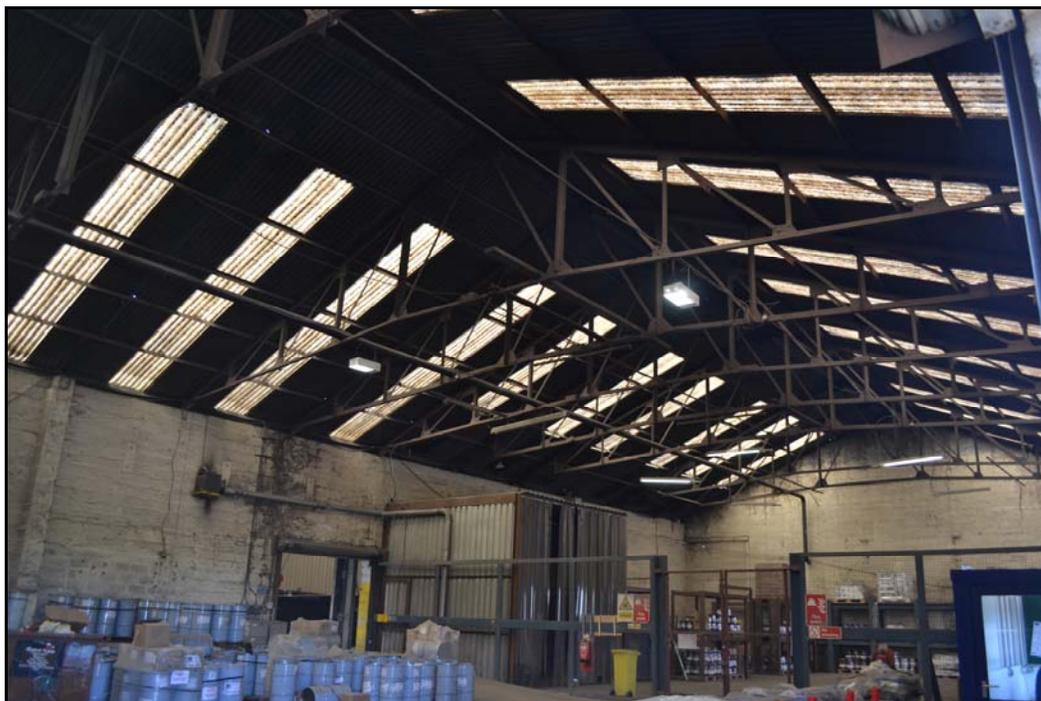


*Plate 33: View of the shipyard in 1919 showing the machine shop 10698g and slipways (10692g) with vessels under construction (Claire Fields Collection)*



*Figure 45: Location of the machine shop 10698g*

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*Plate 34. Interior of the former machine shop at National Shipyard No.1(GGAT/Cadw)*

**Slipways at National Shipyard No.1**

Site name	Slipways at National Shipyard No.1
NGR	SS5648390809
PRN(s)/NPRN(s)	10692g
Site type and description	<p>Six large concrete slipways for launching mass produced merchant ships at National Shipyard No.1 in Chepstow (GWSC01). They were constructed in August 1917 by Royal Engineers and German prisoners of war held at Beachley and possibly the military camp at Bulwark, Chepstow. Each slipway is approximately 150m long by 16m wide. The remains of five of the slipways are visible from aerial photography. Each of the slipways is flanked to the west by a retaining wall constructed of cast concrete blocks of uniform dimension (0.82mx 0.23m, depth unknown). These retaining walls survive in places to a height of 2m and perhaps higher in areas difficult to reach due to undergrowth. These walls not only serve as storage and access areas for the slipways: they facilitate a gradual drop in the level of each slipway towards the north east of the site. A number of square concrete blocks survive at the top of the slipways that would at one time have supported the legs of the large cranes in the yard; a number of these blocks can be seen in contemporary photographs. Iron ring fittings and features survive on at least one slip, including an apparent keel marker to indicate the centre of the slip. It is not known however if these features date to the First World War or to a subsequent era. The slipways were used for the construction of beach landing craft and sections of Mulberry Harbour during the Second World War and it is thought that the earlier slipways were capped by the current concrete slabs at this time. A large amount of silt has built up at the river end of the slipways. However, large sections of concrete block walling and timber an iron revetting can be seen in the exposed ends of the slips and these are likely to be original features.</p>
Community	Chepstow
County	Monmouthshire
References	<p>Crawford, J. 2014 First World War Scoping Project Report No. 2014/25 (Unpublished GGAT Report)</p> <p>Firth N, 2012 Chepstow Ships of World War 1 in Burton, A., M. (Ed.) The Monmouthshire Antiquary Proceedings of the Monmouthshire Antiquarian Society, 4word, Bristol.</p> <p>Booth, G. 2014, Pers. Comm.</p> <p>Field, C. 2014, Pers. Comm.</p> <p>Firth, N. 2014, Pers. Comm.</p> <p>Leitch, A. 2014, Pers. Comm.</p>
Map details	ST 59 SW
Significance	National.

rating

Any current  
management

The site is scheduled for re-development with potential significant risk to the integrity of the slipways.



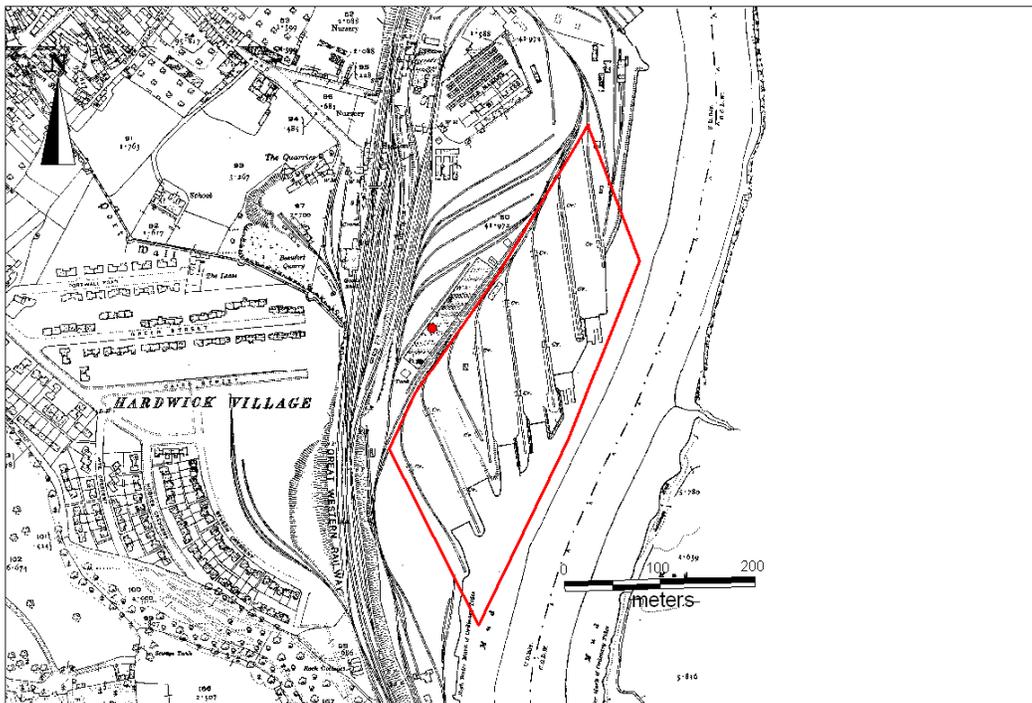
*Plate 3: Aerial view of the shipyard in August 1920 showing the slipways and machine shop, view to north (Claire Fields Collection)*



*Plate 4: Concrete and timber slipway features partially buried by silting (GGAT/Cadw)*



*Plate 35. Section of dividing wall between slipways showing constructional fittings (GGAT/Cadw)*



*Figure 46 Location of slipways (10692g) and machine shop (10698g, red dot)*

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*Plate 36. Concrete keel support on the banks of the river close to the slipways. Identical keel supports can be seen in a First World War photograph held by Chepstow Museum (GGAT/Cadw)*



*Plate 37. Concrete crane bases at the former National Shipyard No. 1, Chepstow, with 1m scale rods (GGAT/Cadw)*



*Plate 38. Keel marker on a slipway, one of a number of surviving fixtures and fittings at the National Shipyard (GGAT/Cadw)*

**Bulwark Camp, Chepstow**

Site name            Bulwark Camp, Chepstow  
 NGR                 ST 53561 92816  
 PRN(s)/NPRN(s)   10691g

Site type and description            Bulwark Camp was a military encampment constructed to house the military workforce employed in the construction and operation of the National Shipyard in Chepstow (10884g). The camp is first depicted on the Third Edition OS map of 1921 having been constructed on the site of Fairfield Farm, immediately west of the Bulwark hill fort. The camp follows an essentially square plan, with a large number (at least 45 separate structures, 38 of which appear to be interconnected accommodation blocks, each of which measures almost 40m in length) located in the eastern half. A further 23 structures which are generally larger, are located in the western half of the camp. These are likely to include offices, kitchens, entertainment facilities etc. According to Chepstow Museum, some 6000 Royal Engineers were employed in the construction of the National Shipyard, a number that would have required significant infrastructure. It is likely that this encampment was therefore occupied by the Royal Engineers during this phase. Unusually, the museum of the Royal Engineers does not contain any material concerning the presence of military units at Chepstow (Adams, pers. Com. 2013). None of the original camp structures appear to have survived, and the site is now occupied by a light industrial park. It is possible however that sub surface structures such as foundations etc. can still be found beneath the ground.

Community            Chepstow

County                Monmouthshire

References            OS Third edition map 1921  
                              Adams, A, Royal Engineers Museum, Chatham  
                              Rainsbury, A, 1989, *Chepstow and the River Wye*, Budding, Stroud.

Map details            ST59SW

Significance rating    Regional

Any current management            The site of the camp is occupied by a light industrial park.

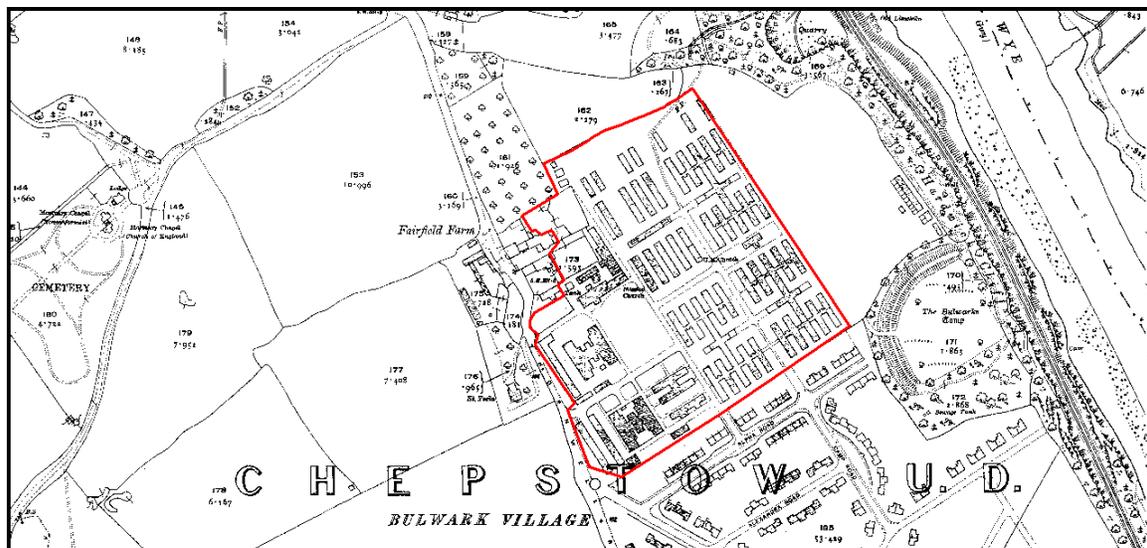


Figure 47. Bulwark military camp (10691g) as depicted on the Third edition OS map of 1921. Nothing of the camp remains although the modern industrial estate which now occupies the site retains much of the road layout.

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*Plate 39.* Former entrance into Bulwark military camp (10691g), view to the north west from the junction of Camp Road and Alpha Road, Chepstow (GGAT/Cadw)

**Hardwick Village, Chepstow**

Site name	Hardwick Village, Chepstow
NGR	ST 53402 93381
PRN(s)/NPRN(s)	10620g
Site type and description	<p>A planned housing estate constructed in 1917-1918 to accommodate workers in the National shipyard (10884g). The housing first appears on the Third edition OS map of 1921 and consists of a series of terraced properties constructed in several streets immediately south of the medieval town walls. The local authority was aware that Chepstow could not provide the accommodation required for the new workforce and therefore petitioned the government to provide support for the construction of a number of 'garden towns' (Firth 2012). There was an original intention to construct 423 houses on two sites and a housing estate called Hardwick village was one of these developments. The development is easily identifiable on the Third edition OS map and forms a discrete area of housing based alongside Portwall Road, Green Street, Caird Street and Rockwood Road. Additionally, three separate but adjacent crescents were constructed, these being Severn Crescent, Hughes Crescent and Wye Crescent. Housing in the crescents consists of a series of terraced houses, none containing more than five properties and with well-defined gardens to the rear. The houses built on the remaining streets are more isolated properties, and the steepness of the sloping ground in this area may explain the absence of depicted garden areas. Contemporary photographs of these properties under construction are held in the archive of Chepstow Museum but have not been made available to the author. The houses were constructed mostly from concrete blocks cast by Royal Engineers and German prisoner of war labour, though most extant properties are now heavily rendered. The street layout and houses have survived, though more properties have been constructed in the area in the intervening years.</p>
Community	Chepstow
County	Monmouthshire
References	<p>Firth, N, 2012</p> <p>Rainsbury, A, 1989, <i>Chepstow and the River Wye</i>, Budding, Stroud.</p> <p>Third edition OS map of 1921</p>
Map details	ST59SW
Significance rating	Regional
Any current management	The houses continue to serve as private homes.



*Plate 40. General view the north of the Hardwick Village estate (10620g) showing the workers housing fronting onto Portwall Street (top), Green Street (middle) and Caird Street (lower) (GGAT/Cadw)*

**Bulwark Village, Chepstow**

Site name	Bulwark Village, Bulwark, Chepstow
NGR	ST 53673 92509
PRN(s)/NPRN(s)	10621g
Site type and description	<p>A housing estate constructed in 1917-1918 to accommodate workers in National Shipyard No1. The housing first appears on the Third Edition OS map of 1921 and consists of a series of semi-detached properties organised around central greens. The local authority was aware that Chepstow could not provide the accommodation required for the new workforce and therefore petitioned the government to provide support for the construction of a number of 'garden towns' (Firth 2012). There was an original intention to construct 423 houses on two sites and the set of houses in the Bulwark area was one of these developments. The street layout and houses have survived, though more properties have been constructed in the area in the intervening years. The housing in Bulwark was initially confined to Alpha Road, Alexandra Road, Marsh Road, Victoria Road and Camp Road and included a feature known as The Octagon, which was a group of houses built around an elliptical road junction. Further housing was planned as the 1921 OS map shows other roads clearly intended for such properties but these had not been constructed at the time of survey. The properties themselves were terraced houses, built in rows of no more than six properties and are designed for use by families, presumably to incentivise skilled workers re-locating to the National Shipyard. All the existing houses are heavily rendered but it is unclear as to whether they were so originally.</p>
Community	Chepstow
County	Monmouthshire
References	<p>Firth, N, 2012, Chepstow Ships of World War 1 in Burton, A., M., (ed.), <i>The Monmouthshire Antiquary Proceedings of the Monmouthshire Antiquarian Association</i>, Vol. XXVIII. 4word Ltd., Bristol</p> <p>Third edition OS map 1921</p>
Map details	ST59SW
Significance rating	Regional
Any current management	Currently used as private housing

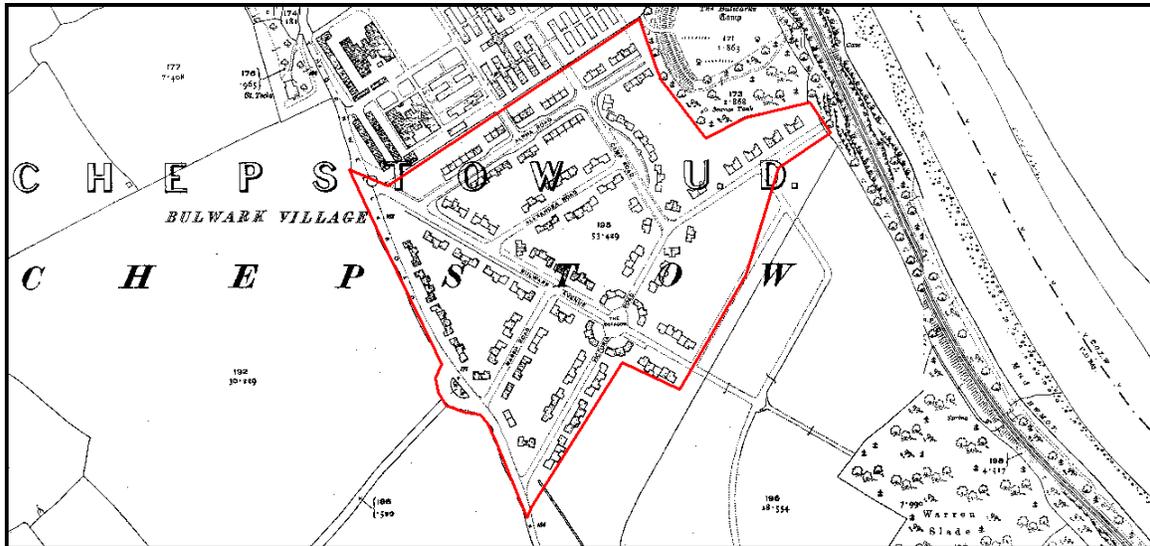


Figure 48. Bulwark village (10621g) as depicted on the 1921 Third edition OS map. Note the roads laid out for the houses which were subsequently completed

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Plate 41. Workers housing at the eastern end of Alpha Road, part of the Bulwark housing estate (10621g), view to the south west (GGAT/Cadw)

**Dowlais Wharf, Roath Dock, Cardiff**

Site name	Dowlais Wharf, Roath Dock, Cardiff
NGR	ST 20507 75135
PRN(s)/NPRN(s)	05059s
Site type and description	The wharf appears on a Guest, Keen and Nettlefolds list of Controlled Establishments dating to 1915 (Jones 1998) the extent of the controlled area being unknown. The site is shown as a timber yard on the Second and Third Edition O.S. maps. The wharf is adjacent to the former GKN Eastmoors Dowlais Cardiff works (07486m) and was probably taken under control as part of the management of that establishment on the virtual nationalisation of the GKN empire by the Ministry of Munitions in 1915.
Community	Splott
County	Cardiff
References	Second edition OS map of 1901 Third edition OS map of 1919 Fourth edition OS map of 1942 Jones, E, 1987, <i>A History of GKN: Innovation and Enterprise 1759-1918</i>
Map details	ST27SW
Significance rating	Local
Any current management	The wharf is still used as an active wharf although the extent of any original features is unknown.

**CH Walker, Sudbrook, Monmouthshire**

Site name CH Walker, Sudbrook, Monmouthshire

NGR ST 50820 87610

PRN(s)/NPRN(s) 08935g

Site type and description The shipyard was originally built as workshops for the construction of the Severn Tunnels around 1870. It was converted into a shipyard in 1886 and produced mercantile vessels during the First World War. The shipyard closed in 1922. Some elements of the shipyard appear to survive in the form of red brick built structures and a number of partially buried features can be seen near the coastline that are possibly related to slipways indicated on Third Edition OS mapping as slips. The works appears to have been substantially demolished by the Fourth Edition OS map of 1946.

Community Sudbrook

County Monmouthshire

References Second edition OS map 1901  
Third edition OS map 1921

Map details ST58NW

Significance rating Local

Any current management The remaining buildings in the shipyard are used by light industrial firms, whilst the former slipway is unoccupied

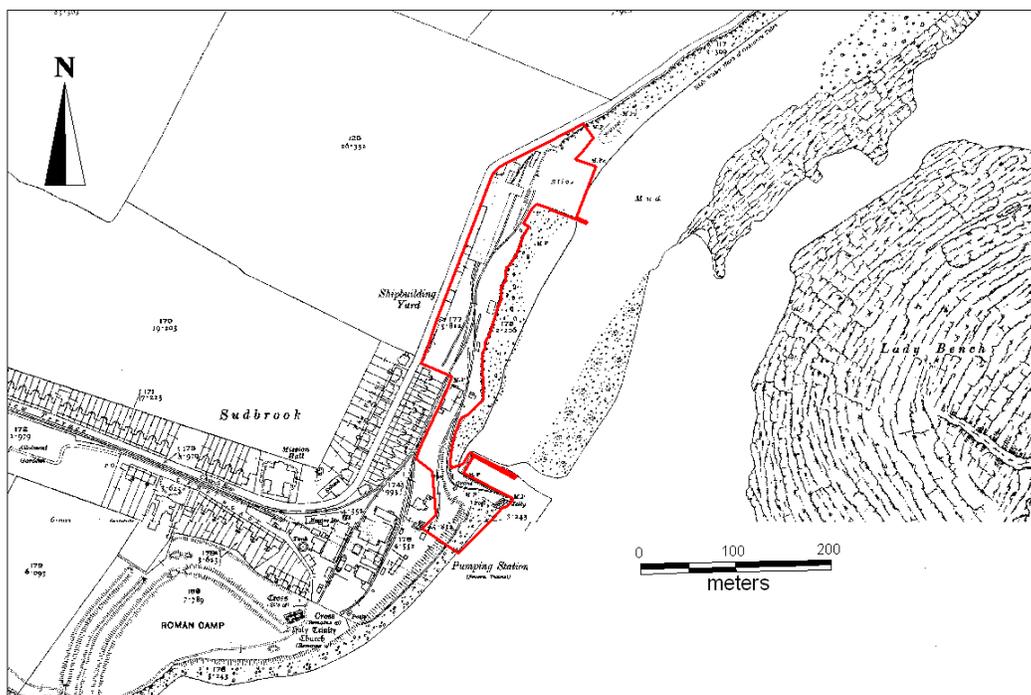


Figure 49. CH Walkers shipyard (08935g) at Sudbrook as depicted on the Third edition OS map of 1920

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Plate 42. Building associated with the CH Walker Shipyard (08935g) adjacent to the west perimeter wall. View to north (GGAT/Cadw)



*Plate 43. Concrete keel supports near the remains of the CH Walker slipways, Sudbrook. Note the strong similarity with those seen at the National Shipyard No.1, Chepstow (Plate 28) (GGAT/Cadw)*



*Plate 44. Remains of the north slipways at CH Walker's Sudbrook shipyard (08935g), view to south west (GGAT/Cadw)*

**Tredegar Dry Dock and Wharf Company, Newport**

Site name	Tredegar Dry Dock and Wharf Company, Church Road, Newport
NGR	ST 31791 86562
PRN(s)/NPRN(s)	NPRN408353
Site type and description	Ship repair and re-fitting operations. Small corners of the yards were given over to manufacture of shell parts (Davis 1998). The works consisted of a dry dock and adjacent large, rectangular shed and ancillary buildings, connected by railway tracks. Significant expansion had occurred between the Second and Third Edition O.S. maps but it is unclear as to whether the existing building on site has significant association with the original site.
Community	Pillgwenlly
County	Newport
References	Davis, H, 1998, History of the Borough of Newport Third edition OS map of 1921
Map details	ST38NW
Significance rating	Local
Any current management	The dry dock has been filled in but the main engine shed appears to partially survive in a re-clad state.

## 4.9 Aircraft production

Aircraft were a cutting edge technology during the First World War and few firms had the knowledge or skills necessary to manufacture them on the outbreak of war. The aeronautical industry, when it did become established, crystallised around London and the Midlands and it was therefore relatively unusual for Welsh firms to become involved in their construction. However, two firms have been identified within Glamorgan and Gwent that saw opportunities in aircraft manufacture, although neither were sufficiently well established to survive the drop in demand for their products at the end of the war.

The following table lists the sites identified in this study.

**Table 8.** Table of sites of aircraft manufacture.

Site name	PRN	Condition	Purpose
Cambrian Aircraft Constructors, 18 Station Road, Penarth	05053s	Unknown	Producers of aircraft components
Cambrian Aircraft Constructors, Tyndall Street, Cardiff	05054s	Destroyed	Producers of aircraft components
Willows Balloon Factory, Westgate Street, Cardiff	05055s	Destroyed	Producer of aerial balloons

**Cambrian Aircraft Construction, 18 Station Road, Penarth**

Site name Cambrian Aircraft Construction, 18 Station Road, Penarth

NGR ST 18435 71263

PRN(s)/NPRN(s) 05053s

Site type and description This site was the location for a branch of the Cambrian Aircraft Company and opened in February 1918. The firm produced components for D.H. 10 aircraft but could not diversify after the war and closed in September 1919. The Third edition O.S. map shows a number of what are probably light industrial units to the east of Station Road. Number 18 Station road has a through road by its side that at one time lead to a courtyard that served a two floor warehouse structure with access to the railway which is likely to be the location of the Cambrian site. An aerial photograph of Penarth dating to 1929 (WPW029388) shows this facility in use in connection with timber products but the detail in the image is not clear enough to discern the type of items being produced, which would in any case have been after the closure of the Cambrian Aircraft Company. The same site is occupied by modern light industrial units but it is likely that any surviving original buildings have been highly modified, as the formerly separate units have been amalgamated. Aircraft manufacture during the First World War within the United Kingdom was generally confined to the London area and Midlands and the presence of an aero related industry was relatively unusual.

Community Penarth

County Glamorgan

References RCAHMW aerial photograph ref: WPW029388  
Airfields Information Exchange [Online]  
Third edition OS map of 1920

Map details ST17SW

Significance rating Regional

Any current management The location is currently used as part of a light industrial estate.



*Figure 50. The Cambrian Aircraft Constructors site (05053s) at 18 Station Road Penarth as depicted on the Third edition OS map of 1920*

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**Cambrian Aircraft Construction, Tyndall Street, Cardiff**

Site name Cambrian Aircraft Construction, Tyndall Street, Cardiff

NGR ST 19541 76196

PRN(s)/NPRN(s) 05054s

Site type and description Cambrian Aircraft Construction was founded in 1917 by members of the Cardiff timber trade, Messrs David, Demery and Morgan Reed. It was started in a woodshed in Tyndall Street, East Moors, also occupying a large warehouse nearby. The company built wings, ailerons and undercarriage components for D.H. 10 aircraft. The peak workforce, the majority of whom were women trained at Cardiff Technical College, was 500. Off-cuts of the high quality and valuable silver spruce, imported from Canada and reserved for aircraft components, were used to make toys, a product that was scarce at the time. The company failed to adjust to peace time production and closed in September 1919. The site has been demolished and modern housing now occupies the area.

Community Splott

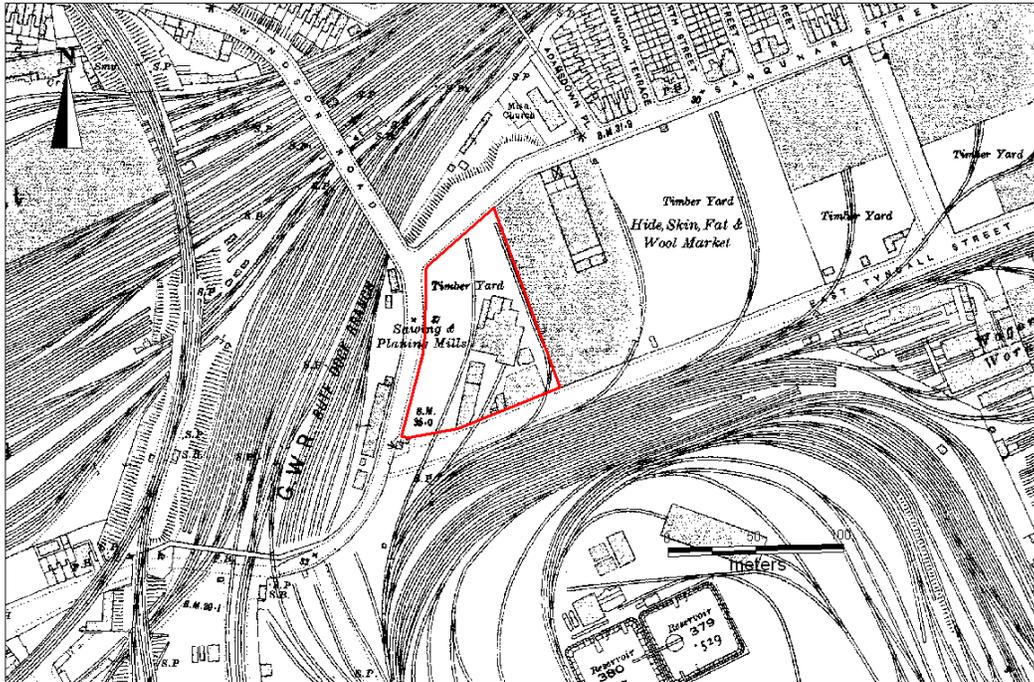
County Cardiff

References Airfields Information Exchange [Online]  
Third edition OS map of 1920

Map details ST17NW

Significance rating Regional

Any current management The site has been destroyed and replaced by a combination of housing and a road system. There is the possibility for the survival of buried remains to survive in the vicinity although these would only have passing relevance to the aero industry.



*Figure 51. The site of the Cambrian Aircraft Constructors works in Tyndall Street, Cardiff as depicted on the Third edition OS map of 1920*

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**Willows Balloon Factory, Westgate Street, Cardiff**

Site name	Willows Balloon Factory, Westgate Street, Cardiff
NGR	ST 18096 76141
PRN(s)/NPRN(s)	05055s
Site type and description	The Willows Aircraft Company was set up in 1918 by Ernest Willows, based in the American Skating Rink (opened in 1909) in Westgate Street, Cardiff. The building had been used earlier in the war for recruiting purposes and had been used to billet troops transiting from Cardiff to other locations. It produced balloons for barrage balloon purposes but demand dried up with the end of the war and the factory closed in 1919. The ice rink itself was demolished in the 1920s.
Community	Cardiff
County	Cardiff
References	Wales Online [Online] <a href="http://www.walesonline.co.uk/news/local-news/roller-skate-rink-hit-city-2357884">http://www.walesonline.co.uk/news/local-news/roller-skate-rink-hit-city-2357884</a> Third edition OS map of 1920
Map details	ST17NW
Significance rating	Local
Any current management	The site has been destroyed and the site is now covered partially by the Millenium Stadium and a tower block.

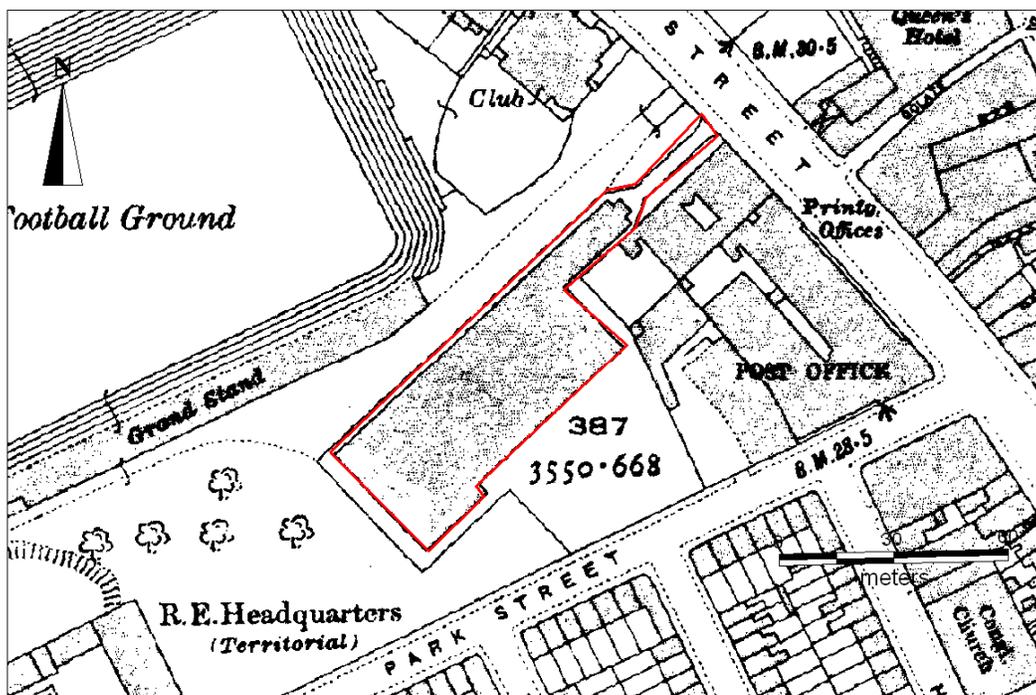


Figure 52. The American Skating Rink, Westgate Street, which was used as the location for the Willows Balloon Company (05055s) in 1918.

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#### 4.10 Miscellaneous industries

A number of sites have been identified that have an industrial connection to the First World War but which do not fit into a broader subject heading. The following table lists these miscellaneous industries.

Timber was a major strategic asset during the First World War, a material that was much more ubiquitous before the advent of plastics and light weight construction materials.

**Table 9.** Table of miscellaneous industries identified in the study

Site name	PRN	Condition	Purpose
Llanthony timber camp	10708g	Unknown	Production of timber
Upper Cwmbran Brickworks, Upper Cwmbran	03916g	Near destroyed	Producer of bricks under government control
Henllis Fire Brick and Retort Works, Oakfield	10830g	Destroyed	Producer of bricks under government control
Uskside Chemical Works, Newport	10715g	Destroyed	Producer of chemical products including glue, and fertilizer

**Llanthony Timber Camp, Llanthony**

Site name	Llanthony Timber Camp, Llanthony
NGR	SO 28 27
PRN(s)/NPRN(s)	10708g
Site type and description	<p>An article in the Abergavenny Chronicle of 25th November 1918 describes the death of Heinrich Harkotter, a German prisoner working at Llanthony Timber Camp. He had fallen onto a circular saw whilst moving timber. The saw had been erected in July 1918, which may provide an indicator of the date of establishment for the camp. The dead man was buried in Cwmyoy but was later reinterred in the German Military Cemetery at Cannock Chase in the Midlands. This is the only reference to the presence of the camp that has been located. A record in the Official History of the Canadian Timber Corps states that a felling operation was carried out, based in 'Llanthony Abbey' and which was undertaken within the No. 54 District between 19/03/1917 and 22/10/1917 (Bird and Davies 1919) Comparison of photographic evidence with cartographic evidence suggests there was extensive de-forestation of the high ground to the west of Llanthony in the modern period, which could well have originated with First World War logging operations. A Saw Mill is depicted on the Second and Third edition OS maps of 1900 and 1920, located south west of Llanthony Priory and which may have been associated with the camp, but there is no evidence for this.</p>
Community	Llanthony
County	Monmouthshire
References	Bird, CW and Davies JB, 1919, <i>The Canadian Forestry Corps Its Inception, Development and Achievements</i> , HMSO
Map details	SO22NE
Significance rating	Local
Any current management	Unknown

**Upper Cwmbran Brickworks, Cwmbran**

Site name	Upper Cwmbran Brickworks, Cwm-Bran
NGR	ST 27311 96833
PRN(s)/NPRN(s)	03916g
Site type and description	The Upper Cwmbran brick works were acquired by Guest, Keen and Nettlefolds (GKN) in the early 1900s and appeared on a list of Controlled Establishments in 1915 as part of the virtual nationalisation of the GKN concern during the First World War. These works had government contracts and were controlled to maximise output, eliminate wasteful duplication, and keep profits down in the face of desperate need and shortage. The works initially opened in 1839 and by the 1840s, were producing some 100,000 firebricks per week. The works remained open until the mid-20th century. The site of the brickworks is now occupied by the Water board Pumping station. Whilst the site is destroyed, it is clear from cartographic and aerial photographic sources that some of the brickworks survive beneath the ground. (Torfaen.gov.uk).
Community	Upper Cwmbran
County	Torfaen
References	Third edition OS map of 1920 Jones, E, 1987, <i>A History of GKN: Innovation and Enterprise 1759-1918</i> Torfaen Council website <a href="http://www.torfaen.gov.uk/en/TransportStreets/WalkingCycling/Torfaen-Walks/Torfaen-Trail-Figure-of-8-Walk/Upper-Cwmbran-to-Henllys.aspx">http://www.torfaen.gov.uk/en/TransportStreets/WalkingCycling/Torfaen-Walks/Torfaen-Trail-Figure-of-8-Walk/Upper-Cwmbran-to-Henllys.aspx</a>
Map details	ST29NE
Significance rating	Local
Any current management	The brick works has been destroyed but it is clear that significant remains associated with the former works may be found beneath the ground.

**Henllis Firebrick and Retort Works, Oakfield, Newport**

Site name	Henllis Firebrick and Retort Works, Oakfield, Newport
NGR	ST 28906 93898
PRN(s)/NPRN(s)	10830g
Site type and description	This brick works was acquired by Guest, Keen and Nettlefolds in the early 1900s and subsequently appeared on a list of Controlled Establishments in 1915 following the virtual nationalisation of GKN by the government during the First World War. It was also known as the Henllis Coal and Firebrick Works. These works had government contracts and were controlled to maximise output, eliminate wasteful duplication, and keep profits down in the face of desperate need and shortage. The works produced refractory bricks (bricks used in high temperature applications such as iron and steel manufacture), with the clay being supplied by GKN's Cwmbran Colliery. The brickworks are shown on the First through Third edition OS maps and underwent expansion between these editions. The works was open until 1964 but has been demolished and replaced by a housing estate.
Community	Llantarnam
County	Torfaen
References	Jones, E, 1987, <i>A History of GKN: Innovation and Enterprise 1759-1918</i> Second edition OS map of 1901 Third edition OS map of 1920
Map details	ST29SE
Significance rating	Local
Any current management	The site is now occupied by a housing estate although there is the possibility that buried remains survive in the vicinity.

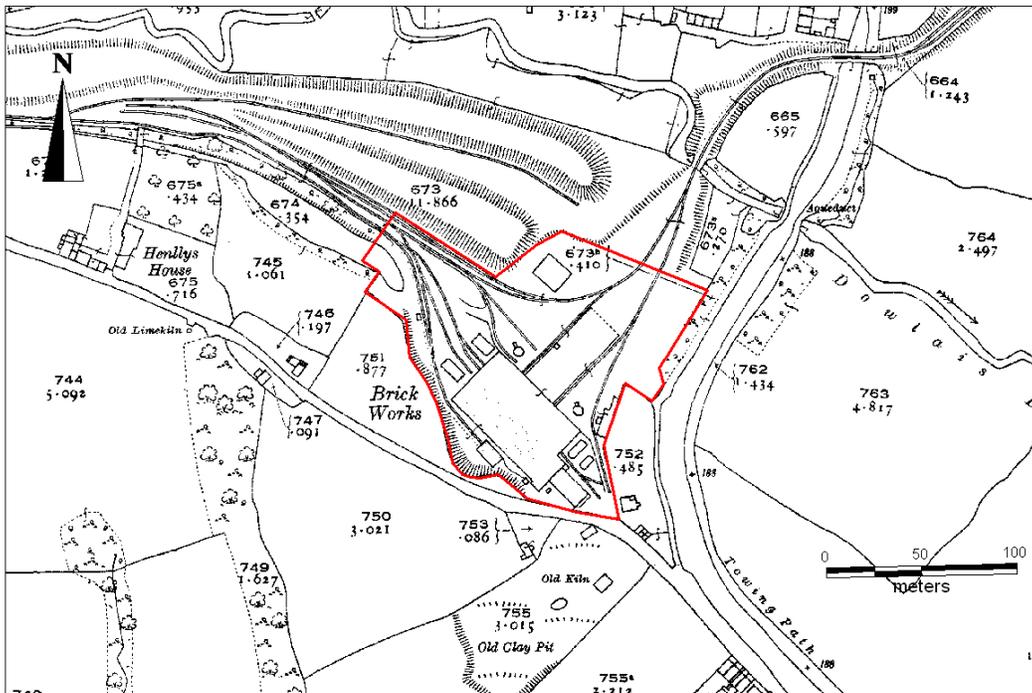


Figure 53. Henllis Fire Brick and Retort works (10830g) as shown on the Third edition OS map of 1921

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**Uskside Chemical Works, Newport**

Site name	Uskside Chemical Works, Newport
NGR	ST 32373 87443
PRN(s)/NPRN(s)	10715g
Site type and description	East Usk Chemical Works (later known as Uskside Chemical Works), Corporation Road, was requisitioned by the government in 1916 and new plant installed to increase production of sulphuric acid used in fertilizers and probably high explosives (Davis 1998). Bones and fat were processed to make glycerine for making glue used in the manufacture and repair of aircraft. Many women were employed. A complaint about the smell emanating from a 32 foot high stack at the works was discussed at a council meeting on 19th September 1916. They agreed to continue monitoring (Gwent Archives). The works produced paint and solvents later in its life and were demolished in the late 20th century.
Community	Liswerry
County	Newport
References	Davis, H, 1998, History of the Borough of Newport Gwent Archives A110/M/23 Third edition OS map of 1921
Map details	ST38NW
Significance rating	Local
Any current management	The chemical works has been destroyed and replaced by housing. It is likely that buried remains can be found in the vicinity.

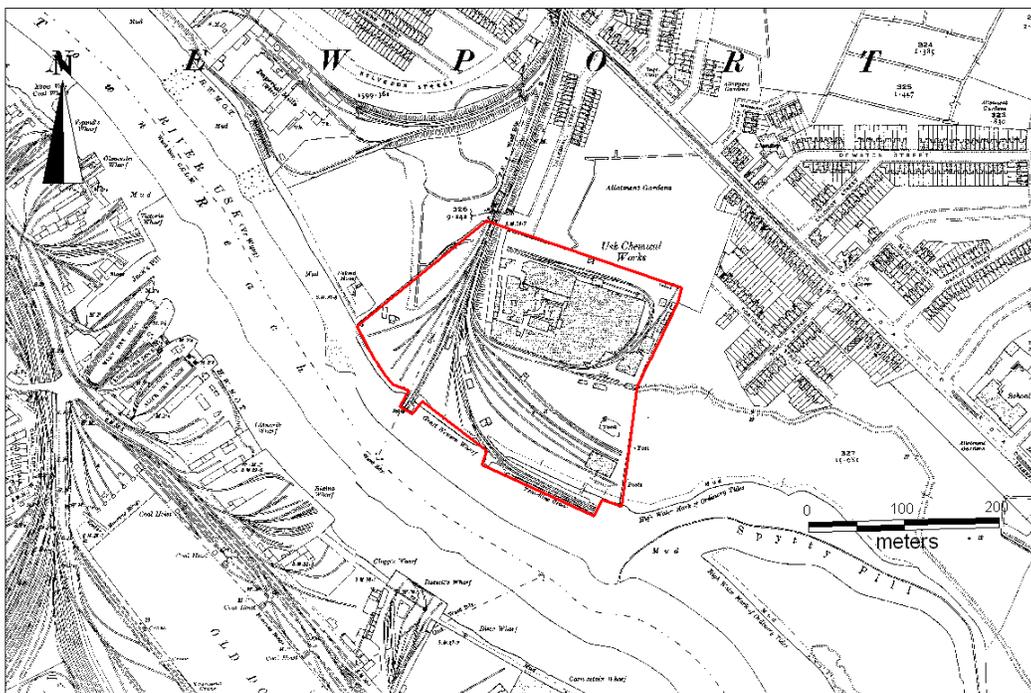


Figure 54. Uskside Chemical works, Newport was as depicted on the Third edition OS map of 1921.

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## 5. Conclusions

There are essentially three identifiable industrial responses in Glamorgan and Gwent to the outbreak and prosecution of the First World War. These responses are not necessarily sequential and indeed multiple responses can apply to a single site but they are broadly reactive to changing wartime circumstances and to technological and administrative advances made during the course of the war.

The initial response was for existing firms to continue production of their existing products, albeit at a boosted rate and for a single client (the government). This type of response was the most common on the outbreak of war, when the prevailing belief held was that the fighting would not last long. The war was viewed as a temporary aberration before life returned to normal. Thus we see from the Taylor and Sons site at Briton Ferry (07318w), whilst there was early and enthusiastic conversion to munitions production, no great change of infrastructure was required, the biggest difference probably being the layout of lathes and other plant to ensure smooth running of the various 'Operations' in the chain.

The second response and the most common one was the adaption of pre-existing sites to accommodate increased or altered production regimes. This is the response that most sites exhibited in the years after 1915, when the war proved to be of a magnitude and duration as yet unseen, and after the formation of the Ministry of Munitions introduced varying degrees of control and compulsion in industrial output. Archaeologically, this can be seen in the construction of additional benzol plants at coke works, the addition of furnaces at existing iron and steel producing sites and, in the case of a surviving example, Lovells Confectionary Works in Newport (09547g), the conversion from producing one product (confectionary) to another (ammunition boxes and mine sinkers).

The final response was the construction of specific facilities to meet particular requirements as set out by the Ministry of Munitions or other government departments. This response includes the National Box and Cartridge Repair Factory in Newport (10612g) and National Shipyard No.1 in Chepstow (10884g). Ironically it is these last two sites that are amongst the best surviving in the archaeological record, despite the fact they were planned as essentially temporary wartime facilities: the haste with which the government offloaded them from account at the end of the war should be seen as an indicator of how temporary they were regarded. Quite why this should be so is somewhat puzzling. In general, the major industries examined as part of this study have prospered and perished according to wider economic conditions but it is possible that the utilitarian nature of the National Box and Cartridge Repair Factory and to a lesser extent the Chepstow site have allowed them to weather the intervening years.

The way in which the First World War has been analysed and commemorated is in a constant state of flux (Saunders 2007), with much of the focus dedicated to study of the fighting or on political and social considerations. However for all the undoubted changes wrought both on the physical and social landscape, this study has demonstrated that there exists a peculiar collective amnesia concerning the industrial contribution of Glamorgan, Gwent and almost certainly other regions, towards the war effort of the First World War. Perhaps the trauma of the war itself on the national psyche, combined with the successive traumas of industrial depression, another world war and the final collapse of Welsh industry has smothered the significance of the changes engendered by the First World War. Whilst there is an undoubted interest on social and military aspects of the war, the same cannot be said of the industrial facets, the vital but unromantic [if war can ever said to be romantic] work of the every-day. It is worth quoting at

length the view of two men who fought in the Second World War in regard to the unsung aspect of the First World War:

“The genre of Sassoon and Graves is history; the history of unusual individuals in unusual circumstances. But people who were not unusual passed from the earth as though they had never been. Some of them must be content to be represented by symbols like the Menin Gate or the Thiepval Memorial. Those who did the grinding work of the pen, the conference room, the drawing board and the classroom have some memorial in the appendices, and sometimes the text, of the *History of the Military Operations in France and Belgium* [and the *Official History of the Ministry of Munitions*]. But as that memorial is dull and seldom visited it has not preserved the memory of how the victory was won, what it took to win or why the sacrifice was necessary”. (Bidwell and Graham, 1982)

The few remaining archaeological sites associated with the industrial effort of the First World War should be seen as remarkable survivors and thought should be given to the future of these assets.

## Evaluation

The intention of the current report was for it to be written using concepts borrowed from a theoretical framework derived from sociology, specifically Actor Network Theory (ANT), in order to begin to examine the links between individual sites or classes of site. ANT can be described as having a "material-semiotic" approach to examining questions. This means that it maps relations that are simultaneously material, between individual archaeological sites in the case of the current study, and semiotic, between concepts or organising principles, which in the case of the current work, is the circumstance of the First World War and the establishment of the Ministry of Munitions. ANT assumes that many relations are both material and semiotic. By formally looking for such links, and by broadening reference material out from the conventionally archaeological, a much more nuanced understanding of the individual sites and their interconnectivity can be obtained. The technique lends itself well to the modern industrial age, where the volume of communications available to the archaeologist can fill in the many semiotic blanks that exist where no communication records survive for other periods.

Examination of archaeological sites within an their appropriate context is something that should be undertaken as a matter of routine but there is a temptation to examine sites in isolation, particularly given pressures of time and resource. The formal use of elements of network theory naturally leads to exploration of the wider context for sites and can perhaps highlight the rationale for phasing in buildings, the presence of particular features and the reasons for expansion or decline; by consciously looking for the semiotic, clues can be found that lead to the material.

A good illustration of the use of ANT to examine the links between sites are the contracts, receipts and cargo notes held by Glamorgan Archives (Glamorgan Archives DPD/2/8) for shipments of benzol, a key component of high explosive, from the Bargoed coke by-product ovens to the Royal Ordnance explosives factory at Pembrey and to various sites in the Midlands and London. These documents provide evidence for the complexity of transport infrastructure, relationships between separate industrial facilities and the nature of the work being undertaken which might otherwise be unknown or guessed at. The links between the by-product plant at Bargoed and Pembrey (the material) need to be contextualised against the backdrop of requirements of the First World War and the compulsion provided by the Ministry of Munitions (the semiotic) on whose headed documentation much of the information is recorded. These 'Actor Networks' cut across regional and even national boundaries, which implies that any serious study of the topic needs to be broadened out from artificially imposed geographical borders.

However, by consciously expanding the boundaries of research using ANT as a theoretical underpinning, tension is created with competing interests of time, resource and responsibility. The interconnectivity between the material and semiotic aspects of sites needs to be explained appropriately and this requires a degree of synthesis that is not necessarily possible when compiling a report to a pre-determined budget and deadline. In the case of the current work, information relating to the archaeological sites had to be compiled largely from primary sources, a lengthy process that reduced the time available for a more thorough synthesis to be attempted.

ANT in its purest sense imbues objects with an agency that is the equal of human actors, which sometimes invites criticism. However, whilst not a perfect theoretical model, ANT is a useful prism through which to examine archaeological sites, being particularly relevant to the

industrial era.

Unfortunately, the time required to fully utilise ANT was underestimated by the author for this current report and the benefits of its use have been limited. However, the approach has been useful in highlighting the key overarching role of the Ministry of Munitions in the wartime economy, and for explicitly demonstrating the interconnectivity of all the sites as they were harnessed for war aims.

The implications for future work using ANT as a basis however, are that project proposals need to factor in a greater degree of time and resource for the research of the semiotic and to allow a greater degree of synthesis to be carried out; without these, the full benefit of the use of ANT as a theoretical basis cannot be realised. Furthermore, the trans-regional and transnational nature of many of the connections between sites suggest that a greater degree of co-operation between relevant researchers is necessary *e.g.* more co-ordinated pan-Wales projects that examine single themes at the same time, although it is inevitable that this would require closer control from a single, co-ordinating body. Whether these implications could be realistically implemented given acknowledged current limitations in time and resources is a matter of debate. Nevertheless, the use of ANT is a useful tool in providing a framework for examining networks of archaeological sites.

Identification of a ‘*chaîne opératoire*’ for the war related products manufactured in South East Wales is possible but would require significant research. Materials are derived not only from local sources but from trans-regional and transnational sources. Examination of relevant shipping manifests would shed light not only on the importation of raw materials but also on the export of the finished product; for example, significant quantities of shell steel were supplied to the French (*e.g.* the Albion Steelworks in Briton Ferry) as the Germans had occupied the main French industrial regions in the east of the country. Whilst it is certainly possible to establish the full network of connections, such a study would almost inevitably expand beyond an original remit, which is one of the chief disadvantages of the use of ANT; if everything is connected, then where does one draw the line? We must not however be afraid of the potential size of the task for unless we examine archaeological sites in their much wider and more nuanced contexts, we will not be able to understand how society as a whole met the challenges of the relatively recent past.

## **Recommendations**

The majority of archaeological sites related to the operation of industry during the First World War have been destroyed. It is possible that future development of these sites might reveal archaeological remains but there are no specific recommendations that could be applied to these sites over and above those that would be recommended by the Planning Process.

The main topic identified in the current project for which there is a lack of understanding is the role of the major South Wales ports during the war. It has been clear from the sources that they were a particularly important facility, both in terms of trans-shipment of imports and exports and for their role in the repair and re-fitting of shipping. Yet the available information on the actual day to day operation during the First World War has been exceptionally limited. It is probable that a specific project will be necessary in order to address this significant shortfall in the record. It is likely that such a project would benefit the study not merely of the First World War but would be applicable to multi-period studies of the archaeology of the South Wales ports.

It is recommended that two sites be considered for some form of enhanced protection for the surviving remains, that of the National Shipyard, and Taylor and Sons, Briton Ferry. Both sites contain substantial upstanding remains that can clearly be identified from contemporary photographs and which retain significant extent and character. Detailed recommendations will be made under separate reports. It is further recommended that surveys of surviving features be carried out both at the site of the National Cartridge and Box Repair Factory, Alexandra Dock, Newport and the CH Walker Shipyard site. Whilst both sites would appear to have been modified, it is likely that features relating to the First World War period survive, particularly in the case of the National Box and cartridge repair Factory.

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- Kerri Joseph, Porthcawl Museum
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## Appendix A

**Table 10.** Combined Table of Industrial sites

Site name	PRN	Condition	Purpose
Cyfarthfa ironworks, Merthyr Tydfil	01169m/GM425	Near destroyed	Pig iron production, shell steel producer
Ynysfach Ironworks, Merthyr Tydfil	01263m/GM331	Near destroyed	Source of scrap iron
Whitehead and Company, Tredegar	10619g	Destroyed	Steel rolling mill
Orb Steelworks, Newport	09210g	Damaged	Steel mill, rolling of brass and zinc
Port Talbot steel works	07340w	Near destroyed	Steel works
Cardiff-Dowlais iron works, Cardiff	07486m/NPRN305757	Near destroyed	Iron and steel works
Castle steel works, Rogerstone	10680g	Destroyed	Steel works
Cordes (Dos) nail works, Newport	09529g	Destroyed	Producer of steel bars, rails, nails
Dowlais iron and steel works, Merthyr Tydfil	01615m	Destroyed	Iron and steel works
Port Talbot iron and steel company general offices, Port Talbot	07931w/NPRN23152	Altered	General office
Blaenavon iron and steel company, Blaenavon	02221g	Near destroyed	Expanded to produce shell steel
Blaina iron works, Blaina	09038g	Destroyed	Source of scrap iron
Braithwaites Neptune Engineering works, Newport	10885g/NPRN415172	Altered	Producer of trench plates, water tanks, ships plating
Briton Ferry steel works (Albion), Briton Ferry	07306w	Destroyed	Steel works
Pontardawe tinplate works, Pontardawe	01161w	Near destroyed	Steel producer and tinplate works
GKN Patent Nut and Bolt works, Cwmbran	10778g	Dear destroyed	Steel and munitions producer
Imperial Mills (Wire works), Newport	10682w	Destroyed	Iron and steel wire works
J C Hill and Company, Oakfield, Cwmbran	10712g	Destroyed	Wire works
British Metals Extraction Company, Llansamlet	07483w/06131w	Destroyed	Zinc smelter
Swansea Vale Spelter Company, Llansamlet	07932w	Destroyed	Spelter (brass) producer
National Cartridge and Box Repair Factory, Newport	10612g	Damaged	Salvage of ammunition boxes and artillery shell cases
Munitions Crèche, Newport	10274g	Near intact	Crèche for the children of munitions workers
Uskside National Works, Newport	10615g	Altered	Munitions and general war industry producer
Ebbw Vale National Shell Factory	10738g	Destroyed	Munitions producer
Newport National Shell Factory	10613g	Destroyed	Munitions producer
Lovells Confectionary	09547g	Near intact	Producer of ammunition

works, Newport			boxes and other war products
Cork Wharf Munitions works	10277g	Unknown	Munitions producer
Tyne Engineering Works, Newport	10778g	Near destroyed	Munitions producer
Cardiff National Shell Factory	05070s	Destroyed	Munitions producer
Curran Metals and Munitions, Cardiff	05056s	Destroyed	Munitions producer
Swansea National Shell Factory, Landore	07379w	Near destroyed	Munitions producer
Taylor and Son, Briton Ferry	07318w	Near intact	Munitions producer
Newport gas works	10351g	Near destroyed	Converted to capture by-product chemicals
Ebbw Vale coke and benzol plant, Victoria works, Ebbw Vale	10740g	Near destroyed	Expanded to increase by-product output
Coedely by-product coke oven, Coedely	07579m	Near destroyed	Expanded to increase by-product output
Risca coke and benzol works, Risca	07580m	Near destroyed	Expanded to increase by-product output
GKN by-product plant, Cwmbran	10650g	Near destroyed	Expanded to increase by-product output. Subject to early government control
Llwynpia colliery coke ovens	07557m	Near destroyed	Expanded to increase by-product output
Bargoed coke and benzol plant, Bargoed	07553m	Near destroyed	Expanded to increase by-product output
Britannic colliery, Evanstown	07565m	Near destroyed	Supply of coal to the Royal Navy and industry
Cambrian colliery, Clydach Vale	07560m	Near destroyed	Supply of coal to the Royal Navy and industry
Cwmbran colliery, Cwmbran	10777g	Near destroyed	Supply of coal for government contracts. Subject to early government control
Dowlais-Cardiff colliery (Abercynon colliery)	NPRN33442	Near destroyed	Supply of coal for government contracts. Subject to early government control
Glamorgan colliery, Llwynpia	01457m	Near destroyed	Supply of coal to the Royal Navy and industry
Naval colliery, Tonypany	07530m	Near destroyed	Supply of coal to the Royal Navy and industry
Viaduct colliery, Pontnewydd	10304g	Near destroyed	Supply of fire clay and coal for government contracts. Subject to early government control
Cambrian Aircraft Constructors, 18 Station Road, Penarth	05053s	Unknown	Producers of aircraft components
Cambrian Aircraft Constructors, Tyndall Street, Cardiff	05054s	Destroyed	Producers of aircraft components
Willows Balloon Factory, Westgate Street, Cardiff	05055s	Destroyed	Producer of aerial balloons
British Mannesmann Tube works, Newport	03674g	Damaged	Steel tube and pipe producers

British Mannesmann Tube works, Swansea	10272g	Near destroyed	Steel tube and pipe producers
National Shipyard No.1, Chepstow	10884g	Near intact	Mass assembly of mercantile shipping
Machine shop at National shipyard No.1	10698g	Near intact	Used in mass assembly of mercantile shipping
Slipways at National Shipyard No.1, Chepstow	10692g	Near intact	Used in mass assembly of mercantile shipping
Bulwark Camp, Chepstow	10691g	Near destroyed	Used to house military workers at National Shipyard No.1.
Hardwick Village Chepstow	10620g	Near intact	Dedicated workers housing for National Shipyard No1.
Bulwark Village, Chepstow	10621g	Near intact	Dedicated workers housing for National Shipyard No1.
Dowlais Wharf, Roath Dock, Cardiff	05059s	Near intact	Wharf used by GKN under government control
CH Walker, shipyard, Sudbrook	08935g	Damaged	Producer of minor mercantile vessels
Tredegar Dry Dock and Wharf	NPRN408353	Damaged	Dry dock used for ship repair and munitions work
Llanthony timber camp	10708g	Unknown	Production of timber
Upper Cwmbran Brickworks, Upper Cwmbran	03916g	Near destroyed	Producer of bricks under government control
Henllis Fire Brick and Retort Works, Oakfield	10830g	Destroyed	Producer of bricks under government control
Uskside Chemical Works, Newport	10715g	Destroyed	Producer of chemical products including glue, and fertilizer
Admiralty sidings, Pontymoile	10688g	Destroyed	Marshalling of Royal Navy coal convoys



**Glamorgan-Gwent  
Archaeological Trust Ltd  
(Projects Division)**



**QUALITY CONTROL**

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**Date:** 26/05/15

As part of our desire to provide a quality service we would welcome any comments you may wish to make on the content or presentation of this report.

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