The Discharge of Waters from Active and Abandoned Mines

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1 Introduction

Water from active mines is discharged in a controlled manner in the UK under a system of licences called consents. But waters from abandoned mines—which are discharged without controls—are a source of poor water quality in specific areas. The situation is a long-standing one in many cases, but mines are still being abandoned so that, generally, the situation continues to deteriorate. This trend needs to be reversed. The extent to which remedial measures can and should be taken with regard to long-abandoned mines nevertheless needs careful consideration and priorities need to be established.

Dealing with the problem is not helped by the legal position, which is briefly discussed. The nature of mine water is briefly described also, because it determines not only the effects which such waters have on the aquatic environment, but the difficulties which arise when trying to ameliorate such effects, which vary from the aesthetic to the toxic. The scale of the problem has yet to be fully evaluated in the UK, primarily because many of the effects are most acute in streams and upper reaches which are not routinely monitored, and are thus unclassified. Nevertheless, some attempt has been made to characterize the scale and nature of waters affected by abandoned coal and metal mines and suggestions made as to how the situation could be improved.

2 The Nature of Mine Water and its Potential Environmental Impact

Deposits of coal, and of minerals, lie at various depths and have been exploited by man for a very long time. Even without human intervention, however, both surface and groundwaters have permeated such areas, leaching metals and other substances in the process. But mining increases the surface area of the deposits, facilitates and increases the passage of groundwater, and may thus accelerate the rate, and change the scale, of these leaching processes.

Water enters most mines in the UK. In working mines it has to be removed by pumping. In addition to the direct downward movement of rainwater reaching the underlying aquifers, water may also enter via faults, gallerys, and adits, many of which may extend well beyond the surface watershed of the catchment. The quantity of water can thus be very large and very variable. The chemical nature of such waters varies from mine to mine, but a common feature is that of a reddish-brown suspension due to the presence of iron minerals. Another common feature of such mines is the presence of iron pyrites which, upon prolonged contact with water, dissolves to form sulfuric acid. This can lead to the leaching of other metals which are naturally present. The final waters emerging from a mine may therefore be acidic, laden with metals such as cadmium, copper, and zinc, plus suspended materials which co-precipitate out as a highly coloured floc. Another not uncommon feature in some mines is that of 'saline' water—the salts being of chloride or sulfate.

Treatment facilities are installed and operated at working mines to reduce the potential impact of such waters—together with effluent arising from pithead activities. Not all mine water is necessarily of poor quality, however; indeed some of it is very good and is used to offset the effects of poor quality surface waters by providing additional dilution. Some mine water may also be used, after treatment, for potable supply.

The Chemistry of Mine Waters

The nature of mine waters, like those of surface waters and other groundwaters, varies very considerably. Different areas exist where waters draining from mines are alkaline, moderately or highly saline, alkaline and ferruginous, or acidic and ferruginous. The nature and effect of such waters can also differ, within the same mining complex, between that arising from shallow level workings and adits and that pumped or emerging from deeper levels. Understanding the nature of such waters is an essential preliminary to dealing with the discharges of individual mines. This in turn is usually related to the hydraulic features of the mine. And whilst it is difficult to generalize on this subject, it is useful to examine the causes of one of the most common features—that of ferruginous waters—emanating from mines, particularly coal mines.

Ferruginous mine waters are caused by the oxidation of iron pyrites (pyrite), which is a mineral form of iron sulfide; superficially it resembles gold in appearance, hence the name 'fools gold'. Iron pyrites is common in both the coal itself and in the mudstones, of marine origin, which overlie the coal seams. It is also common in metal mines. Up to 10% of coal layers may consist of this mineral. They may be continuously or sporadically exposed to air in near-surface levels, but in deeper workings such strata will have been below the water table. When the water table is lowered by pumping, these strata become exposed to air. The iron pyrites then rapidly oxidizes, although such oxidation can take place in a variety of ways and via a number of intermediate chemical products, depending on the precise environmental conditions. Factors which are known to influence the rate and extent of the oxidation reactions include the sulfide mineral content, its morphology, the availability of oxygen, and the ferric ion concentration. Several of the rates of oxidation are also greatly increased by the catalytic activity of bacteria. Other sulfide minerals present may undergo a similar series of chemical reactions when exposed to air and water. The oxidation creates acidic conditions, with the result that sulfuric acid is produced in various quantities and at different rates. This acid may then cause other minerals to dissolve.

In underground workings the pumping of mine water reduces the rate at which leaching occurs from exposed surfaces. Acidic mine waters are treated to neutralize them—if only to protect mining machinery! When mining operations cease, however, and the pumping stops, the water table rebounds to its natural level—or to a new level as a result of the mining operations. This flooding of the exposed seams stops the oxidation of the iron pyrites, but brings into solution the sulfuric acid and the iron sulfates which are the products of the oxidation reactions. The result of this depends on the nature of the rock strata. If they are calcareous, and particularly of limestone, the mine water may be neutralized; such waters usually have a reduced iron content. If they are not calcareous, however, the mine water may become highly acidic—as low as pH 1 or 2—and become even more loaded with iron, and often with manganese.

When the water finally reaches the surface it may emerge via old adits, emerge as springs, or as seepage through the ground or even through the bed of an existing river or stream. As it emerges it may well be clear and almost colourless, because the underground water is low in oxygen and the iron in solution. As this water mixes with the air—which may occur before it emerges above ground—and with oxygenated water, the iron rapidly oxidizes from the ferrous to the ferric form and precipitates out as an orange deposit. In shallow mines, or in adits set in higher ground, such cycles may be repeated continually as the groundwaters fluctuate. In deeper mines connections may be made with underground aquifers. Quite frequently the history and extent of mining is such that neither the hydraulic conditions nor the chemical state of the water can be easily or accurately predicted once the last mining activity ceases.

Similar chemical reactions also occur in colliery and metal mine spoil tips above the ground, such that run-off from them may be acidic and ferruginous. A further problem, however, is that they are a source of particulate material, usually of very fine, often colloidal, clay and shale particles which in turn may carry other chemicals, particularly metals, with them. Thus factors such as rainfall can affect the natural variation of waters in surface adits, and the rates of leaching within surface spoil tips. Discharges from active mines are controlled in order to prevent receiving waters from such effects.

Biological Impacts

The impacts on aquatic communities of untreated mine water may not be immediately apparent, but can be of serious environmental consequence. The observable biological effects include: (1) depletion of numbers of sensitive, and diversity of all, free swimming and benthic (bottom dwelling) aquatic organisms; (2) loss of spawning gravel for fish; and (3) direct fish mortalities, particularly of natural game (salmon and trout) fish. A range of less readily observed sub-lethal effects may also occur.

Clear streams can turn into highly ochreous ones of a vivid orange appearance. Such discharges make rivers virtually fishless by coating the river bed with precipitating iron hydroxides. Depletion of the numbers and diversity of benthic (bottom dwelling) species occurs because the precipitate has a smothering effect, reducing oxygen, and covering the river bed with iron oxides. This process also reduces the extent of spawning gravels for fish breeding, by occluding the interstices of the gravels with fine sediment, and therefore limiting the availability of nursery streams. Natural game fish populations are particularly susceptible to such pollution. The low pH can be directly toxic, causing damage to fish gills. It can also solubilize metals, not only those which emerge from the mine water, but those—such as aluminium—which become dissolved within streams, and which are also toxic to fish.

Perhaps the greatest impact of mine water pollution occurs in the smaller streams which are not usually classified under the river quality assessment schemes. These streams, which typically form the headwaters of rivers, are vitally important as fish breeding grounds and nursery areas for developing juveniles.

Impacts on Other Water Users

Other impacts of untreated mine waters include the imposition of restrictions on legitimate users of the water body, who may find the water unsuitable for irrigation, livestock watering, industrial, or potable water supply. There may also be significant consequences for shellfisheries, conservation areas, and for recreation and tourism.

The aesthetic impacts which ferruginous mine waters cause to rivers and streams, by the presence of a high colouration, immediately reduces the amenity value of an area. A direct consequence of this visual damage is a reduction in the use of a waterbody for recreational and watersport activities. Again, this reduces the value of the water resource to the local community. An impairment of the quality of a river because of mine-water pollution may also render it unsuitable for industrial and potable water supply, and often unsuitable for irrigation.

Predicting the effect on water quality as a result of mine closure is extremely difficult: the time taken for groundwater to rebound to a more or less equilibrium value can take from a few months to several years. Part of this is due to the point of entry, particularly via various mine shafts. Indeed a knowledge of and provision for looking after mine shafts is an integral part of dealing with the problem. Poor planning decisions are often made because of mine shaft location, and they are often inadequately infilled prior to redevelopment of the land. Shafts are often left uncapped, which not only leads to water entry, but to the use of the shafts for fly tipping an unknown quantity of potentially polluting chemicals and materials.

Finally, it is also important to consider that changed flow regimes which are a consequence of the cessation of pumping can affect flow rates of rivers on the surface. Changed flow patterns can then affect the availability of water for abstraction, or can lead to localized flooding problems as old wells and springs become reactivated, or exacerbate existing flooding problems within vulnerable downstream areas. Changes in flow patterns and groundwater levels may exceptionally render natural slopes unstable, resulting in landslides. Subsidence may also occur due to the softening of earth and mudstone. Methane gas may be forced to the surface. Flooding may occur.

As with all other situations involving the pollution of a natural resource, there is an economic cost as well as an environmental one. In this case, there are many economic costs. The reduction in the quality of water will affect the wide variety of uses which are demanded of it and ultimately there is a price to pay. The environmental consequences thus cannot be separated from the economic impacts and the two must be viewed in parallel.

3 Active and Abandoned Mines

It is evident that mine water is potentially very damaging. Water emanating from working mines is therefore carefully controlled, the (usually) acid waters neutralized, suspended solids removed, and the treated effluent then discharged under licence. Discharges from working mines in England and Wales are controlled through consents issued by the NRA under the Water Act 1989, since consolidated into the Water Resources Act 1991. Similar provisions exist elsewhere in the UK. Such consents generally include conditions relating to the quality, quantity, discharge regime, and monitoring of the mine water. Separate consents are given for discharges from related above-ground activities. Once the mine is no longer operational, the mine owner can ask for his consents to be revoked. Should pollution subsequently occur, there is then limited control over the discharges, for two reasons. Firstly, with regard to committing a pollution offence, the principal offence under Section 85(1) of the Water Resources Act 1991[1] (previously Section 107(1) of the 1989 Water Act), is that a person:

> '. . . *causes or knowingly permits* any poisonous, noxious or polluting matter or any solid waste matter to enter any controlled waters'.

A defence under Section 89(3) of the Water Resources Act 1991 is that:

> 'A person shall not be guilty under Section 85 by reason only of his *permitting* water from an abandoned mine to enter into controlled waters'.

As can be seen, the defence relates only to *permitting*, which in the case of long-abandoned mines implies that action need not be taken to ameliorate the effect of past practices. An *abandoned mine* is not defined in the 1991 Water Resources Act, nor in any other relevant legislation. However, a *mine* is said to have the same meaning as that in the Mines and Quarries Act 1954.[2] It could be argued, perhaps, that the act of abandoning a mine *causes* pollution if, subsequent to such action, contaminated mine water enters controlled waters. Nevertheless, it is likely to be only one link in a chain of events. This was essentially the basis for the only successful prosecution in relation to mine closure—that of Lockhart *versus* National Coal Board (NCB) in Scotland in 1981. The case involved pollution of surface water resulting from the closure of a mine which had operated from 1951 to 1977. Under Section 22(1) of the Rivers (Prevention of Pollution) (Scotland) Act 1951,[3] the Crown argued that the NCB had *caused* pollution and that they could prove that they had '. . . carried out

[1] Water Resources Act 1991, HMSO.
[2] Mines and Quarries Act 1954, HMSO.
[3] Rivers (Prevention of Pollution) (Scotland) Act 1951, HMSO.

some active operations or chain of operations the natural consequence of which . . .' was to cause polluting matter to enter a stream: essentially, that the pollution resulted from a hole being dug which, after mining operations had ceased, filled with water and caused pollution. This was described by the court as '. . . the result of the respondent creating the latent danger and then leaving it to the mercy of the forces of nature, which activated the danger'.[4] Although helpful, this case does, however, illustrate the legal difficulties which arise when mines with a very long history are abandoned, particularly where they have been inter-connected with previously dug workings, many of which will be at a shallow level and may therefore be the principal contributors to the final poor quality water.

In the case of the Wheal Jane tin mine in Cornwall in 1992, because of the complicated history of the mine, the NRA—after taking detailed legal advice—concluded that it would not be successful in bringing a case against Carnon Consolidated Ltd., the mine's owners, for causing pollution in abandoning the mine. Thus the only purpose in attempting to bring about a prosecution would have been to demonstrate deficiencies in the law and, because of its capacity as a 'Crown prosecutor', this would not have been a correct use of the NRA's position, and it has therefore sought to secure legal changes by making direct approaches to the Government. (The Wheal Jane incident is discussed further in the next article). In their document 'This Common Inheritance The Second Year report',[5] the Government stated that it was considering '. . . the framework of legal responsibility for pollution from abandoned mines'.

In the case of coal mine closures—for mines operated by British Coal—when the closure of a colliery is announced, British Coal undertakes a structured analysis of the issues relating to the closure which stems primarily from safety considerations in relation to the impact on adjacent working mines. But it also addresses environmental and land ownership issues. The cessation of pumping is an important element of the closure programme and the matter is discussed with the NRA.

Where a colliery closure programme is implemented, 'due regard' is given by British Coal to the future activities and the need for a consented discharge to controlled waters. A proportion of mines and associated tipping lands are held on a leasehold basis and the requirements of the lease may restrict the opportunities available. In freehold situations British Coal is generally required by specific planning consent conditions, or by an arrangement with the Department of the Environment with respect to collieries closed since 1 April 1990, to restore colliery surfaces after abandonment unless alternative forms of development are accepted by the Planning Authority. When mines are not closed permanently they are retained on a 'care and maintenance' basis and therefore pumped and ventilated, and subjected to regular inspection.

The second control available relates to possible remedial action. Where pollution is occurring the NRA has general powers, under what is now Section 161 of the Water Resources Act 1991, to carry out works which may be necessary to prevent the contaminated water from entering controlled waters, or to remove, remedy, or mitigate any pollution, and restore the waters to their previous state.

[4] 'Water pollution from abandoned mines', Water Law, July 1992, pp. 119–120.

[5] This Common Inheritance: The Second Year Report, HMSO, October 1992.

The NRA is also entitled to recover expenses reasonably incurred in such work from those who caused or knowingly permitted the pollution *but* not

> 'from a person for any works or operations in respect of water from abandoned mines which that person *permitted* . . . to enter controlled waters'.

Thus, taking this and the situation with regard to prosecution together, the NRA and similar regulatory bodies are somewhat limited with regard to what they can do. Prosecution for polluting is difficult, and if it fails, the cost of remedial action would have to be borne by the regulatory authority. As the abandonment of a mine is often concomitant with its owners being in financial difficulties, any reimbursement of costs—even if prosecution was successful—is likely to be limited anyway. But an owner may have other sources of income, or have the capability of actual or potential development of the site from which an on-going revenue may be raised. The mine could also be re-opened within a relatively short period of time. The powers available to the NRA under Section 161 are nevertheless clearly of value in those circumstances where a polluting event has occurred and action can be taken to prevent or remedy the situation without any future commitment falling on either the NRA or the owner, providing that the funding is available. More difficult are those situations where remedial action would require long-term management of works installed to prevent further pollution: the NRA could rapidly acquire a long list of sites to manage in this way.

There is also the question of cleaning up the site above the ground, and the possibility of a mine being mothballed for subsequent re-opening. Such matters involve complicated issues with regard to land ownership, mineral and development rights, mining rights, and the planning law. Briefly the situation is as follows.

Ownership, Mineral Rights, and Mining

Mineral rights for precious metals and for uranium in the UK are all owned by the Crown, but with the exception of small gold mines in Wales, no mines have been worked exclusively for these metals in modern times. For coal, mineral rights rest with British Coal at present. For most other minerals ownership of land may also carry with it the ownership of the mineral rights, but in many cases the two have become separated and the mineral rights are owned separately.

A further complication is that neither the owner of the land nor the holder of the mineral rights may necessarily be the developer of a mine. In order to develop a mine in such a situation it is necessary for the would-be miner to apply to the owner for the lease of the land, the possessor of the mineral rights—to whom he will pay royalties—in order to exploit them, and to the relevant Planning Authority in order to develop a mine on site. In Cornwall the situation has been particularly complicated by Stannary Parliaments and Stannary Laws.

Planning and Remediation

Where a Mineral Planning Authority decides, after the necessary consultations, to grant planning permission for an application to work minerals—including underground mining—such permissions are normally subject to a number of attached conditions. These are likely to include requirements to minimize or prevent environmental effects (including visual impacts or disturbance to surrounding areas) during the operation of a site and to ensure reclamation of the site to a beneficial use when working has ceased. Mineral permissions are now time limited, so that if a mine has been abandoned for the purposes of the Mines and Quarries Act 1954, then it would depend on the time of the planning permission as to whether anyone wishing to re-open the mine would have to apply for a new permission to do so. In some circumstances the applicant/operator may also have entered into a voluntary agreement (now termed a 'planning obligation') with the mineral planning authority under Section 106 of the Town and Country Planning Act 1990.[6]

International Commitments

As a member of the European Community (EC) the UK Government is required to comply with EC legislation. Because of the metalliferous content of many mine waters, the NRA in England and Wales has specific responsibilities through the Water Resources Act 1991 with regard to their effect on compliance with EC Directives relating to dangerous substances in surface and underground waters. Of specific interest are the two metals cadmium and mercury. The relevant Directives have been implemented into national law by means of the Surface Waters (Dangerous Substances) (Classification) Regulations 1989 (SI 2286)[7] which specifies standards for freshwater (DS1) and coastal waters (DS2) within respective classification schemes. The NRA has been directed by the Department of the Environment (DoE) to perform various duties with regard to SI 2286, primarily relating to the consenting of discharges containing the substances listed, and the implementation of a suitable monitoring and analysis programme by which compliance with the classified objectives can be demonstrated.

When the NRA has reason to believe that surface waters are liable to fail the requirements of an annual mean standard, it has to provide the DoE with all relevant information as to the nature and circumstances of the reasons for failure, and the steps that the NRA has taken, or proposes to take, to restore the quality of the water. If such steps are unlikely to be effective within 12 months, the NRA has to provide the Department with such information as will allow the Secretary of State to '. . . determine in relation to any relevant discharge to those waters an appropriate emission standard in accordance with the relevant Council Directive'. It has been the practice, for the previous Water Authorities—and thus subsequently the NRA— to include in their monitoring programme those sites influenced by discharges from mining operations, but not necessarily those close to contaminated land. The NRA has also to send to the DoE by 30 April each year information on the discharges, sampling, and analysis for the previous calendar year, and details of variations and additions to related discharge consents.

[6] The Town and Country Planning Act 1990, HMSO.

[7] The Surface Waters (Dangerous Substances) (Classification) Regulations 1989, Statutory Instrument No. 2286, HMSO, 1989.

Other EC Directives of relevance to the topic of mine waters are the Freshwater Fisheries Directive,[8] the Abstraction of Drinking Water Directive,[9] the Shellfish Water Directive,[10] and the Groundwater Directive.[11]

4 The Scale of the Problem from Abandoned Mines

It might be thought that, with legal requirements in place to record abandoned mines, estimating the number of such mines should be a straightforward exercise; but this is not the case. The Mines and Quarries Inspectorate holds only non-coal records, and the data are not in a form which is easily accessible to the public. There are no records of any mines prior to 1872. British Coal holds its own data base of approximately 10 000 abandoned mine workings, but this figure is only an estimate and complications arise as a result of recent trends to re-open mines for commercial, recreational, and educational purposes.

The number of discharges from coal mines causing significant pollution, *i.e.* subjects of complaint, deterioration in water quality, and failure of non-statutory River Quality Objectives (RQOs) in England and Wales is about 100, affecting about 200 km of rivers. This does not include less serious discharges, of which there are many, or natural ochreous discharges.

As with coal, the mining of metals has a very long history in some areas, and many mines have been more or less continually worked for centuries. As a result, underground workings can be extremely complex and the extent of them is rarely fully known: above ground contamination with various metals can be equally extensive, and again this is rarely fully known. Entire water catchments may be affected, and delineating the precise source of contamination is in many cases virtually impossible, other than to conclude that the contaminant is ubiquitous within a very large area.

Certain regions therefore have problems with waters emanating from both abandoned metal and coal mines. Some 400 km of classified rivers are affected in England and Wales. Both the nature and extent of the problem varies, and its full scale is not easy to determine. In Devon and Cornwall, which have the principal problems with water from abandoned metal mines, there are at least 1700 abandoned mine-workings, many of which were small operations producing ore for a short time only. At present there is only one metal mine still in operation, on the Red River in Cornwall, and this is currently not causing significant pollution problems. Most mines produced several minerals—principally copper, tin, zinc, arsenic, lead, and some silver—with many minor minerals also being present. Some 22 catchments in the area are affected by non-ferrous mining activities, with 212 km of river being significantly affected. And this does not include the lengths of unclassified, unmonitored, streams—many of which are significantly affected.

[8] 'The Quality of freshwaters needing protection or improvement in order to support fish life', (78/659/EEC), 1978.

[9] 'The quality required of surface water intended for the abstraction of drinking water', (75/440/EEC), 1975.

[10] 'The Quality required of Shellfish Waters', (79/923/EEC), 1979.

[11] 'Protection of Groundwater against pollution caused by certain Dangerous Substances', (80/68/EEC), 1980.

Some discharges are semi-saline, some are warm, and some contain substantial quantities of naturally occurring radionuclides.

Wales, too, has had serious problems with abandoned metal mines—problems equally as serious as those arising from abandoned coal mines. There are over 500 abandoned metal mines in west and north Wales, the majority arising from the mining of lead, zinc, and silver in North Ceredigion near Aberystwyth and in north east Wales. In Meirionnydd, copper and gold were extracted, the gold being associated with mineralized veins containing zinc. In all cases the most serious pollution problems are related to the discharge of contaminated water draining from the abandoned mine workings. The most affected major rivers are Ystwyth and Rheidol near Aberystwyth. The poor quality is due to zinc pollution derived from underground drainage water from the abandoned mines. There are also significant problems with water quality on the Conwy, upper Teifi, upper Towy, upper Dovey, and upper Mawddach. At Parys Mountain, the Afon Goch is seriously polluted with elevated copper concentrations.

Since the NRA was set up, much effort has been expended to quantify further this inherited problem, with surveys being carried out particularly in the south west corner of England, and in Wales. Such work is being integrated with other studies on the not-unrelated problem of contaminated land, and will be evaluated through a process of catchment management planning. This therefore naturally raises the questions of what can be done, when, and how the residual water quality problems can be tackled.

5 Some Thoughts for the Future

There are several positive actions which could usefully be taken. These include a clarification of the law with respect to what constitutes an abandoned mine, the need to inform the relevant environmental agencies in good time of the intention to abandon a mine, and full allowance in the planning system for the future opening and closing of mines, including their re-opening. With regard to the standing of long-abandoned mines, however, it is clearly impractical to attempt to ameliorate their effects, by whatever means, until their relative contribution to poor water quality in different catchments has been fully assessed. It is suggested, nevertheless, that priority needs to be given to those mines which: (1) are a cause of breaching a surface water quality standard; (2) can be shown to be a significant contributor to the annual input of toxic chemicals into coastal waters; or (3) are a unique cause of poor water quality in an otherwise good quality river.

There is also the question of what, practically, can be done. It is clear that adequate provision needs to be made for the consequences of mine closure as soon as mines are opened, and some form of arrangement is needed for the long-term running of treatment plants, where necessary, when a mine has been closed in order to safeguard receiving water quality. There are several options available to deal with the polluting aspects of mine waters. Much of the ameliorative research and experimental work has been carried out in the USA; less is known about similar work in Europe. But, the NRA itself is extensively involved in research and development for the treatment of abandoned mine water.

The principal objectives of treating abandoned mine waters are to remove the iron floc and associated metals, and to adjust the pH. The potential treatments fall into three categories, as follows:

(1) *Physical systems*—which are processes in which oxidation of the water is accomplished through engineered cascades, together with facilities for sludge settlement. The costs involved are largely capital expenditure, but revenue costs arise for the disposal of the contents of settlement tanks and desludging processes.
(2) *Chemical systems*—which are of two sorts: active processes, which are expensive to run because of both the cost of the treatment chemicals, and the disposal of the resulting sludge; and passive processes, which are used in the USA and appear to be much less expensive.
(3) *Biological systems*—which are processes that include bacterial oxidation and the use of reed beds. Recent work in the USA has demonstrated that the use of reed beds is a relatively low cost approach.

The biggest problem, however, is how such work should be paid for, and by whom? Within the UK this still requires a wider national debate.