DANGEROUS STUFF

The History of No. 42 Group Royal Air Force

1939 - 1955

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Appendices

Abbreviations

AAP Air Ammunition Park (pre approx 1941)

	Advanced Ammunition Park (post approx 1941)
ACP	Advanced Chemical Park
AD	Ammunition Depot
AFD	Aviation Fuel Depot
ASD	Ammunition Supply Depot
CW	Chemical Weapon
DA	Danger Area
FAD	Forward Ammunition Depot
FFD	Forward Filling Depot (mustard gas)
HC	High Capacity
HE	High Explosive
IAD	Intermediate Ammunition Depot
LC	Light Case (typical mustard bomb container)
kt	Kilo-tons = 1,000 tons
MC	Medium Capacity
MT	Mechanical Transport
MSU	Maintenance Sub Unit
MU	Maintenance Unit
RAD	Reserve Ammunition Depot
SCI	Smoke Curtain Installation

BACKGROUND

During the expansion of the RAF in the mid 1930s it was believed that one of the most serious shortcomings of the scheme was the ability to supply the units with the required armaments. At that time it was felt that British industry had the capacity to produce effective weapons, whilst the RAF with its new bombers provided the means of carrying the munitions to Europe. What was believed to be the most serious problem was that of storing and routing the weapons to the airfields. In 1938 the RAF possessed only two depots capable of handling munitions, these being Altrincham and Pulham, both of which were Small Arms & Ammunition units - totally unsuitable for the secure storage of high explosives in large quantities.

Before the start of the war empty ammunition containers had been stored at Hartlebury, Handforth and Quedgeley. An initial plan dated 23.6.37 detailed the requirements of the RAF being supplied by underground ammunition depots located at Chilmark, Eastlays, Monkton Farleigh, Acorn Bank, Beer, plus "two others". Acorn Bank - an old gypsum mine east of Penrith was dropped primarily as the workings suffered from flooding and also due to the fact that the tunnels ran beneath the village of Temple Sowerby. Beer near Seaton in Devon also achieved strong local opposition and was dropped as it is likely that the site would constitute an easy target from the air being situated on the south coast only a few miles from Exmouth.

In March 1938 a scheme was finalised to supply the ammunition and bomb demands of Bomber Command in the state of war with their needs. The principal requirement was for the provision of protected high explosive storage sites. Three large underground depots were constructed to house a six month reserve of 82,000 tons of explosives and 16,000 tons of incendiaries. For security and convenience of distribution these sites were situated in the Northern, Midland, and Southern areas of England.

THE MAIN STORAGE DEPOTS

These depots consisted principally of an underground HE storage area, plus a number of dispersed reinforced semi-underground bunkers for the storage of incendiary and pyro devices. Surface buildings would be provided for tail units and other non-hazardous devices. The underground depots were constructed on two principles: either modification of an existing mine, or roofing and covering an existing quarry, this latter system being known as an artificial underground depot. In either case the aim was to provide headcover of a minimum 40 feet consisting of concrete, earth and a sandwiched rock bomb burster layer.

The Northern Depot - Harpur Hill, was built in Sorrow Quarry - a disused limestone working 5 miles south of Buxton and opened in the Spring of 1940. Fauld, the Midland site was originally a gypsum mine and Chilmark - the Southern depot was also an old limestone quarry. Five months later a fourth underground site began construction in an old slate quarry at Llanberis in North Wales.

To reduce the likelihood of air attack these sites were selected west of the line joining Southampton and Edinburgh: this being considered a relatively safe part of Britain. The actual locations were very carefully chosen, Harpur for example had excellent road and rail facilities, but owing to high hills and the prevalence of frequent cloud and mist was extremely difficult to locate from the air - indeed one airman quoted:

> *The district is noted for bad weather, being 1400 feet above sea level and some 300 feet above Buxton itself. It must have the most severe weather of any home RAF unit.*

There was strong opposition from the Duke of Devonshire to the building of a large ammunition depot in the area, principally since Buxton was a popular Spa Town. In this case an Exercise of Compulsive Powers proved essential for requisition, though it was later necessary to relinquish rights to Burbage, a second site closer to Buxton which had been intended for use as an incendiary site.

All the depots were to hold identical stocks for security and had sub-units (MSUs) or satellites, typically disused railway tunnels, examples being the Swainsley tunnel at Butterton near Leek and Rowthorne, a 970 yard tunnel near Chesterfield, both of which were used by 28MU. Linley Caverns, a disused stone mine at Aldridge near Walsall was converted into a substantial underground depot, whilst Chilmark took control of a new site at Newland in the Forest of Dean, comprising three railway tunnels totalling 1800 feet in length. The function of this unit was to store ammunition for units in South Wales, since these were considered to be outside the operating range of either Chilmark or Fauld. There was also the question of storing a large quantity of doubtful explosives captured from Italian shipping in 1940

which for safety reasons was ideally held away from the main depots. Formally one of these tunnels had been allocated to the National Museum of Wales for the storage of art treasures, but the claim was relinquished when the RAF showed interest. The total cost of providing services, access roads, and Decauville narrow gauge tracking for the Newland depot was around £5,000.

During the Spring of 1939, No 42 group was formed, the prime function of which was the storage and supply of explosives and ammunition. The other function of the unit was the supply of aviation and MT fuels and oils which is outside the scope of this document. The group initially comprised 2MU Altrincham, 2MSU's Pulham & Ridge Quarry, 11MU Chilmark and 21 MU Fauld.

The War Department had also requisitioned several large underground Bath-stone quarries in the Corsham area to be known collectively as the Central Ordnance Depot. The three principal sites were Tunnel, Monkton Farleigh and Eastlays / Ridge. Owing to pressure from the W.O. for storage purposes the latter quarry was the first to be used though in its unfinished state. Ridge Quarry was loaned to the RAF in November 1936, becoming *RAF Holdings - No2 MSU*. Its intended capacity was 5,000 tons of 250/500lb GP bombs, plus 8,000 tons of other explosives, principally TNT. This unit comprised 6 acres of underground workings some 90 feet below the surface, access being via a 1 in 3 inclined shaft utilising winch and hawser. Alternatively a vertical shaft could be used in emergencies - a 33% capacity flow through then being available. Monkton Farleigh, the largest single underground depot in the UK was used for a short period by the Air Ministry and was until recently open to the public as a tourist attraction. Eastlays was also used for the duration of the war by the Air Ministry. On the 10th October 1940 Ridge became a sub-station of 11 MU Chilmark. A new road was constructed giving improved access to the nearby Eastlays depot, and from this site all main roads to the railhead at Beanacre Halt were widened to improve transportation. One further quarry in this area was used for a short period. In March 1942, Elm Park was transferred from 7 MU Quedgeley (No 40 group RAF) to 42 group until it was returned to the Admiralty in August 1943. Earlier this year a second shaft had been opened at Ridge adding a further 1500 tons, giving a total storage capacity of the Eastlays / Ridge site of 28 kilo-tons.

A further underground site at Grange Quarry near Holywell was used as a sub unit for Fauld before transferring to Llanberis during the early part of 1942. This depot was until recently open to the public as a museum.

AMMUNITION DEPOTS
(15 - 20,000 tons)

MU	Parent	Sub-site
2	Altrincham	Pulham
11	Chilmark	Eastlays / Ridge
21	Fauld	Holywell
28	Harpur Hill	Rowthorne, Butterton
31	Llanberis	Rhiwlas

These main holding units were named Storage Depots, and were intended to hold stocks of up to 25,000 tons of high explosive, which would be routed principally by rail to intermediate units designated Air Ammunition Parks, each holding in the region of 1,000 tons, theoretically one weeks war consumption. The AAPs, which would only be used in a state of war, would ideally be sited in areas adjacent to the bomber bases. Transport to the airfields would then be by road and it was initially planned to hold cushion stocks of four days requirements at each station.

The 1937 plan detailed five such parks, these being located close to the following places - Boroughbridge, Wheatley, St Neots, Newark and Lockington Station. (These approximated to Brafferton, Eynsham, Lords Bridge, Norton Disney and Southburn.) Within the next two years the list had been amended as follows.

Air Ammunition Parks

No.	Location	Parent and stations served
1	Southburn	DRIFFIELD, *Leconfield, Catfoss*
2	Brafferton	DISHFORTH, *Leeming, Linton, Topcliffe, Catterick, Church Fenton, Thornaby*

3	Norton Disney	BINBROOK, *Cottesmore, Finningley, Waddington, Grantham, Digby, Hatfield Woodhouse, Kirton in Lindsey Hemswell, Newton, Scampton, Hucknall*
4	Barnham	HONINGTON, *Horsham, Feltwell, Bircham Newton, Swanton Morley, Watton, Stradishall, West Raynham, Coltishall, Marham, Wattisham, Mildenhall,*
5	Lords Bridge	BASSINGBOURN, *Cranfield, Wyton, Upwood, Duxford, Debden, Wittering*
6	Eynsham	ABINGDON, *Brize Norton, Upper Heyford, Bicester, Honeybourne, Chipping Warden, Moreton in Marsh, Harwell, Wing, Pershore, Wellesbourne Mountford, Thame, Oakley, Weston on the Green, Islip, Oxford, Kidlington*
7	Staple Halt	MANSTON, *West Malling, Bekesbourne, Eastchurch Lympne, Detling, Hawkinge*
8	Mawcarse	LEUCHARS - *and Scotland*

On the 2nd November 1939 the Parks became Maintenance Units, and were renumbered by adding 90, thus No 1 AAP became 91 MU.

The reasoning behind the naming of Norton Disney has always posed a problem. The site was originally known as Swinderby, however in 1940 the airfield with the same name opened. It was then decided to rename 93 MU Norton Disney, however this was met with opposition principally since 93 MU was closer to Swinderby than the airfield and the latter was closer to the village of Norton Disney. Whether it was meant to confuse the enemy no one will ever know but the objection was overruled and 93 MU officially became Norton Disney on the 4th October 1940.

CAMOUFLAGE

The earlier storage units suffered several air attacks, the frequency being roughly in proportion to their age and proximity to the South East. At Chilmark RAF Officers and Airmen worked together, alongside the Army guard, Works services and the Railway Authorities for up to 14 hours a day in August 1939 to conceal the entire unit. Despite this the depot still suffered more than its fair share of air attacks, most of which were unsuccessful. During the first three months of 1941 there were several instances of Ju88's bombing and strafing the camp, again mainly without success. Altrincham was attacked during the Manchester raids of 1941 when some 300 incendiaries plus HE bombs fell and ignited the unit's own incendiary store. As a result of prompt action by the staff the spread of damage was inhibited and two staff were commended by 38gp HQ.

During the Battle of Britain period Staple Halt was machine gunned by low flying aircraft. Shortly after this the unit closed and was replaced by 36 MU at Snodland. Different camouflage schemes were required at the AAPs to ensure that they blended in with the surrounding land. For example Brafferton and Norton Disney were surrounded by grazing land, Southburn by ploughland, Lords Bridge by ploughland and stubble, and Barnham by heathland and conifers.

One very obvious target was that of 53 MU, Pulham owing to its rather obvious airship hangar. With foresight it was decided in mid 1939 that this unit should only be used for the storage of non-explosives e.g. tail units. In the first two weeks alone of June 1940 this site received ten air-raid warnings and was attacked twice. The shed was rapidly camouflaged as a result of which the site received even more attention from the enemy! In the early part of 1940 Chilmark produced some very effective "Green" concrete which was quickly tested for the effects of weathering. The effects of the tests are not recorded.

The System In Operation

Under normal conditions a bomb would start its journey at either a factory or a port. It would be routed to the Storage Depot by rail and on arrival would be transferred to either narrow gauge railway, or unit MT for delivery to the stacking area at the site. When required it would be transferred again by narrow gauge or MT to broad gauge railway for delivery to the AAP. At the AAP the device would be stacked again involving transfer by MT until required by an operational airfield, upon which the Station MT - usually a heavy tender - would collect the devices.

The actual amount of handling was thus:

1) Transfer from Factory, or Port to main line Railway
then transport by road or rail

2) At the Ammunition Depot transfer to narrow gauge railway

3) Narrow gauge to stocking site
bomb now in storage until required, then -

4) Stocking site to narrow gauge

5) Narrow gauge to Main line or Road transport
then transport by road or rail

6) At the Ammunition Park transfer from above to stacking site
bomb again in storage until required, then -

7) Stacking site to Airfield MT.
final transport by road

8) Airfield MT to airfield bomb dump

9) Bomb dump to bomb tender.

Thus nine stages of handling were required to route each item from source to airfield. It was soon obvious that this scheme was highly inflexible and grossly inefficient, involving a phenomenal turnover at all units involved. The system clearly called for some dramatic streamlining if the requirements of the bomber force were to be met. Early in 1941 major reorganisation took place with the advent of the Forward Ammunition Depot scheme.

The plan, finally adopted in late 1941, proposed that the Ammunition Depots were renamed Reserve Ammunition Depots, (RADs), and the Air Ammunition Parks became Forward Ammunition Depots (FADs).

Later smaller units using the existing abbreviation of AAP were used, (this time meaning Advanced Air Park) to supplement the FADs. The present FADs were expanded from 750 tons capacity to 10,000 tons and several new sites were added. Operationally this meant that under normal circumstances the main holdings (RADs) would be short-circuited, factories supplying the forward units directly. In practise it was found that 95% of items were delivered direct to the FADs. Under extreme circumstances, eg. in case of urgent needs, then the factories would supply individual airfields directly. During the peak period of late 1944 some 25% of items were sent direct to the airfields. An overall improvement in efficiency over the previous system in excess of 60% is recorded, the main saving being a dramatic reduction in the amount of rail and MT overhead requirements.--

The aims of the Reserve Dumps were now as follows:

1. To receive, store, issue, modify and maintain reserve stocks of explosives, typically 20 - 40 kt.

2. To cover overseas shipping requirements

3. To buffer normal supplies to the FADs

4. To distribute smaller items to the FADs which, because of their size and quantity would be uneconomical if shipped direct from the factories, e.g. detonators.

The Forward Depots were tactically sited to store and receive directly from factories and ports, and to issue to local units - typically 10-15 heavy bomber airfields ideally within a 25 mile radius. The FADs would therefore hold a large cushion stock of active explosives which would only be used to cover periods of breakdown due to unforeseen transport and production problems, and to cater for sudden changes of pattern in Bomber Commands requirements. The New Advanced parks were intended largely to provide for coastal and fighter command stations, whose requirements were relatively small and infrequent compared with the needs of Bomber Command and were normally fed directly from the Reserve Depots, typical holdings being 500 - 1,000 tons of high explosive. One such unit, Kiplin in North Yorkshire originally a depot for the fighter stations at Catterick and Scorton was intended to supplement its neighbour at Brafferton, by supplying the nearby bomber stations of Leeming, Middleton and Croft, and as such became a small FAD in its own right.

FADs constructed during the war were built on very different lines from the earlier parks. Instead of one large traversed HE area, the explosives were stored in dispersed dumps in woodland. Generally sawdust and woodchip roads were used; a system which proved extremely successful since they remained intact even in high wind conditions. 80, 100 and 202 MU opened in 1941/2 and were known as Field Storage Depots. By 1945 some thirty depots were operational, apart from satellites.

MID WAR EXPANSION

In the autumn of 1941 it was realised that the supply of bombs from factories and ports greatly exceeded the storage facilities of No 42 group and consequently many temporary sites were rapidly brought into operation. These included Hollins Wood at Parlington near Garforth, Tumby (Lincs) held 3 kt, Edlington (Yorks) - 10 kt, and Broughton (Lincs) - 10 kt. Harewood Forest became a sub-site of Longparish and stored 40 kt, and Whittlewood Forest near Silverstone held 30 kt. Other major sites proposed at this time for development as Forward Ammunition Depots were Milford (Staffs), West Perry (Hunts), Park End (Forest of Dean), Cranford (Northants), Drumchardine (Inverness) Savernake Forest (Wilts), Newthorpe (Yorks), Belvoir Castle (Leics), and Woburn Park (Beds). Emergency Reserve Depots were planned for Swynnerton Old Park (Staffs), Ercall Head (???) and Wyre Forest. Mention also has been made of Dukeries, Yardley Chase, Salcey Forest, Haynes Park and Hatley Park. The majority of these sites were used for a relatively short period after which they ceased to exist, many being absorbed (or their contents were), into larger units. There was a proposal to construct a 12 kt FAD at Ilmington near Chipping Campden in October 1942, however this was abandoned several months after work commenced when its prospective airfields were found to be only partly operational. (This appears to be an anomaly as the local bases were 91 and 92 OTU stations most of which had been operational for some time. Furthermore the locals cannot remember construction of the depot, though around this period there were large quantities of bombs stocked alongside the Fosseway.

Edlington was suspended when notice was received from the Air Ministry concerning a planned heavy bomber base at Tickhill - this failed to materialise but work at the FAD never resumed. Work was proceeding with great speed at Parlington as the site was intended to relieve much of the work of Norton Disney and Brafferton when in September 1941 it was discovered that there was a Starfish decoy site less than half a mile from an area destined to hold several thousand tons of high explosive! The stocks were rapidly moved to a new site at Escrick.

June 1941 saw the opening of satellite parks at 92, 93, 94 and 95 MU to be stocked with 20, 40, 250 and 500lb bombs in a real attempt to take the pressure off the FAD main sites. The selection of suitable satellite sites proved to be a never ending problem principally due to the ever increasing stocks and the stringent demands of safety distances. There was also the problems of transportation, rail transport was ideal for supplying weapons to the sites but already the network was stretched to capacity. Bombs would be issued to airfield MT - hence sub-units served only by narrow country lanes were far from satisfactory. Norton Disney found an ideal satellite but on application for requisition were informed that it was soon to become Bircotes airfield!

There were further problems involved in obtaining the labour required for construction of the new sites. All suitable local labour was generally utilised in airfield construction as this had No 1 priority. However new airfields demanded increased stocks at the FADs which in turn required additional storage sites. Fortunately unlike airfields FADs could operate in a limited capacity when only fractionally complete.

In February 1942 28MSU Shane's Castle opened as a forward depot for the whole of Northern Ireland, and, in an attempt to optimise the supply situation in the south-west, the disused Lansalon china clay pit near St Austell was requisitioned to serve airfields in Devon and Cornwall. It was declared ready for stocking in September 1942, though it seems doubtful that the site was ever used despite being designated 230 MU for a period.

In November 1942 a thorough search was made in the Ilkley and Yeadon area for disused quarries which could function as reserve depots; though none were eventually selected for further development. A detailed study was then made concerning the mines and caves of Britain as it was declared that these would be ideal as underground reserve depots. Again none appear to be found suitable, possibly as the threat of aerial attack had greatly diminished. There was also definite evidence that the newer field storage depots were proving entirely satisfactory regarding storage and more particularly handling requirements. By the end of 1943 two underground sites, Rowthorne and Newland (now 11MSU), had been reduced to closed status due to the cumbersome methods of handling the now more common larger weapons in restricted areas.

Linley too was closed as it had been somewhat of a disaster since conception. It was originally designed as a 25 kt depot with a turnover of some 600 tons per day. Despite almost £1 million being spent in developing the mine, an inspection in July 1941 revealed that many parts of the underground workings were in an extremely dangerous and unstable condition. Though a further grant towards stabilising the floor of the mine had just been

awarded by the Treasury this was deemed a total waste of money as massive stone blocks seemed to be for ever falling out of the roof. An official statement was issued declaring that:

> *" - it is strongly advised that no equipment or persons are in these areas during a roof collapse."*

This now seems somewhat of an understatement as many roof-falls were reported to have been of the order of 20 tons.

The status and function of many units changed several times during the 1942-44 period as the airfield requirements varied. Southburn, near Driffield, one of the original pre-war parks was almost closed during this period as many of its surrounding airfields could be supplied from the larger depots. However a compromise was reached and 91MU was reduced to AAP status. Similarly the only Scottish FAD at Mawcarse near Kinross became an AAP when the advanced site at Redcastle on the Beauly Firth opened and shared the workload. Market Stainton, previously a sub unit of 93MU, became a large FAD in its own right in June 1943.

As a last resort to overcome the desperate shortage of stacking facilities the system of roadside storage was approved and most depots began to search their surrounding areas for suitable sites - ideally class B roads with wide verges. The approved method of storage is shown in below. Generally stocks would be unguarded, although both ends of the road in question would be closed to all except local residents with passes. It was found desirable to cover the stocks wherever possible, usually with tarpaulins, as there had been several instances of bombs found with dangerously rusted and corroded handling lugs due to unprotected open storage for lengthy periods. By November 1943 with most FADs stocked well beyond capacity, the order was given to allow selected airfields on care and maintenance to be used as sub-units by 42 group. The first stations utilised in this way were Connel, Cottam, Kirknewton and Macmerry.

42 GROUP IN OPERATION

Turnover of the group had changed from 350 kt during the first year of the war to 3200 kt during 1944. The weapons too had changed; from the 'standard' 250lb GP bombs, the 500 lb MC & GP bombs to the 2,000, and 4,000 HC devices being the principal units. Later the 8,000, 12,000 and 22,000 lb bombs started to be used in ever increasing quantities. By comparison SAA was relatively easy to store which is fortunate since in July 1942, 42 group had 400 million rounds of .303, and 50 million rounds of 20mm in stock. Though High Explosives and Incendiary constituted the bulk of the stock held at the FADs, they were also responsible for nose and tail units, pistols, delay pistols, exploder adapters, detonators, lugs, bolts, arming wires, target indicators, reconnaissance flares, flame floats, window, signal cartridges, plus numerous miscellaneous items including "special" weapons. The forward depots also stocked AA ammunition for the army defence of operational airfields.

Prior to 1943 the units would normally receive deliveries of oxygen from British Oxygen Company for delivery to the airfields, but again with rapidly increasing demands certain units were equipped with Kentford plants which enabled them to manufacture their own supply. This scheme began in April 1943, the first units being supplied to 202, 36, 92, 233, 231, 98 and 96 MUs. As an example of the scale of this operation, 100 MU was refilling some 2700 bottles per month, during the peak of the bomber offensive, whilst 231 MU filled a record total of 222 cylinders in one day.

From around 11 am each morning the Master Provision Officer located at RAF Fauld would receive the orders from the airfields of all items under heavy consumption or in short supply. Typically these were 1,000 & 500 lb bombs during tactical operations, and 4,000 lb devices during strategic periods. Considerable pressure was placed on the MPO when Bomber Command made sudden changes in their methods of attack, e.g. with virtually no warning Bomber Command would change from tactical to strategic operations.

Despite these difficulties the units took great pride in being able to meet the rapidly changing needs of bomber command. For example in early March 1945, 617 Sqd. Lancasters received 48 off 12,000 HC bombs which had been requested at short notice to attack a factory the Amiens -Albert Road. Five hours earlier these devices had been in storage at 93 MU covered with thick ice and snow. The delivery of the bombs to the airfield involved a 40 miles journey on treacherous icy roads. The same unit ran out of 4lb incendiaries in December 1942, having issued a quarter million of the devices in a three day period.

The first 4,000 lb HC bomb to be used by Bomber Commend was delivered 12 via Barnham. The airmen at the FAD had not seen one of these before

and presumed it to be part of the boiler system for the cookhouse. Fortunately it was not "fired", though it could possibly has some bearing on the term "cookie".

Though the original aim was for the Reserve Depots to hold identical stocks for security reasons, this was not the case with the FADs for practical purposes. Hence 95MU had special areas for the storage of PFF devices, 96MU had facilities for filling considerable stocks of smoke bombs for its OTUs, and 233 eventually became the main depot for Grand Slams, being the sole unit equipped with a modified Bay City crane - the only device capable of handling these weapons.

Unlike Reserve Depot satellites however, FAD satellites would hold identical stocks to the main unit for two reasons. With MT sections from up to 25 airfields visiting each FAD daily to collect their requirements it was prudent to allow each airfield to use a sub-unit if this was geographically more convenient than the main depot. This practise would also help to conserve supplies in the event of enemy attack or accident. Operationally each FAD would issue a timetable to its airfields detailing times for collection in order to alleviate bottlenecks.

PREPARATIONS FOR THE INVASION

42 Groups principal function was the supply of explosives to Bomber Command, the requirements of fighter and coastal units being minimal by comparison. Hence the number and size of depots in the south of England was very small during the early part of the war. 64MU opened at Ruislip in November 1941, initially to supply Luton, Hatfield, Hunsdon, Sawbridgeworth, North Weald and Southend.

Sub-sites were soon operative at Woodside Place, (Hatfield) and Oaklands Park near Newdigate. The latter unit was opened to feed the more southerly stations at Tangmere, Manston, Ford, Shoreham and Croydon. Later still additional units opened at Black Park (Iver Heath) for Northolt and Heston, Warley Barracks (near Brentwood) to supply Hornchurch, Bradwell Bay and Southend; and Browns Mill (where is this) feeding Luton. 64 MU and its satellites were gradually absorbed by 94 MU in 1945.

A disused quarry at Snodland (36 MU) had served most of the southern fighter and coastal command bases until major reorganisation in 1942 when Newdigate was transferred from 64MU to become the main unit, Snodland then serving as an MSU.

In February 1943 Newdigate transferred to Russ Hill House at nearby Charlwood, and by the end of the year the three units were stocking over 6 kilotons of weapons for use by the 2nd TAF. Two advanced sub-sites, Dorking and Redhill (for Kenley, Biggin Hill, Croydon and Gatwick) opened in 1945.

Longparish became the principal Reserve Depot for the 2nd TAF, with additional support from Chilmark. A general estimate was that the group would require to store 115 kilotons of HE, and 62 kilotons of incendiary during the 1944 invasion period. Throughout the whole of this time certain items, notably 500lb 'dive' bombs, rocket motors and 60 lb rocket heads were in such short supply that they were always routed direct from factory to the airfields with virtually no involvement by 42 group.

Three specialised units were formed during the first quarter of 1944 to prepare for transfer to Europe. No. 422 Advanced Ammo Park was formed at Copped Hall, Epping in February, but soon moved to Bury Lodge where it was renamed 422 Advanced Fuel and Ammo Park. The unit then transferred to Slindon Park near Arundel before its final English destination at Holmsley South. In late March No 423 AFAP was formed at Willinghurst, followed two weeks later by No 424 AFAP at Aston Down. The latter unit transferred to Groombridge, near Tunbridge Wells before moving to France with the other units.

INFRASTRUCTURE

Each Forward site would normally consist typically of a Headquarters building, admin building, 3 bay MT shed, 5,000 galls fuel storage, equipment store, picket posts and a guardhouse. The larger FADs (91, 92 and 97 MUs) were initially planned to be manned by 2 officers + 79 airmen, whilst 93 - 96 MUs would be manned by 2 officers + 125 men. Later these figures were increased to up to 10 officers and up to 500 other ranks. A RAD would have typically 5 Officers and 150 O/Rs.

The depot would be surrounded by an unclimbable fence. Nissen accommodation was normally provided. Transport inside the unit was achieved by substantial roads and in the case of the reserve depots, Decauville narrow gauge railways. Each unit had specialised fire sections to deal with: H/E, incendiary, components, pyro and SAA, oxygen, general domestic. Woodchip roads were used very successfully at many of the field depots, however

when these proved unsuitable Sommerfeld tracking was used to stabilise the ground. 93MU used over a mile of tracking in this capacity at its Spalford sub-site. Hutted accommodation was urgently required at the reserve depots to protect much of the stock from the elements and as Nissens were in extreme short supply owing to their success in accommodating personnel, a new type of hut - the Igloo was used for this purpose, some 250 being supplied to Longparish alone.

ACCIDENTS

There was a very serious underground collapse of the main tunnel at Llanberis on Sunday 21st January 1942, whilst a supply train was discharging its contents. Though no loss of life occurred, the 27 truck train and some 14,250 tons of depth charges, bombs and TNT were buried by the collapse (at the time this represented 14% of total RAF stocks). 9,000 tons had to be removed urgently and many devices were found to be in an unstable state with liquid exuding from them. It was necessary to rapidly install a narrow gauge railway in the emergency access tunnel at the rear of the mine to enable the explosives to be removed. As a temporary measure the stocks were moved to the adjacent SAA and pyro sub-site at Rhiwlas. The seriousness of the situation was such that it took ten months to recover the explosives from the buried area, though only 19 bombs were eventually found to be damaged beyond repair. The accident occurred through a miscalculation in the weight of the slate fill over the roof.

As a result of this accident, immediate checks were made on other underground sites and the roof of Harpur Hill was found to be dangerously cracked in many places. Temporary supports were hastily moved in, but it was necessary to completely empty the mine in order to effect more permanent repairs. In order to clear the tunnel as quickly as possible, all overseas shipments were made from this unit and work was hastened on the new MU at Wortley allowing the tunnel to be emptied in about 1 month.

On 3rd December 1940, a fused 250lb A/P bomb returned from Linton-on-Ouse exploded whilst being unloaded at 92MU setting fire to a ammunition lorry and killing three airmen. Later two NCOs received the BEM for their prompt action in dealing with what could have been a much more serious incident. On the 4th February 1944 at 1600 hrs there was an explosion involving an Ammo train at Catterick Bridge station - Kiplin's loading depot. One airman was killed, and eight were injured.

Since the FADS were tactically sited there was of course the likelihood of being struck by allied aircraft. On 26th June 1943 a Halifax from Topcliffe crashed within a few yards of one of Brafferton's HE areas, fortunately no damage to the unit or personnel resulted. During the Manchester flying bomb attacks in 1944 one weapon fell somewhat short and landed in the depot at 100 MU but fortunately caused minimal damage.

By far the most serious accident was the huge explosion at Fauld in November 1944 which killed 68 and seriously injured 22. This incident instantly devoured 1584 off 4,000lb bombs, (or 3670 tons of HE) producing a crater of some 12 acres, and causing extensive damage up to a mile away. Although never proved, the most likely cause of the explosion was the use of a brass chisel on a CE exploder fitted to a 1,000lb MC bomb - a practise which was believed to be highly dangerous. A report of this incident can be found in After the Battle magazine - No. 18.

An immediate consequence of this incident was to review the HE storage levels and safety distances at all airfields and storage depots. Originally designed to give maximum safety, these had been continually relaxed since the beginning of the war owing to increasing stocks and insufficient storage capacity. This then placed enormous pressure on all units at the same time as turnover was running near peak level. One airfield of consequence was Lindholme where it was discovered that a major road ran within feet of the HE storage dump!

CHEMICAL WEAPONS

Prior to WW2 the British government approved the manufacture and storage of two principal weapons - Phosgene, a particularly nasty highly concentrated choking gas; and dichlorethyl sulphide, more commonly known as mustard gas. This is actually a brownish oily liquid which apart from its deadly choking properties results in terrible burning and blistering when in contact with the skin, and was often referred to as liquid vesicant.

Primarily with hindsight of "the trenches" mustard gas had been shipped to France with the BEF at the beginning of 1940, however all stocks were successfully returned in June via Fowey and transported to 28 MU where a great deal of time was spent in inspecting for gas leaks before putting the units into store. A new section of Harpur Hill ('E' site), plus the sub-site at the Butterton railway tunnel, was set aside for this purpose.

In 1941 a new unit opened in a remote area of the North Yorkshire Dales - Bowes Moor. This unit was parented by Middleton St. George and became the main holding unit for chemical weapons including smoke devices.

As from late 1940 small supplies of these weapons, typically 65 lb mustard, and 250 & 500 lb phosgene bombs, were in fact held at all units usually at separate sub-sites. Each forward depot would have 1 corporal and 4 airmen specifically trained in the handling of these devices.

The coding of chemical weapons is somewhat of a mystery, partly because of its hazardous nature. Mustard was manufactured in a variety of forms with different physical properties, e.g. viscosity and freezing point, enabling the weapon to be sprayed from aircraft from both 'low' and 'high' altitudes as well as being used in bombs. At the mustard gas factories most of the workers called the substance 'syrup'. They were of course well aware that it was an extremely hazardous substance but many believed that it was simply the residue following the manufacture of certain other chemicals e.g. anti-freeze. (This is true, except that anti-freeze just happened to be a useful by-product!). The ICI and MoS called the principal variants Runcol and Pyro, but the latter was already an approved term in use by the RAF. Air Ministry documents frequently refer to 'H' type gases, e.g. HB, HD, HS, HT. The RAF themselves tended to use the code 'Y' for chemical and certain other specialised weapons ('X' already referring to conventional explosive weapons), and; thus we get frequent references to Y3, and Y13 type weapons - these again being variations of mustard.

During the first two years of the war the intended training plan for bomber crews in the use of chemical weapons varied almost monthly, however in December 1942 a 'Final Instruction' on chemical weapons was issued.

Nos. 88, 226 and 107 Boston Squadrons at Attlebridge, Swanton Morley and Great Massingham would train in the use of Low Spray (SCI); whilst Stirling squadrons 15 (Bourn), 149 (Lakenheath), and 214 (Chedburgh) would train in 65lb LC and 400lb SC weapons

However as plans for the invasion of Europe progressed it was decided to dramatically increase the amounts of chemical weapons at all forward units. It was feared that the enemy might resort to extreme measures once the invasion had started and plans were made to counteract accordingly -

> *"Should the enemy initiate chemical warfare, HM Government intends to retaliate in kind. . . . unrestricted heavy scale bombing against centres of German population best calculated to bring about a collapse of German moral."*

Though much of the information regarding chemical warfare is closed well into the next century, these retaliatory plans are well documented and would be of two types:

> 1) High Explosive and Incendiary followed by Phosgene.
> 2) High Explosive followed by Mustard Gas.

Though the first system would certainly result in civilian casualties on a massive scale, it was felt that the second would have a greater demoralising value on the enemy population, since it was pointed out that the decontamination of explosive damaged buildings is virtually impossible, and that every single mustard bomb used is of value since it cannot fail to contaminate something and thus hinder the enemy. Plans came close to being fruition to gas bomb the V weapon launch sites in Northern France as retaliation for the bombing of London. Fortunately this was not done as it was believed that gas weapons would be relatively ineffective against these sites and may possibly result in escalation of chemical weapons on both sides. In hindsight, with the knowledge that the Germans had developed and produced large quantities of the nerve gas Tabun, the decision was an extremely wise one!

The most common mustard gas weapon was the 65lb Light Case bomb - an extremely fragile device and notoriously difficult to transport in quantity any distance without incurring some percentage of 'leakers'. (The interior of the container required coating, and this was often not done well.) In late 1941, in an attempt to overcome this problem, the Air Ministry looked into the concept of bulk storage of poison gases close to the bomber stations and a preliminary proposal was made in April the following year for an installation in East Anglia. This was modelled on the Ministry of Supply storage site at Woodside adjacent to the main production and underground storage facility - Valley, near Rhydymwyn in North Wales. This site stored 1840 tons of liquid mustard in underground tanks.

Eventually five FADs were selected as being suitable for the provision of specialised sites. The first two sites were authorised in October 1942, and the remainder in December of the same year. The installations were designed and constructed by the Ministry of Supply with the co-operation of ICI, and were known as Forward Filling Depots by the RAF, and Advanced Chemical Parks by the USAAF. Each site was equipped with two or three lead lined underground tanks of 250 or 500 ton capacity, for the storage of liquid mustard. Large steel sheds were provided for the storage of empties, the filling (charging) of containers on a large scale, plus a bonding building, i.e. storage for at least 48 hours to guard against 'leakers'. The liquid mustard was circulated under pressure in the filling system, and distributed to two filling heads in the charging room which allowed 1440 off 65 lb LC bombs to be charged per day plus, in the case of FFDs 1 & 2, 144 off 500lb LC bombs. The remaining buildings were all of substantial brick construction - much more so then the usual mid war temporary construction. There were also bath and change rooms as well as emergency decontamination facilities *as shown below.*

FFD	Ammo. Depot	Location
1	Barnham	Little Heath
2	Melchbourne Park	Riseley
3	Norton Disney	main site
4	Lords Bridge	main site
5	Escrick	West Cottingwith

Nos. 1 & 2 FFD were under the control of the USAAF and were equipped with three tanks each filled with 500 tons of Runcol. They were designed to fill both the standard 65lb LC bomb, plus the American M33 spray tank. The other three units were operated by the RAF and would by used only for the 65lb weapon. They were each fitted with two 250 ton tanks and were filled with 500 tons of Pyro in the case of Cottingwith, and 250 tons each of Pyro and Runcol for FFDs 3 & 4. (these chemicals were also coded Y13 and Y25) The large tanks were 34' 10" in diameter and 15' 6" deep and the smaller ones 24' diameter by 15' 6". Water for the sites was provided from a borehole, (1,000' deep in the case of FFD 3), however sites 2 and 3 were also on RDC mains supplies.

The task of construction began in late 1942 and took over 18 months to complete. In June 1943, at the peak of the building program over 900 men were employed. All sites had separate adjacent rail sidings, with the exception of FFD2 which was some 5 miles away at Kimbolton.

Authors note: The Official History of the RAF 'Works' incorrectly states that seven FFDs were constructed instead of five.

THE 8th AIR FORCE

Since the RAF had planned to use Liberators and Fortresses as part of Bomber Command the arrival of the USAAF caused no immediate problems, several FADs and one main depot being transferred to the Americans in due course.

An initial requirement by the USAAF was for a main unit serving the function of a Reserve Depot. In true Air Ministry style they were offered 68MU Linley which had been virtually disused for some period due to water seepage and the poor state of the roof as described earlier. A second site was also offered, 220 MU Wortley, a new field storage depot consisting of 20 miles of good 2nd class roads near Penistone. This park was accepted and handed over to the US Service of Supply on the 1st October 1942 and a few days later Linley became a dormant depot used only for the storage of obsolete RAF weapons.

Four further sites were soon handed over to the Americans, these being the Chilmark MSU at Groveley Wood (Wilts), Sharnbrook (Beds), Braybrooke (Northants), and a new site Gaddesby / Great Dalby near Melton Mowbray. A planned RAF FAD at Wakes Colne near Sudbury was used until the new site at Bures was taken over.

Later the USAAF took control of several of the existing RAF sites - notably Barnham and Lords Bridge, the former being manned by the first US coloured troops to arrive in Britain.
In Dec 1942 No 42 Group agreed to supply oxygen requirements to 8th AF for first three months this being estimated at 9.5M cu feet.

USAAF Depots

with their intended capacity (kilotons)

Main Depots	
Groveley Wood	25
Lords Bridge	?
Wortley	25
Melchbourne	10
Warren Woods	20

Forward Depots, serving 10 - 15 airfields - typically:

Sharnbrook 17.5
Nuthampstead, Podington, Duxford, Thurleigh, Bovingdon

Braybrooke 17.5
Goxhill, Atcham, Molesworth, Alconbury, Grafton Underwood.

Bures 16.5
Andrewsfield, Ridgewell, Boxted, Framlingham, 9th AF.

Earsham 17.5
Shipdham, Hardwick, Bungay, Horsham St Faith

Barnham 20
Snetterton, Horham, Halesworth, Knettishall, Great Ashfield

Temporary sites

Gaddesby	21
Triangle Spinney	10
Cinderford	5
Kinghorn	25 (where is this)
Savernake Forest	10
Marston Magna	5

POST WAR

The year 1944 had proved relatively stable regarding the functioning of No 42 group, Despite the introduction of new weapons and having to cater for Overlord the system was now working well with all sites operating efficiently at around maximum capacity. The spring of 1945 however saw many changes as the ending of the war became a reality, the most important of which was the dramatic reduction in issues to airfields.

Initially this meant an immediate requirement for more storage sites as receipts at ammunition depots remained constant. A rough estimate made in May was that the group would receive some 15 kilotons per week from factories and ports during the next three months. This quantity was already in the production and transportation pipeline and could not be cancelled. Fortunately there were operational and training airfields which would soon become redundant and would make ideal temporary sites. Headquarters Maintenance command immediately organised a mass inspection of airfields and produced the following list of suitable sites.

Storage Airfields

MU	HQ Site	Airfields
11	**Chilmark -**	Long Newton & Charlton Horethorne
28	**Harpur Hill -**	Ashbourne & Darley Moor
36	**Charlwood -**	Redhill
53	**Pulham -**	Bungay & Seething
59	**Newland -**	Rhoose
80	**Escrick -**	Riccall
91	**Southburn -**	Cottam
92	**Brafferton -**	Acaster Malbis & Dalton
93	**Norton Disney -**	East Kirkby, Balderton & Fulbeck
94	**Barnham -**	Great Ashfield & Mendlesham
95	**Lords Bridge -**	Bourn, Nuthampstead & Ridgewell
98	**Mawcarse -**	Fordoun & Balado Bridge
219	**Gisburn -**	Great Orton & Annan
231	**Hockering -**	Old Buckenham, Shipdham, Attlebridge & Rackheath
233	**Market Stainton -**	Bardney, Caistor & Goxhill

These sites were available either immediately or in the very near future and would thus help in the current crisis. Some airfields were already in use by maintenance units, e.g. Tatenhill and Church Broughton had been rapidly taken over following the catastrophic explosion at 21 MU Fauld at the end of 1944.

Typically an airfield could be expected to safely store 15 kt of explosives on its runways taxi tracks and hardstandings.

At the end of the war the group had in excess of half a million tons of high explosive and incendiary bombs, plus tens of thousands of tons of chemical weapons. Some of this would be required for the Tiger Force and the war in Asia, and in July 233 MU sent its first Grand Slams overseas; however within a month 42 group realised that it had one enormous problem regarding the question of disposal of the stocks.

Within the first year most of the smaller and more remote units, e.g. Snodland, Redcastle, Hatfield and Warley, had already closed. 42 group HQ moved from Burghfield House to Kidlington in March

1946, and within three months most of the USAAF ammunition depots were returned to the RAF. More disused airfields were handed over to the group during the 1946/8 period, and at one time eastern Britain consisted of a few operational stations scattered between an enormous number of ammunition storage airfields.

However, despite adequate warnings to all pilots communications somehow went adrift in October 1945 when a DH Dominie en route from Stretton to Halesworth landed at Attlebridge amongst piles of bombs stored on the runway. The pilot, a Naval officer, had failed to notice the white 'landing prohibited' crosses painted at the ends of the runways.

Bridleway gate became a satellite of 2MU Altrincham and other stations which are documented as being used for ammunition storage include North Killingholme, Leconfield, Abbots Bromley, East Moor, Skipton-on-Swale, Elvington, Tholthorpe, Ludford Magna, Kelstern, Skellingthorpe, Fiskerton, Strubby, Downham Market, Witchford, Wratting Common, Elsham Wolds, Breighton, Metheringham, Sturgate, Gransden Lodge and Spilsby.

In February 1946 the agreed holding was to be 175 kt, but this was increased to 270 kilotons in December 1947 Ammunition stocks around this period totalled some 400 kilotons and included 300 Grand Slams, 3250 12,000lb bombs, 27,000 4,000 lb 'Cookies', almost a quarter of a million 1,000 lb GP/MC bombs, 17 million rounds of 20mm and 35 million rounds of .303.-- In 1946 this meant that some 300 kt plus had to be disposed by the three principal methods, i.e. deep sea dumping, returning to ordnance factories for boiling out, and by local demolition.

As an example, during the twelve months ending December 1948 39 kilotons were returned for boiling out, 13.5 kilotons were dumped at sea and 71.7 kilotons were disposed of by other means e.g. demolition and burning. This last figure includes a very high proportion of chemical weapons.

Deep Sea Dumping

In November 1945 275 MU was formed at No 2 Military Port, Cairn Ryan near Stranraer. It was equipped with 4 LCTs each of which could carry 100 tons per trip and in six months had dumped 42 kt of weapons. Three more craft were soon added and in May 1946 the unit dumped a record 14 kilotons in one month. Unfortunately only the smaller bombs could be disposed of by this method as the larger ones proved to be too difficult to manhandle at sea.

The following October the unit moved to West Freugh, only to close in March 1948 when Silloth became the principal port for deep sea dumping. Increased pressure on disposal however instigated the re-opening of the unit in February 1949 at Cairn Ryan.

Demolition

Generally only the smaller devices were dealt with in this manner and public heathland was used initially e.g. Cannock Chase. Later ex bombing ranges were used for this purpose. This method tended to be extremely unpopular with locals who having survived the horrors of the war now found themselves confronted with possibly greater danger and certainly a great deal of inconvenience.

There are many cases of irate letters being received by the Air Ministry from people complaining of bombs being detonated "at the bottom of their garden", plus the problems arising from burning tons of chemical smoke just down the road from a village. Methods of destruction varied from site to site and often depended on local ingenuity. In particular detonators were difficult to destroy safely. One unit constructed a furnace for destroying these devices but found that it had almost totally destroyed itself after the second burning. The Air Ministry eventually approved the so called "shaft method" of destruction which enabled 31 MU to consume 120,000 detonators per month.

Return to Factories

Undoubtedly the most ecologically sound method of disposal, this was used for many years after the ending of the war. In February 6,000 off 540lb bombs of the USAAF in one of the Corsham quarries were found to be in an unstable condition. Lack of ventilation in this part of the mine had also rendered the wooden dunnage unsafe and it was believed that a "drop of a few feet" may initiate. These stocks were very carefully removed for checking at Pembrey.

The procedure of returning bombs to factories tended to occur in phases, most of which were codenamed e.g. Operation Rocker Box was the return of all surplus fragmentation bombs to Pembrey in 1953, and in 1955 all surplus 500 lb bombs were returned to the same factory for boiling out under Operation Rear Light.

Roadside stocks

Despite a massive effort by 42 group personnel there was still over 50 kilotons of explosives lying on verges beside Britain's second class roads at the end of 1947. The severe winter of 1946 / 47 had hampered clearance but there was an additional factor. Unfortunately group HQ had overlooked the fact that a great deal of maintenance was required with stocks put into long term storage. During the war when turnover was high virtually no maintenance was required of bomb stocks; this had now changed such that increased manpower was required to inspect these stocks, a task which was aided by stacking the bombs less densely than before, but which unfortunately required even more storage facilities.

A further factor which hampered progress was the need to empty the underground sites of high explosive content. This appears to have been somewhat delayed following the disastrous incident at Fauld in 1944, but was now hastened when it was calculated that an explosion at Harpur Hill would not only totally destroy the whole RAF camp, but also the Safety in Mines Research Establishment, plus an ICI wagon repair depot. In future these sites would be used for SAA and incendiaries, their original contents being transferred to yet more airfield sites.

In the summer of 1948 more airfields were added to the groups already large number to assist in roadside clearance. Those finally chosen after several months of debate during which some sites closed and reopened were: Fulbeck, Balderton, Hitcham, Faldingworth, Holme-on-Spalding Moor, Melbourne, Riccall, Marston Moor and Bottesford.

At the end of the year the stocks had been reduced to 23 kilotons, and twelve months later 8 kilotons was the figure. There were clearly other priorities now since less than 4 kilotons were removed from roadside sites during 1950, and the day the final bomb was removed is not recorded however it is likely to be some time during 1951.

Chemical Weapons

Throughout the course of the war 42 Group had amassed some tens of kilotons of chemical bombs, plus large quantities of bulk mustard gas in store at the Forward Filling Depots. Clearly disposal of these noxious substances would be no easy matter.

Phosgene which was returned to ICI was broken down and then recycled commercially. The stocks of the extremely fragile 65 lb LC mustard bomb had reached such proportions that in March 45 a specialised unit was formed at Melchbourne Park FFD for decanting leaky CW bombs. Leakers from all units were sent to this site for disposal.

Experiments conducted at 81 MU Bowes in July 1945, under the guidance of the group's consultant Professor Peacock, showed that in one hour some 150 gallons of mustard gas liquid could be destroyed by burning, the smoke vapour emitted being "completely non toxic!"

An immediate problem arose with the announcement that the group's total stock of 150,000 65lb LC bombs CW bombs would be unstable by the end of the year and destruction must commence without delay. (Though hindsight showed this to be not true as many units were still disposing of these bombs several years later.) It was further stated that for safety this operation can only be done at 81MU.

The method eventually approved for mustard destruction was to 'fire' the storage sheds with the aid of incendiary bombs, the intense heat produced thus destroying the gas and decontaminating the shed at the same time. Later up to 5 tons per day were being disposed of this method. One airman based at 95 MU remembers destroying piles of mustard gas bombs at the Orwell satellite by pouring petrol on the bombs, adding a few incendiaries for good measure, firing several hundred rounds from a Sten gun to start the bombs leaking, and igniting the fire. Later the entire pile would be covered with copious quantities of bleaching powder.

The order then given to dispose of 30lb LC, 400lb SCI and 100 lb weapons - a grand total of 14 kt. To speed up the process it was decided in September 1945 that certain chemical weapons would be dumped at sea, and this process was hastened when very positive earth contamination was discovered at 81 MU the following summer. Mustard gas was transported to Liverpool and Barry Docks from whence it would be loaded into ships and scuttled in deep water. 31 kilotons was disposed of in this way in the month of August 1946, followed by further supplies at the rate of 1 ship per month. Phosgene was sent to Silloth from where it could be dumped at sea. Bowes Moor finally closed in late 1947, but the land still remains MoD property, due to contamination.

The ex USAAF base at Melchbourne Park was the next depot to receive priority for disposal, beginning in the Summer of 1947. This site, now

renamed Riseley, consisted of an extensive concreted area in Coppice Wood as well as the bulk Forward Filling Depot. The wood stored some 9,000 tanks each containing 55 gallons of Y3 mustard under pressure, and the disposal exercise was codenamed Operation Inkpad. This involved decanting the drums into burning pits, a process which took some eight months, after which the empty drums were decontaminated in a furnace. Again to hasten the operation a quantity of 'safe' stock was dumped at sea. The operation was completed by January 1949. Some 18 months later the site was declared clear and placed under care and maintenance, however an inspection in 1954 revealed that the site was so badly contaminated that it would remain Air Ministry property for an indefinite period. In fact it was finally declared safe in 1988!

The remaining chemical sites fortunately very much smaller were dealt with in the late 1940's. In October 1949 there were 21 active sites, and this total had been reduced to 11 by the Christmas of the following year. These remaining sites were inspected at six monthly intervals as most were believed to be clear, however the 95 MSU Comberton site at Marsh Close followed the fate of Riseley as it was known that there was serious ground contamination. It was finally released in 1989 and has just been purchased by a company who wish to continue the sites hazardous history by constructing a firework factory / store on the land!

The Forward Filling Depots

By late 1944 the five bulk chemical depots in use by the RAF and the USAAF were storing 4,500 tons of liquid mustard. Fortunately this had not been used in war and in June 1945 the depots went into care and maintenance, FFDs 1 & 2 being transferred in due course to the RAF from the 8th AF. In June 1948 an inspection revealed that only the Lords Bridge depot was serviceable and that spare parts were required to make the remaining units functional. Nine months later the order was given to make all units fully operational.

Apparently all units remained under Care and Maintenance until 1954 when it was decided to dispose of the Little Heath and Cottingwith sites (FFD 1 & 5). Clearance of the former site began in late 1953 under the codename Operation Pepper Pot. Five trains were used to empty the three underground tanks and the liquid mustard was returned to MOS / ICI where it was used to fill 1,000 lb bombs. The empty pots were then sprayed to decontaminate after which they were filled with scrap material and items thought to be suspect! By November 1954 the Ministry of Supply had declared the area clean, but as a safety precaution the entire site was treated with bleach solution and the ground harrowed to a depth of 18". The pots themselves were sealed and contained within a security fence.

The other four sites were all dealt with in a similar manner around the same period. It is interesting to note that only now, some thirty years later is the land around these sites becoming de-restricted, though in most cases the pots are still in situ and surrounded by a security fence. Most, if not all sites are still inspected by the MoD at regular intervals and in 1985 there was a scare at Riseley when very positive contamination was found. The pots were broken open and decaying containers of liquid mustard were found inside. The state of the FFDs as at September 1989 is:

FFD1 - Barnham
The site is at present an industrial unit, with most buildings intact. The pots were (in 1992) surrounded by a fence and earth covered.)

FFD2 - Melchbourne
There was a scare in 1987 reported in the RAF Mews, when full mustard gas containers were found leaking inside the pots. The pots were re-opened and decontaminated. Today the entire FFD site is clear except for the chemical store / emergency bathroom. This contains chemicals which are obviously used for decontamination. There is free access to the pots which are partly open at the top.

FFD3 - Norton Disney
The site access gates were locked in April 1989, but open in July. A MOD sign still guards the entrance. The large metal sheds have all been cleared, but most of the brick buildings remain, though all are very heavily overgrown with bramble etc. The area around each pot is enclosed by a rough fence, and the tops of the pots are covered by mounds of earth.

FFD4 - Lords Bridge
The entire site is part of the Cambridge University / Mullard Radio Telescope site. The FFD site is virtually intact with only the boiler house and a storage building missing. However it is totally fenced off and very heavily wooded making viewing impossible. The two pots are still inspected at regular intervals.

FFD5 - Escrick

The large steel sheds have been cleared but most of the brick buildings remain. Each pot is enclosed by a substantial steel fence bearing MOD notices, and the tops of the pots have been encased in concrete.

OPERATION DISMAL

When the Allies over-ran Germany in 1945 they made a rather terrifying discovery. Situated in a well protected store was a large quantity of chemical weapons containing an mysterious liquid. Code-named 'GA' the substance turned out to be Tabun - the world's first nerve gas and described as "dozens of times more powerful than any chemical weapons the allies possessed".

Each bomb was consisted of a steel case, 14" in diameter - rated at 330 lbs (250kg ??) LC contained 190 lbs of the gas - described as a dark oily liquid with a faint fruity smell. As a result of a visit to the storage depot in March 1946, the decision was made to transport a large quantity of the weapons to the U.K., the reason being that they would be "nice to have!" A suitable site had to be found for storage purposes and Llandwrog airfield was chosen, partly for its remoteness, and partly for the prevailing wind direction - an important factor in the event of leakage. The sole purpose of the unit - numbered 277 MU, was the storage of these nerve gas bombs. 21 Bellman / T1 / T2 Hangers were erected on the runways to serve as stores for the bombs.

The first phase in the operation, code-named 'Dismal' consisted of the transportation of the Tabun bombs from NW Germany to the UK. The first shipment left Emden docks in September 1946 and arrived at Newport docks, from where the bombs were transported to Llandwrog. Skilled medical personnel were on hand, to deal with any accidents, and a total of 1700 tons was received during this first month. This transportation phase lasted until June 1947, by which time some 70,000 weapons had been received at the airfield. A further 600 weapons were also received from the underground Ministry of Supply factory at Rhydymwyn. The total stored then amounted to 17,000 tons, each in a wooden box 70" x 21" x 19.5". 3,000 bombs were stored in each hangar.

Preservation of the weapons consisted of first removing the nose cap detonators, and then coating the bomb in lanolin. This process began in September 1947 and was complete by mid 1950, after which the weapons remained in store for several years to ensure that there was no danger of leakage. Clearly this meant an extensive and regular inspection programme, and specialised Porton gas detectors were provided in all storage hangars, to ensure absolute safety for all maintenance personnel. The nose caps themselves were also preserved in mineral jelly.

277 MU was civilianised in September 1953 and became a sub-unit of 31MU Llanberis. At this time the only working function of the unit seems to have been an ammunition box repair unit, which also serviced the wooden crates for the Tabun bombs. The bombs had been filled in 1943/4 and the German technicians gave them a 'life' of ten years. At the time it was thought that this meant that chemical decomposition would render the weapons less useful, however regular analysis of the gas at Porton revealed that no decomposition whatsoever had taken place ten years later.

Unfortunately however some of the weapons started to leak around this period. It was discovered that the bomb cases were internally welded, and this was causing the problem. This was exacerbated by the inability to inspect the internal welding. Detection of one leaking bomb in 3,000 in a hangar was extremely difficult. There was also some risk of the entire airfield being submerged on very high tides, as a result of coastal erosion. The decision was taken to dispose of the weapons.

The safest method was by burning, but the technology was not really available in 1955, and it was estimated that by the time the operation was in full swing it would take 3 years before the last bombs were destroyed. This was too late. The next choice was to neutralise the bombs chemically. Tests showed that the best method was to use caustic soda. Unfortunately each bomb would then produce half a ton of 'fairly' toxic material which was again clearly unacceptable.

Disposal

The decision was then made to dump the weapons at sea. For safety it was agreed that scuttling old vessels would be much better than simply rolling the bombs overboard. Time would then neutralise the bombs since GA hydrolyses in water. One year later the process of bomb disposal began. The operation was codenamed Sand Castle and a stacking area, plus loading jetty was constructed at nearby Fort Belan. It was then decided that in order to economise storage it would be prudent to remove the tails of the bombs. This required the construction of a guillotine and in the forthcoming weeks all 70,000 weapons were shortened by 20". All personnel in the area were required to wear full anti-gas equipment. This operation also highlighted other potential problems in that several units were

found to still contain their fuses! It was also decided to fit a sealing plug in the detonator hole, as the detonator tube had proved to be the weak link regarding leakage.

The bombs were then individually returned to their crates and transported to Fort Belan where they were loaded onto LCTs ready for shipping. Even this operation was considered so critical that the fork lift truck operators practised for several days with dummy units before being allowed access to the real thing. The LCTs began operating in June 1955 and transported the bombs to 31 MSU Cairn Ryan where, over the next few months they were transferred to three elderly merchant vessels.

There was considerable local interest when one newspaper asked why had the Air Ministry bought an old hulk and sent it to the port, at the same time as high explosives were suddenly banned from the port. It is not known whether a 'D' notice was issued, however one documented theory is that we didn't want the Russians to know what was happening, since they were aware of our possession of the bombs.

In the summer of 1955 the *SS Empire St Clai*r sailed with 16,088 weapons and was scuttled somewhere off the Outer Hebrides (12' W, 56'30" N) in at least 1,000 fathoms of water. The following May the *MV Vogtlan*d was sunk containing nearly 29,000 bombs, and in July 1956 all remaining weapons were loaded aboard the *SS Kokta* to be dealt a similar fate. In August Cairn Ryan's operations were transferred to 28 MU Harpur Hill and by the end of the year both Llanberis and Llandwrog were placed under care and maintenance. An interesting but somewhat chilling phase in the history of chemical warfare had come to an end.

EXPANSION

At the end of 1947, two major ammunition supply divisions were formed; the Yorkshire Ammunition Area and the East Anglian Ammunition Area. This involved disbanding all units which were previously associated with these sections of the UK and quickly reforming them a few days later. The former division comprised nos. 80, 90 and 224 MU, under the command of 91 MU at Cottam; and the latter consisted of nos. 95 and 231 MU under 94 MU. Some idea of the size of these organisations can be gained by considering that 94 MU alone consisted of the HQ site at Great Ashfield, the WW2 FAD at Barnham; the airfields of Attlebridge, Bungay, Mendlesham, Nuthampstead, Old Buckenham, Rackheath, Ridgewell and Seething; plus the chemical weapon sites at Little Heath and Riseley.

The following August it was decided to split the East Anglian Area: 53 MU Pulham took control over Bungay and Seething; and Ridgewell became the parent for Lords Bridge, Riseley and Nuthampstead.

In 1950 the requirements of Bomber Command were reassessed under 'Plan Galloper' and it was decided to rationalise the ammunition supply situation by replacing the present large number of airfield sites with a maximum of seven units which would be called Permanent Ammunition Depots. An initial recommendation was that a new construction at Barnham, plus a disused airfield site would suffice, each likely to cost in the region of £1M. By September a large number of airfields had been investigated and Fulbeck and Faldingworth were proposed, though plans were also considered to replace Barnham by a second airfield site.

One month later Barnham and Faldingworth were confirmed as being suitable for development as PADs: the former would serve Honington, Marham, Watton, Wyton, Upwood and Bassingbourn; the latter to serve Binbrook, Coningsby, Waddington, Scampton and Hemswell. There was also the suggestion that a third site would be needed in Yorkshire. Acaster Malbis was geographically ideal but, owing to its close proximity to the city of York was dropped in favour of Riccall.

A detailed search was then made throughout the entire U.K for a new underground site, as the only depot operating at this time with any degree of safety and efficiency was Ridge Quarry (which was destined to close in the near future). The only suitable find was 'Shepherds Tump' in Radnor Forest, a site which appeared to offer excellent communications but would be difficult to develop and likely to cost over £1M. In view of the fact that half a million pounds had been spent on improving underground Llanberis in 1942, following the roof collapse it was decided to waive a recent decision to close the tunnel site.

One of the largest units in the group was 93 MU, with its HQ at Wickenby airfield. In May 1950 this HQ site controlled the following sub-units and satellites.

93 MU Wickenby, controlling Faldingworth, Ludford Magna and Strubby.

93 MSU Goxhill, controlling Caistor and North Killingholme.

93 MSU Bottesford, controlling Fulbeck, Balderton, East Kirkby and Metheringham.

93 MSU Norton Disney, controlling Skellingthorpe, the CW site at Spalford and its own Forward Filling Depot FFD3.

93 MSU South Witham, controlling North Witham and the Moor Lane satellite.

This unit therefore possessed a potential storage capacity of a quarter of a million tons of High Explosive alone, apart from incendiary and chemical weapons. Two years later, due to being overburdened this unit split with 92 MU reforming at Wickenby and controlling Goxhill, Caistor, Woodhall Spa, Faldingworth, Skellingthorpe and Ludford Magna. 93 MU handled most of the remaining sites with the headquarters moving shortly to Newton airfield.

By 1953 the 'Faldingworth / Barnham' plan had been confirmed - both sites had to be operational by 1956. However there were still many reservations. It was intended that each depot would store 50 kilotons of High Explosive, but there was strong evidence that the units would also be required to store 'special weapons', in which case the quantities of conventional explosives would have to be dramatically reduced. The possibility of constructing a third depot at Kingscliffe airfield was considered in depth, but eventually the overall feeling that the principle of storing all ones 'eggs' in two (or three) baskets was impractical. The final decision was to drop Kingscliffe and to retain a significant number of conventional 'disused' airfield ammunition depots.

Though the original estimate was £1M each for the PADs, in the event Barnham cost 3M and Faldingworth cost £3.5M. It is also significant that many of the operational stations e.g. Scampton and Waddington were soon to be equipped with their own very high security weapon stores,

The USAF requirements

In January 1949 there was a preliminary proposal to provide storage facilities for the United States Air Force in Europe. Four months later visits were made to four sites in East Anglia these being the FAD at Earsham, and the airfields of North Pickenham, Tuddenham and Little Snoring. At the beginning of June 280 MU was formed at Earsham. It was also proposed that the other sites would become sub units and store a total of 19 kilotons of HE, plus 11 kilotons of incendiary. Plans changed somewhat during the next two months when North Pickenham became 281 MU and assumed control of the other two airfield sites. Stocks began to arrive at the Watton railhead on the 11th August, and by the end of the month 475 wagons had delivered 11 kilotons of incendiaries to the site. Priority was now given to empty the old 8th Air Force depot at Warren Wood near Barnham; these stocks also being transferred in due course to North Pickenham. In June supplies of 100 lb bombs were received at the Tuddenham satellite from Germany. The estimated capacity for the unit was to be 27 kilotons and it was also decided that the second sub-unit at Little Snoring would not be required, despite still more stocks from a second 8th AF WW2 ammunition depot base at Sharnbrook being transferred in the following months.

The Americans then requested a major depot to accommodate some 30 kilotons of stocks. In mid September 6 airfields in the Oxford - Reading area were visited and Welford was proposed along with Grove available as a reserve depot. Three months later Welford was accepted and transferred initially to No 42 group. Yet another major site was proposed during 1951, this being Ramsden Park near Witney, however plans were quickly shelved for reasons unknown.

Wing airfield was used until Welford became available in the mid fifties, as much construction work was required at the latter site including the provision of three 10 kiloton storage blocks. 280 MU was no longer required by the USAF and closed in May 1953.

In 1956 282 MU Bicester opened to control Finmere and Wing.

RAF Barnham - Site Description

This site was sold by the MoD in the sixties and currently operates as the Gorse Trading Estate. The majority of its buildings are extant. As can be seen from the plan the unit was surrounded by three fences. The outer two were of barbed wire between which alsatian dogs roamed freely to at least visibly deter would-be intruders. At each corner of the pentagon shaped site is a watchtower. One present user of the base remembered occasionally being driven past the unit when it was active.

Evidently if your vehicle stopped on the main road for any reason at night, it would instantly be illuminated by a searchlight, and a MoD Police Landrover would arrive within the minute. Access to the central compound is via two very heavy

electrically operated sliding gates. Almost certainly ones papers would be very securely inspected before the second gate was opened.

Two of the three massive HE stores, surrounded by their substantial earth and concrete traverses are now used as industrial units - The third accidentally burned down a few years ago. Between the HE stores are the Special Weapon stores - each approx 10' square with a heavy steel door fitted with a combination lock. Apparently each unit was temperature controlled and was equipped with a doorswitch which informed the security block that access to that particular store had just been achieved. These buildings can only be accessed from a narrow pathway leading from the internal ring road. Steel guide rails prevent one from straying onto the grassed area surrounding these interesting buildings. One can only wonder what would be the effect of attempting to gain entry to the stores by an unofficial route!

The 'sister' PAD at Faldingworth closed in November 1972 and is currently occupied by BMARC - a subsidiary of Oerlikon who use the depot for testing weapons. Hence security is only slightly more relaxed than it was some twenty years ago.

Footnote.
Access to the more recent records of ammunition supply and storage activities is denied in a number of cases, many of which undoubtedly contain details relating to chemical and possibly nuclear weapons. The ORBs relating to No 42 group are still closed for the years 1951 and 1953 - 55 inclusive, the former being available in 2027 ! Strangely access has been granted for the 1952 ORB which makes pretty uninteresting reading! The group itself disbanded at the end of 1955, its activities being transferred to No 40 group.
(***All ORBs now open 2001)***

BOMB STORES AT AIRFIELDS

Airfield bomb stocks had risen from somewhat less than 150 tons in 1939 to an average of 800 tons in 1945. At the peak of the offensive certain operational stations were holding up to 3,000 tons of ready-use explosive.

Airfield bomb dumps were designed to store the following items, with emphasis being placed on safety and security: High Explosive bombs, incendiary bombs, fused bombs, tail units, small-bomb containers, bomb components (eg detonators, delay pistols etc), and Small Arms Ammunition.

The development of aerodrome bomb stores can be traced through three distinct phases.

Expansion Period (L scheme) stations - e.g. Finningley

Expansion period stations utilised a symmetrical layout comprising two separate 6 compartment HE stores (type 3054/36). Each compartment was traversed and held a maximum of twelve tons in three layers up to 5' in height. The store was built of brick with reinforced concrete floors and roof, and had three sets of double steel doors, plus a gantry and 1 ton lifting tackle per compartment. Smaller bombs defined as up to 120 lb, (usually of the 20 and 40 lb variety) were stored in boxes between the larger bombs - (See below.)

A separate enclosure for the temporary storage of fused and ready use weapons was installed, this having two covered and two uncovered compartments, each being fitted with gantries and lifting tackle. In addition three sets of articulated trolleys, and three x 1 ton chain tackles were provided

A twin compartment incendiary and pyro store and two separate component stores completed the bomb storage requirements. The latter building was divided into two compartments, the smaller one being for the storage of detonators, the other for fuses, pistols and exploders. All these buildings were traversed. The dump was always located some distance from the main technical area and had to satisfy the following criteria:-

> *There must be a minimum of 500 yds from each bomb group to the aerodrome perimeter, together with an ideal minimum 700 yds from aircraft hangars, villages or isolated houses. 120 yds was the minimum distance between groups and 12 yds between each individual bomb store*

Finally up to three fusing point buildings were provided, two for heavy bombs and one for small bombs. These were semi-underground sheds, 60' x 18', with a 30" earth traverse and were often located some distance from the main dump.

M Scheme & early wartime stations - e.g. Polebrook

M plan stations and those constructed during the first two years of the war utilised a much simpler bomb store in the shape of individual 30' square open compartments protected by a 5' earth traverse and capable of holding up to 24 tons of HE; (Bomb store type C, 5416/40). The bombs were normally stored around the internal perimeter, thus enabling cranes and loading vehicles to enter the bay. By late 1940 these dumps were already holding up to twice the intended quantity.

The earlier fused and ready-use bomb store was also installed though the gantries were no longer fitted. The component stores remained basically similar, however the incendiary and pyro store was replaced by a larger three compartment design, having two compartments for incendiaries and one for pyro storage. In fact this design had already been used at many of the expansion scheme stations. In January 1941 it was decided to increase ammunition levels at all bomber stations. Heavy bomber and OTU satellites were to hold a minimum of 640,000 lbs; and Medium bomber and OTU parent stations would carry 320,000 lbs.

Later developments - e.g. all temporary station

In November 1941 a new scheme was proposed for the secure storage of airfield HE which involved a complete redesign of the bomb dump. The overall aim was to improve handling efficiency mainly by doing away with cumbersome and expensive gantries and cranes.

New airfields would be provided with four 200 ton dumps - (Bomb store type 'D', 3164/42, later 1212/43). Each dump was separated into four open compartments by earth / brick traverses. (Note stores types B and C had one and two compartments respectively and were rarely used). The bombs would be stored ideally in a single layer along the length of each compartment, with an access road at each end of the compartment - (see below).

The actual compartments were constructed with a slight slope which greatly simplified handling - the "upper", or lorry road was used to fill the dump - gravity being used to position the bombs from the lorries via a concrete ramp, and the "lower" (trolley) road to empty it by means of a simple lifting device. In practice as station stocks increased the bombs were stored in stacked rows in each bay. In many cases one or both of the traverses parallel with the lorry and trolley roads would be omitted.

A further scheme to improve handling was the provision of a minimum of two ground level fusing-point buildings, commonly using a sixty foot Nissen hut, protected by a 5' earth traverse. These were now located on the service road between the bomb dump and the airfield. Bypass loop roads were provided for each fusing point.

Incendiary bombs were now stored in a variety of ways, initially in traversed protected multi-compartment buildings, then in Nissens and finally in open storage often using the obsolete 1940 style HE store. This redesigned store was a dramatic improvement by comparison with the earlier designs and was to last for the duration of the war.

Early bomb stores were camouflaged, usually by means of steel and wire netting supported on cables held by vertical tubular steel poles. Steel wool and brushwood was added to the net to improve the effect. In 1942 it was decided to discontinue this rather expensive luxury, (typically £15,000 per installation), since bomb dumps were now considerably more dispersed than the earlier designs and less likely to suffer from aerial attack.

SAA was generally stored in Nissen type huts, though permanent brick buildings were constructed at several stations e.g. Lichfield. SAA stocks at bomber stations were typically half a million rounds of .303.

Appendix 1 The 1939-41 Scheme

AMMUNITION DEPOTS (15 - 20 kilotons)

11 MU Chilmark
21 MU Fauld
28 MU Harpur Hill
31 MU Llanberis

Other major sites: Eastlays, Ridge Quarry, Linley, Rowthorne

AIR AMMUNITION PARKS (750 - 1250 tons)

MU	name	Parent and stations served
36	Snodland & Ruislip	Manston, West Malling, Bekesbourne, Lympne, Detling, Hawkinge, Eastchurch
91	Southburn	Driffield, Leconfield, Catfoss
92	Brafferton	Dishforth, Leeming, Linton, Topcliffe, Catterick, Church Fenton, Thornaby
93	Norton Disney	Binbrook, Cottesmore, Finningley, Grantham, Lindholme, Hemswell, Newton, Scampton, Waddington, Digby, Kirton in Lindsey, Hucknall
94	Barnham	Honington, Horsham, Feltwell, Bircham Newton, Swanton Morley, Stradishall, Coltishall, West Raynham, Mildenhall, Marham, Watton, Wattisham
95	Lords Bridge	Bassingbourn, Cranfield, Wyton, Upwood, Wittering, Duxford, Debden
96	Eynsham	Abingdon
97	Staple Halt	Manston
98	Mawcarse	Leuchars
100	South Witham	1 group

Other Sites:
2 Altrincham - (SAA & Pyrotechnics)
53 Pulham - (SAA & Pyrotechnics)
59 Newland
81 Bowes Moor - (Gas / chemical weapons)

Appendix 2 The 1941-45 Scheme

RESERVE AMMUNITION DEPOTS

MU	Main Site	Other Sites (examples)

11 Chilmark	Dinton, Groveley Wood, Eastlays, Ridge, Beanacre, Elm Park, Pitts Wood, Teffont, Ladydown
21 Fauld	Bagots Wood, Hilton, Linley
28 Harpur Hill	Rowthorne, Butterton, Sheldon, Monyash, Hartington, Shane's Castle (N.I.)
31 Llanberis	Rhiwlas, Holywell
202 Longparish	Harewood Forest
219 Gisburn	Slaidburn, Grindleton, Wigglesworth Road, Tosside, Holden, Broom Hill
220 Wortley	(transferred to USAAF)

FORWARD AMMUNITION DEPOTS

MU	Cap.	Main Site	Other Sites (examples)-
80	10	Escrick	Cawood, Naburn, Skipwith Common, Cottingwith,
91	6	Southburn	High Wood, Low Wood, Bainton
92	10	Brafferton	Pilmoor, Boroughbridge Station
93	15	Norton Disney	Sands Lane, Spalford, Tumby, North Scarle
94	20	Barnham	Warren Wood, Aughton Spinney, Exclamation S.
95	8	Lords Bridge	Meldreth, Comberton, Orwell, Harston Copse
96	6	Eynsham	Church Handboro, Cuckoo Lane
100	10	South Witham	North Witham A/F, Stretton Road
231	10	Hockering	Tuddenham Road, Old Buckenham A/F
233	20	Market Stainton	Hemingby, Bardney & Caistor A/Fs

ADVANCED AMMUNITION PARKS

MU	Cap.	Main Site	Other Sites
36	6	Snodland	Charlwood
59	0.75	Newland	Russels Enclosure, Blakeney Walk, Lower Soudley
64	0.5	Ruislip	Hatfield, Newdigate
77	0.5	Redcastle	Kilcoy, Macmerry Airfield
98	0.75	Mawcarse	Fordoun, Balado Bridge Airfield
224	2	Kiplin	Moulton, Scorton Airfield

(Snodland & Charlwood later became FADs for 2TAF, Kiplin became 6gp FAD)

Other Sites:
81 MU Bowes Moor - Chemical Weapons

(Cap. = Original intended HE capacity in Kilotons, calculated on minimum safety distances.)

Appendix 3 No 42 Group Storage facilities October 1946

MU	HQ & Subsites	Tonnage
91	**Cottam**	15,000
	Brafferton	2,000
	Southburn	4,000
	Escrick	6,750
	Acaster M.	9,000
	Scorton	5,500
	Kiplin	1,300
		43,550
28	**Harpur Hill**	14,000
	Ashbourne	10,000
	Darley Moor	10,000
		34,000
93	**South Witham**	6,750
	North Witham	8,000
	Norton Disney	3,500
	Fulbeck	8,000
	Balderton	10,000
	Spalford	3,000
		39,250
94	**Barnham**	12,000
	Warren Wood	10,000
	Great Ashfield	5,000
	Mendlesham	7,000
	Hockering	6,700
	Attlebridge	3,500
		44,200
11	**Chilmark**	17,000
	Groveley Wood	14,000
	Charlton H.	4,500
	Long Newton	6,000
	COD, Corsham	11,000
		52,500
233	**Wickenby**	
	Market Stainton	10,000
	Goxhill	6,000
	Caistor	3,000
		19,000
202	**Long Parish**	26,000
	Eynsham	3,200
		29,200
31	**Fauld**	16,000
	Tatenhill	9,000
		25,000
2&	**Altrincham**	10,000
219	**Gt. Orton**	10,000
	Annan	2,500
		22,500
53&	**Pulham**	no exp.
231	**Bungay**	9,000
	Seething	9,000
	Old Buckenham	6,500
	Rackheath	5,500
		30,000
31	**Llanberis**	10,000
	Holywell	5,000
		15,000
98	**Kirknewton**	6,000
	Grangemouth	6,000
	Fordoun	3,000
		15,000
95	**Lords Bridge**	4,800
	Nuthampstead	10,000
	Ridgewell	6,000
		20,800

Total stock = 390,000 tons of HE and incendiary, + 80,000 tons of pyro making 486,000 tons. 2 further airfields urgently required to store 16,000 tons.

Source: AIR 2 / 10438

Appendix 4 The Proposed 1953 Scheme

2MU	Altrincham
11MU	Chilmark, Dinton, Ridge
21MU	Fauld, Tatenhill, Bagots Wood
28MU	Harpur Hill, Ashbourne, Darley Moor
31MU	Llanberis, Rhiwlas, Llandwrog
53MU	Pulham, Bungay, Seething
91MU	Acaster Malbis, Cottam, Southburn, Escrick, Brafferton, Riccall, Dalton, Melbourne, Marston Moor, Cottingwith
92MU	Wickenby, Faldingworth, Caistor, Goxhill, Woodhall Spa, Skellingthorpe, Ludford Magna
93MU	Newton, Norton Disney, South Witham, North Witham, Balderton, Bottesford, Fulbeck, Kingscliffe
94MU	Honington, Hockering, Mendlesham, Attlebridge, Barnham, Old Buckenham, Rackheath, Gt. Ashfield, Little Heath
95MU	Ridgewell, Lords Bridge, Nuthampstead, Gosfield, Riseley
202MU	Long Parish, Chilbolton

OPERATIONAL AREA - NOVEMBER 1954

91MU	All stations north of and including Church Fenton, Leconfield, Elvington, Driffield and Finningley
92MU	Scampton, Binbrook, Strubby, Waddington, Cranwell, Coningsby
93MU	Wittering, Upwood, Cottesmore, North Luffenham, Wyton
94MU	Marham, Honington, Horsham, Langham, Coltishall, Waterbeach, West Raynham, Watton, Lakenheath, Mildenhall
95MU	Bassingbourn, Bradwell Bay, Stradishall, Wattisham, Duxford, Martlesham

Support sites

2MU	Altrincham
11MU	Chilmark, Dinton
21MU	Fauld
28MU	Harpur Hill
217MU	Cardington and Riseley

Appendix 5 The Proposed 1958 Scheme

Ammunition Depots		Function / Airfields served
2MU	Altrincham	SPECIAL NON-EXP. DEPOT
11MU	Chilmark, Dinton	OVERSEAS SUPPLIES
21MU	Fauld, Tatenhill	SAA, PYRO, EMPTIES + MPO
28MU	Harpur Hill, Ashbourne	SAA & C/W
31MU	Llandwrog	C/W
91MU	Acaster Malbis, Riccall	Finningley
92MU	Faldingworth	(special stores), Scampton, Coningsby, Woodhall Spa, Skellingthorpe Binbrook
93MU	Norton Disney, South Witham	Waddington, Cottesmore Fulbeck, Kingscliffe, Wittering, Upwood, Bottesford Wyton
94MU	Barnham, Old Buckenham,	Marham, Watton, *Little Heath* Honington
95MU	Ridgewell, Lords Bridge,	Bassingbourn Riseley
202MU	Long Parish (to close 1955 ??)	

Appendix 6 Principal WW2 Ammunition Factories

Filling Factories

No.	Site	Function	Started	Opened	
1	Chorley			Dec 40	
2	Bridgend			Dec 40	
3	Glascoed	Naval		Spr 38	Mar 40
4	Hereford	Shells		Apr 39	
5	Swynnerton			Sept 39	Oct 41
6	Risley	Mines, bombs		Oct 39	Sept 41
7	Kirkby			Dec 39	Aug 41
8	Aycliffe	Shells		Spr 40	Jun 41
9	Thorpe Arch	Cartridges		Spr 40	Oct 41
10	Queniborough			Jan 41	Sept 42
11	Brackla				
12	?				
13	?				
14	Ruddington			Dec 40	Sept 42
15	Walsall			Dec 40	July 42
16	Elstow			Dec 40	July 42
17	Featherstone			Nov 40	Oct 42
18	Burghfield			Aug 40	July 42
??	Healy Hall	20 lb bombs		Mar 41	

Propellant Factories: - Trade Filling plants:

Waltham Abbey	COR	Witton	
ICI Ardeer (Glasgow) ?		Standish	
Bishopton (Glasgow)	COR	Yeading	
Wrexham	COR	Abbey Wood	
Ranskill (Doncaster)	COR	Kidderminster	
Irvin	TNT	Doncaster	
Pembrey	TNT	Farnham	
Drigg	TNT	Sellafield	TNT
Tutbury?			

Small SAA Factories:

Bridgwater	RDX	Mexboro	
Radway Green	.303	Pendine	
Southall		Wootten Basset	
Summerfield		Kirklington	
Hirwaun		Antrim	
Chelford		Patricroft	
Bootle	E		

Alphabetical List

Types: **E**ngineering **T**rade **F**illing **F**illing **F**actory **P**ropellant

Abbey Wood	TF
Antrim	
Ardeer (Glasgow)	
Aycliffe	FF
Birtley, Durham	E
Bishopton (Glasgow)	P
Blackburn	E
Blackpole	E/SAA
Bootle	
Brackla	FF
Bridgend	FF
Bridgwater	P
Burghfield	FF
Cardiff	6pdr tank E
Cardonald	shells E
Chelford	
Chorley	FF
Dalmuir	
Drigg	P
Doncaster	TF
Ellesmere Port	E
Elstow	FF
Enfield	E
Farnham	TF
Fazakerley	E
Featherstone	FF
Glascoed	Naval FF
Hayes	E
Healy Hall	FF
Hereford	FF
Hirwaun	E/SAA
Hootan	E
Irvine	P
Kidderminster	TF
Kirklington	
Kirkby	FF
Leeds (Barnbow)	E
Maltby	E
Mexboro	
Newport	E
Nottingham	E
Patricroft	E
Pembrey	P
Pendine	
Poole	E
Powfoot	Non COR pdr

Queniborough	FF
Radcliffe	E
Radway Green	E/SAA
Ranskill (Doncaster)	P
Risley	FF
Ruddington	FF
Sellafield	P
Southall	SAA
Spennymoor	E
Standish	TF
Steeton	E
Summerfield	SAA
Swynnerton	FF
Theale	E
Thorpe Arch	FF
Tutbury	
Walsall	FF
Waltham Abbey	P
Wigan	E
Witton	TF
Woolwich	E
Wootten Basset	
Wrexham	P
Yeading	TF

Appendix 7 Chemical Weapon Factories

RANDLE - Area of land between Manchester Ship Canal and Mersey, 2.5 miles from Runcorn towards Warrington. Manufactured chiefly mustard gases HS, HM, HB, HT, also known as Runcol and Pyro BD.

This was also the only factory to be able to manufacture mustard from basic raw ingredients, (alcohol, chlorine and sulphur). (The other factories required complex manufacturing processes using the intermediary product - thiodiglycol). Storage was in 100 off, 5 ton enamel lined cast iron tanks set in concrete.

VALLEY - 90 acres at Rhydymwyn includes hillside tunnel storage of 3,120 tons in 65 ton tanks. Production was 100 tons of HT per week, and 200 tons of HS which could be converted to HM. Also Woodside site of 1,840 tons 3.5 miles away near Gwern-y-Marl to the north-east storing 60 tons each in 9 underground tanks, later extended to a total of 1,840 tons. The Antelope field, a temporary storage site on the opposite side of the valley was cleared in 1948.

SPRINGFIELDS - adjacent to Salwick Station 6 miles west of Preston on LMS railway. Manufactured Pyro only.

ROCKSAVAGE - Principal Phosgene factory, plus intermediates for mustard.

WADE - manufactured mustard intermediates

HILLHOUSE - manufactured mustard intermediates

ROYD MILLS - manufactured mustard intermediates

Total mustard production was about 1,200 tons per week.

At the end of the war (4.6.46) the chemical weapon stocks were as follows:

Springfields -	1,000 tons
Valley -	3,000 tons
RAF poor mustard -	1,200 tons
Gwern-y-Marl / Woodside -	2,000 tons
RAF filled bombs -	1,500 tons
RAF FFDs -	4,500 tons
Phosgene -	2,700 tons

Appendix 8 Chemical Weapon Storage Sites – Post War

Base	SUB-SITE	SHEET	REF
DINTON		167/41	014312
HARPUR	'E'	111/43	067689
ACASTER	Bowes	84/35	982148
	Bainton	98/44	956540
	Escrick	97/44	631409
	Kiplin	91/44	274988
	Cottingwith	98/44	676428
	Southburn	98/44	997535
WICKENBY	Norton Disney	113/43	863647
	Spalford	113/43	839687
	South Witham	123/43	951185
	Hemingby	105/53	255770
RIDGEWELL	Riseley	134/52	040647
	Comberton Heath	148/52	382540
	Orwell	147/52	347514
	Lords Bridge	148/52	394540
GT. ASHFIELD		52	852777
	Little Heath	136/52	854785
	Triangle Spinney	136/52	853805
	Aughton Spinney	136/52	853799
	Exclamation Spinney	136/52	853799
	-do- burning area	136/52	847801
LONGPARISH	'E'	168/41	382423

Official map references - New Popular Edition / Cassini WOFO

PRO Source files on Chemical Weapon Manufacturing and Storage

SUPP 5/1003	ICI Factories at Randle, Springfields, Valley and the FFDs - (1944)
SUPP 5/1004	ICI Factories at Rocksavage, Wade, Roydmills and Lowerhouses - (1946)
SUPP 5/1005	ICI Randle, the Assembly Unit - (1945)
SUPP 5/1006	ICI Randle, manufacture of Runcol - (1945)
SUPP 5/1007	ICI Randle, the Field Storage System - (1945)
SUPP 5/1008	ICI Randle, the Larmine Plant - (1945)
SUPP 5/1009	ICI Randle, the Charging unit - (1945)
SUPP 5/1010	ICI Springfields History - (1944)
SUPP 5/1011	ICI Valley (Rhydymwyn), 1940/45 - (1945)

Appendix 9 Mustard Gas Variants

Name used by			Usage in weapons				
WO & MoS	**Air Min**	**ICI**	**30 lb**	**65 lb**	**250 lb**	**500lb**	**SCI**
H							
HS (original gas)							
HB	Y13	Pyro		√			
BD	Y25	Pyro D		√			
HBV	Y14D					√	
HBDV	Y26					√	
HM	Y5	Pyro M			√		
HT	Y3	Runcol	√	√	√		
HTV	Y4						√

Notes: H is Levinstein Mustard, containing sulphur impurities. It is pale yellow to clear in colour. It is very easy to produce but unstable in storage and smells of mustard or sulphur.

HD is distilled mustard, more stable and smells of garlic. HD is mixed with compound "T", (sulphur / chlorine mixture) in the ratio 60:40 to produce HT. This has a much stronger blistering effect and is more persistent, but less volatile and requires stronger concentrations to be effective.

HS the original gas evidently was named "Hun Stuff". The French called it "Yperite" which could explain the Y codes. HT is effectively three times as powerful as HS, and has a much lower freezing point and thus can be air sprayed.

HD is a refined form of H (dirty mustard)

Runcol was manufactured from thiodiglycol, + hydrochloric acid. Runcol was thickened with 'MM' (perspex), Y3 contains 10% benzene and is therefore inflammable.

Pyro was manufactured from ethylene and sulphur dichloride. It had 15% carbon tetrachloride added to depress the freezing point.

Pyro M has 1% carbon tetrachloride + 7% benzene monochloride, which makes it inherently more stable.
Pyro B has 7% benzene monochloride only. These mixtures freeze at around 7 deg.
Pyro HM requires magnesium oxide crumbs 8 - 13% to stabilise 65lb LC bombs. It effectively stops the pressure build up. Production HM is chemically unstable and most was to be used in LC bombs.

HN is nitrogen mustard derived from ammonia. Three versions are used, HN1 - HN3. These are dark oily liquids with no smell and are much more dangerous, and persistent (HN3 only), than HD. (They were until recently used in operating theatres.

Mustard Gas would have been delivered by one or more of the three methods:

1) Bombs. Ideally used against towns as a method of denial and moral boost. The town would be first attacked by high explosive, followed shortly afterwards by mustard bombing. The most prolific bomb was the 65 lb LC (light case) device which in reality was nothing more than a five gallon tinplate “petrol style” container filled with liquid mustard. These would be dropped in large numbers and would burst on impact discharging the contents and thus contaminating several square metres of ground. A viscous / sticky liquid is ideal in this situation and in the

case of bomb damaged properties would be extremely difficult to decontaminate. No incendiary devices would be used as mustard breaks down under temperature..

2) Low Spray. Ideally used against beachheads just captured by the enemy. Small fast aircraft would spray the liquid accurately on advancing troops.

3) High Spray. Many Wellington aircraft were modified to carry the SCI tank. (Smoke Curtain Installation) Originally this device was intended for use to help / hinder advancing troops by laying down a protective smoke-screen It was then adapted for use as a mustard gas dispenser. Used at a high altitude this method has the advantage that troops might not realise until it was too late that they were under chemical attack. Conversely it is difficult to target a small area accurately. A special form of mustard has to be used than does not freeze as it falls.

Appendix 10 B.O.C. Oxygen Filling Plants

Southampton
Greenwich
Wembley
Witham
Coventry
Wolverhampton
Derby
Rotherham
Leeds
Hull
Stockton-on-Tees (Billingham)

Appendix 11 92 MU, Description

Brafferton is a typical example of one of the earlier Air Ammunition Parks. The site was constructed in the late 1930s and became operational on the 22nd August 1939, the first security threat becoming apparent a few weeks later when it was reported that the IRA was active in the area. The depot was parented by the nearest airfield - in this case Dishforth and its initial function was to supply weapons to this airfield together with Linton-on-Ouse and Thornaby, the first supplies being made to the latter station on 28th August 1939.

Rail access was provided by a group of sidings capable of handling a train of 30 wagons from the LNER branch line which served the main explosive areas directly - in particular the group of 4 HE compartments. Originally designed to hold a maximum of 56 tons each, these 72 foot square cells were frequently used to over four times their intended capacity. The theoretical maximum limit was calculated at 625 tons per bay, and a "safe" estimate was then given as 400 tons. The design of these compartments was such that a 56 ton explosion in one cell would be totally restricted to that cell and not affect the other three compartments. Provision was made to add a further pair of compartments at a later date, and in addition three sets of compartments could eventually be sited at each depot. Overhead gantries were used to load and unload the compartments to rail or road transport.

Oxygen was initially supplied to the unit from BOC Leeds, though in the second quarter of 1943 an oxygen manufacturing and filling plant was installed at nearby Cundall.

The site was defended by 10 machine gun posts and there was an observation post in a tower attached to the roof of the decontamination block. Five shelter trenches were provided and 2 fire tanks could be used in emergencies, though it was noted on several site inspections that the condition of these tanks was poor due to leakage and they took a long time to fill.

From January 1941 the site was instructed to store a small quantity of chemical weapons. A search occupying several days failed to locate a suitable site, hence the main unit was used until June 1943 when a nearby site, Prests Plantation, was eventually selected and fitted with decontamination equipment.

As new airfields opened and the demand from the unit increased extra storage had to be found and in early 1941 a search was made for a main sub-unit site. Some three miles away at Pilmoor an ideal site featuring natural camouflage was found in an old timber yard, a suitable rail head being available to accommodate two 14 wagon trains. Work began on 4th May to prepare the site which officially opened seven weeks later, though it was not until September that Nissen accommodation and storage facilities were available. By then the work had increased to such a level that a second satellite was required and Kiplin near Catterick was chosen to serve the more northerly bases.

In June 1941 more sites were surveyed for sub-sites including Varley Quarry near Forcett, and Cowhill Wood near Craythorne / Trenholme Bar, though none of these were eventually used.

No 92 MU had its fair share of accidents: On 3rd December 1940, a fused 250lb A/P bomb returned from Linton-on-Ouse exploded whilst being unloaded at the depot setting fire to a ammunition lorry and killing three airmen. Later two NCOs received the BEM for their prompt action in dealing with what could have been a much more serious incident. Since the FADS were tactically sited there was of course the likelihood of being struck by allied aircraft. On 26th June 1943 a Halifax from Topcliffe crashed within a few yards of one of Brafferton's HE areas, fortunately no damage to the unit or personnel resulted.

On the 4th February 1944 at 1600 hrs there was an explosion involving an Ammunition train at Catterick Bridge station - Kiplin's loading depot. One airman was killed, and eight were injured. The Unit band was called Braf-a-tonic and frequently performed in the depot's entertainment centre the "Brafferdrome", an interesting building which has been described in more than one book as a WW1 aircraft hangar!

Selected monthly site statistics of 92 MU, Brafferton

DATE	KILOTONNAGE			RAIL WAGONS		ROAD LORRIES		PERSONNEL	
	In	Out	Total	In	Out	In	Out	Offs+O/Rs	
Dec 40	0.3	0.7	1	4	9	8			
Mar 41	1.5	0.7	2.2	271	?	?	280		
May 41	2.0	1.4	3.5	275	7	65	431		
Aug 41	1.6	1.4	3.0	299	10	72	408		
Dec 41	2.0	1.0	3.0	282	32	107	333		
Mar 42	1.2	0.7	1.9	197	20	58	207		
May 42	2.5	1.4	3.9	220	114	73	197		
Jul 42	3.2	2.4	5.6	422	202	64	175		
Oct 42	1.7	1.4	3.1	240	114	42	130		
Feb 43	2.8	2.4	5.2	350	174	65	634		
Jun 43	3.0	2.7	6.1	259	342	326	163+?		
Sep 43	2.3	2.7	5.3	268	224	126	279		
Dec 43	3.7	2.3	6	437	184	167	355		
Feb 44	3.3	2.6	6.3	410	249	302	628		
Apr 44	8.0	8	16	1057	540	296	1271	4	+ 242
Jul 44	7.1	2.0	14.1	796	456	518	1285	3	+ 241
Sep 44	12.0	12.0	24.0	1670	488	785	2792	3	+ 284
Nov 44	9.4	3.2	19.9	1276	366	743	2760	5	+ 225
Jan 45	9.3	1.1	16.4	994	287	1157	1983	4	+ 208
Apr 45	6.5	3	9.5	791	246	686	991	6	+ 277
Dec 45	0.06	0.08	0.13	6	6	15	15	3	+ 235
Oct 46	0.45	1.9	0.64	42	22	53	8	5	+ 113
May 47	0.07	0.13	0.13	0	9	2	18	3	+ 23

Notes:

Reduction in receipts probably due to 224 MU Kiplin becoming self accounting.

Difference in total kilotonnage turnover for later years was due to some stocks being moved on but manhandled at 92 MU.

Appendix 12 Event Chronology

Pre 1937

1.4.24:	No 2 Stores Depot (later 2 MU) opens at Broad heath, Altrincham to store all types of ammunition, bombs and pyrotechnics.
Nov. 36	Application to the treasury for approval to construct storage for 6 months war consumption.

1937

	Intensive search for disused mines and quarries
1.4.37	11 Equipment depot opens at Chilmark.
23.6.37	Projected ammo dumps are Chilmark - Eastlays - Monkton Farleigh - Acorn Bank - Beer + 2 others
Dec. 37	Four sites (two southern) confirmed as ADs

1938

March	Authorised reserve storage is confirmed at 82 kt of HE and 16 kt of incendiary

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1939

17.4.39	No 42 Group formed at Andover.
8.5.39	2 MSU Pulham to use Blandford site.
15.6.39	Group comprises 2MU Altrincham, 11MU Chilmark, 17MU Melksham & Ridge, 21 MU Fauld. Temporary storage is available at Newport, Pulham, Worthy Down, Aston Down, Hawkinge, Didcot and Kemble. 28MU Harpur Hill, 31MU Llanberis and Linley are in preparation.
28.7.39	Pulham officially opens - the large shed is 250x80x50 yards
Aug 39	Approval to construct main depot at Llanberis. Ridge contains 2 kt Army TNT, 6 kt of RAF 250 & 500 lb bombs and 4 kt RAF TNT.
29.8.39	Very large scale camouflage required at Pulham
31.8.39	Chilmark camouflaged

Sept 39

1.9.39	Arrangements to take over Grange Quarry for 7 kt.
4.9.39	HQ 4 group moves from Andover to Burghfield House.
3.9.39	War Declared - 4 AAPs open at outbreak of war.
5.9.39	Nos. 1,2,3 and 4 AAPs open, facilities incomplete at rest.
15.9.39	2 MSU Pulham becomes 21 MSU
26.9.39	MC HQ issued directive to man and equip Southburn, Brafferton and Barnham
2.9.39	AAPs renumbered, thus No1 AAP becomes 91MU etc
4.9.39	42gp HQ from Andover to Burghfield Common
9.9.39	AAPs to store and receive AA ammo for army defence of operational airfields. Plessey belting machines supplied to Altrincham, Fauld, Ruislip, Chilmark to overcome desperate shortage of belted ammunition.
Oct 39	Each AAP to have 1 corporal and 4 airmen specifically trained in the handling of gas weapons.
1.10.39	91 - 95 (94?) MUs officially opened. Mawcarse for N of Tweed (Turnhouse, Leuchars, Drem, Invergordon, Oban, Kinloss, Lossiemouth, Dyce, Wick)
16.10.39	Lords Bridge under construction
25.10.39	Tail units sent from temp. store at Hawkinge to Chilmark, former closed Nov 39
16.11.39	95 MU Lords Bridge opens
18.11.39	First Chemical weapons delivered to Barnham and Norton Disney.
Dec 39	Holywell available for Fauld. Fauld - roof fell in.
1.12.39	28MU operational and will eventually feed 1 and 92 MU
15.12.39	28MU Harpur Hill officially formed
22.12.39	Ridge becomes 11MSU from 2MU
29.12.39	AAP in Scotland is required.

1940

Jan 40	Chilmark produces "green" concrete
9.1.40	Ridge becomes u/c 11 MU Chilmark.
Feb 40	
Mar 40	First stocks underground to 28 MU - tunnels were found to be 12' in height, whilst a railway wagon is 12' 1". Railway lines lowered by 1".
6.3.40	40 - 43 MU renumbered 18, 33, 51, 52. 26 MU closed
8.3.40	AAPs are well stocked for their purpose. 28 MU not fully functional and not in control of 91/2 MUs
15.3.40	21 MSU Pulham visited.
Apr 40	
18.4.40	Mawcarse surveyed 18 acres of firm well drained land with good screening, close to main railway line and well served by roads. 20 miles WSW of Leuchars
May 40	
1.5.40	98MU Mawcarse formed
20.5.40	97MU Staple Halt formed, for Manston, Bekesbourne, Hawkinge, Lympne and Detling.
21.5.40	6,000 off 40 lb Chorley bombs inspected at Harpur Hill - numerous defects.
26.5.40	27 trucks of CW to 28 MU from Fowey
Jun 40	Two air attacks on Pulham. Harpur Hill - handling storage and inspection of C/Ws returned from BEF.
1.6.40	Eynsham Surveyed - & possibly opened
8.6.40	Longhope (Ross on Wye) surveyed - nearby empty manor house.
14.6.40	Snodland surveyed
21.6.40	Air Raid on Pulham - cattle killed
Jul 40	
9.7.40	36MU Snodland (at Lees Limeworks) opened under Detling
10.7.40	Staple Halt closed
10.7.40	Air Raid on Pulham, 13 bombs in danger area, Decauville railway blown up
23.7.40	Dornier attack - 16 bombs, 5 bombs hit hangar - no personnel involved
Aug 40	
1.8.40	21 MSU Pulham becomes 53 MU
8.8.40	Visit to Corwen Slate Quarry in N Wales, site rejected due to lack of access roads
8.8.40	First dump completed at Snodland
21.8.40	20 delayed action bombs dropped on Pulham
Sep 40	
2.9.40	Surveys in Forest of Dean (163)
5.9.40	Newland proposed to store dodgy captured Italian ammo
12.9.40	Survey in Yorks for CW sites
25.9.40	Redcastle proposed to supply N of Inverness
Oct 40	
2.10.40	Newland surveyed. (177, 194)
4.10.40	Swinderby officially renamed Norton Disney
22.10.40	Lansalon China Clay works at Ruddlemoor surveyed and found ideal. (184)
Nov 40	
Dec 40	Turnover of group during last 15 months was 350 kt.
6.12.40	Butterton Approved

1941

Jan 41	
9.1.41	Eastlays & Ridge now under army control, RAF establishment at Ridge removed. AAP for short notice in Cornwall planned
11.1.41	Notification from HQ to increase CW stocks at Brafferton
Feb 41	Long Plantation site for 93 MU Melton Mowbray available Pontefract (Hollins Wood, or Micklefield) urgently required. Ridge has capacity of 13 kt, and Eastlays 8 kt JU88 strafed and bombed Chilmark
16.2.41	JU88 attacks Pulham - 3 bombs on hangar
19.2.41	Single Ju attacks Brafferton area close to unit

27.2.41 Enemy aircraft machine guns Pulham

Mar 41

6.3.41 Braidbar Quarry - Giff(h/n)ock surveyed - evidence of flooding and subsidence

7.3.41 Pontefract area surveyed for AAP, Hollins selected, Lotherton Hall Estate with accommodation at Garforth Golf Club.

11.3.41 Ridge - 10.40 am Set of skips pushed into shaft - not attached to haulage gear. Skips crashed into a support pillar, were derailed and bombs were wildly scattered. A labourer was hit by a skip and received fatal injuries - Bath Hospital.

16.3.41 Damaged Ju88 fell on Dinton - exploded and burned setting fire to undergrowth. No damage to park 1. Crew escaped - 3 captured immediately, 1 three days later.

19.3.41 Pretoria Mine Bakewell surveyed - high humidity and constricted.

20.3.41 Brafferton - problems due to heavy increase in stocks

21.3.41 Each forward site to find a satellite

Apr 41

30/4/41 Linley acquisition proposed for 20 kt HE, 5 kt Inc. - turnover 500/600 tons per day. Camp for 500 - 750 men.

May 41

Besthorpe - Sands Lane site for 93 MU, Triangle Spinney for 94 MU, Pilmoor, North Scarle and Hartston Copse all in use.

4.5.41 Pilmoor to be opened up

6.5.41 Brafferton - oxygen storage increased by 25 to 100 cylinders.

12.5.41 Llanberis commences stocking

19.5.41 59MU Newland to open, Accommodation in Old Brewery next to Upper Redbrook station.

26.5.41 He 111 bombs Pulham

Jun 41 Garforth to relieve Norton Disney

92 MSU Boroughbridge station open 94 MSU Warren Wood open 95 MSU Victoria Plantation open

Rowthorne - Northern end of tunnel closed and Decauville railway fitted.

2.6.41 31 (Llanberis) and 59 MU commenced functioning

11.6.41 Clearwell Caves inspected as MSU for Newland - rejected. Russels enclosure found to be OK as was Blakeney Walk (1003,000) and Lower Soudley (105315)

17.6.41 Redcastle AAP partially opens under Evanton

29.6.41 Ford works available for Fauld

30.6.41 Satellite parks opened at 92,93,94,95 MUs to store 20, 40, 250, 500lb bombs under field conditions.

Jul 41 Pilmoor is almost full.

95 MSU Orwell is 70% stocked

Fox covert available for 93 MU

4.7.41 Victoria Plantation is taken over

22.7.41 1M already spent on Linley. It was found that the roof had collapsed in many places with blocks of 20 - 500 tons ."It is extremely advisable that no equipment or persons is under even a small block during a collapse. Treasury had just allocated a further £1M ??%0.,000 towards improving the floor. This was deemed a total waste of money owing to the state of the roof. (294)

23.7.41 Dornier 217E drops 4 bombs on Pulham - some damage

26.7.41 6 each special 4,000lb bombs to MSG and Linton from Brafferton

Aug 41 20 ton roof fall at Linley

93MU opens Caborne Wood

80MU surveys Holly Carrs Wood

Following sites proposed - FADs - Dukeries, Belvoir, Yardley Chase, Salcey Forest, Haynes Park, Hatley Park, Woburn Park, Kilten ?. RADs - Swynnerton Old Park, Ercall Head, Wyre Forest

12.8.41 91 & 92 MUs surveyed for satellites.

16.8.41 64MU surveyed for satellite sites

Sep 41

4.9.41 Starfish site found 800yds from storage area at Parlington

6.9.41 Three nissens supplied to Pilmoor for sleeping, office, cookhouse and dining.

11.9.41 Gaumont British film stocks of 600 & 1,000 lb bombs at Eastlays.

19.9.41	Bowes is 50% complete
Oct 41	Garforth to move to Escrick
	Pelham Wood + siding for Brafferton
	Comberton and Orwell for 95 MU followed by Meldreth
1.10.41	Drumchardine FAD if required
7.10.41	Linley to be closed or suspended
10.10.41	5,000 off 65lb LC bombs from Valley to Brafferton
Nov 41	Satellite of 64 MU at Hatfield - woodchip roads
29.11.41	Redcastle opens fully
Dec 41	
3.12.41	Bowes opened (possibly)
6.12.41	Rowthorne Tunnel opened for 28MU (5 kt)
8.12.41	Bowes Moor commenced taking stocks
18.12.41	Comberton and Victoria Plantation to 95MU
29.12.41	Linley - no stocking until underground work complete

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1942	3 main parks (93/4/5) increased to 10 kt
	The production of bombs greatly exceeds storage capacity of 42 group. "Rowthorne is available, Edlington and Milford are suspended, Broughton / Tumby and West Perry are in progress."
Jan 42	
21.1.42	Forest of Dean abandoned
25.1.42	Accident at Llanberis (or 23rd)
26.1.42	Elm Park available from 42 group
Feb 42	Butterton and a new area of Harpur is in use for 250 lb LC storage
	Wortley Inspected - good 2nd class road 10 miles N and S of Wortley
	Cranford (Kettering), Newthorpe (Leeds Selby) and St Austell to be opened as FADs if required
1.2.42	31 MSU Holywell affiliated
8.2.42	Sudden change in weather at 91 MU caused incendiaries to freeze, leak and thaw - many burst into flames.
12.2.42	Harpur Hill carefully investigated re roof collapse
14.2.42	Shane's Castle opened for all of Northern Ireland under 26 ASD.
19.2.42	21MSU Holywell transferred to 31 MU *(date correct?*)
Mar 42	
5.3.42	Wortley approved (had been open for some time)
6.3.42	Elm Park transferred to 42 group from Quedgley
18.3.42	Brafferton surveys for roadside storage
23.3.42	Newdigate commenced stocking
27.3.42	80MU, under Snaith, 100MU under Cottesmore ready to receive stocks
Apr 42	Preliminary proposal for the first FFD
1.4.42	31MSU Portmadoc Proposed, 11 MSU Linley Proposed
6.4.42	20 Special 4K bombs to Redcastle from Chorley
8.4.42	10 ditto to Lossiemouth, 10 to Linton-on-Ouse
10.4.42	Scouts Dike Camp used by 220 MU
15.4.42	Gisburn 219 MU opened
22.4.42	202MU proposed as RAD
27.4.42	31 MU - all stocks removed from undamaged area - 7 kt to Rhiwlas. Portmadoc postponed.
29.4.42	180 'A' mines, 1500 lbs to be delivered to 95 and 94 MUs urgently
May 42	
1.5.42	Holywell first mentioned as a sub unit of Llanberis - not Fauld.
5.5.42	59MU Newland renumbered 11MSU
9.5.42	36MU now is Newdigate with Snodland as MSU
11.5.42	64MSU Newdigate formed under Gatwick to supply fighter stations S of London - Westhampnett, Manston, Ford, Shoreham, Redhill, Kenley, Biggin Hill, Croydon, Gatwick
12.5.42	221 MU Sharnbrook visited.
14.5.42	28 MU emptied for repairs - unavailable for approx 6 months

30.5.42	Urgent issue - 9 lorries and 5 trailers from Brafferton to Middleton St George.
Jun 42	
1/6/42	Newdigate = msu of Snodland *(1.6.43 perhaps? - almost certainly not)*
19.6.42	Possibility of 100 kt of USAAF ammo arriving in next three months.
19.6.42	Warley (Barracks) opens for Hornchurch, Bradwell & Southend
Jul 42	
1.7.42	Snodland is now a MSU of Newdigate
1.7.42	Proposed new site at Meldreth for 95 MU. Meldreth / Kneesworth to be closed.
6.7.42	EAM Warley & Hatfield become MSUs for Ruislip (all SAA)
13.7.42	Following FADs to carry CW - Escrick Brafferton Norton Disney Market Rasen Braybrooke Edlington S Witham, plus AAPs at Kiplin Southburn Eynsham Newdigate.
27.7.42	IAD Black Park (Iver Heath), 64 MSU for Northolt and Heston
27.7.42	Ruislip to Woodside Place, Hatfield under Hunsden
29.7.42	220MU and Linley to be transferred to USAAF
Aug 42	Proposal for 3 FFD tanks at Melchbourne & Barnham
	5 Offs, 60 Enlisted and 82 coloured EM arrive at Lordsbridge.
6.8.42	Serious concern over progress at Hockering - urgently required.
8.8.42	81 Vegetables from Milford Haven and 40 from Frater arrive at dusk at 93 MU by road.
14.8.42	227 MU Wadworth Yorks proposed FAD, also Wakes Colne (Sudbury), 221 MU Sharnbrook proposed also Edlington.
21.8.42	77 & 98 MUs briefed re special task
Sep 42	Sheep penetrate Bowes moor puncturing 65lb LC bombs - sheep proof gates to be fitted.
4.9.42	202 MU Longparish formed as a 40 kt depot, opened officially on the 7th Oct.
11.9.42	Visit to 230 MU - St Austell - ready for use, parented by St Eval.
Oct 42	Directive to proceed with FFD1 and FFD2
1.10.42	Kiplin formed, under Catterick. 220 MU transferred to US Service of Supply, RAF Equipment transferred to Longparish. 11MSU Groveley opened
2.10.42	Ilmington proposed
15.10.42	Linley 21MSU opened as "explosives for which there is no immediate demand - eg small & obsolete bombs)
17.10.42	ICI supply plans for FFD at Cottingwith
21.10.42	Ilmington visited
Nov 42	Search in Ilkley and Yeadon area for disused quarries - *"mines and caves in land in great demand*."
	Recovery of bombs from 31 MU complete.
1.11.42	Kiplin formed under Catterick
4.11.42	Meldreth inspected
18.11.42	Wadworth inspected
18.11.42	Pilmoor satellite extensions proposed & inspected, *or should this read Pilmoor proposed and extensions inspected ?*
19.11.42	Halifax crashed 30 yds from HE store at 100 MU - Unit fire service extinguished flames.
25.11.42	Extremely contaminated train of vesicant bombs arrives at Bowes from Valley and Randle
Dec 42	Group to supply oxygen requirements to 8th Af for first three months = 9.5M cu feet.
	Directive to proceed with FFDs 3-5
	Warren Wood for 94 MU
11.12.42	Final Instruction on chemical weapons: Boston - 88 (Attlebridge), 226 (Swanton Morley), 107 (Gt. Massingham) sqds to train in Low Spray (SCI). Stirling 15 (Bourn, 149 (Lakenheath), 214 (Chedburgh) to train in 65lb LC and 400lb SC weapons
13.12.42	93MU has supplied 0.25M incendiaries in three days
14.12.42	80 MU moves under Riccall from Snaith
29.12.42	*CHECK DATE* Proposed extension for Brafferton to cost £17,600 and will provide storage for 3800T HE, Inc. 360T, Pyro and special weapons 10,000 sq ft, components 2,000 sq ft.

1943	Ilmington, Tumby, West Perry, Broughton scrapped
Jan 43	
	Part of Spalford for 93 MU
	Lords Bridge surveyed for FFD
1.1.43	231 MU, Hockering opened under Swanton Morley.
5.1.43	New type of 65lb LC decanting machine tried at Barnham
11.1.43	Hockering available under Swanton Morley

16.1.43	Pilmoor roadside storage approved
20.1.43	93 MSU Market Stainton commenced stocking, under Wickenby
Feb 43	Triangle Spinney, 93 MU transferred to USAAF for FFD and renamed Heath Site
1/2/43	RAF Newdigate = Oaklands Park became Russ Hill House Charlwood
9.2.43	Ilmington under construction
12.2.43	No 2 Shaft opened at Ridge adding 1.5 kt capacities now are 17 kt , plus further 11 kt at Eastlays.
Mar 43	
8.3.43	Holywell to be used for obsolescent bombs only.
15.3.43	Braybrooke opened under North Luffenham, 3 officers + 286 OR
23.3.43	Pilmoor, Spalford and Meldreth open for 92, 93 and 95 MUs
Apr 43	First seven Oxygen plants to be ready at 202, 36, 92, 233, 231, 98, 96 MU's
26.4.43	Brafferton CW moved to Prests plantation
30.4.43	11MSU Elm Park assumed
May 43	
12.5.43	Holywell reduced to closed storage
16.5.43	93 MU handled 1 kt today
21.5.43	Ilmington abandoned
25.5.43	Garendon Hall, Loughboro No 15 Base ASD - RAF stocks to 5 Area Saxelby Park.
Jun 43	All 92 MU CW is now in Prests Plantation
	Peak of construction for the FFDs 900 men, (220 in Oct and previous Feb.)
5.6.43	Market Stainton now 233MU (was Norton Disney MSU)
Jul 43	Braybrooke starts to clear
1.7.43	Stocks within group are 400M .303, 50M 20mm.
28.7.43	Braybrooke cleared
Aug 43	Stocks at end of month 154 kt HE + 19 kt Inc.
9.8.43	Elm Park Closed (to Admiralty - 26/10/43)
14.8.43	Braybrooke transferred to USAAF *(check 14th, poss 1st)*
21.8.43	Four oxygen plants received at 93 MU
30.8.43	Charlwood under 49MU Faygate (from Gatwick)
Sep 43	
5.9.43	Spalford Approved *(is this really 1943 ?)*
30.9.43	Southburn High Wood available
Oct 43	FFD ready at Lords Bridge
26.10.43	11MSU Elm Park returned to Admiralty
Nov 43	Additional storage areas for 65lb LCs at 6 units - required by all units in forward area.
	6 kt CW site available at 100MU
	Oxygen plant exploded at 94 MU
	McMerry declared unsuitable as a site (naval/factory present?)
	Newland and Rowthorne declared cumbersome and inefficient
Dec 43	
13.12.43	Kirknewton, McMerry, Connel and Cottam to be used
16.12.43	Lancaster crashes on 233 MU's HE area - no damage to equipment or personnel.

1944

Total storage requirements for the year will be 115 kt of HE and 62 kt of inc.
Turnover for 1943 was 1 MT
325 kt turnover / month in 1944 of which RAF Bomber Cmd used 86 kt of bombs in 1 month alone

Jan 44	Group stocks are 222kt of HE, plus 33 kt incendiary.
6.1.44	First stocks to Luton / Browns Mill
10.1.44	Mustard Vesicant sent to Norton Disney
24.1.44	Mustard Vesicant sent to Lords Bridge
29.1.44	Snodland attacked - two bombs dropped setting fire to small quantity of pyro.
31.1.44	First stocks of Window to Pulham
Feb 44	Turnover = 153 kt.
	Lords Bridge - both pots filled

	Scorton and Catterick proposed, but not used.
1.2.44	Connel taken over
4.2.44	1600 hrs - Accident at Catterick Bridge Station - Kiplin's loading depot, 1 airman killed, 8 injured.
12.2.44	Charlwood - record no - 110 off 16,000 litre oxygen bottles filled in one day.
14.2.44	Kirknewton taken over
24.2.44	Snodland attacked again - small bomb dropped which broke windows.
Mar 44	Following sites are now in use: 11MU Pitts Wood, Ladydown 80 MU Naburn Road 28 MU Sheldon, Monyash 92 MU many roadside sites 93 MU Eagle Wood road, Spalford Roads, Tumby Woodside roads 96 MU Church Handboro 224 MU Hodber Hill Road 231 MU Tuddenham Road
	Spalford CW site opens at 93 MU (March 1944 ? ?)
	Turnover = 230 kt.
1.3.44	Norton Disney sends 12,000 lb bombs to 617 sqd.
22.3.44	92 MU oxygen plant commences to function at Cundall.
Apr 44	Turnover = 280 kt., storage = 205 HE + 57 Inc.
18.4.44	CW site started at 233 MU
21.4.44	FFD opened at 93 MU from MoS - 30 trucks filled each pot.
30.4.44	FFD opened at 95 MU from MoS
May 44	Turnover = 348 kt, 175,000 500lb bombs issued this month
mid 44	Special site prepared at Lords Bridge for PFF weapons
	Kentford oxygen plants received at 94 MU
	700 Italian co-operators drafted in to 42 group to reduce manpower shortages.
5.5.44	Holywell reopens to issue 500 lb bombs
13.5.44	1900 oxygen cylinders serviced by 231 MU Hockering.
Jun 44	Turnover = 307 kt.
	219 MU moves to Settle
1.6.44	No 5 FFD opened at Escrick from MoS
18.6.44	244 MU opens at Connel
Jul 44	Turnover = 263 kt.
2.7.44	Lancaster crashes close to Pilmoor satellite.
6.7.44	Receipt of stocks at 244 MU to cease.
13.7.44	244 MU to close with approx 2 kt in stock.
13.7.44	Lancaster crashes at Sotby lane corner site, 233 MU - no damage.
25.7.44	Liberator from Attlebridge took off and developed engine trouble. Fortunately pilot did not jettison bombs immediately as many would have fallen in Hockering's storage areas.
26.7.44	244MU transfers to Cottam, Connel airfield now under Oban.
Aug 44	Turnover = 286 kt.
28.8.44	Black Park closed
Sep 44	During the first 11 days of this month 92 MU handled 13.5 kt of explosives in 1106 trucks without outside assistance.
	By 22nd Sept 1944 all RAF stocks at 24 district Eastlays to be transferred to Ridge.
11.9.44	Black Park closed (*but see 28/8/44 ??)*
Oct 44	
13.10.44	Flying bomb landed at 100 MU only damage was broken windows.
12.10.44	Brafferton - 99 trucks unloaded in one day - a record
Nov 44	
Dec 44	Turnover for last 12 months = 3,000 kt
	42 group stock holding = 253 kt
1.12.44	Kiplin moves to Scorton under Leeming

1945

	Redhill and Dorking sub-sites opened
	Turnover for 1944 was 3 MT

Jan 45	
Feb 45	
	93 MU - all roadside sites are stocked to capacity
21.2.45	Caistor taken over by 233 MU
Mar 45	Melchbourne Park FFD became the centre for decanting leaky CW bombs
Apr 45	Fulbeck and Balderton (15 kt each) to be used by 93 MU
14.4.45	Charlton Horethorne - Chilmark Sub site
23.4.45	Balado Bridge - 98, Bardney - 233, Riccall - 80, Dalton - 92, East Kirkby - 93, Bourn - 95. *(what is this ?)*
May 45	Anticipated 60 kt per month for next three months from factories and ports to be stored by 42gp Mass inspection of A/Fs for suitable sites - Gt Orton and Annan for (219 ?), Ashbourne & Darley for 28, Goxhill for 233, Redhill for 36, Old Buckenham for 231, Rhoose for 59, Nuthampstead & Ridgewell for 95, Attlebridge & Rackheath for 231, Long Newton for 11, Bungay and Seething for 53, Fordoun for 98, Gt Ashfield & Mendlesham for 94, Rhoose for 59, All Grand Slams were sent to 233, which had the only crane in the service capable of handling the weapons (a modified Bay City)
2.5.45	Goxhill to 233 MU - *(also dated 12.5.45 ?)*
17.5.45	Old Buckenham for 231 MU, followed by Attlebridge and Rackheath and Shipdham later
28.5.45	Ashbourne and Darley taken over for 28 MU
Jun 45	
5.6.45	249 MU forms at Great Orton with sub-sites at Annan and Shane's Castle
16.6.45	First Tallboys sent overseas from Market Stainton
Jul 45	244 MU Cottam receives 70 off 12,000 lb MC Mk 2 bombs, plus a Bay City Crane All 64 MU sub-sites started clearing
8.7.45	Mustard burning experiments at Bowes - 150 galls per hour
13.7.45	First Grand Slams sent overseas from Market Stainton
31.7.45	Ashbourne A/F is full
Aug 45	Charlwood - HQ moves to Redhill
9.8.45	The groups total stock of 150,000 65lb LC bombs CW bombs in store which will be unstable in six months time - destroyed by burning. This can only be done at 81MU by firing the stocks in situ with the aid of incendiaries - thus decontaminating at the same time. Tests made under the guidance of Professor Peacock, Senior Scientific Officer at Ministry of Aircraft Prod. ?!?. Order then given to dispose of 30lb LC, 400lb SCI and 100 lb weapons - a grand total of 14 kt 4 LCTs sent to Carn Ryan to be used for DSD
Sep 45	First stocks from Bowes for Deep Sea Dumping (DSD) 244 MU Cottam unable to receive any more HE as war storage requirement relaxation no longer in force. Stocks must now satisfy AP 2608A
13.9.45	Redcastle prepare to disband - 20,000 super sensitive detonators destroyed by burning
Oct 45	2,500 tons of C/Ws received at Bowes for disposal Mendlesham and Great Ashfield to 94 MU
30.10.45	DH Dominie from Stretton to Halesworth flown by Naval officer landed at Attlebridge amongst the explosives stored on the runway - failed to notice the landing prohibited signs
Nov 45	
17.11.45	275 MU formed at No 2 Military Port, Cairn Ryan
30.11.45	244 MU Cottam transfers to 91 MU Cottam
Dec 45	Smaller units began to be closed - eg 77MU 275 MU - LCTs only handling 100 tons per trip - not 150 as estimated - hence more required. 2kt dumped to date
1.12.45	245 MU disbanded 91MU moved to Cottam 275 MU formed
20.12.45	Redcastle cleared and closed

1946	42 group should be reduced by 52,000 posts would result in some 600 kt remaining without disposal
Jan 46	
15.1.46	Bridleway Gate becomes satellite of 2MU Altrincham
27.1.46	Cairn Ryan has dumped 4500 tons

Feb 46	Lords Bridge is decanting 65lb LCs for burning at Riseley
	Post war holding to be 175 kt (Stocks = 325 kt + 150 kt incendiary)
28.2.46	Acaster Malbis becomes 80 MSU
28.2.46	64 MU is now completely closed
28.2.46	Cairn Ryan has dumped 9300 tons
Mar 46	2 RAOC coasters + 2 LCTs to Cairn Ryan to allow RAF to dump 500 tons per day
14.3.46	Hatfield and Warley closed
18.3.46	Lords Bridge now under 54 MU Newmarket from 2 MTC Quy
20.3.4	HQ 42 group moves from Burghfield to Kidlington
26.3.46	Visit to Germany to discuss Tabun
Apr 46	Rowthorne closed
	36 MSU Snodland closed
15.4.46	RAF School of Explosives moves from 42 group to 24 gp Technical Training Command based at Tatenhill, parented Fauld
15.4.46	HQ Site 59 MU Newland moves to Rhoose, small working party remains to clear explosives
15.4.46	Rowthorne cleared and closed
24.4.46	Brafferton - first consignment of CW to Bowes
29.4.46	Eynsham Personnel move to Kidlington
31.5.46	Cairn Ryan has dumped 42 kt
May 46	USAAF sites Groveley Woods and Warren Woods transferred to RAF
	30,000 65lb C/Ws destroyed at Bowes - currently running at 3 - 4,000 per day
	Mawcarse to close by October, Market Stainton by Jan 47 - has the largest roadside storage in the group. Escrick and Hockering to be retained
1.5.46	247 MU disbanded
4.5.46	USAAF Sharnbrook transferred to Min. of Supply
7.5.46	USAAF Melton Mowbray transferred to Min. of Supply
8.5.46	USAAF Braybrooke transferred to Min. of Supply
19.5.46	Snodland now closed
27.5.46	Brafferton now responsible for Elvington
31.5.46	Record for month - 13,855 tons dumped from Cairn Ryan, using 6-7 craft per day. Total to date is 42 kt Insignificant number of small bombs now available - large ones difficult to handle
Jun 46	Bowes - positive earth contamination discovered. Urgent action to dispose of all chemical weapons. Special convoys to be arranged to transport weapons to burning areas. Certain weapons are unsuitable for burning - to be dumped at sea. Air Ministry to supply hulks
	98MU moves to Fordoun, under Leuchars Groveley and Warren Wood transferred to 42 group
	36 MSUs Charlwood, Newdigate, Jordans Wood return to owners.
6.6.46	224 MU HQ moves from Leeming to Catterick
9.7.46	All CW clear from Brafferton
28.6.46	FFD1 transferred to 94MU Barnham
Jul 46	Detonator shaft method approved at Llanberis to destroy 120,000 per month
	40,000 65lb LCs burnt to date
	400 lb SCI / mustard sent for scuttling
	FFD Little Heath transferred to RAF 94 MU
	Barry Dock now has scuttling ships to dump 'Y' filled bombs - 31 kt to be scuttled in August followed by 1 ship per month. Phosgene will not be scuttled but dumped via Silloth - not Cairn Ryan
4.7.46	A quantity of German C/Ws is to be stored in the UK. Llandwrog surveyed and becomes 277 MU. Bellman hangars to be transported from other sites and erected
11.7.46	Mawcarse closed
August 46	233MU moves to Wickenby
	Required RAF holding now stated to be 486 kt
23.8.46	*SS Empire Peacock* leaves Barry Dock to scuttle 3,186 tons of mustard weapons
Sept 46	Contaminated water at Bowes trapped by trenches dug around outer perimeter of site. Water then purified and released. Trenches to be complete by March 1947
	1,270 tons of Phosgene DSDd via 275 MU
	1,277 tons of mustard scuttled in *Kindersley*
	During the war turnover of explosives was high - little maintenance necessary - no longer the case - thus more labour, plus less dense stacking necessary

	277 MU Llandwrog opens with railhead at Llanberis - last week - Operation Dismal commences - the transportation of Tabun from NW Germany to the UK Emden to Newport docks. Skilled medical personnel on hand. 1700 tons received during month. One 250 kg Green Ring bomb destroyed
Oct 46	275 MU disposes of 1,378 tons of CW in *SS Empire Woodlark* for scuttling, followed by 1272 tons in coasters from Silloth, followed by 1,278 + 305 + 620 + 837 tons
Nov 46	Snow hampering clearance at all units Unable to disband Bowes Moor as *'Empire Rhodes*' had been sold by A.M. - this had been destined to take all remaining stock
28.11.46	Hangars begin to arrive at 277 MU
Dec 46	8 hangars begin erection at 277 MU 14,000 tail units sent during last few months for disposal to Henderson Clark of Middlesbrough. 206,000 bundles of Window to be sent to Ironbridge Metal Works

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1947	Escrick & Hockering to be retained 25,000 65 lb LC bombs sent to Norton Disney from 233 MU for demolition
Jan 47	Heavy snow hampering clearance at all units 233 MU has largest roadside stocks in the group
End Jan	7.7 kt (38,605 containers) received to date at 277 MU
31.1.47	36 MSU Redhill closes
Feb 47	219 MU HQ moves from Falcon Hotel to Ashfield Hotel
Mar 47	
Apr 47	Riseley CW site high priority for clearance of Y3
15.4.47	219 MU cleared
May 47	31 MSU Holywell now closed SS Empire Leighton at Cairn Ryan for final stocks from Bowes Moor Operation Inkpad - OIP - Riseley - the burning of 9,000 x 55 gallon drums containing mustard gas. Dangerous as containers pressurised. Drums will be decanted into a large tank connected by pipes to burning pits - due to start in September 8 hangars now available at 277 MU
20.5.47	219 MU Settle Disbanded - *(possibly 19th*)
Jun 47	
29.6.47	Operation Dismal - phase 1 complete. Final stocks to Llandwrog making 69,909 weapons total. All hangars are now available - further 600 weapons due from Rhydymwyn
Jul 47	Bowes cleared
Aug 47	
Sept 47	2 trains from MSCD Rhydymwyn deliver to 277 MU. Hangar 23 is used for preservation process which consists of dipping the GA bombs in DTD 663 lanolin OIP - problems with smoke dispersal and caking of residues
Oct 47	
21.10.47	81 MU due to disband
Nov 47	
10.11.47	275 MU moves from Cairn Ryan to West Freugh
Dec 47	Stocks of 42 gp to be reduced from 472 kt to 270 kt Start of decanting 65lb LC bombs at FFD5 Grangemouth, 243 MSU cleared
15.12.47	Yorks Ammo Area formed. comprising 80, 90, 224. HQ = 91 MU Cottam, (units were first disbanded)

1948	Stocking - all HE to be retained; 33% of .303 to be retained; 75% of 20 mm and .5" to be retained; all rockets to be retained
Jan 48	East Anglian Ammo Area = 95, 231 under 94 MU Gt. Ashfield (Pulham, 53 MU excepted) OIP - 25,000 gallons of mustard left. burning to continue but some 'safe' stocks to be DSD Start of weapon preservation at 277 MU = 70,000 bombs
12.1.48	High Carr Wood at East Moor to be used by 42 group
27.1.48	Admin. from Lords Bridge and Hockering close; Great Ashfield now controls the EAAA (Attlebridge, Barnham, Little Heath, Bungay, Mendlesham, Nuthampstead, Old Buckenham, Rackheath, Ridgewell, Seething, Riseley

Feb 48	1300 lengths of RSJs from E's and L's to be used for rebuilding airmen's barrack blocks Stocks = 460 kt including 41 kt roadside
10.2.48	21 MU to store incendiary and SAA underground
Mar 48	Additional storage sites still urgently required by 42 group as still 36 kt on roadside OIP - all gas now burnt - decontamination of drums to commence - furnace constructed Demolition of explosives on Cannock Chase by 21 MU to cease - Rufforth bombing range to be used
20.3.48	275 MU closes as a port for DSD - Silloth to take over
Apr 48	
May 48	Totals destroyed for month = CW 979 tons; HE DSD - 415 tons, HE boiling out - 2411 tons, breakdown - 703 tons, demolition - nil. Total = 4508 tons 10.5.48 Cairn Ryan closed *(for first time ?)*
Jun 48	Ridge - 445 suspect 500 lb USA bombs sent to Long Newton 36 kt still on roadside sites - additional storage facilities required Inspection of FFDs - Lords Bridge is serviceable, others require spares. All Pots are full except 1 FFD which has 300 tons (max 1500 tons). 41 airmen per FFD = strength Present stocks include - 300 22,000lb bombs, 3250 12,000 lb bombs, 27,000 4,000 lb bombs, 215,000 1,000 GP/MC bombs, 35M rounds of .303, 17M rounds of 20 mm
Jul 48	FFD empties storage building is 96' x 80' x 15' and can store 10,000 crated 65lb weapons.
2.7.48	FFD5 has 26,000 empties stored at Acaster Malbis
Aug 48	Following sites to be transferred to 42 group to enable all roadside sites to be cleared asap - Riccall, Fulbeck, Balderton, North Killingholme, Hitcham, Marston Moor
Sept 48	North Kill withdrawn, Dalton and Tholthorpe added Following airfield sites to be cleared urgently - Leconfield, Abbots Bromley, Long Newton, Charlton Hawthorne
Oct 48	Following sites to be cleared urgently - Riseley, Kiplin, Warren Wood, Groveley Wood, Pulham, Kirknewton, Nuthampstead, Fordoun, Eynsham, Great Orton, Rackheath, East Moor, Skipton-on-Swale, Elvington, Tholthorpe, Melbourne, Holme-on Spalding Moor, Ludford Magna, Kelstern, Skellingthorpe, Fiskerton, Strubby, Downham Market, Witchford, Wratting Common, Elsham Wolds, Breighton, Metheringham, East Kirkby, Sturgate, Gransden Lodge, Spilsby Rhoose Dalton & Tholthorpe rejected - too close to villages Faldingworth added (found to be ideal), also possible Woodhall Spa and Dunholme Lodge
Nov 48	
Dec 48	New airfields to be used for storage are Fulbeck, Balderton, Hitcham, Faldingworth, Holme, Melbourne, Bottesford. Riccall and Marston Moor are already stocking with HE 4,000 empty 65lb LC bombs to be destroyed by burning at Cottingwith. Phosgene to be scuttled or returned to ICI. Chemical smoke to be DSD

Total for year - Boil out - 39 kt, DSD - 13.5 kt, CW disposal - 63 kt, + misc = 71.7 kt

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1949

Jan 49	Stocks = 396 kt including 23 kt roadside Harpur Hill must be emptied as an underground explosion here would destroy the RAF camp, the Safety in Mines Research Association, and an ICI wagon repair depot. Site to be used for SAA and nose ejection clusters 280 MU proposed to open 1.6.49 to supply explosives to the USAF in Europe OIP - decontamination of drums complete
Feb 49	
11.2.49	Cottam moves to Acaster Malbis, Cottam becomes MSU 15.2.49 Cairn Ryan reopened from Silloth
Mar 49	All FFDs to be made fully serviceable, and present stocks of filled C/Ws to be maintained
Apr 49	Barnham - Aughton & Exclamation Spinney are CW sites Meeting re future of FFDs - retain for the present
22.4.49	233 MU now inactive
May 49	Llandwrog - 70,000 weapons to be preserved.
19.5.49	North Pickenham, Tuddenham and Little Snoring visited
Jun 49	Stocks = 377 kt including 15 kt roadside

19.5.49	Earsham inspected with a view to supplying USAF Europe
Jul 49	
1.6.49	280 MU Earsham opens with MSUs at North Pickenham, Tuddenham and Little Snoring, to store 19 kt HE plus 11 kt incendiary
Aug 49	Split of East Anglian Ammo Area - 4 sites removed - Ridgewell controls Lords Bridge, Riseley, and Nuthampstead; 53 MU Pulham controls Bungay and Seething
3.8.49	North Pickenham (under Watton) becomes 281 MU under 42 group, to handle 27 kt for USAF
11.8.49	475 rail wagons begin to arrive until end of month containing 3300 tons of incendiary at Watton railhead Little Snoring and Tuddenham available as satellites
Sept 49	
Oct 49	Stocks = 361 kt including 10 kt roadside 42 group has 21 active CW sites
Nov 49	Review of all ammo storage sites
30.11.49	11 MSU Groveley Wood closes
Dec 49	
31.12.49	Stocks = 377 kt including 8 kt USAF & 8 kt roadside

1950

Jan 50	
1.1.50	Bungay and Seething now under 53 MU for admin.
15.1.50	11 MSU Long Newton closed
Feb 50	
Mar 50	Preservation at 277 MU is virtually complete, 70,000 nose caps are also to be preserved in mineral jelly. The unit aims to be civilianised by September 1953
Apr 50	Stocks = 365 kt including 5.5 kt roadside
May 50	Warren Wood stocks to be cleared to North Pickenham

93 MU Wickenby

93MU	*93 MSU*	*93 MSU*	*93 MSU*	*93 MSU*
Wickenby	**Goxhill**	**Bottesford**	**Norton Disney**	**South Witham**
Faldingworth	Caistor	Fulbeck	FFD-3	North Witham
Ludford Magna	Killingholme	Balderton	Spalford	Moor Lane
Strubby	East Kirkby	Skellingthorpe	Metheringham	

as at May 1950

Jun 50	Stocks arrive at 281 MU from Germany - 100lb bombs Tuddenham accepted as MSU, Litle Snoring rejected
Jul 50	New buildings at Altrincham for servicing of groups stocks of .303 and .5 Proposal to enlarge doors of 'E's and Lamellas Riseley now finally clear, bleach traps remain Barnham (cost of 1M) plus 'an airfield' proposed for Permanent Ammunition Depots of 50 kt each. Seven depots in total will be required
Aug 50	All stocks from MOS Sharnbrook sent to 281 MU
15.8.50	95 MU Riseley to C & M
Sept 50	
1.9.50	95 MU HQ transferred from Lords Bridge to Ridgewell
16.9.50	6 airfields visited to find accommodation of 30 kt of USAF explosives. Welford recommended as HQ site
26.9.50	Fulbeck or Faldingworth proposed as PADs - for new Bomber Command plan 'Galloper' - this is instead of Barnham
30.9.43	243 MSU Fordoun cleared
Oct 50	Barnham & Faldingworth proposed as PADs, latter to serve Canberra bases at Binbrook, Coningsby, Waddington, Scampton and Hemswell. Possibility of a Yorkshire site being developed - probably Riccall, as Acaster too close to York

	Warren Wood and Kirknewton to close - Ridge to remain temporarily as the best underground site. National search for a new underground site - only suitable find was 'Shepherds Tump' in Radnor Forest - good communications but difficult to develop - likely to cost over 1M (seems cheap !). In 1941 0.5M had been spent on underground Llanberis - recent decision to close is being waived - re-inspection necessary
	Demolition of Smoke weapons at 31MU suspended due to local complaint
Nov 50	Warren Woods dangerous - priority for clearance
30.11.50	Stocks = 348 kt including 4.2 kt roadside
Dec 50	All CW sites now cleared - Riseley and Comberton to be purchased by the Air Ministry. Final 11 sites to be inspected at 6 month intervals
1.12.50	Welford requested by USAF - transferred to 42 gp

1951	MoS depot Wakes Colne is in use holding 722 tons of USAF ammo
	Proposed USAAF storage site at Ramsden Park near Witney, Oxford
	Earsham opens to supply Lakenheath, Brize Norton, Sealand, Mildenhall, *LIVEFAD?* , Manston, Wyton, Tuddenham, Burtonwood
	93 MU Wickenby HQ transfers to Newton, *(Reduse Bottesford*. FORM 93 MSU Wickenby ? what does this mean?)
Jan 51	281 MU, North Pickenham opens ?
	95 MU Ridgewell has satts at Riseley, Lords Bridge and Nuthampstead 8.1.51 93 MU moves to Newton
Feb 51	93 MSU Spalford to be used as a burning and demolition site
Mar 51	91 MSU "Holme on Spalding Moor" ??? to be cleared by 16.4.51. All stores will be taken to Riccall and Melbourne
Apr 51	94 MU - last of Warren Wood stocks sent for DSD. Sites still to be cleared are Mendlesham, Barnham, Hockering and Hitcham
	MoS inspectors from Kidbrooke and Mold complete boring and test sampling on the Spalford site. Results are very positive (ie bad!)
	93 MU stocks are 49 kt of HE, 14 kt incendiary, 1kt of SAA, 256 tons of fuses and 500 tons of mustard. Fulbeck is in use and Elsham and Skellingthorpe are shortly to be cleared
May 51	
Jun 51	
30.6.51	96 MU Eynsham to close
Jul 51	31 MSU at Llandwrog has box repair facility
	93 MU - Elsham now clear, Skellingthorpe and half of North Killingholme to be clear by August. Faldingworth inspected for PAD. Kelmarsh and *Stonsley??* AFDs taken over
Aug 51	93 MU - Bombs from Ludford, Metheringham, Strubby, and East Kirkby to be sent to Balderton and North Witham. 4,000 lbs to North Witham, remainder to Balderton. Killingholme continues to clear
Sept 51	
Oct 51	93 MU FFD - liquid mustard has after a number of years penetrated the lead tank and is dripping into the concrete sump. Daily checks made. sump water is slightly positive contamination.
Nov 51	
1.11.51	Wing to be used by USAF until Welford is available., later will have 3 off 10 kt H/E blocks
12.11.51	93 MU Faldingworth 9,000 ton stocks start to transfer to Woodhall as former to become PAD
Dec 51	93 MsU Killingholme clear, Skellingthorpe to become storage unit.

1952	93 MU has AFDs at Stonesby, Kelmarsh, Redmile, Misterton, Brampton, Langford
Jan 52	
Feb 52	
Mar 52	
Apr 52	Dalton taken over by 91 MU - to be stocked from Great Orton.
	93 MU takes over Ludford, Skellingthorpe and Kingscliffe
May 52	
Jun 52	Skellingthorpe to receive stocks from 249 MU Annan
Jul 52	

Aug 52	There is a new 4,000 lb bomb servicing line at Escrick. Brafferton also stores 4,000 lb bombs
18.8.52	282 MU forms at Bicester but transfers very quickly to Kidlington
Sept 52	
1.9.52 92	MU forms at Wickenby - (93 MU is overburdened) - controls Goxhill, Caistor, Woodhall Spa, Faldingworth, Skellingthorpe (and Ludford Magna ?), plus the AFDs at Langford, Misterton, and Brampton (Stow Park). Also to parent inactive stations at North Killingholme and Kirmington
24.9.52	Gosfield taken over by 95 MU
1.9.52	282 MSU Finmere taken over, though CAD is still resident
Oct 52	
Nov 52	MoS report that Norton Disney & Spalford are clear of contamination. Caistor Closing Bicycle sheds to Ridgewell consist of Igloo galvanised sheet type
Dec 52	

1953	Llandwrog has a box repair facility Faldingworth & Barnham to be ready by 1956 Cottingwith and Little Heath to clear in 1954
Jan 53	
Feb 53	282 MSU Wing taken over to supply Brize Norton Upper Heyford and Fairford
Mar 53	
Apr 53	
May 53	280 MU no longer required by USAF - to close 27.5.53
Jun 53	92 MU - Large receipts at Ludford as Goxhill is closing There are 4 Grand Slams at 91 MSU Cottam
Jul 53	Operation Rocker Box - return of surplus fragmentation bombs to Pembrey
14.7.53	Operation Pepper Pot (OPP) commences. This is the disposal of FFD 1 - Little Heath Site, and is likely to take ten months. The site will have Technical, domestic and Admin sites built thereon. Actually OPP then continued to dispose of all FFDs
Aug 53	31 MSU Rhiwlas closed, Goxhill closing
Sept 53	
14.9.53	Llandwrog civilianised
Oct 53	Operation Spring Onion - transfer of vesicant from Little Heath to ICI Randle, due to start 20/21st Oct.
Nov 53	Goxhill closed 91 MU now consists of Acaster Riccall Escrick Melbourne Cottam Brafferton and Dalton
Dec 53	

1954	Riseley is so badly contaminated that it is likely to remain AM property indefinitely (under 279 MU) 28 MU has detachment at Cairn Ryan. Norton Disney has C/Ws ready for transportation to Harpur Hill. Skellingthorpe to provide for Waddington - (1954 ?) Operation Steering Wheel suspended due to bad weather at Cairn Ryan.
Jan 54	Supply of RAF compressed gases from 243 MU Keith, 244 and 279 MUs Cardington, and 94 MU Barnham. Gosfield is stocking for 95 MU
Feb 54	Faldingworth - almost clear
15.2.54	OPP1 - phase 4 - transportation of vesicant Y3 to Randle by train.
Mar 54	
4.3.54	First train arrives at Randle - due to decanting difficulties further trains will be delayed.
Apr 54	OPP1 - 2 further trains to Randle. Decontamination of Pot A commences. 5 trains in total required. OPP was due to end this month. Earsham apparently closes ?
May 54	Balderton 93 MU to be clear by Nov 1954 Pot B is also empty and C is emptying

11.5.54	Fourth train is full
17.5.54	Advance party for OPP stage 2 leaves for 91 MU Acaster (Cottingwith)
18.5.54	Port C emptying commences to train 5
Jun 54	OPP1 - all pots emptied.
	91 MU - Escrick Cottam Southburn are now closed and handed over to AMWD
Jul 54	2,000 off 1,000 LC Y3 bombs from Randle to Norton Disney
	OPP - dumping of scrap metal in Pot A. Internal spraying to commence - may not be effective.
	94 MU - Hockering Wood clearance complete
	91 MSU Brafferton closed, personnel transferred to Topcliffe.
12.7.54	OPP-4 124 tons of mustard to Randle, first train arrives 27th July.
29.7.54	OPP-4 second train arrives and delivers further 126 tons in August
Aug 54	OPP3 - 93 MU begins for Y3 & Y25
	OPP4 - All pots decontaminated - all that remains is to dispose of clean and suspect material.
16.8.54	Honington transfers from Maintenance Commend to Bomber Commend. 94MU becomes a lodger unit.
19.8.54	281 MU North Pickenham handed over to 7559 Supply Squadron USAF.
Sept 54	Concrete CW box dropping tests at Llandwrog
2.9.54	282 MU Kidlington, Wing and Finmere handed over to 7559 Supply Squadron USAF.
Oct 54	OPP3 - 3 tons only of Y3 left at Norton Disney, also 560 tons of misc chemical weapons left (appendix 892)
	OPP - all contaminated equipment now removed from site. 4 contaminated road / rail tanks, plus 3 contaminated trailers to MoS Randle. FFD1 is now clear of all contaminated pumping and associated equipment.
	95 MU - Scrap metal from Comberton Spinney to be sent to Riseley. Perimeter of latter is to be reduced. Nuthampstead is to close. 95 MU will close in April 1955 and become a sub-site of 94 MU.
	Operation Sandcastle commences at Llandwrog - the disposal of CW bombs.
	Skellingthorpe clearing.
Nov 54	OPP - Min. of Supply scientists declare Little Heath clean.
Dec 54	92 MU - Skellingthorpe cleared. Ludford Magna - Wick Wood is only remaining site. Wickenby has 4.7 kt, Woodhall Spa has 8.8 kt and Ludford has 9.1 kt
	OPP - complete. Entire area treated with bleach solution, surrounding ground dug and harrowed to 18". All toxic and suspect materials dumped in the Pots which were sealed. Area of the Pots to be surrounded by an unclimbable fence.
8.12.54	Further CW train arrives at Lords Bridge. Return expected 21.12.54, but postponed until mid Jan. 55

1955

Jan 55	95 MSU Gosfield is clearing. OPP-4, second Pepperpot team arrives at Lords Bridge to break down the technical equipment at the FFD, and remove the vesicant from 'K' tank.
27.1.55	Train with 25 trucks of Y25 left FFD4 under escort for FFD3. 11.1.55 Check date re this and above.
	09.55 Lords Bridge FFD. There was an explosion and fire in 'K' tank holding approx 130 tons of Y25. The area was immediately evacuated and RAF personnel from Lords Bridge arrived to tackle the fire, which was under control at 10.15, and extinguished by 10.20. The civil fire brigade arrived but were not required. The civil police warned civilians re the cloud of toxic smoke which drifted across the countryside. All civilians were medically checked during the next few days for effects. K tank was completely shattered - the top had blown off and hurled on its side. 20 tons of vesicant were lost. There was no signs of contamination around the tank, in the nearby stream, or in the water bore hole. Meticulous safety precautions were taken, the remaining vesicant in the open pot was blanketed with a thick layer of foam, day and night. In spite of snow and hard frost the remaining vesicant was sucked into a temporary 5 ton tank and then blown into pot 'J' under pressure. Cpl Saunders and Flt Lt Cambell were commended.
Feb 55	Old Buckenham - clearance of perimeter track prior to construction of new perimeter road
	Operation Rear Light - return of surplus 500 lb bombs to Pembrey for boiling out.
9.2.55	FFD 4 - 6 off 1,000 lb containers filled Y25 sent to Porton by special convoy on 11.2.55.

11.2.55	95 MSU Gosfield transferred to AMWD.
14.2.55	Lords Bridge transferred to 217 MU.
Mar 55	All 92 MUs surplus stocks to be sent to ROFs for boiling out. Erection of guillotine at Llandwrog for removing 20" of tail unit to save space when prepared for DSD. Porton Detectors used for leak detection. All personnel in area of guillotine to wear full anti-gas equipment.
21.3.55	95 MU is now 94 MSU
Apr 55	
May 55	
13.5.55	2MU Altrincham to be used for:- Titanium tetrachloride filling of 8.5lb practise bombs Receipt inspection and sale of "fired brass" Receipt inspection and maint. of non exp. equipt. Receipt inspection and maint. of empty exp.containers.
Jun 55	
14.6.55	Phase 2 of Operation Sandcastle - the loading of KC 250, lll, GR bombs in boxes (approx 6' x 18" sq.)onto ammo dumping craft at Fort Belan, then transferred to 31 MSU Cairn Ryan for transfer to hulks prior to scuttling. The target for summer 1955 to be 16,000 bombs, to be dumped on the *SS Empire Claire*.
22.6.55	The first B.A.I.D Oxygen plant to be supplied to the RAF in the UK is delivered to Acaster Malbis on three trucks. There are parts missing, it has not been lubricated.
July 55	OPP - breaking down the pots at Cottingwith is drawing to a close. Heavy machinery is required to finish the job. 93 MU North Witham to clear by 23.7.55
Aug 55	OPP - 8 men to dig out buried scrap at Cottingwith. Bulldozer and tipper delivered to site. 91 MU appears to consist of only Acaster and Riccall now.
Sept 55	North Witham being closed Six kennels, dog being manufactured for 94 MU sub-sites 92 MU sends 12,000 lb bombs for DSD
Oct 55	Vampire from Swinderby force lands at 92 MSU Faldingworth OPP - FFD5 - the pots were recently emptied. All contaminated pipelines and metal work will be cut into small pieces by oxy-acetylene. Exterior ducting for pipelines has been heavily bleached and filled in with rubble and earth. The surrounds of the pots has been dug over and harrowed to 12 "and treated with a heavy concentration of bleach paste, The pots are to be completely filled, the metal covers sealed, and topped off by concrete caps.Nov 55
Dec 55	Acaster Malbis - a 17' wide strip of tarmac has been provided from Stubb Wood, round the peri-track to the DA entrance.

1956	282 MU Bicester to control Finmere and Wing, (surveyed in 1954) Jan 56 42 group disbands - to 40 group The BAID oxygen plant at 91 MU is still very unreliable. Feb 56
13.2.56	Brafferton C&M under Topcliffe
23.2.56	Dalton C&M under Topcliffe
Mar 56	Escrick Wood to be de-requisitioned.
Apr 56	93 MU Fulbeck clear, transferred to Cranwell Kingscliffe to close All SAA stocks from Riccall will be sent to Harpur Hill to eliminate the need for extra guards, police dogs and alarm bells.
16.4.56	North Witham - 93MU now inactive
May 56	92 MSUs Ludford and Woodhall to 93 MU
1.5.56	A train loaded with HE from 93 MU to Cairn Ryan involved in an accident. 48 hours later it was reported that 1 bomb (photoflash) was missing. A full search of the area was made and all staff involved in the rescue operation were questioned. 9 days later the bomb was found in a truck at Newark - it had catapulted off the ammo train and landed on a train going in the opposite direction.
29.5.56	*MV Vogtland* sails at 15.50 with 28,737 GA bombs and scuttles at 22.19 the next day.
Jun 56	South Witham closed 93MU
11.6.56	*SS Kokta* available for remaining GA bombs
July 56	
23.7.56	*SS Kokta* scuttled.
Aug 56	Cairn Ryan transferred to 28 MU

1.8.56	Llanberis now C & M under Llandwrog, believed Llandwrog also C & M in October
Oct 56	93 MU - all CW stocks to clear.
30.10.56	93 MSU Kingscliffe cleared
Nov 56	
12.11.56	93 MU - 1,000 lb LC bombs, + 1 litre steel bottles to Riseley. Remaining stocks to 91 MU. (sec 12M ? ?)
Dec 56	91 MSU Riccall is no longer required by 40 group and is to be cleared by Jan 1957.

1957

Jan 57	
3.1.57	91 MU Acaster Malbis is no longer required by 40 gp. The BAID oxygen plant is to go to Rufforth, which will become 93 MSU. Acaster will be 93 MU det. Riccall and Cottingwith will come under Rufforth. Inactive stations included are Breighton and Escrick, under Church Fenton, and Pocklington and Melbourne under Leconfield.

Appendix 13 List of all known sites used by RAF and USAAF in WW2

ABBOTS BROMLEY
Redundant airfield, sub-site of
Inspected *Taken over* *Stocking*
Filled Clearing 9/48 *Cleared to C&M* *to AMWD*

ACASTER MALBIS
Redundant airfield, sub-site of 91MU To 93 MU Jan 57. 80 MSU from Feb 46
Inspected 5/45 *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

ACORN BANK
Pre-war intended underground storage site 1 mile NW of Temple Sowerby, Westmorland - 620280. Disused Gypsum Mine. Probably abandoned due to flooding and proximity of mine tunnels to village.

ALTRINCHAM 2 miles NW of Altrincham - 750895.
Main Depot 2 MU Sub unit was Corringham Moss
Opened 1.4.24 as No. 2 Stores Depot, to store all types of ammunition, bombs and pyrotechnics.
Closed

ANNAN
Redundant airfield, sub-site of
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

ASHBOURNE
Redundant airfield, sub-site of Inspected
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

Became a sub-site of 28 MU Harpur Hill in May 1945 and was fully stocked with bombs by August 1945.

ATTLEBRIDGE
Redundant airfield, sub-site of
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

BAGOTS WOOD
Subsite of 21 MU Fauld
Opened Closed

BAINTON
Southburn Satellite - 18 trucks 442706 98/44/956540
Opened Closed

BALADO BRIDGE
Redundant airfield. sub-site of 98 MU Mawcarse - 095035. 2 miles NW of Kinross.
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

BALDERTON
Redundant airfield, sub-site of
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*
Became a sub-site of 93 MU in August 1948. Still in use in August 1951 when stocks from Ludford, Metheringham, Strubby, and East Kirkby were sent here (to allow the others to close).

BARDNEY
Redundant airfield, sub-site of 233 MU
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

BARNHAM
FAD under Honington for Horsham St Faith Feltwell, Bircham Newton, Swanton Morley, Stradishall, Coltishall, West Raynham, Mildenhall, Marham, Watton, Wattisham. 2 miles S of Thetford. Old Site 862804, New Site - 852798. Became one of the two Forward Permanent Ammunition Depot developed in the fifties. A separate site for the storage of atomic weapons was constructed during this period. Aughton Spinney and Exclamation Spinney are CW sites.

Opened Closed

BEANACRE
Sub-site of 11 MU Chilmark. Railhead for Corsham Quarries
Opened Closed

BICESTER
Redundant airfield, sub-site of
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

BLAKENEY WALK
Sub-site of
Opened Closed

BOTTESFORD
Redundant airfield, sub-site of 93MU
Inspected *Taken over Oct 48* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

Transferred to 42 Group in October 1948, then became a sub-unit of 93 MU Wickenby, controlling the depots at Fulbeck, Balderton, East Kirkby and Metheringham.

BOURN
Redundant airfield, sub-site of
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

BOWES MOOR
Main RAF Chemical Weapons Depot - 80 MU 84/35/982148 975145
Opened Cleared 7/47 Closed

BRAFFERTON
FAD Headquarters Site - 92 MU. Originally supplied Leeming, Linton, Topcliffe, Thornaby, Church Fenton, Catterick. 5 miles NE of Borobridge - 450709
Opened Closed 7/54 C&M Topcliffe 2/56

BRAYBROOKE 141/SP775825
FAD 3 miles SE of Market Harborough
Opened Closed

Why the Air Ministry should construct a large ammunition depot for the RAF right in the middle of the U.S. 8th Air Force First Bombardment Wing's group of airfields might remain another mystery of WW2. Yet on the 15th May 1943 No 223 MU Braybrooke officially opened as a Forward Ammunition Depot. The base was parented by North Luffenham, and at this point was staffed by 3 officers, plus 286 other ranks. It probably came as no surprise to be told a few weeks later that the site was to be de-stocked prior to being transferred to the Americans who had already been operating from many of the local airfields for several months. By the end of July the roads had been cleared and the base was transferred to the US 8th Air

Force Service Command during the following month. The depot consisted of several miles of second class roads within the triangle formed by the villages of Braybrooke, Artingworth and Desborough. Loatland wood was used to store SAA and pyrotechnics. The technical, sleeping and communal sites were on the western outskirts of Desborough. The storage capacity of the unit was 17,500 tons of bombs and it served up to 15 local heavy bomber airfields including Polebrook, Alconbury and Grafton Underwood, plus the two fighter training stations at Atcham and Goxhill. At the end of hostilities the sight was quickly cleared and returned to the Ministry of Supply on the 8t May 1946. Virtually no trace remains of the depot today, Loatland Wood disappeared many years ago, and the technical and sleeping sites are now part of a housing estate. However it is just possible to make out some of the bomb storage bays at the verges on the roads within the area described.

Site Description - see map-

A,C,D,E	Bomb Stores, high explosive and incendiary
B,G	Components, eg tail fins, detonators, delay pistols, lugs, etc
F	S.A.A - typically .303 for general purpose, 0.5 for aircraft machine guns, 50 mm for fighters.
H	Gas - usually mustard but also some phosgene. There would also be a separate site for breathing oxygen.
L	Loatland Wood - S.A.A and pyrotechnics.
X	Communal Site - Dining Room, institute, cinema/theatre, medical inspection, ration store, tailors, shoemakers & barbers etc. Y Sleeping Site - separate huts for airmen, sergeants and officers. Also latrines and ablutions and pay room.
Z	Technical site - Station HQ, MT park - offices - petrol tank and pump, fire tender shed, armoury and workshop, equipment stores.

BREIGHTON

Redundant airfield, sub-site of

Inspected	*Taken over*	*Stocking*
Filled Clearing	*Cleared to C&M*	*to AMWD*

BRIDLEWAY GATE

2 MsU from 1/46

BROOM HILL

Sub-site of

Opened	Closed

BROUGHTON

Proposed FAD - work in progress end of 1941

Opened	Closed

BUNGAY

Redundant airfield, sub-site of

Inspected	*Taken over*	*Stocking*
Filled Clearing	*Cleared to C&M*	*to AMWD*

BURES

USAAF 7 miles NW of Colchester - possibly 326984

Opened	Closed

BUTTERTON

Swainsley Tunnel - 5 miles E of Leek - 091577. Approved 6/12/40 Sub-site of 28 MU Harpur Hill. Used to store Chemical Weapons

Opened	Closed

CAIRN RYAN

to 28 MU Aug 1956 from 31 MSU

Opened	Closed

CAISTOR

Redundant airfield, sub-site of 233 MU, then 93MU under Goxhill

Inspected	*Taken over*	*Stocking*
Filled Clearing 11/52	*Cleared to C&M early 53*	*to AMWD*

CANNOCK CHASE

proposed at end of 1941 as a 12 kt depot

CAWOOD

Sub-site of 80 MU Escrick

Opened	Closed

CHARLTON HORETHORNE

Redundant airfield, sub-site of

Inspected	*Taken over*	*Stocking*
Filled Clearing	*Cleared to C&M*	*to AMWD*

CHARLWOOD

Opened	Closed

CHILMARK

11 MU Main site Limestone Mine. Sub-sites as at 1.3.44 included Ladydown and Pitts Wood.
Opened 1.4.37, as No.11 Equipment Depot
Closed

CHURCH HANBOROUGH

Sub-site of Eynsham

Opened	Closed

CINDERFORD

Sub-site of

Opened	Closed

COMBERTON

95 MU satellite from October 1941

Opened	Closed

CONNEL

Redundant airfield, sub-site of

Inspected	*Taken over*	*Stocking*
Filled Clearing	*Cleared to C&M*	*to AMWD*

COTTAM

Redundant airfield. 91 MU from 12/45, 244 MU from to 12/45?????

Inspected	*Taken over*	*Stocking*
Filled Clearing	*Cleared to C&M*	*to AMWD*

COTTINGWITH

Chemical Weapons - Forward Filling Depot No. 5, sub-site of 80 MU Escrick. 3.5 miles E of Escrick. - 676429. Site still fairly intact 1989 - Pots capped and large sheds removed.

Opened	Closed

CUCKOO LANE

Sub-site of

Opened	Closed

DALTON

Redundant airfield. sub-site of 91 MU

Inspected	*Taken over 4/52*	*Stocking*

Filled Clearing *Cleared to C&M 2/56 (Tpcliff* *to AMWD*

DARLEY MOOR
Redundant airfield, sub-site of
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

DINTON
Sub-site of 11 MU Chilmark.
Opened Closed

DOWNHAM MARKET
Redundant airfield, sub-site of
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

EAGLE WOOD
Sub-site of 93 MU, contained FFD3 Opened Closed

EARSHAM
2 miles SW of Bungay, destined to close May 1953, Opened
Probably closed 4/54

EAST KIRKBY
Redundant airfield, sub-site of 93 MU
Inspected *Taken over* 4/45 *Stocking*
Filled Clearing 8/51 N Witham *Cleared to C&M* *to AMWD*

EAST MOOR
Redundant airfield, sub-site of
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

EASTLEYS
Sub-site of 11 MU Chilmark. Actual site was part of the Central Ordnance Depot at Corsham, comprising Tunnel, Monkton Farleigh and Eastlays / Ridge. Used as a filming location for the Fourth Arm. Opened
Closed

EDLINGTON
550970 - Large Wood - proposed FAD, including Peter Wood for 10 kt

ELM PARK
Underground stone quarry - near Corsham. transferred from **MU Quedgeley sub-site of situated at back of builders yard in Gastard. Due to be reopened soon.
Opened Closed

ELSHAM WOLDS
Redundant airfield, sub-site of 93MU
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

ELVINGTON
Redundant airfield, sub-site of
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

ESCRICK 635406 - Field storage FAD near Riccall Common - 80 MU
Escrick CW site was 250yds N of main unit. sub-sites as at 1.3.44 included NABURN ROAD
Opened Closed to AMWD

6/54

EYNSHAM
Originally planned to supply Abingdon, Benson, Bicester, Harwell and Upper Heyford. Opened possibly June 1941 under Kidlington and Abingdon. Satellites were Eynsham Park, Cuckoo Lane. Railheads were Handboro station and Kingham Junction. Sub-sites as at 1.3.44 included CHURCH HANDBORO.

Stations eventually to be served are - Brize Norton, Upper Heyford, Abingdon, Chipping Warden, Bicester, Moreton in Marsh, Honeybourne Harwell Wing, Pershore Wellesbourne Mountford, Thame, Oakley, Weston on the Green, Islip, Oxford, Kidlington
Opened Closed

FALDINGWORTH
Redundant airfield, sub-site of
Inspected *Taken over 12/48* *Stocking*
Filled Clearing 2/54 *Cleared to C&M* *to AMWD*

July 51 93 MU - Faldingworth inspected for PAD.

Used as normal airfield bomb store (15,000 tons) by 93 MU from Dec 48 to early 1954. In the meantime: July 51 - 93 MU, Faldingworth inspected for PAD. In October 1951 Faldingworth was one of two sites proposed as being suitable for conversion to Permanent Ammunition Depot (50,000 tons), to serve the Canberra airfields of Binbrook, Coningsby, Waddington, Scampton and Hemswell. The estimated cost for the project was 1M, the actual cost 3.5M !

FAULD Opened Closed

FINMERE
Redundant airfield, sub-site of 282 MU
Inspected *Taken over 9/52* *Stocking*
Filled Clearing *Cleared to C&M* *to USAF 9/54*

FISKERTON
Redundant airfield, sub-site of
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

FORDOUN
Redundant airfield. sub-site of 243 MU
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

FULBECK
Redundant airfield, sub-site of 93MU
Inspected *Taken over 8/48* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

FULSBY WOOD
proposed sub-site of 3 kt for 93MU, located at Tunby

GADDESBY 129/SK717137 6 m SSW of Melton Mowbray, to the North of the Gaddesby / Gt Dalby Rd
Opened Closed

As early as February 1941 the area surrounding the town had been surveyed for suitable ammunition storage sites, and a wooded areas between Gaddesby and Great Dalby was proposed as being suitable. In fact the site was not used until July 1943 when it was accepted by the 8th Air Force Service Command as temporary munition stores capable of 21,000 tons capacity. The site eventually became a truck storage depot and was handed back to the Ministry of Supply on the 7th May 1946, --

GARFORTH see Parlington Opened Closed

GISBURN
221 MU, Field storage Reserve Depot - 3.4.42 - June 1944, when HQ moved to Settle. Many sites in the Forest of Bowland - Gisburn Forest area.
Opened *Cleared 4/47* *Closed 5/47*

GOSFIELD
Redundant airfield, sub-site of 93 MU
Inspected *Taken over 9/52* *Stocking 1/54*
Filled Clearing *Cleared to C&M 2/55* *to AMWD*

GOXHILL
Redundant airfield, sub-site of 91MU
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

Airfield, sub-site of 91MU April 1945 to 233 MU, then to 93 MU then 92 MU June 53 92 MU - Large receipts at Ludford as Goxhill is closing closed in Nov 53

GRANGEMOUTH 243 MU cleared 12/47

GRANSDEN LODGE
Redundant airfield, sub-site of
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

GREAT ORTON
Redundant airfield, sub-site of
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

GREAT ASHFIELD
Redundant airfield, sub-site of
Clearing Cleared to C&M to AMWD
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

GRINDLETON
sub-site of
Opened Closed

GROVELEY WOOD sub-site of
Opened Closed

HAREWOOD FOREST
sub-site of
Opened Closed

HARPUR HILL
28 MU - Reserve Ammunition Depot, 2.5 miles SW of Buxton at 055703. Sub-sites as at 1.3.44 included SHELDON and MONYASH
Opened Closed

HARTINGTON
Field storage sub-site of 28 MU, 10 miles SSE of Buxton at 127590.
Hartington Accommodation was Beresford Cottage
Opened Closed

HARTSTON sub-site of
Opened Closed

HATFIELD Opened Closed

HEMINGBY Lincs 250766
Chemical Weapons subsite of 233 MU Market Stainton - utilised Green Lane. a 3 mile long wide verged road NE of Hemingby
Opened Closed

HIGH WOOD
sub-site of
Opened Closed

HILTON
sub-site of Fauld Opened Closed

HITCHAM
Redundant airfield, sub-site of
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

HOCKERING
231 MU, FAD from 11.1.4? parented by Swanton Morley. 9 miles NE of Norwich at 072145Sub-sites as at 1.3.44 included TUDDENHAM ROAD
Opened Closed

HOLDEN sub-site of
Opened Closed

HOLME-on-SPALDING MOOR
Redundant airfield, sub-site of
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

HOLYWELL
Underground quarry sub-site of Harpur Hill ? then 31 MU Llanberis. located in Grange Quarry - 170759.
Opened Closed

HONINGTON
Redundant airfield, sub-site of 94 MU (HQ)
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to Bomber Cmd 8/54*

ILMINGTON
proposed 15 kt depot

KELSTERN
Redundant airfield, sub-site of
Inspected *Taken over* *Stocking*
Filled Clearing 10/48 *Cleared to C&M* *to AMWD*

KINGHORN
WHERE IS THIS ? ? ? Opened Closed

KIRKNEWTON
Redundant airfield, sub-site of
Inspected *Taken over* *Stocking*
Filled Clearing *Cleared to C&M* *to AMWD*

KIPLIN

Originally AAP - sub-site of 92 MU Brafferton. but became 224 MU FAD in Nov 1942 under Catterick. Sub-sites as at 1.3.44 included HODBER HILL ROAD, MOULTON and THRINTOFT. Moved to Scorton in 1944, u/c Leeming. Opened Closed

LADYDOWN
sub-site of
Opened Closed

LECONFIELD
Redundant airfield, sub-site of

Inspected	*Taken over*	*Stocking*
Filled Clearing	*Cleared to C&M*	*to AMWD*

LINLEY
Proposed for 20 kt of HE, plus 5 kt incendiary, with a turnover of 500 - 600 tons per day. Staffed by 500 - 700 men. (April 1941)

0.75 miles from Linley on Walsall / Aldridge road was Helliwells aircraft aerodrome, used as medical site.
Opened Closed

LITTLE HEATH
Chemical Weapons sub-site of 94 MU Barnham - known as Heath Site, used by USAAF.
Opened Closed

LLANBERIS

Llanberis 200' deep quarry close to main road and railway line. Roof was several feet of concrete covered with thousands of tons of slate waste - 100 feet thick.

Final underground main storage depot - 31 MU, located in Slate mine at 565605, area just south of Pengilfach, 1 mile NW of Llanberis.
Sub-site RHIWLAS, WAENFAWR was used as a tail unit storage site.
Opened Closed

LLANDWROG
Redundant airfield. used post war for storage of German Chemical weapons - 277 MU. Subsequently became 31 MSU. civilianised 9/53

Inspected	*Taken over*	*Stocking*
Filled Clearing	*Cleared to C&M 10/56*	*to AMWD*

LONG NEWTON
Redundant airfield, sub-site of

Inspected	*Taken over*	*Stocking*
Filled Clearing	*Cleared to C&M*	*to AMWD*

LONGPARISH
202 MU Opened Closed

LORDS BRIDGE
FAD under Bassingbourn for Cranfield, Wyton, Upwood, Wittering, Duxford and Debden. Subsites included HARTSTON COPSE, ORWELL, MELDRETH. COMBERTON. Opened Closed

LOUGHBORO
No 32 ASD for 15 kt of HE plus inc. Opened Closed

LOWER SOUDLEY
Sub-site of Newlands
Opened Closed

LUDFORD MAGNA

Redundant airfield, sub-site of

Inspected	*Taken over*	*Stocking*
Filled Clearing 12/54	*Cleared to C&M*	*to AMWD*

Oct 48 to be cleared asap May 50 93 MSU under Wickenby Aug 51 93 MU - Bombs from Ludford, to be sent to Balderton and North Witham. 4,000 lbs to North Witham., remainder to Balderton. June 53 92 MU - Large receipts at Ludford as Goxhill is closing Dec 54 Ludford Magna - Wick Wood is only remaining site with 9,100 tons. . and Ludford has 9.1 kt

Oct 48 in use by 42 group May 50 - - 93 MU. -

MACMERRY

Redundant airfield, sub-site of

Inspected	*Taken over*	*Stocking*
Filled Clearing	*Cleared to C&M*	*to AMWD*

MARKET STAINTON - Lincs, 122/TF230800 7 miles SW of Louth

Originally sub-site of 93 MU but became FAD in ???? and renumbered 233 MU. Served by Withcall, Hallington and Donington stations. Second railhead opened at East Barkwith. Accommodation was at 230800 opposite the Hall. Opened Closed

In January 1943 Norton Disney opened an advanced sub-site which could provide for the new airfields under construction in the west of the county, such as Kelstern, Spilsby and Ludford Magna. Parented by the nearest local station, Wickenby the depot was known as 93 MSU Market Stainton, and comprised many miles of second class roads capable of storing some 20,000 tons of bombs in the area surrounding the village. Being in the middle of heavy bomber country business was brisk and to relieve pressure on 93 MU, Market Stainton became a full Forward Ammunition Depot in its own right in June 1943, and was renumbered 233 MU. The railheads for the unit were the stations at Withcall, East Barkwith, Hallington and Donington and an accommodation and admin site was constructed in the village opposite Market Stainton Hall, south of the Stenigot Road. Sattelite depots opened at Wragby and Orby and the principal chemical weapons site was located at Green Lane, a 3 mile long wide verged road NE of the village of Hemingby.

During the final year of the war the depot became the principal base for the earthquake bombs, and was equipped with No. 42 Group's sole modified Bay City crane, this being the only machine capable of handling the Grand Slam. The tedium of handling vast quantities of bombs and ammunition did have a few interesting diversions - In December 1943 a Lancaster from Ludford Magna crashed on to a HE storage area, and in July 1944 a Halifax crashed near the Sotby Lane corner site. Fortunately both incidents did not involve damage to personnel or stocks When the war finished 233 MU became one of the few large ammunition depots destined for early closure, principally due to the tens of thousands of tons of HE, incendiaries and chemical bombs lining the public roads.

By May 1945 Bardney, Caistor and Goxhill airfields had been allocated to the unit to enable some of the roadside stocks to be cleared, and during July and August quantities of both Tallboys and Grand Slams were sent overseas. Although the roadside stocks remaining were greater than at any other unit the decision was made in 1946 to close the site by January of the following year. In August 1946 233MU administration moved to Wickenby airfield which provided better accommodation plus yet another site for bomb storage. Despite an enormous effort during the following months including moving 25,000 mustard gas bombs to Norton Disney, the severe winter of 1946/7 delayed the final closure of the unit until the winter of 1948. As might be expected there is virtually no trace of the depot today, but the concreted bases of the admin site can be seen in the trees opposite the Hall. Near the top of the hill on the Stenigot Road there is a solitary temporary brick building, however this is the remains of a PoW camp whose inmates assisted in clearing the storage depot.

MARSTON MAGNA

Temporary site used by USAAF Opened Closed

MARSTON MOOR

Redundant airfield, sub-site of

Inspected	*Taken over*	*Stocking 12/48*
Filled Clearing	*Cleared to C&M*	*to AMWD*

MAWCARSE
18 acre screened site of firm well drained soil well served by roads and rail. FAD 145057 3.5 miles NE of Kinross ,20 miles WSW of parent Leuchars. Proposed October 1939 Opened Closed

7/46

MELBOURNE
Redundant airfield, sub-site of 91 MU

Inspected	*Taken over*	*Stocking*
Filled Clearing	*Cleared to C&M*	*to AMWD*

MELCHBOURNE (PARK)
USAAF site south of Chelveston airfield. Actually two adjacent sites, second was ACP (FFD2) and known as Riseley. Opened Closed

MELDRETH
sub-site of 94 MU Lords Bridge. ?/1941 on. Opened Closed

MELTON MOWBRAY- see GADDESBY

MENDLESHAM
Redundant airfield, sub-site of

Inspected	*Taken over*	*Stocking*
Filled Clearing	*Cleared to C&M*	*to AMWD*

METHERINGHAM
Redundant airfield, sub-site of

Inspected	*Taken over*	*Stocking*
Filled Clearing	*Cleared to C&M*	*to AMWD*

Aug 51 93 MU - Bombs from Ludford, Metheringham, Strubby, and East Kirkby to be sent to Balderton and North Witham.

MIDDLETON
Southburn Satellite 30 trucks 419694
Opened Closed

MILFORD
Staffs - work in progress FAD, 1941 later suspended

MONYASH
sub-site of 28 MU Harpur Hill Opened Closed

MOULTON
sub-site of
Opened Closed

NABURN
609438 sub-site of
Opened Closed

NEWDIGATE
For Westhampnett, Manston Ford, Shoreham, Redhill, Kenley, Biggin Hill, Croydon and Gatwick
Opened Closed

NEWLAND
Railway tunnel site in Wales Opened Closed

NEWTON

Redundant airfield, sub-site of

Taken over	Stocking	Filled
Clearing	Cleared to C&M	to AMWD
Inspected	*Taken over*	*Stocking*
Filled Clearing	*Cleared to C&M*	*to AMWD*

8.1.51 93 MU moves to Newton

NORTH SCARLE
sub-site of 93 MU Norton Disney

Opened	Closed

NORTH WITHAM
Redundant airfield, sub-site of

Taken over	Stocking	Filled
Clearing	Cleared	
9/55? to C&M	to AMWD	

May 1950 - satt of 93 MSU Bottesford Aug 51 The airfield was again used as a bomb store by 93 MU. All 4,000 lb bombs in store at Ludford, Metheringham, Strubby, and East Kirkby were to be sent to North Witham. Sept 55 North Witham being closed

NORTH KILLINGHOLME
Redundant airfield, sub-site of

Taken over	Stocking	Filled
Clearing	Cleared to C&M	to AMWD

to 42 group Aug 48 93 MU under Goxhill May 1950 July 51 93 MU - half of North Killingholme to be clear by August. AFDs Aug 51 93 MU - Killingholme continues to clear

NORTH PICKENHAM
Redundant airfield, sub-site of 281 MU

Taken over	Stocking to USAF 8/54

NORTON DISNEY - Lincs 121/SK865645. Immediately NW of Swinderby station.

Opened 23.8.39 as (originally) Swinderby until 4.10.40
sub-sites as at 1.3.44 included EAGLE WOOD ROAD, SPALFORD ROADS, TUMBY WOODSIDE ROADS. Also NORTH SCARLE

OpenedClosed

2m NW of Swinderby airfield The Air Ministry 'F' scheme for the expansion of the RAF required the provision of ammunition storage areas in the immediate vicinity of the bomber bases. These would be called Air Ammunition Parks and would be prepared but not manned until the advent of war. Five were planned initially, of which one would be required to serve the airfields in the Lincolnshire area. A search was made towards the end of 1937 in the west of the county towards Newark which resulted in the selection of an ideal site adjacent to Swinderby Station. No 3 AAP, Swinderby began operating in August 1939 and opened officially a few weeks later on the 5th September, but was renamed 93 MU on the 2nd November 1939. It was one of the larger depots intended to supply the stations of Binbrook, Cottesmore, Finningley, Waddington, Grantham, Hatfield Woodhouse (Lindholme), Hemswell, Newton, Scampton, Digby, Kirton in Lindsey and Hucknall. In August 1940 the local airfield bearing the same name opened and it was then decided to rename the park Norton Disney. However this met with opposition principally since 93 MU was closer to Swinderby than the airfield and the latter was closer to the village of Norton Disney. Whether it was meant to confuse the enemy no one will ever know but the objection was overruled and 93 MU officially became Norton Disney on the 4th October 1940.--

In common with other pre-war ammunition depot designs 93 MU consisted of large traversed bomb storage areas fed from branch lines and sidings from the main line railway. Three groups of High Explosive bays (224

tons each) were constructed together with four incendiary areas. At this time the intended capacity of the unit was 1250 tons of bombs. Prior to 1942 most of 93 MUs supplies came from its Parent Depot 21 MU, RAF Fauld, however several important changes were necessary to improve the efficiency of No 42 Group's operations. The Ammunition Parks were renamed Forward Ammunition Depots, the capacity of the unit was increased to 10,000 tons and in future all 'heavy' supplies which meant the vast majority of bombs would arrive directly from the filling factories and ports, thus short-circuiting the parent depots, which were now renamed Reserve Ammmunition Depots.

Within two years the need had arisen for satellites to store weapons and suitable ones were found at Fox Covert, Long Plantation, Sands Lane Besthorpe, and North Scarle. The depot continually seemed overloaded and there was always there seemed to be a permanent need for more and more sub-sites. Ideal satellite depots at Bircotes and Edlington were turned down when the Air Ministry announced that they were planning to build bomber bases there. A new depot near Garforth in Yorkshire had been intended to take some of the pressure off the unit but this was also rejected at a very advanced stage. Only when the new depot opened at Escrick in South Yorkshire was pressure alleviated , for a while at least. A large Advanced Park opened at Market Stainton, and a new FAD was planned at Tumby near Coningsby, however this was scrapped in 1943, though the roads surrounding the area and 3,000 tons in Fulsby Wood continued to be used by 93 MU. Later additional explosive storage was achieved by using the country lanes at Eagle Wood and Spalford roads. Norton Disney was possibly the busiest of all of the Forward Depots, and as an example of the work involved the depot ran out of 4lb incendiaries in December 1942, having issued a quarter of a million of them in a three day period. On the 16th May 1945 the unit handled over 1,000 tons, a surprising figure when one considers that the original capacity of the unit was little more than this figure and was meant to be one week's war consumption.

In the early days of the war all supplies of breathing oxygen for the RAF came from BOC factories, via the ammunition depots, however with vast increases in quantity it became prudent for the depots to manufacture their own and in August 1943 four semi-portable oxygen plants were delivered to the depot. Most of the Forward Depots stored quantities of chemical weapons, those at 93 MU started arriving as early as November 1939, and a special site was eventually constructed at Spalford, to the south west of Wigsley airfield to store mustard gas bombs. Over a mile of Sommerfeld track had to be laid at this site which began operating in March 1943.

Chemical weapons were notoriously difficult to transport and store for any length of time. Unacceptably high proportions of 'leakers' were not only dangerous but wasted a great deal of manpower in the decontamination of affected equipment. In late 1942 it was decided to construct the necessary installations to enable gas weapons to be filled, when required from bulk storage tanks located at five of the Forward Depots. These installations would be called Forward Filling Depots and Norton Disney was one of the sites selected. In February 1943 work began at a site in Eagle Hall Woods just to the north of the main unit. The installation was code-named "Triangle" and was based on a proven design by ICI. Mustard gas began arriving in January 1944 and the site was officially handed over to the RAF from the Ministry of Supply on the 21st April 1944 becoming No 3 FFD. The site was self contained with its own power unit, boiler-house, stores, canteen and changing and emergency decontamination facilities. The cost of the depot had been £104,000 and it now stored 250 tons of each of the two principal variants of liquid mustard, Pyro BD and Runcol, in its two underground lead lined tanks or 'pots'. When required the liquid could be pumped under pressure into the charging building in which empty 65lb LC cases could be filled at the rate of 1440 per day. Attached to this building were two large 'hangars' or storage sheds, one for housing up to 10,000 empty cases and the other, the bonding building in which the filled bombs would be stored for at least 48 hours to guard against leakage. Fortunately this weapon was never used, however the site remained under care and maintenance until the mid 1950s when the pots were emptied and all contaminated equipment was removed.

As the war in Europe drew to a close redundant airfields were offered to all munitions storage units as weapons were still being received from factories and ports and were no longer being issued.-- All roadside storage sites used by the unit had been stocked to capacity since February, hence the airfields of East Kirkby, Balderton and Fulbeck became available to the depot during the forthcoming months giving an additional storage capacity of 45,000 tons. The Spalford chemical weapons sub-site of Norton Disney was converted into gas burning site to destroy tens of thousands of mustard bombs and detonators. Unfortunately the ground at this site became seriously contaminated as a result of which the site remained Air Ministry Property until recently.

Much of 93 MU has disappeared during the last few years, the COs house is in use by road, and just to the north the concrete base of the oxygen filling shed can be seen. At the rear of the site the access gates to the FFD were locked in April 1989, but open in July. A MOD sign still guards the entrance. The large metal sheds have all been cleared, but most of the brick buildings including the charging building remain, though all are very heavily overgrown with bramble etc. The area around each underground pot is enclosed by a fence bearing suitable warning notices, and the tops of the pots are covered by mounds of earth.

NUTHAMPSTEAD
Redundant airfield, sub-site of 95 MU

Taken over	Stocking	Filled
Clearing	Cleared to C&M	to AMWD

OLD BUCKENHAM
Redundant airfield, sub-site of
Taken over

Stocking	Filled	
Clearing	Cleared to C&M	to AMWD

ORWELL
147/52/347514 sub-site of 95 MU Lords Bridge from October 1941

Opened	Closed

PARKEND
proposed possibly late 1941, depot in Forest of Dean.

Opened	Closed

PARLINGTON
often known as Pontefract or Garforth. Large wood used = Hollins, 1.5 miles N of Garforth at 415353. Accommodation was at Lotherton Hall and Garforth Golf Club.

PILMOOR
sub-site of 92MU Brafferton at 460730. Old timber yard with access for 2 off 14 wagon goods trains. Good road access and excellent natural camouflage.

Opened	Closed

PITTS WOOD
sub-site of

Opened	Closed

PULHAM
Originally airship station - became pyro and non-explosives store in 1940. Lot of practise bomb filling

Opened	Closed

RACKHEATH
Redundant airfield, sub-site of

Taken over	Stocking	Filled
Clearing	Cleared to C&M	to AMWD

REDCASTLE
Advanced Ammo Park in Scotland on Beauley Firth, parented by Evanton. Used from 17.6.41 - 20.12.45. Originally proposed 25.9.40 for airfields N of Inverness. MSU was at Kilcoy. Opened Closed 12/45

REDHILL
Redundant airfield, sub-site of

Taken over	Stocking	Filled
Clearing	Cleared	Closed 1/47

RHIWLAS
Incendiary and pyro sub-site of 31 MU located 4 miles north of Llanberis at 574654. Had semi-underground buildings?? had 25 Laing huts capacity 3.5 - 4 kt.

Opened	Closed 8/53

RHOOSE
Redundant airfield, sub-site of

Taken over	Stocking	Filled
Clearing	Cleared to C&M	to AMWD

RICCALL
Redundant airfield, sub-site of

Taken over	Stocking	Filled
Clearing	Cleared to C&M1/57	to AMWD

RIDGE
Underground limestone quarry at Corsham. Was 2 MSU then 11 MSU
Opened as 2MSU, became 11MSU on 22.12.39
Closed

RIDGEWELL
Redundant airfield, sub-site of

Taken over	Stocking	Filled
Clearing	Cleared to C&M	to AMWD

RISELEY 134/52/040647
Name given post war to the chemical weapons site at USAAF base at Melchbourne Park.

Opened	Closed

ROWTHORNE 4 miles NE of Mansfield at 477647
Disused railway tunnel - sub-site of 28 MU. 5 kt depot.

Opened 12/41	Closed 4/46

RUISLIP

Opened	Closed

RUSSELS ENCLOSURE
sub-site of

Opened	Closed

ST. AUSTELL
Temporary site - located in Lansalon China Clay Quarry - Ruddlemoor, 2m NW of St Austell.

SANDS LANE
Sub-site of 93MU Norton Disney - Sand Pit is situated 100yds off the main Newark / Gainsboro road in Besthorpe. Sands Lane is a turning RHS of Road to Gainsboro, 100yds from the Lord Nelson Inn.

Opened	Closed

SAVERNAKE FOREST
Proposed reserve storage depot, used by the Army as part of the COD.

SCORTON

Redundant airfield. took over from Kiplin

Taken over	Stocking	Filled
Clearing	Cleared to C&M	to AMWD

SEETHING

Redundant airfield, sub-site of

Taken over	Stocking	Filled
Clearing	Cleared to C&M	to AMWD

SHANE'S CASTLE

Sub-site of 28 MU Harpur Hill, the only depot in Northern Ireland (Antrim), opened 14/2/42.

Opened	Closed

SHARNBROOK

USAAF forward depot

Opened	Closed

SHELDON

sub-site of Harpur Hill

Opened	Closed

SHEPHERDS TUMP 148/155655

Proposed post war underground site, 3 miles ENE of Penybont - 1 mile south of Llanfihangel Rhydithon.

SKELLINGTHORPE

Redundant airfield, sub-site of

Taken over	Stocking	Filled
Clearing 12/54	Cleared to C&M	to AMWD

May 50 satt of 93 MU Norton Disney July 51 93 MU - Skellingthorpe to be clear by August. Dec 54 92 MU - Skellingthorpe cleared.

SKIPTON-on-SWALE

Redundant airfield, sub-site of

Taken over	Stocking	Filled
Clearing	Cleared to C&M	to AMWD

SKIPWITH COMMON

sub-site of 80 MU Escrick 5 miles NE of Selby at 660378

Opened	Closed

SLAIDBURN

sub-site of 219 MU Gisburn

Opened	Closed

SNODLAND

Forward depot, replacing 96 MU Staple. for Manston, Detling, Bekesbourn Lympne, Hawkinge, Eastchurch.

Opened	Closed

4/46

SOUTHBURN

98/44/997535 91 MU parented by Driffield, also feeding Catfoss and Leconfield. High Wood was CW site, Low Wood was incendiary site. No 1 Satt. was Bainton Wood. At 23.8.39 site had 3 wooden barrack huts, 1 airmens mess and cookhouse, 1 ablution hut, 1 office hut + tentage. Site had several near misses during BoB attack on Driffield. also June 1941 attack on Driffield and Hull Opened Closed

(to AMW)D 6/54

SOUTH WITHAM
123/43/951185 Parented initially by Cottesmore, then Woolfox Lodge. Satellites at

STRETTON ROAD and MOOR LANE (both incendiary sites)
Opened Closed

130/SK/951185 10 miles S of Grantham to the East of the A1. 100 MU was one of the first field storage depots to be used by No 42 Group. The base began stocking in March 1942 and was controlled by Cottesmore for a short period after which Woolfox Lodge became the parent station. The main storage area was situated in Morkery Wood in which 22 bays holding a total of 8,800 tons of high explosive were constructed. Handcraft huts were installed to house 1,000 tons of incendiaries and pyrotechnics, whilst three of the larger Iris huts were used to store bomb components such as fuses, pistols, lugs and arming wires. The neighbouring Stocken Hall became the admin HQ for the depot with adjacent outbuildings used for workshop and storage facilities Roadside satellites were eventually brought into operation at Stretton Road and Moor Lane.

Being in the middle of the operational area the base suffered a few mishaps during its history. In November 1942 a Halifax crashed 30 yds from a HE store and the unit fire service successfully extinguished the flames. During the flying bomb attacks on the U.K. in October 1944 one weapon went somewhat astray and landed in the depot at 100 MU but fortunately the damage was limited to a few broken windows. 100 MU disbanded in 1949, the weapons still in stock and personnel becoming part of 93 MU. The South Witham site and the Moor Lane satellite finally closed in the mid fifties. Very little remains of the depot today. Morkery Wood is now a Forestry Commission site.

SPALFORD
Chemical weapons sub-site of Norton Disney 113/43//839687 Part opened in Jan 1943. Gas burning site at Spalford used for detonator destruction - a demolition pit was constructed using complete half sections of Nissen hut sunk to 7' in soil. Concrete bottom fitted, protected by 6" of sand whilst burning was in progress. This site showed serious contamination 3 - 4' below the surface due to impervious layers. Opened Closed

SPILSBY
Redundant airfield, sub-site of

Taken over	Stocking	Filled
Clearing	Cleared to C&M	to AMWD

Oct 48 to be cleared asap STRUBBY to be cleared asap Oct 48 93 MU U/C of Wickenby - May 1950 Aug 51 93 MU - Bombs from Strubby, to be sent to Balderton and North Witham. 4,000 lbs to North Witham, remainder to Balderton.

STAPLE
97 MU also known as STAPLE HALT, near Ash, Canterbury - possibly opened May 1940. (97 MU later was used for Ferryside - March 1942 - Marine Craft Repair.
Opened Closed

STRETTON ROAD
sub-site of
Opened Closed

STRUBBY

Redundant airfield, sub-site of

Taken over	Stocking	Filled
Clearing	Cleared to C&M	to AMWD

May 59 - 93 MU - U/C of Wickenby Aug 51 - 93 MU - Bombs from Strubby to be sent to Balderton and North Witham.

STURGATE

Redundant airfield, sub-site of

Taken over	Stocking	Filled
Clearing	Cleared to C&M	to AMWD

Oct 48 - to be cleared asap

TEFFONT

sub-site of 11 MU Chilmark

Opened	Closed

THOLTHORPE

Redundant airfield, sub-site of

Taken over	Stocking	Filled
Clearing	Cleared	

to C&M to AMWD

TRIANGLE SPINNEY

sub-site of 136/52/854785

Opened	Closed

TUDDENHAM

Redundant airfield, sub-site of 281 MU

Taken over	Stocking	Filled
Clearing	Cleared to C&M	to AMWD

TUDDENHAM ROAD

sub-site of

Opened	Closed

TUNBY

sub-site of 93 MU Norton Disney, Fulsby wood was used.

WARREN WOOD

sub-site of 94 MU Barnham, 4 miles west at 800805. Site used by USAAF. Depot may be on B1106, 1 mile N of A11T.

Opened	Closed

WAKES COLNE

6 miles NW of Colchester - abandoned in favour of BURES.

Opened	Closed

WELFORD

Redundant airfield, sub-site of

Taken over	Stocking	Filled
Clearing	Cleared to C&M	to AMWD

WEST COTTINGWITH - See Cottingwith

WEST PERRY
Staughton Highway, work in progress for FAD end of 1941

WHITTLEWOOD FOREST
proposed late 1941 for 30 kt depot - 730430 5 miles NE of Buckingham

Opened	Closed

WICKENBY
Redundant airfield, sub-site of

Taken over	Stocking	Filled
Clearing	Cleared to C&M	to AMWD

In August 1946 the airfield became the HQ site for 233 MU from Market Stainton, but when 233 MU closed the airfield became the HQ site for 93MU. This was an extremely large depot, which owing to its size was split into sub-groups each with its own HQ, but reporting to Wickenby.

These sub units were controlled by Goxhill, Bottesford, Norton Disney and South Witham. At the same time Wickenby was also responsible for its own sattelites at Faldingworth, Ludford Magna and Strubby.

In January 1951 93MU HQ moved out to Newton, leaving the station purely responsible for the last three stations mentioned above. However 93 MU was so overburdened that the unit split in September 1952 when the ex - Yorkshire depot 92 MU reformed at Wickenby. The station then became responsible for Goxhill, Caistor, Woodhall Spa, Faldingworth, Skellingthorpe and Ludford Magna. HQ transferred to Faldingworth when the new PAD was open in 1956. Dec 54 Wickenby has 4.7kt

93 MU Wickenby ! -- - - ! - ! ! ! ! !

93 MU 93 MSU 93 MSU 93 MSU 93 MSU

Wickenby Goxhill Bottesford Norton Disney South Witham

! ! ! ! ! Faldingworth Caistor Fulbeck FFD-3 North Witham Ludford Magna Killingholme Balderton Spalford Moor Lane Strubby East Kirkby Skellingthorpe Metheringham

as at May 1950

WING
Redundant airfield, sub-site of 282MU From 2/53, to USAF 9/54

WITCHFORD
Redundant airfield, sub-site of

Taken over	Stocking	Filled
Clearing	Cleared to C&M	to AMWD

WOODHALL SPA

Redundant airfield, sub-site ofy		Taken over	Stocking	Filled
Clearing	Cleared to C&M	to AMWD		

Available to 42 Group Oct 48 still open Dec 54 with 8.8kt

WORTLEY
OpenedClosed

In 1942 the RAF realised the need for more Reserve Ammunition Depots. The need for secure underground sites on the lines of Fauld and Chilmark had greatly diminished, since enemy bombing was now considered a much reduced threat, but also since bomb capacities had greatly increased since the beginning of the war and great difficulty was experienced in manoeuvring these in confined spaces of underground depots. The emphasis was now on open storage under field conditions and in March 1942 220 MU Wortley became available. Used initially to house the stocks of 28 MU Harpur Hill whilst underground roof repairs were carried out on the latter, the site consisted purely of around 20 miles of good 2nd class roads near Penistone, beside which some 20,000 tons of high explosive plus 1,000 tons of incendiary could be stored.

The main accommodation and administrative site was opposite the Scout Dyke reservoir which became available on the 10th April 1942. However only a few months later an order was received indicating that the unit would be transferred to the USAAF Service of Supply on the 1st October 1942. RAF Equipment was used initially. Some time later the site was used as a truck storage depot. The accommodation and administration site was at Scout's Dike, 2 miles NE of Stocksbridge. Several temporary brick buildings still can be seen at the this site

WRATTING COMMON

Redundant airfield, sub-site of

MISC NOTES

Blandford site to be used at Pulham as airship hangar was easy target. Sub unit Corringham Moss (or was this MSU of Altrincham)
Cottam + Southburn manned by West Indian personnel at end of war - difficult to get a good days work out of then on a cold day.
FADs were originally designed to store 1.5 kt, but by 1944 several units had a turnover of 37 kt per month.
Closure of SLGs - Wath Head 1/12, Brockton 21/12, Middle Farm 10/1, Brayton Park, 1/2, Teddesley 6/2 (45 or 46?)

Lords Bridge: Tony Brown, Dick Dolling, Don Rolph, Mike Turner.