Mine water policy in the UK and the proposed Directive on mine waste

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Abstract

After the Aznalcóllar and Baia Mare disasters the regulation of the environmental impacts from the extractive industries has become a focus of attention for European environmental policy. The EC Framework 5 project ERMITE has specifically supported the development of European policies on the management of water in the mining sector. One component of the project was the review of mine water policies in six case study countries in Europe and their links with European policy. This paper presents a summary of the findings of the UK case study. A key element of the project was the establishment a National Stakeholder Group with regulators, industry, consultants and representatives of civil society. Four main open issues for mine water management in the UK were identified: closure of coal mines and large coalfields, abandoned metal mines, spoil heaps and improvement of working mines and quarries. From the analysis of the UK position on the consultations for the proposed Directive on waste from the extractive industries three critical questions are discussed: water pollution from excavation voids, establishment of programmes of abandoned site remediation and inclusion of all structures for stability and water pollution purposes. Finally, based on the conclusions of the study the UK ERMITE team proposes a set of seven specific recommendations for mine water management in the UK.

1 Introduction

After the Aznalcóllar and Baia Mare disasters the regulation of the environmental impacts from the extractive industries has become a focus of attention for European environmental policy. Following the recommendations of the Baia Mare task force (CEC 2000), the European Commission initiated a legislative process to cover the glaring omissions in the European environmental policy framework that allowed such events to occur (Kroll et al., 2001). The crafting of a new proposed Directive on the management of waste from the extractive industries (CEC 2003) has been the most important element of this process.

The EC Framework 5 project "Environmental Regulation of Mine Waters in the European Union" (ERMITE) ran from February 2001 to January 2004. The goal of this project was to provide integrated policy guidelines for developing European legislation and practice in relation to water management in the mining sector. ERMITE succeeded in establishing a dialogue with officers of the European Commission around this topic and contribute to shaping the proposed Directive. Members of the ERMITE consortium were also involved in subsequent discussions in the European Parliament.

One of the research activities of ERMTE was a review of mine water policies in six case study countries in Europe. This paper presents the main findings for the UK. The core element of this component of the project was the establishment of a UK National Stakeholder Group (UK NSG), whose members were selected to include as many as possible of the UK administrative bodies involved in mine water management, industry, consultants and representatives of civil society. A very important factor for the objectives of the project was the presence of the key regulators (the Environment Agency (EA), the Scottish Environment Protection Agency (SEPA) and the Coal Authority (CA), and the involvement of the Office of the Deputy Prime Minister (ODPM), which represents the UK government in the discussions concerning the proposed Directive on mine waste management. The UK NSG met three times during the project. Informal regular contacts were maintained actively between meetings, in relation to particular aspects of the work. The transcripts can be found in ERMITE document D7 (Amezaga and Younger 2004). The topics discussed in the NSG meetings were further explored in one to one semi-structured interviews with the members of the UK NSG.

In this paper we will present briefly the main issues identified in the case study. We will also provide some comments on the UK position regarding the proposed Directive on mining waste. At the end, we review the

main conclusions and provide a table of recommendation for mine water management in the UK.

2 Open Issues for mine water management in the UK

Closure of Coal Mines and Large Coalfields

The country was not prepared for the scale of coal mine closure programme in the 1980s and 1990s. Much has been learned since then with the emergence of the national remediation programme based on a Memorandum of Understanding between the CA, the EA and SEPA and sponsored by the Department of Trade and Industry; but it is far from being a resolved question. When the CA inherited the mines, closure procedures had not taken into account the long term environmental management of the sites. There were a lot of uncertainties about water levels and the future evolution of the systems, yet very few monitoring data were available. After 1998, a base line review of every coal field in the UK provided the basis for the current risk based approach. The monitoring programmes are still in their infancy and changing, as information becomes available. The ability to prioritise mine water rebound to develop a prevention programme is still not in place. Specific solutions will require considerable expertise in order to get a ranking system that is robust enough to target actions but does not require a disproportionate cost to maintain (Tate 2002). A key development was the appearance of the Mines (Notice of Abandonment) Regulations 1998 which forced that after 31.12.99 all operators should take appropriate action to avoid pollution when abandoning a mine, accepting the costs and liabilities. It is still too early to judge the efficacy of the 1998 mine abandonment regulations. However, some indications of problems are beginning to appear. The long term liability of mine owners comes into question when the company disappears. A recent case in point is the closure of the Longannet Mine (near Alloa, Scotland) in March 2002, which was precipitated by an unanticipated inrush of water to this, the last underground coal mine in Scotland, from nearby old workings which had previously been considered to be safely isolated from the modern workings by subsurface dams. The mine had to close suddenly, forcing the company (Scottish Coal Deep Mines Ltd) into liquidation. Receivers for the liquidated company were then reported by SEPA to be refusing to transmit to them the information stipulated in, making planning for post-closure monitoring / preventative action virtually impossible.

Abandoned Metal Mines

Metal mines have always been in private hands and until 1999 were also free to pollute upon abandonment. In fact most of the metal mines in the country closed before that date, leaving a legacy of mine water pollution without a liable owner. The lack of any organisation really responsible for such sites, and above all, the absence of any specific budget to deal with them, is not a sustainable solution. There is no a priori case for the absence of an active policy for remediating the pollution from abandoned metal mines along the lines of the successful national coal mine water remediation strategy. It can only be surmised that the lack of such a policy for metal mines reflects: the remoteness of most of the polluted sites and affected communities from the locations of decision-makers, and that the fact that metal mines were never nationalised (and thus never the object of a politically-controversial privatisation), which might increase the public feeling of collective responsibility for them.

Spoil heaps

British Coal owned huge amounts of land to enable its extensive mining and coal processing operations. Upon privatisation the CA retained land with value with respect to coal and other considerations, while the remaining pieces of land were transferred to commercial parties, local authorities and development agencies. There are also spoil heaps from mines that were never privatised. Run-off from this material is often highly acidic, with a high concentration of metals. In England alone spoil disposed above ground has affected almost 22000 hectares of land (DOE 1996). The best way to deal with these sites and their accompanying water pollution problems is through re-mining or redevelopment. Operators complain that at present it is often extremely unattractive to mining companies to re-mine old spoil heaps and brown field areas. In England, English Partnerships (EP) do have a ring-fenced budget from the ODPM for coalfield regeneration. The EP coalfield programme currently involves sites that were transferred directly from British Coal at the time of privatisation and sites added as a result of the 1998 Coalfield Task Force report and reflect the burden that EP was able to absorb at that time. An important question is the role of the recently created Regional Development Agencies. Most of the RDAs in coal areas do not have a particular coalfield focus. They would rather target easy sites than deal with the mining legacy. A more consistent approach is needed from the RDAs, giving adequate priority to the regeneration of mining areas and ensuring that EP can deliver the full potential of the coalfield regeneration programmes.

Working mines and quarries

The mine abandonment regulations have forced the operators to be very careful with some of their decisions. In particular, open mines have to avoid connecting with older workings. The case of Ellington Colliery (Northumberland) shows well the possible consequences. Ellington is the last remaining mine in a large coalfield and it is also the low point from the point of view of drainage. Some 50% of the water pumped at the mine comes from other mines. The problem is that Ellington is now in hands of UK Coal and the rest of the coalfield is the responsibility of the CA. Mining companies, in general, operate with very high standards but they can still improve considerably the degree of care on mine water issues in the early stages of exploration and operation. Ground water management is still an unresolved problem. This will become ever more important with the forthcoming new Groundwater Directive. Scotland has made some progress with the publication of a code of practice for mineral extraction in relation to the Groundwater Regulations 1998 (Scottish Executive 2003). Finally, the management of fine-grained silts is one of the issues where most of the industry has still to improve its performance.

3 UK position on the proposed Directive on mine waste

One of the questions researched with the UK NSG was the influence in the UK of new developments in European policy. The two main focus of attention for the purpose of the project were the implementation of the Water Framework Directive and the proposed Directive on the management of waste from the extractive industries. ERMITE's direct involvement in the discussions around the proposed Directive provided an excellent opportunity to analyze the UK's position in the process. The views of ERMITE UK were expressed in a response to ODPM's consultation on the proposed Directive. The full text of the response can be found in ERMITE Report D7 (Amezaga and Younger, 2004).

The UK representatives have played a constructive role during the consultations organized by the European Commission for the proposed Directive. They have had an important influence on the evolution of the text from the first working document, which drew heavily (but inappropriately) on the wording of the Landfill Directive, towards the current proposal which is far more in accordance with industrial and regulatory practices in the extractive sector. This constructive engagement has helped to make many of the requirements of the proposal reflect existing good practice in

the UK. However, there are several issues were the UK position should be revised.

First, the UK views the proposed Directive as strictly a waste management issue. Based on this position, while acknowledging the importance of the prevention of water pollution left to flood after closure, they have not supported its inclusion in this Directive. The official understanding being that this is already covered by the provisions of the Water Framework Directive (2000/60/EC). In reality the Water Framework Directive alone is very poor instrument for the prevention of pollution from mining activities, and the proposed Directive on mineral waste management is likely to represent the only opportunity to close this loophole in EU legislation. Moreover, this is exactly the role of The Mines (Notice of Abandonment) Regulations 1998, which all UK companies have to fulfil. Accordingly, the UK should support the inclusion of specific provisions to prevent water pollution from excavation voids.

Second, the current proposed Directive is the best opportunity for establishing a rational and not onerous programme of remedial measures for abandoned mine sites at the European level, following the model of the national rolling programme managed by the Coal Authority. As presented above, even the UK lacks such a programme for abandoned metal mines. The version of the proposed Directive that was finally produced by the European Commission had watered down unacceptably the provisions at this respect of the previous working document. Now, the European Parliament has introduced amendments to this particular Article (19) with more robust proposals (P5_TA-PROV (2004)0240). The UK should support this version of the Article 19.

Third, the UK has sought to limit the scope of the Directive in relation to the temporary storage of waste that will be used to re-contour, landscape and rehabilitate the excavation voids. However, now the Mine and Quarries Regulations include all kind of structures regardless of size or their permanent or temporarily character (Walton and Cobb 2002). It is our view that, at least, the provisions of the Directive related to the control of stability and the control of water and soil pollution should apply to all structures regardless of their temporary character or their labeling as waste or residues.

4 Conclusions.

In recent times the UK has developed a relatively successful model for the management of mine waters described in the ERMITE Report D3

(Amezaga and Younger 2002). However, the drivers for this success have usually been external to national water policy. The reality is that mine waters have never been a priority for water quality policy makers. Active lobbying by the Coalfield Communities Campaign and pressure from Brussels have been key elements for policy development. It is quite significant that ERMITE UK has not been able to engage the water quality policy community in the activities of the project, in spite of active collaboration with all other relevant stakeholders. National water policy should embrace mine water issues as it is the major risk of pollution in many northern and western catchments. And this should be reflected in the implementation of the Water Framework Directive.

The UK government has had a positive stance in the consultations organised by the European Commission on the proposed Directive on the management of waste from the extractive industries. The UK government should support the approval of the Directive and seek the inclusion of excavation voids and abandoned mines. So far the government (as well as the European Commission) has failed to grasp the policy implications of the Directive within the current framework of European water policy.

The key issues in mine water management in Great Britain presently centre on dealing with the legacy of abandoned mines. Mines abandoned before 31.12.99 were exempted from the obligation to treat mine water. Now the Coal Authority is in charge of a very successful national programme of remediation addressing the legacy from British Coal. However, the management of the closure and post-closure phases of large coalfields is far from being a resolved issue. The monitoring programme has to be further developed and the prevention programme has to be more proactive that it has been so far. In the North East, there is an urgent need to find a sustainable solution to a very real and urgent threat to public water supplies and the wider environment.

The willingness of the government to establish such a remediation programme in relation to abandoned coal mines presumably reflects the fact that the coal industry was formerly in public ownership, for no analogous commitment has been made in relation to metalliferous mines (which were never nationalised en masse).A substantial legacy of pollution from such metalliferous mines remains largely un-addressed: with the exception of the Wheal Jane site in Cornwall, where a combination of pressures from the EU and unplanned assumption of some liabilities by the former National Rivers Authority conspired to require remedial action, only local, largely 'voluntary' remedial efforts are so far being proposed for any other abandoned metal mine sites. The Environment Agency's recent 'National Metal Mine Strategy for Wales' seeks to deliberately encourage such voluntary initiatives, but even this rather weak policy instrument is not repli-

cated in Scotland or England. Currently, there is no official framework to deal with these mines in the UK.

As mentioned above, there is a still of problem with the promotion of remediation initiatives through re-mining or redevelopment. There is a need for EA / SEPA to develop an "enabling" approach to regulation of voluntary remediation initiatives, rather than blind application of the last letter of the law. The formation of the new The Land Restoration Trust to address the regeneration of contaminated sites is a very positive step.

Much has been learned with the progress of the national mine water programme for abandoned coal mine. However, there is still a need for capacity building and further development of understanding. In particular, the environmental regulators, EA and SEPA, have very limited resources devoted to this topic; and they are sometimes unable to fulfil their strategic role. Even the Coal Authority is concerned about the increasing 'age profile' of its staff, and the increasing reliance on consultants. A large void in experience and knowledge will be created once staff starts to retire. More planning is needed to ensure an educated and experienced succession. The EA is currently trying to address this issue through the efforts of the national Air, Soil and Water science group, which has established a Fellow on Mining and Mine Wastes.

In the UK the industry works, generally, according to the highest standards. However, there is still scope to improve mine water management in the early phases of exploration; groundwater management is an unresolved problem; and there is a need for a clear strategy for coping with liquidation of mining companies prior to resolution of post-closure problems. Some sectors of the extractive industry need to improve substantially their management of fine-grained silts. Where silt is released en masse to receiving watercourses, it tends to clog stream-beds, cutting off light penetration to benthic algae and thus halting primary production. Vigilance must therefore be maintained at any mine waste operation which involves handling fine-grained materials, whatever their composition.

6 Recommendations

Table 1. Recommendations for mine water management in the UK

Recommended Action	Implementing entity	Priority
1. Provide specific guidance for the management of mine waters in the implementation of the Water Framework Directive.	DEFRA/EA Scottish Executive/SEPA	Very High
2. Support the proposed Directive on mine waste and seek to include excavation voids and abandoned mines	ODPM	Very High
3. Improve the existing framework for the management of large closed coalfields with particular attention to groundwater issues	CA/EA/SEPA	Very High
4. Develop and fund a national programme for remediation of metal mines based on the example of the existing coal mines programme	sponsors: DEFRA/DTI actors:EA/CA	Very High
5. Develop a national framework to facilitate the voluntary remediation of abandoned sites	ODPM/DEFRA Scottish and Welsh Exec.	High
6. Increase research and capacity building in the EA, SEPA and the CA to fulfil their regulatory roles	EA/SEPA/CA	High
7. Improve the performance of industry (preventive measures, groundwater and silts)	Industry/EA/SEPA	Medium

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References

Amezaga JM, Younger PL (2002) National case study 3. Great Britain. *In ERMITE Report: D3 Institutional Research*, The European Commission Fifth Framework Programme, Energy, Environment and Sustainable Development, Contract No EVK1-CT-2000-0078, University of Oviedo

Amezaga JM, Younger PL (2004) Recommendations for mine water management in Great Britain. *In ERMITE Report: D7 National Recommendations and Workshop Reports*, The European Commission Fifth Framework Programme, Energy, Environment and Sustainable Development, Contract No EVK1-CT-2000-0078, University of Oviedo

Commission of the European Communities (2000) Communication of 23 October 2000 from the Commission on Safe operation of mining activities: a follow-up to recent mining accidents. COM (2000) 664final

Commission of the European Communities (2003) Proposal for a Directive of the European Parliament and of the Council on the management of waste from the extractive industries. COM (2003) 319final

DoE (1996) Restoration and Revegetation of Colliery Spoil Tips and Lagoons. Department of the Environment. HMSO

Kroll A, Amezaga JM, Younger PL, Wolkersdorfer C. (2001) Regulation of mine waters in the European Union: The contribution of scientific research to policy development. *Mine Water and the Environment*, 21 (4), 193-200

Scottish Executive (2003) A code of practice for the owners and operators of quarries and other mineral extraction sites: Groundwater Regulations 1988

Tate G (2002) Putting the legacy into perspective and the progress on tackling the issues in a fair and consistent manner. *In Mine Water Treatment: A Decade of Progress- Proceedings of a National Conference held at the University of Newcastle upon Tyne, 11-13 November 2002*. Nuttall CA (ed.). Hydrogeochemical Engineering Research and Outreach, University of Newcastle, Newcastle Upon Tyne

Walton G, Cobb A (2002) Monitoring inspection and reporting on tips in relation to their construction. *In Proceedings of a seminar on proposed EU directive on mining waste. Burlington House, London, 12 December 2001*. ODPM