

Tetryl (CE) - A Donation & Mills Archive Information Summary 1

With the introduction of on line viewing, it might be helpful where there is information in the Archive on a particular subject but it is diffuse to pull it together in a Mills Archive Information Summary. The following is an example.

Trinitrophenyl-methyl-nitramine

Tetryl – Trade Name

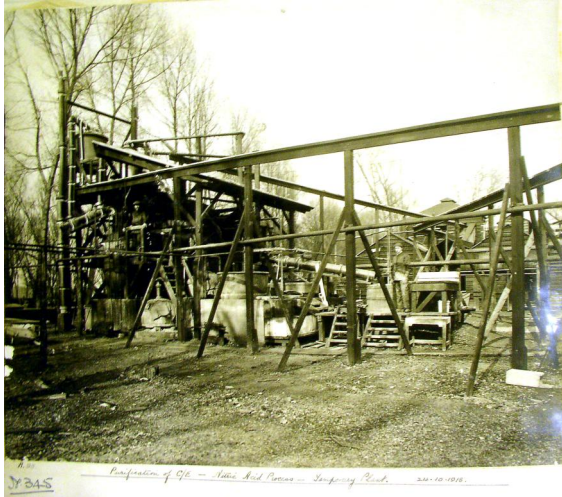
CE (Composition Exploding) - Service Name

For general comment purposes the two names are interchangeable.

Tetryl was the product of nitration of Dimethylaniline, which had been dissolved in concentrated sulphuric acid. It was an intermediate high explosive, the culmination in 1903 of work by Oswald Silberrad, a noted chemicals consultant with his work focused on explosives and the related dyestuffs and metallurgy. His expertise in explosives had been recognised in appointment to the Government Explosives Committee in 1901, with the post of Superintendent Chemical Research. He left the Committee in 1906 and in 1907 established a consultancy business at his property in Loughton – Dryads Hall on the edge of Epping Forest a few miles from Waltham Abbey, building a separate laboratory block and library.

Tetryl was termed intermediate as it acted as a ‘booster’ between the mercury fulminate initiator and the main charge in shells etc. The term derived from Tetryl’s function providing a reinforcing sharp shock to ensure reliable and complete detonation. It was eminently successful and was a core element in the detonation process of Composition B, the standard explosive filling of the Allies in WW2. (*Note 1*)

A Tetryl plant was constructed to the western flank of the RGPF North Site in WW1. A fire occurred in the Purification Plant and a temporary plant was put into operation.



**Temporary Tetryl
Purification Plant
1918 WAI - 1743 -
9175 - 01**

In WW2 from 1940 a new plant was built to the east and it is in this area that elements survive (below). Along with surviving parts of the old group, Tetryl production therefore was in a kind of arc from west to east, in a rather ad hoc arrangement. Any visitor to the plant expecting a 'normal' factory must have been startled when he saw what this Mills factory looked like.

Archive Donation

Mrs. J. Muir of Wingrave, Aylesbury has made a donation to the Archive, comprising the working papers of her father, Mr. J. Houghton, who worked at the Waltham Abbey Tetryl plant from 1942.

The papers include 100 pages of process description, operating instructions, listing of buildings and plant, a blueprint of the plant, a Tetryl flow sheet with production data, a Handbook No. 1 - Explosives from War Office Text Book of Ammunition, widely distributed to the RA, RAOC, Technical and Training Establishments and Schools of Instruction.

This is an important link with the actuality of use by a member of the staff of the plant.

RGPF Blueprint

The blueprint, to be lodged in Archive Section WANBD, will be the only blueprint in the Archive. Detail is:

51in.W 28in.D Scale 1inch = 1 Foot

Title Detail: Superintendent RGPF, RGPF 3695 (Sheet 1), 16-12-42,
Drawn by JRM

Elevations Acetoning Plant for CE Upper Works.

Acetone and Acetone Recovery

Acetone was an integral part of Tetryl manufacture. Acetone, which the RGPF bought in, was never an easy supply, with other industries competing for scarce supplies. As early as 1905 therefore a system of acetone recovery from cordite drying was introduced at RGPF and every effort for recovery was made thereafter.

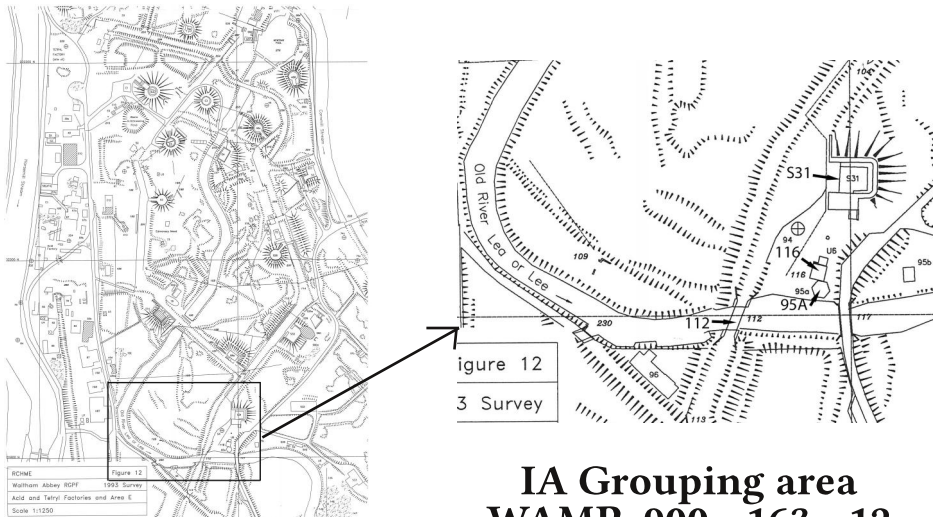
Pure tetryl was produced from a crude tetryl / acetone solutionpurified in the Purification Plant. Acetone was recovered by distillation from an acetone liquor/ caustic soda solution.



Bringing in Acetone 1920 WAI 102 - 09

IA Grouping and the Land Train

Almost all of the Tetryl plant has been razed, but fortuitously several elements have survived, important in themselves but also with the advantage they provide a feature visible from the Land Train. In addition, other built features are also visible from the same point and together form an interesting grouping for the IA enthusiast, which will be termed IA Grouping in the following:



From the Land Train

1. The Hexagon (95a) 1917 Tetryl Purification Plant

A hexagonal concrete structure catches the eye. Part of its possible interest to land train guides is that it defies all public efforts to guess what it is. It is in fact a base block for the Tetryl Purification Plant.



Concrete hexagon 1994

(Photo Les Tucker)



**CE Purification
Plant Acetone Stills**

WAI 640 – 110 -01

2. Tetryl Packing House - Surviving part (S31) 1879 original date

S31 is a good example of adaptive re use at the Mills long before the term became fashionable.

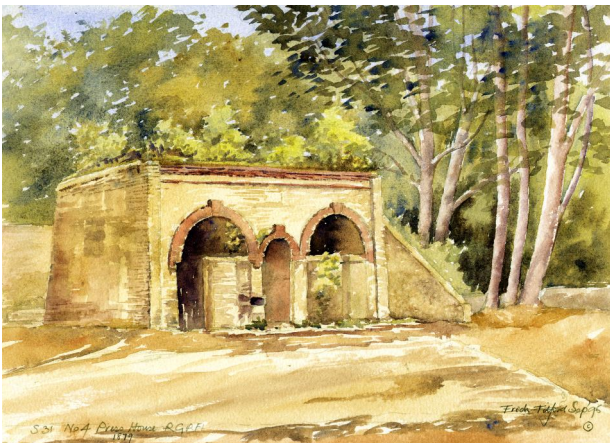
The building of which S31 was a part started life in 1879 as Press House No. 4, hydraulically powered from steam produced hydraulic power from what was later Group E, L149. Around 1900 the Press House became No.1 Moulding House, then later Cylinder Cutting House and finally in 1917 CE Packing House.

A large part of the House was demolished in 1945, the surviving substantial remains later being designated S31.



**S31 Entrance
tunnel and two
Bays 1994**

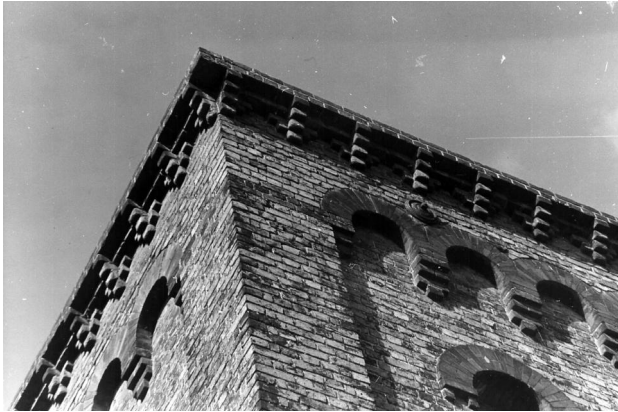
(Photo Les Tucker)



**Ravaged by time,
weather, vegetation**

**S31 Water Colour by
Freda Titford 1994
WAI 1250 - 16**

The brickwork was of good standard overall, evidenced by features such as the dentil course, and there are two stone wall plaques – one VR and one reading ‘No. 4 Press House 1879’,



**Dentil course
Earlier days
WAI 1214-19**



**VR Plaque
WAI-1214 - 02**



Date Plaque WAI 1214-16

(Any chance of some volunteers doing some 'scrub bashing'? The site around S31 probably looks rather scrappy)

3. Cast Iron Aqueduct (112) 1878 / 1879

Also visible is an Aqueduct carrying a canal over the Old River Lea. Made up of iron plates riveted together, as with ships of the time, this is interesting as one of only 26 cast iron aqueducts in the UK, i.e. entirely self contained metal troughs to carry the canal in a novel application of the cast iron which dominated so much of Victorian engineering. A study was made by a canal expert of iron canal aqueducts in Britain, coming up with a definitive total of 23. Unfortunately for the author, hidden within the Mills and totally unknown were three more, bringing the true total to 26.

As well as documentaries, the North Site has attracted film companies for location work. S31 appeared in the film 'Enigma'.

Kate Winslett filming on location at a bridge near S31.



**Cast Iron
Aqueduct
1994**
*(Photo Les
Tucker)*



**TV
Cameraman
filming the
Aqueduct
2005**
**WAI 1246 –
01**
**S31 in
background**

Tetryl - the last Mills Survivor – the final Chapter 1944

For general purposes manufacturing ceased at the Mills in 1943. Realistically the buildings and facilities in normal circumstances by the 30's might well have been deemed no longer a viable manufacturing facility.

But WW2 changed all that and the venerable buildings were called on for one last effort, finally ending production in 1943.

But there was one exception - Tetryl. Normally termed CE in the War, practically unknown it was vital to Allied artillery capability. It had never been in easy supply and the ancient Waltham Abbey Tetryl plant was in fact an important element in national supply. So critical that it continued to produce into 1944, alone as the last Mills survivor.

(1) Possibly partly for reasons of security, history has not been kind to explosives, in the sense of recognition of scientific discoveries which had monumental implications, either military or civil or both. Tetryl is a case in point. Arising from his consultancy work Oswald Silberrad's immense collection of scientific papers was bequeathed to the nation, only, to lie untouched for over 50 years and, only recently has a start been made in examining and cataloguing.

Les Tucker

Friends Association of the Royal Gunpowder Mills

IA Industrial Archeology