Mine Water Reclamation and Reuse Schemes – Obtaining buy-in from Key Stakeholders

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Abstract Over the past decade, the coal mining industry in South Africa has successfully implemented mine water reclamation and re-use as a tool in sustainable mine water management. The process of developing and implementing a mine water reclamation and re-use scheme requires the securing of endorsements and approvals from various stakeholders of which the mining company, the regulator and the community are considered key. Although alternate financing mechanisms are becoming available, the mining company is typically faced with the approval of the capital funding of the project and premise that the operational costs for the facility may continue into perpetuity. The benefits of mine water reclamation and re-use schemes are many but it is crucial that they be presented in a way that it is clear that they outweigh the costs to be approved. This paper looks at the development phase of mine water reclamation and reuse schemes and unpacks the influence of the economic, social and environmental aspects on the project approval process and shares the learning on how important it is to succinctly convey these aspects to both internal and external stakeholders in a way that aligns with their understanding and objectives.

Key Words mine water, reclamation, reuse, benefits, approvals

Introduction

Over the past decade, the coal mining industry in South Africa has successfully implemented mine water reclamation and re-use as a tool in sustainable mine water management. This is evidence of a paradigm shift in the approach of mine water management from dealing with mine affected water as a pollution threat, to recognising mine water as a valuable resource in a water scarce country (Mey, 2009). The process of developing and implementing a mine water reclamation and re-use scheme requires securing endorsements and approvals from numerous and diverse stakeholders. While each of the stakeholders' values will differ to a point, one thing is universal, the decision making process is driven by the interpretation of the benefits that would be derived by that stakeholder through the establishment of the mine water reclamation and reuse scheme. This paper shares experiences in the development stages of mine water reuse and reclamation projects in attaining buy-in from the mining company, regulator and community in the Mpumalanga Coalfields in South Africa.

Mine Water Reclamation and Re-use Schemes in the Mpumalanga Coalfields

Coal mining started in the Witbank area, Mpumalanga in the 1890s, expanding as the demand for coal was fuelled by the export market and the need to produce electricity using thermal power stations. Some of these mines are now closed leaving behind a legacy of residual impacts on the water resources in the Olifants River Catchment.

For those mines still operating, there is an increasing production of excess mine water that cannot be fully managed by existing practices of pollution control at source, re-use and recycling and storage. The accumulating mine water is threatening access to mineable coal reserves. (Tshwete, 2006). Recognising that each pollution threat by mine water is unique in some way with a corresponding fit-for-purpose solution, the solution proven to best address the management of saline, gypsiferous and sometimes acidic water produced by the coal mining activities in the Mpumalanga coalfields, takes the form of a mine water reclamation and re-use scheme. As depicted in Figure 1, the components of a typical mine water reclamation and re-use scheme are:

- Mine water collection infrastructure to convey the contaminated water from source to the feed water dams of the treatment facility;
- A mine water treatment facility based on technology best suited to treat the affected water to the discharge requirements or quality suitable for re-use;

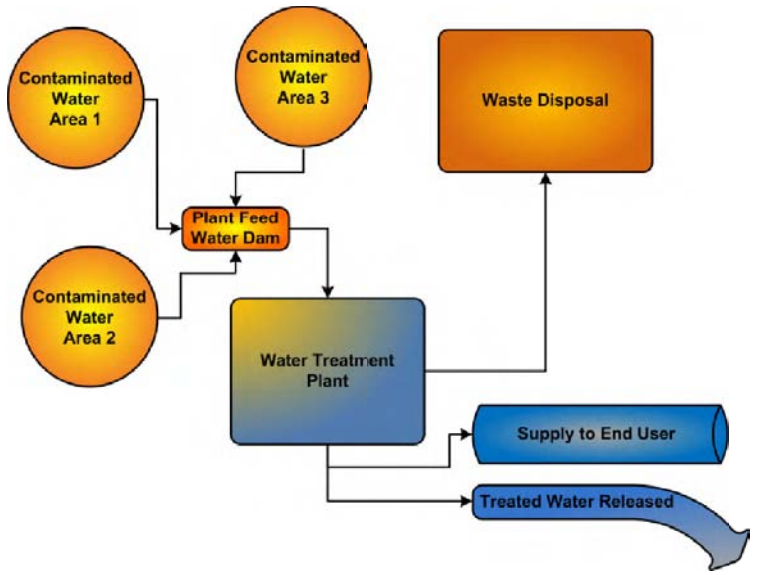

Figure 1 *Typical Mine Water Reclamation and Re-use Scheme*

- Waste disposal facilities to manage the waste produced by the treatment process;
- Distribution infrastructure to convey the treated water fit for release into the catchment or to transfer the treated water to the end user;

Mine Water Reclamation and Re-Use Project Endorsements and Approvals

Authorisation of Mine Water Reclamation and Re-use Projects can be described in terms of project funding and permitting. In the South African Coalfields experience, the funding is typically provided by the mining company and the permits for the activities associated with the mine water reclamation and re-use scheme are issued by the respective regulators.

Funding Approval

Mine Water Reclamation and Re-Use Projects require substantial capital investment followed by operation and maintenance costs. In many instances, the revenue linked to the mining area generating the mine affected water has already been banked and the water treatment costs not taken into account during the determination of the profit made and dividends declared. In some cases, the water management liability is inheritted through mergers and acquisitions and the mining company is is required to fund the project without ever mining the area posing the water pollution threat. Although alternate financing mechnisms are becoming available, the mining company is typically faced with the approval of the capital funding of the project and premise that the operational costs for the facility may continue into perpetuity. BHP Billiton Energy Coal South Africa (BECSA) has demonstrated a commitment to the environment as stated in the BHP Billiton Charter, by funding the development and implementation of mine water reclamation and reuse projects in the Upper Olifants River Catchment.

In the South African experience in the establishment of mine water reclamation and re-use schemes, it can take several years from the start of the study to the approval of the funding for the implementation of the project. To secure buy-in to the project and the subsequent funding approval, the project team should endeavour to widen the base of the project support within the organisation, and ensure that the understanding of the problem, acceptance of the proposed solution and enthusiasm to see the project implemented is entrenched at all levels.

Communicating the problem in the same language and terminology used by the stakeholders and demonstrating why the proposed project is the optimal solution are fundamental requirements for buy-in to and approval of the project. Assurance that the establishment of a mine water

reclamation and re-use scheme does not increase the current liabilities or create additional liabilities is key to approval of the funding by the mining company.

The project must be aligned to the goals and objectives and business needs of the mining company. The common financial objective in mining companies is to increase shareholder wealth. In support of this objective, one of the key motivators of the decision to invest in a capital project is typically based on the cost benefit analysis that demonstrates that the investment exceeds the mining company's "hurdle rate". Applying conventional economics as a stand alone entity, the mine water reclamation and re-use scheme projects generally loses money. Legal compliance is an overriding factor, but the motivation to implement a mine water reclamation and re-use scheme must also focus on the benefits relating to company values, ethics, priorities, strategies and policies and demonstrate the the project makes financial sense.

In terms of the values, ethics and policies, responsible mining companies will recognise the establishment of a mine water reclamation and re-use scheme as a non-elective capital investment to mitigate the threat of polluting the environment. The key to getting internal approvals lies in aligning the project with the business strategy and demonstrating that in the bigger picture, the project makes financial sense. Where the access to mineable reserves is under threat due to the storage of large volumes of mine contaminated water, the financial motivation can be based on the potential revenue loss in not exploiting these areas. This will also demonstrate alignment of the capital investment with the strategic dimension of the business. However, where the excess contaminated water does not impact future mining plans, the financial benefits are less clear cut. South African legislation allows for the implementation of the "polluter pays" principle as a tool to encourage water users to manage the water impacts at source (Asmal, 1998). Incorporating potential "fines" and "waste discharge charges" into the cost benefit analysis assists in demonstrating the financial value of the project.

Mine water reclamation and re-use schemes will be most effective when the pollution threat can be converted into an opportunity to meet the needs of a nearby water user, such as the local community. These projects can make a positive impact in the community and this is another area where there can be alignment between the mining company's goals and objectives pertaining to community involvement.

Licence and Permitting Approvals

It is a key success factor to mobilize and engage the different regulatory authorities in an integrated and coherent process, underpinned by a public participation and stakeholder consultation process (van Niekerk, 2009). In regards to South Africa legislation the main statutory requirements that govern a mine water reclamation and re-use scheme are the Mineral and Petroleum Resources Development Act (MPRDA), Act 28 of 2002, the National Water Act (NWA), Act 36 of 1998, the National Environmental Management Act (NEMA), Act 107 of 1998 amended in 2006, and the Environmental Conservation Act (ECA), Act 73 of 1989. An integrated regulatory approach is generally adopted by the project in order to manage all necessary approvals to be obtained. This in essence entails the four main regulatory process (Environmental Impact Assessment (EIA) process, Water Use Licence Application (WULA) process, Waste Permit process and Environmental Management Plan (EMP) process) running in parallel to one another.

In the communication of a major proposal to implement a mine water reclamation and re-use scheme to regulatory authorities, it is important to ensure broad stakeholder involvement, for example, by including representatives from both local and national offices of Government agencies. There must be alignment between the project objectives and the regional and national strategies in place by the respective government departments. For example, where there is a water reform programme in place to move water use away from the agricultural sector in the vacinity of the project, the proposal to allocate the treated water for irrigation use will not easily be approved. In the South African context, the regulators driving the mine closure processes have voiced their preference to see the establishment of regional water treatment facilities with the emphasis on co-operation between the mining companies to jointly develop mine water recalamtion and re-use schemes. Cogniscence of this must be made in the project planning and details included in the permit applications.

Although the regulator takes the final decision to approve the implementation of the mine water reclamation and re-use scheme, consideration is given to the public acceptance of the proj-

ect prior to sanction. Therefore, the public participation process is an important component of the project approval process. Each concern raised must be treated as a practical problem that demands an effective response.

Conclusions

It is not sufficient to look only at the technical aspects of a mine water reclamation and re-use scheme when motivating the project. The social, economic and environmental aspects must be unpacked and evaluated in terms of benefits, potential problems and objections. People may not get excited about the facts behind the idea, but they embrace the story that surrounds the facts. To be effective, the narrative must be compelling, which means the project must make intuitive sense to the stakeholder according to his or her view of the world. Decision-makers will inevitably see the project from their own perspective. Understanding the audience is crucial to tailoring the motivation for project approval. The project team must therefore ensure that the key stakeholders' needs are understood and the features, functions and benefits of the mine water reclamation and re-use that address these needs are communicated clearly (Reiling, 2009). This may require "translating" some of the technical aspects of the project into terminology familiar to the stakeholder. In this approach, those aspects of the mine water reclamation and re-use scheme relating to the broader aspects of sustainability are conveyed in a way that leads to the necessary approvals and endorsements being attained.

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