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# World War II Coastal Minefields in the United Kingdom

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Field Notes

# World War II Coastal Minefields in the United Kingdom

by Roly Evans [ Geneva International Centre for Humanitarian Demining ]

While not widely appreciated today, there were once 1,997 minefields in the United Kingdom containing between 338,500–350,000 landmines.[1] If you were to walk today on a beach suitable for amphibious landing on either the south or east coasts of the United Kingdom, chances are that you would be walking on a former 1940s minefield. This article briefly explores the story of the United Kingdom's coastal minefields, from their hasty installation through their costly clearance. Many of the lessons from this period remain relevant today, as countries seek to apply land release principles to reduce the risk of explosive contamination to tolerable levels.

In June 1940, the U.K. government believed it faced the imminent threat of invasion. The authorities immediately began fortifying the ports and potential landing beaches alongside inland defensible features. The British Army had lost equipment during the Battle of France and would have possibly struggled to defend a long and exposed coastline had Operation Sealion, the German invasion plan, been launched.[2] Fortifications and obstacles were seen as a means of evening the balance against what was feared would be an irresistible *blitzkrieg* invasion force. In such circumstances, many minefields were laid in great haste. The *Corps of Royal Engineers Journal* states that "the laying of minefields was the first large scale practical experience the British Army had had in this branch of warfare. Lack of experience, and hurried operation, led to many mistakes being made which were to cause much trouble to units and members of the Corps later."[3]

Minefields were typically combined with other obstacles such as wire entanglements, scaffolding, dragon's teeth to destroy landing craft, anti-tank ditches, and anti-tank blocks. Some—but by no means all—minefields were to be covered by machine gun fire, usually from a protected pillbox or a trench system. Around 28,000 pillboxes were built in Britain in 1940 alone.[4]

Figure 1. B Type C mine.
*Photo courtesy of Imperial War Museum.*

A number of different mines were used in 1940. These included the B Type C from Royal Navy stores that contained 11.4 kg (25.1 lbs) of explosive, usually Amatol. The B stood for **beach mine**, although the mines were sometimes colloquially referred to as **mushroom mines**. While the mine had enough explosive to destroy a tank or a vehicle, it could also be initiated by a person. This mine required as little as 22.7 kg (50 lbs) of weight to initiate the fuze, which consisted of a striker separated from a cartridge primer by a simple bow-shaped spring. The bow spring was prone to becoming weaker as the mine corroded, often making the mine more sensitive to pressure. The device effectively functioned as both an anti-personnel and anti-tank mine. The B Type C mine would become infamous during the subsequent clearance efforts.

A soldier based in Suffolk in August 1942 remembers "I was attached to the Essex Regiment. We were involved in laying mines from the Minsmere Sluice to where the power station is now. We would dig a round hole and put in it a sort of

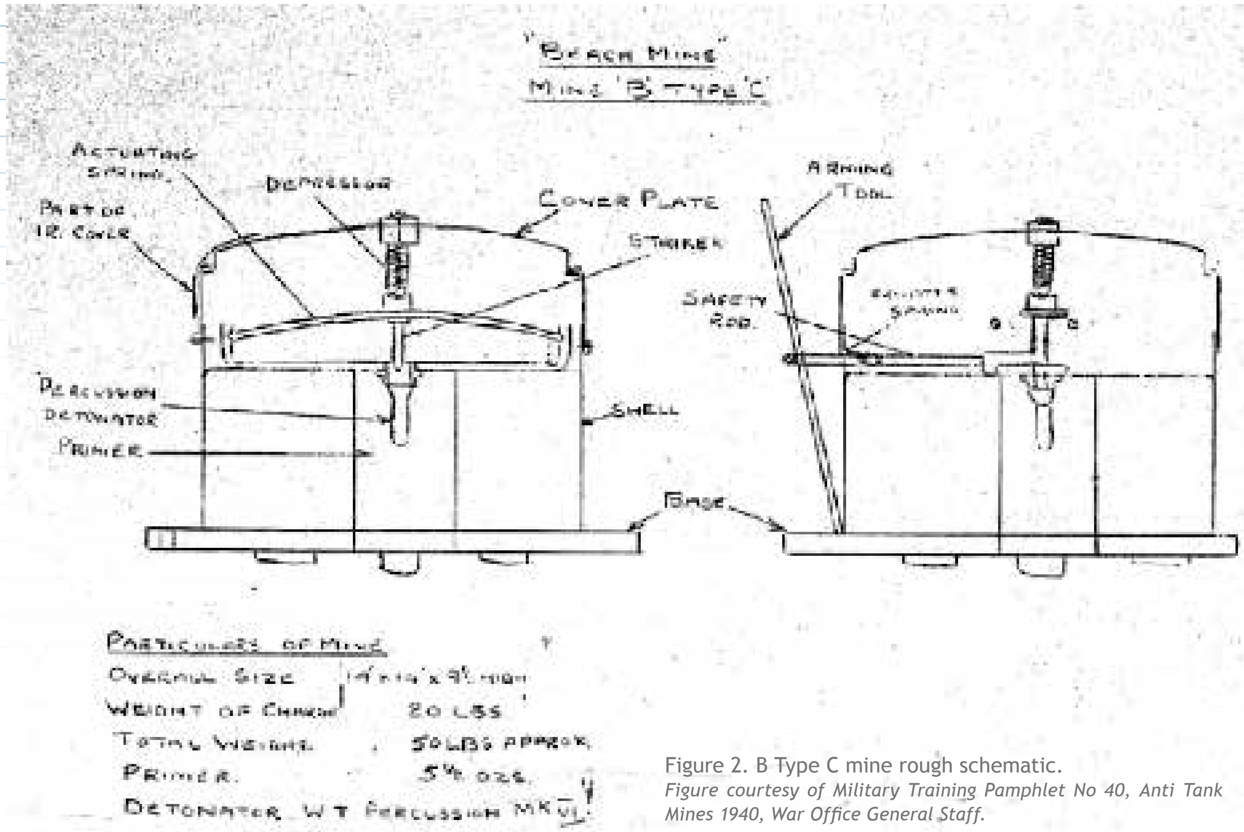



Figure 2. B Type C mine rough schematic.
*Figure courtesy of Military Training Pamphlet No 40, Anti Tank Mines 1940, War Office General Staff.*

biscuit tin with a hole in it. Into that you would put the detonator, then gently replace the lid, and very gently cover the mine with sand. We meticulously marked every spot we put a mine on a map, so that they could be lifted later. Both sides of the belt of mines were protected by wire to prevent people straying into the area accidentally. Sometimes a sheep would get through the wire and would be blown up."[5]

Generally the Royal Engineers were tasked with laying, cordoning, and recording minefields. For example, the War Diary for 558 Field Company, Royal Engineers for November 1940 records that "nearly 2700 A/T Mines MK1V were laid, armed, and mapped, protected, and carefully recorded." The same phrase is used for 4,500 mushrooms (B Type C mines) and 30 RE No.1 Mines.[6] While effort was taken to fence off minefields and record mine locations accurately, anecdotal evidence suggests that this practice was not as universal as desired. Inaccuracies in record keeping, combined with changes caused by the tides, inhibited some of the later clearance efforts.

Some of the minefields in which this Essex Regiment soldier worked are visible in Figure 3, page 35. Figures 4, 5, and 6 (pages 35 and 36) show where the minefield from Figure 2 would have been in 1945 prior to removal and what is there today: the largest nuclear power station in the United Kingdom.

Some efforts were made to improve on the hasty minefield laying as early as late 1940. When properly planned and executed, beach minefields would be laid above the high water mark, and mines would be secured in place by recovery wires. Recovery wires linked mines and held them in place, assisting later clearance efforts greatly. Clearance of minefields without recovery wires would often prove problematic, since mines would be more prone to migration.

In the autumn of 1940, the 125th Infantry Brigade took over a stretch of Suffolk's coastal defense. They noted that "mines have also been placed on the beaches, but the sea sucks them out to sea up to 50 yards out from the mine fields as marked on the maps. Anywhere near the sea side of the mine fields is dangerous. The mine fields are very well marked on the maps, but of course they are moved by the action of the sea."[9]

Sergeant Fred Hinton of the Royal Engineers remembers "just after Christmas (1940) we moved to Deal in Kent and billeted in empty boarding houses. My job, with a section of men, was to take up 2 rows of beach mines that had been laid in the shingle beach between Deal and Sandwich and replace them with 4 rows wired together and mapped. The 2 rows we picked up had been laid 7 paces apart one row staggered behind the other. The land was sand dunes with sand leading

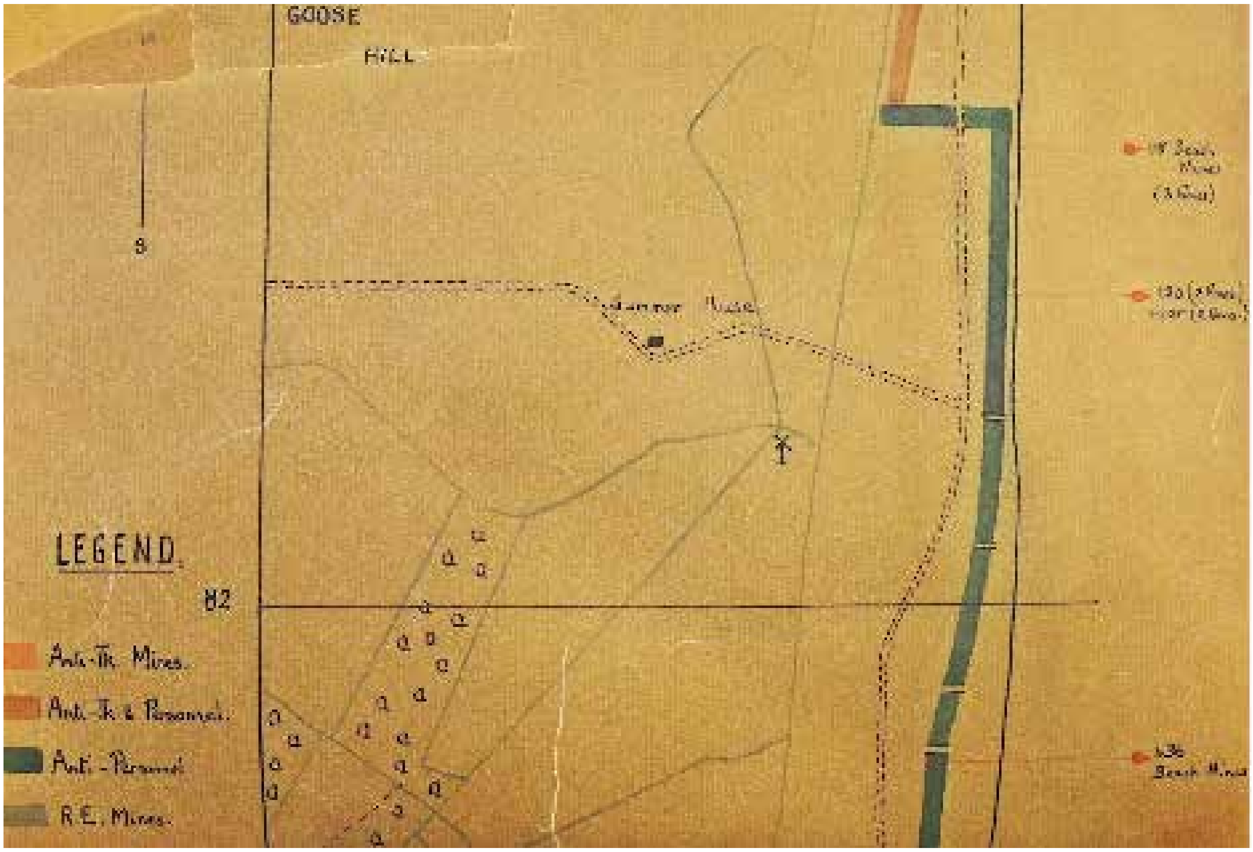



Figure 3. A 1942 image of the minefields north of Sizewell on the Suffolk Coast, United Kingdom.
*Figure courtesy of The National Archives.*

Figure 4 (left). A 1945 aerial view of Sizewell Nuclear Power Complex. Figure 5 (right). A 2014 aerial view of Sizewell Nuclear Power Complex. Both figures show the immediate coast to the north indicating the minefield from the 1942 diagram shown in Figure 3 and believed location of the minefield continuing to the south.[7]
*Figures courtesy of Google Earth.*

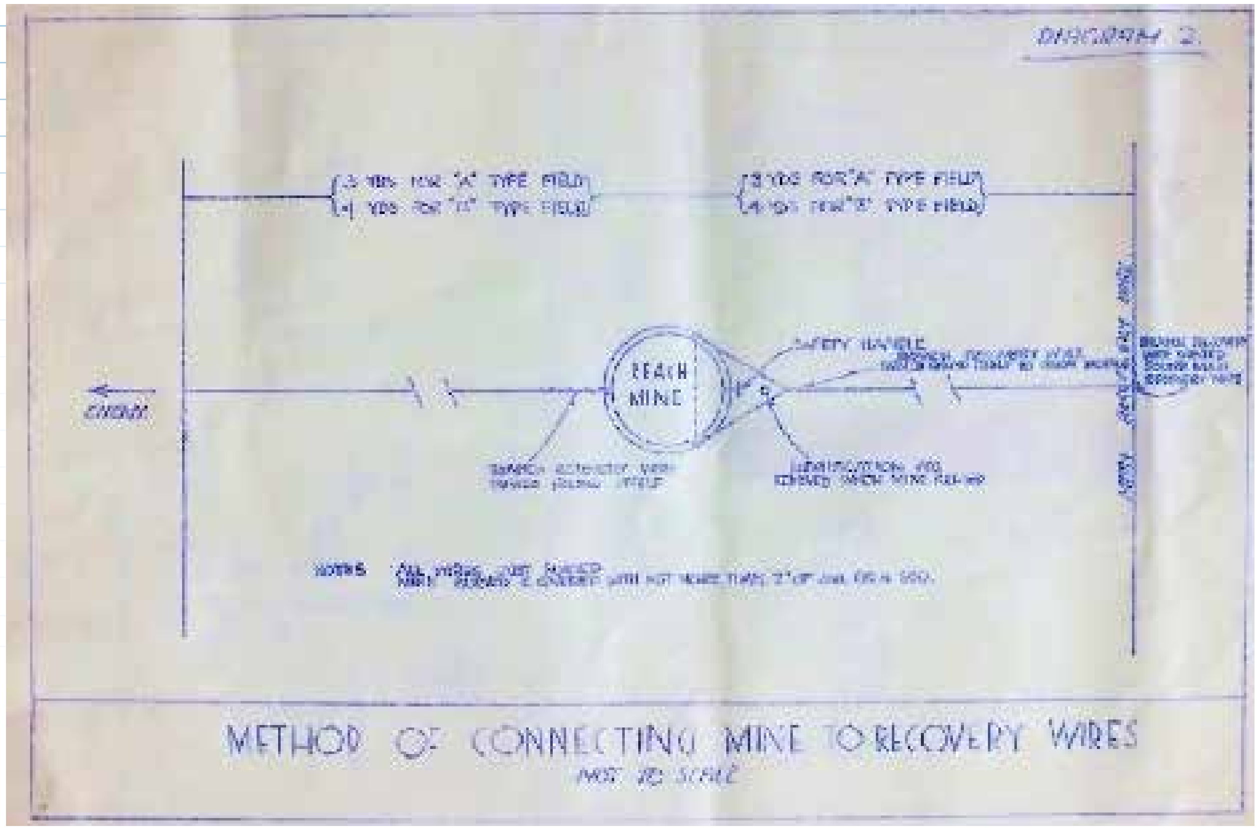



Figure 6. Instructions for laying beach mines, diagram 2. Method of connecting to recovery wires.
*Figure courtesy Chief Royal Engineer, 44th Division.*[8]

down to a shingle beach… We lost 2 men early on before adopting a 3 mine distance rule. After that, we had a minimum of men on the beach and those carrying the mines from the beach keeping well clear of the 2 finders. Each day a stretch of beach would be cleared and wired off, 4 rows dug and new mines laid, wired together and mapped. I was on the job for about 11 months. We took 3500 mines up and re-laid 7000. This was mainly on the beach of the Sandwich Golf Course."[10] The Royal St. George's Golf Club is now one of the courses used to host the Open Golf Championship.

Some of today's major tourist attractions, even quintessential images of England, were mined. Cuckmere Haven on the Sussex coast is one such example. This beach has since been used in a number of Hollywood films. In 1940, an extensive system of pillboxes and anti-tank defenses overlooked six minefields containing 1,532 landmines (556 B Type C mines and 976 General Service anti-tank mines).[11] The Cuckmere minefields claimed lives during the war. In September 1940, three Royal Engineers were killed by a B Type C at Cuckmere.[12] There were more casualties in 1942.[13]

Clearance of the U.K.'s minefields commenced in earnest in late 1943, once it seemed certain that the threat of a German invasion had receded. Clearance certificates were carefully worded and plainly stated that mines were only removed from specified areas. Often certificates would end with a subheading titled "Opinion as to safety." It is noteworthy that many certificates in the archive include the phrase "no guarantee can be given that the area may be considered safe." Sometimes the "Opinion as to safety" noted that "the area may be considered safe except for the possibility of mines being washed up on to the beach from other minefields."[14]

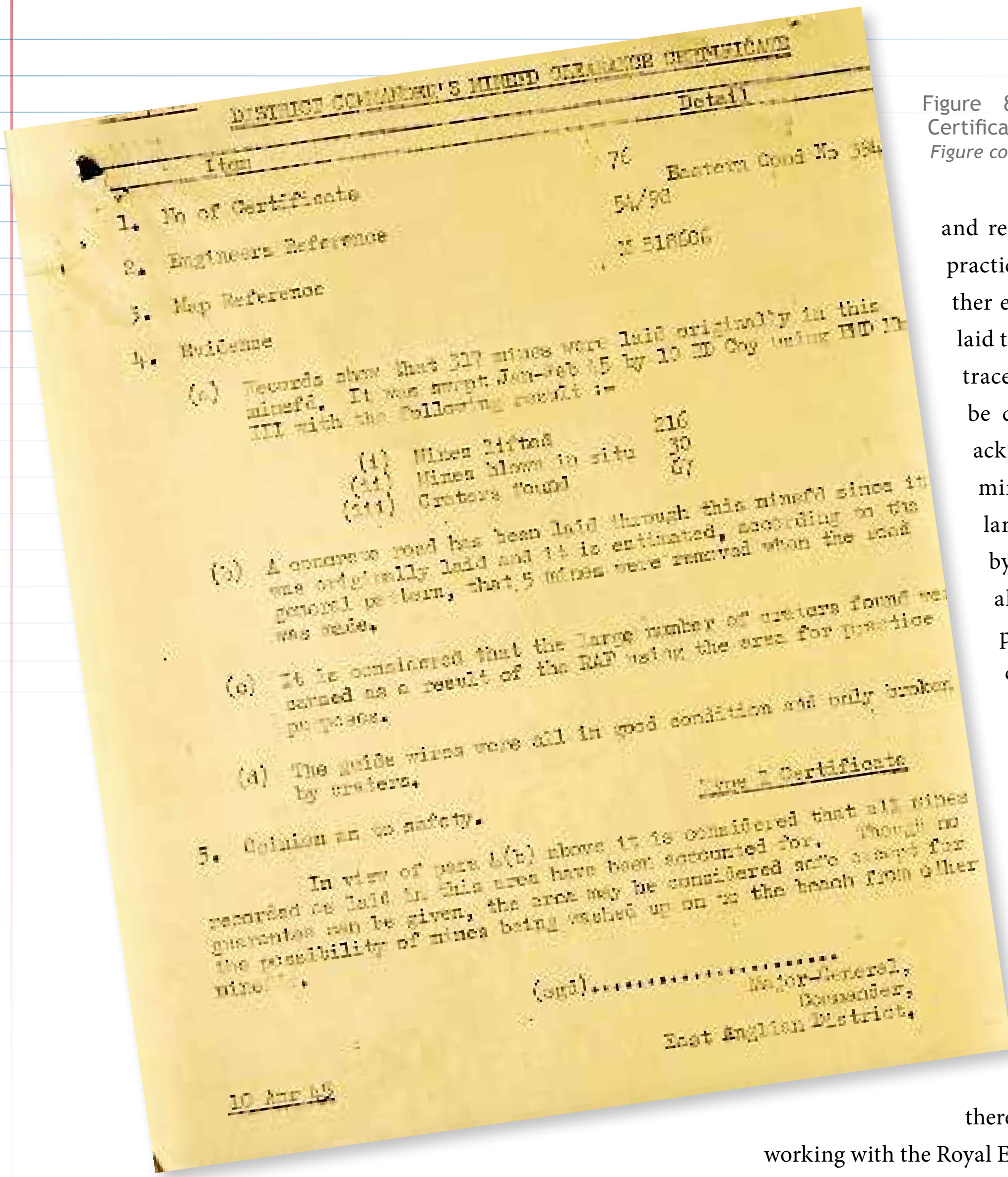
While few realize that Britain once had extensive minefields, fewer know that significant casualties were sustained during the clearance efforts. The Corps of Royal Engineers History puts total casualties for all Bomb Disposal duties (including mine clearance) in the United Kingdom during World War II at 55 officers and 339 other ranks killed, and 37 officers and 172 other ranks wounded.[15] During the immediate post-war years, a further 151 Royal Engineers died clearing Britain's beaches.[16] To put that figure into context, the United Kingdom lost a total of 1,078 during the Korean War, and 255 were killed in the Falklands War. Some estimates place the total number of fatalities that occurred on Britain's beach minefields at approximately 500 civilians and military personnel.[17]

Figure 7. Cuckmere Haven from the west.
*Photo courtesy of the author.*

Causalities continued into the 1950s. One notable incident occurred in May 1955 in the town of Swanage in Dorset; five boys were killed after tampering with a mine that the coroner later stated likely washed up on shore.

The minefield at Swanage was laid in 1940. A clearance operation of the relevant section was undertaken in 1945. It was repeated in 1947 and again in 1949. Eventually, a clearance certificate was issued on 17 February 1950. The original minefield record and the subsequent clearance records show that 117 mines were originally laid, of which only five were lifted in clearance. There was some evidence of small craters where 54 other mines had been. Minefields consisting of B Type C mines were known to be prone to significant sympathetic detonations; an animal initiating one mine could set off many more. The remaining 58 mines were unaccounted for. It is possible some of these mines were laid without recovery wires and may have washed away during the course of the war. One of the men who survived the incident, Robert Key, later became a Member of Parliament. During the debate on ratifying the *Convention on Cluster Munitions* in March 2010, he called for parts of the Dorset coast to be re-cleared. He noted that the officer in charge of the clearance task in 1950 had refused to issue a certificate of clearance but had been overruled.[18] Issues of liability and the difficult decisions involving risk assessment of challenging clearance sites are nothing new to mine action.

The rush to defend Britain's coast in 1940 resulted in difficulties in clearance from 1943 onwards. Even in 1940, Eastern Command reminded corps staff that "unless accurate records are kept of locations it will be impossible to recover mines on termination of hostilities, and many casualties during recovery will result."[19] Not only were accurate records required, but so too was the stringent use of recovery wires to prevent mines from moving. In 1945, the MP for Evesham was well aware of the problem and urged Prime Minister Atlee that "in various parts of the country some land mines have been overlooked, will he instruct the Service Departments to issue a questionnaire to serving and non-serving personnel asking them to notify any special knowledge they may have regarding the location of these undetected mines, in view of the danger to children and the general public?" It appears an evidence based approach to survey of minefields is nothing new. The Prime Minister rejected the appeal and asked "whether [the] questionnaire suggested would provide any useful


DISTRICT COMMANDER'S MINED [illegible] CERTIFICATE

| Item | Detail |
|---|---|
| 1. No of Certificate | 76 Eastern Comd No 384 |
| 2. Engineers Reference | 54/98 |
| 3. Map Reference | [illegible] 518606 |
| 4. Evidence | |

(a) Records show that 317 mines were laid originally in this minefd. It was swept Jan-Feb 45 by 10 BD Coy [illegible] III with the following result :-

(i) Mines lifted 216
(ii) Mines blown in situ 30
(iii) Craters found 67

(b) A concrete road has been laid through this minefd since it was originally laid and it is estimated, according to the general [illegible], that 5 mines were removed when the road was made.

(c) It is considered that the large number of craters found were caused as a result of the RAF using the area for practice purposes.

(d) The guide wires were all in good condition and only broken by craters.

Type I Certificate

5. Opinion as to safety.

In view of para 4(b) above it is considered that all mines recorded as laid in this area have been accounted for. Though no guarantee can be given, the area may be considered safe [illegible] for [illegible] the possibility of mines being washed up on to the beach from other mine[illegible].

(sgd)........................ Major-General,
Commander,
East Anglian District.

10 Apr 45

Figure 8. Eastern Command Clearance Certificate No.76, April 1945. WO 199/98.
*Figure courtesy of The National Archives.*

and reliable assistance. It is already the practice, where necessary, to seek further evidence direct from the men who laid the mines. Such men can readily be traced through record offices and can be cross-examined on the spot." He acknowledged that, "the location of mines is a difficult problem, particularly as many may have been shifted by tides and soil movements, and, although the work is being actively pursued, I am afraid that complete clearance may take a long time."[20]

As in other European countries, many prisoners of war (POW) were co-opted into the dangerous clearance efforts. In 1946, around 1,200 Ukrainian POWs were employed as deminers in the United Kingdom. Although all were eligible for repatriation by 1948, some chose to stay as civilian employees of the Royal Engineers. By 1962, there were still 113 Ukrainian civilians working with the Royal Engineers in a unit called the Mixed Service Organisation. Some would remain working with the Royal Engineers into the 1980s. Innovative clearance methods were developed that included the use of bulldozers and water jets to move sand and even shingle. The water jets would expose mines and often detonate them. Ultimately, areas swept by this process would be subsequently searched by electronic detector.

All mines used on Britain's shores had a high metal content and were relatively easy to find if they were within the confines of the minefield perimeters. From late 1943 until late 1948, a total of 1,986 minefields consisting of 338,500 mines were cleared, mostly by the Royal Engineers.[22]

Eleven other more complex and difficult minefields were cleared by 1972.[23] The last mined beach at Trimmingham in Norfolk was finally released to the public in 1972. In 2004, a memorial was unveiled nearby at Mundesley to commemorate the 26 Royal Engineers killed while clearing the beaches in this area alone.

Figure 9. Royal Engineers make use of water jets while clearing Saunton Sands in Devon, 1947.[21]
*Figure courtesy of British Pathe.*

Figure 10. Beach defenses near Aldeburgh in Suffolk, United Kingdom, photographed by the RAF on 17 December 1941 where B Type C mines are believed to have exploded.
*Figure courtesy of Historic England RAF Photography.*

Cleared minefields did not just return beaches to public use. By the 1960s, certain sites became nuclear power stations. Figures 12 and 13 (pages 40 and 41) show the minefields protecting Dungeness in December 1941. Part of that minefield ran straight through the current super structure of a nuclear power station.

While many efforts were made to clear minefields, the residual risk remained. In 1961, for example, a Royal Engineers Bomb Disposal Team was tasked to re-clear the beach at Sandgate near Folkestone, because the local council wished to replace the beach groynes (ocean shore barriers designed to limit the movement of sediment). A remaining B Type C mine was found. Such instances were relatively common. In June 1967, the Royal Navy had to re-clear an area of Slapton Sands in Devon of 32 anti-tank mines. The beach was originally cleared in 1948.[25] The last recorded, deliberate clearance of B Type C mines was in Whitsand Bay in Cornwall in 1998. As late as December 2011, a beachcomber group on the beach

Figure 11. The memorial to the Royal Engineers who died clearing minefields near Mundesley, Norfolk, United Kingdom.
*Figure courtesy of Tour Norfolk.*

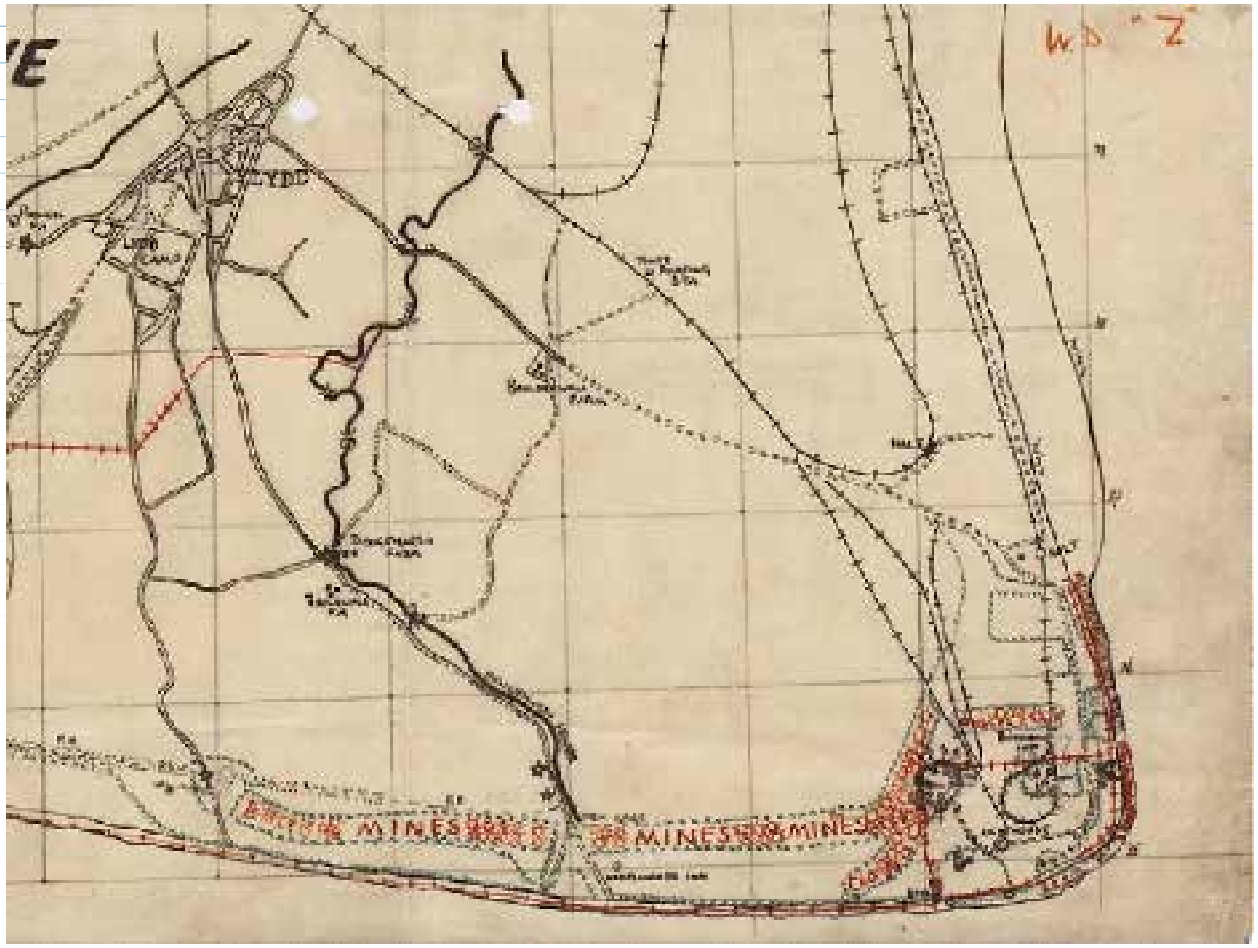



Figure 12. A 1941 image representing defenses at Dungeness, Kent, from the War Diary 8th Royal Fusiliers.[24]
*Figure courtesy of The National Archives.*

at Seaford just west of Cuckmere Haven called the police having found a very weathered B Type C mine.[26] Other instances are relatively frequent.[27] For instance, landmines have been found in fishermen's nets.[28]

In February 2014, the U.K. Ministry of Defence replied to a Freedom of Information (FOI) request that asked for "details of WW2 beach minefields for North East Scotland, either maps or clearance certificates from post war demining." The Army Secretariat rejected the FOI on the basis that certain individuals might attempt "to locate and unearth these munitions, potentially leading to serious harm to themselves and others in the vicinity." Interestingly, the secretariat added that "another consideration is that the accuracy of this information is not guaranteed, nor is it considered comprehensive."[29] It would appear that the implications of the hasty installment of minefields on the U.K. coastline remain with us and are relevant today. In October 2015, a suspected landmine washed ashore in Aberdeen and was subsequently destroyed.[30] It will likely not be the last to be found on U.K. shores.

The United Kingdom's experience with clearing minefields is still applicable to current ongoing efforts to clear minefields and battlefields. Firstly, it is noteworthy that the United Kingdom quickly accepted that clearance resources were insufficient to guarantee zero risk from explosive hazards. An all reasonable effort approach to target resources effectively was adopted. Those who have promoted land release since 2005 would recognize this approach. The most difficult minefields were left to the end and cleared over a prolonged period, allowing quicker clearance of more straightforward areas. In general, it appears that prioritization of clearance was appropriate and successful. The United Kingdom also led the development of mine clearance technology, including 4A mine detectors, Electrical Research Locators, and techniques such as the use of water jets. Moreover, along with many other countries in Europe, the United Kingdom developed realistic

Figure 13. Aerial image of Dungeness, Kent, as it appears today.
*Photo courtesy of Google Earth.*

capabilities to deal with the inevitable residual contamination. It is not known whether any national clearance program has managed to clear all contamination. Residual contamination can typically be minimized but not eliminated completely. The solution is to develop reasonable risk management and legal frameworks backed by a sustainable professional clearance capacity. This model is seen in a number of countries including many in Europe as well as Japan. The challenge for countries with more recent contamination is to develop a suitable and viable national capacity that can effectively manage the ongoing risks of residual explosive hazards.

*See endnotes page 65*

*The author would like to thank Wendi Pedersen for helping to prepare figures 5 and 6 of this article.*

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