POLICY BRIEF

August 2019
The WRC operates in terms of the Water Research Act (Act 34 of 1971) and its mandate is to support water research and development as well as the building of a sustainable water research capacity in South Africa.

The legislative requirements for the use of Pitlakes as a mine closure option

There are over 200 pitlakes in South Africa due to over two centuries of coal mining. A recent Water Research Commission (WRC) study investigated the possible use of pitlakes as a sustainable coal mine closure option in South Africa. The study investigated the water balance, chemistry, limnology and bacteria of three selected pit lakes. The aim of this policy brief is to detail the applicable and potential legislative changes required in order to legalise the use of pitlakes as a closure option for coal mines in South Africa.

Background

The three pitlakes investigated occur in the three major coal basins of South Africa and are a result of different mining methods. The major factors controlling the water balance of the pitlakes are rainfall, runoff, groundwater and inflow from historical mine workings. The major losses from the pitlakes are evaporation or discharge of water on surface.

The study findings suggest that pitlakes can be designed to be terminal sinks and, as a result, a sustainable closure option in terms of the water balance. The groundwater chemistry showed the pitlakes to be stable with alkaline pH, mostly a sodium sulphate type water with total dissolved solid content of less than 3 000mg/*l*. The phytoplankton and microbiological data showed that the pitlake supported aquatic life. The study findings suggest that with the correct design, coal mine pitlakes are an environmentally sustainable closure option for South African coal mines. In this regard, the legislative requirements for pitlakes to be considered as a sustainable mine closure option are governed by the following Acts:

- The National Water Act (Act no. 36 of 1998) (NWA)
- National Environmental Management: Waste Act (Act no. 59 of 2008, as amended) (NEMWA)
- National Environmental Management Act (Act no. 107 of 1998) (NEMA)
- Minerals and Petroleum Resources Development Act (Act no. 28 of 2002) (MPRDA)

The National Water Act

For a pit lake to be considered as a mine closure option, authorisation is required in terms of the NWA. As the potential use of pit lakes is a new and emerging closure approach, there are no specific legal requirements and this option has not been included into the current environmental legislation.

Water and the use of water in South Africa is governed in terms of the NWA. The Department of Water and Sanitation (DWS) is the custodian of South Africa's water resources, and is primarily responsible for the formulation and implementation of policy governing this sector. Water uses that require authorisation from the DHWS are defined in Section 21 of the NWA and include:

- Section 21 (a): Taking water from a water resource;
- Section 21 (b): Storing water;
- Section 21 (c): Impeding or diverting the flow of water in a watercourse;
- Section 21 (d): Engaging in a stream flow reduction activity contemplated in Section 36;
- Section 21 (e): Engaging in a controlled activity identified as such in Section 37(1) or declared under Section 38(1);
- Section 21 (f): Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- Section 21 (g): Disposing of waste in a manner which may detrimentally impact on a water resource;
- Section 21 (h): Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
- Section 21 (i): Altering the bed, banks, course or characteristics of a watercourse;
- Section 21 (j): Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of

people; and
- Section 21 (k): Using water for recreational purposes.

In terms of the current water use authorisation requirements and the defined Section 21 water uses, pit lakes fit mostly into the Section 21(g) water use description for the "disposing of waste in a manner which may detrimentally impact on a water resource". While no water is being disposed from the pit lake to the adjacent environment, water is being "disposed" into the pit lake from the surrounding rehabilitated open cast areas and groundwater resource. Like other typical Section 21(g) water uses present at coal-mining operations (e.g. pollution control dams, return water dams etc), this section of the Act is inclusive of dirty water storage facilities. Although the water in the pit lake is not of a bad quality, it is considered dirty water as it does not comply with the research water quality objectives (RWQO).

With the aim of incorporating pit lakes as an accepted closure option, discussions need to be held with officials and policy makers from the DWS in order to determine:

- The approach required to license a pit lake as a closure option (is it considered a Section 21(g) of is there a need to add an additional water use to Section 21); and
- The application process required, and the necessary motivation and studies needed to authorise a pit lake as a closure option;
- How a mine can obtain full closure and the issuance of a closure certificate with a pit lake remaining after complete rehabilitation. Discussions will also need to be undertaken with the Department of Mineral Resources (DMR) in this regard.

Making use of the pit lake after mine closure for other activities such as irrigation or recreation may also trigger other water uses in terms of Section 21 of the NWA. Irrigation for example would require a license to be issued in terms of Section 21(e). When licensing a pit lake and approaching the DWS, the end use of the pit lake will also need to be known and its viability investigated.

National Environmental Management: Waste Act (NEMWA)

The National Environmental Management: Waste Act (Act 59 of 2008, as amended), will be triggered by the introduction of Pit Lakes ***if the authority classifies the Pit Lake as a waste body***. The Pit Lakes may be considered to contain waste because the open void will contain remnants of ore and waste from the mining operation and discarded after decommissioning. However, in terms of the definition of waste from the NEMWA (below), it is unlikely.

"Waste means any substance, whether or not that substance can be reduced, re-used, recycled, and recovered –

- That is surplus, unwanted, rejected, discarded, abandoned or disposed of;
- Which the generator has no further use of for the purposes of production;
- That must be treated or disposed of; or
- That is identified as a waste by the Minister by notice in the Gazette, and includes waste generated by mining, medical or another sector, but –
- A by-product is not considered a waste; and
- Any portion of waste, once re-used, recycled and recovered, ceases to be waste."

Should the Pit Lakes be considered to contain waste, then the following listed activities may be triggered under Category A, requiring a Basic Assessment for authorisation, or Category B, which will require a full Environmental Impact Assessment (EIA) for authorisation.

Category A, Listed Activity 1 – The storage of general waste in lagoons; or

Category B, Listed Activity 1 – The storage of hazardous waste in lagoons.

Hazardous Waste is defined as: "any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment." Therefore, it is likely that the "waste" within the Pit Lake may be considered hazardous waste, if it is classified as waste by the authority.

It is recommended that a specialist opinion be obtained to ascertain whether the NEMWA is relevant at all to the implementation of Pit Lakes in rehabilitation and closure.

Considering the process of Pit Lake development, Pit Lake may be considered NOT A WASTE body and therefore NEMWA may not apply.

National Environmental Management Act (NEMA)

Several activities may be triggered using Pit Lakes as a rehabilitation option. This will generally trigger activities within Listing 1, thereby requiring a Basic Assessment for authorisation. The Environmental Impact Assessment Regulations: Listing Notice 1 of 2014 (GNR983 in GG 38282, 4 December 2014 as amended by GN 327 and GN 706) provide details on the activities triggered under specific circumstances. Any listed activities trigger under Listing 3

would also need a Basic Assessment. However, the study findings suggest that no NEMA activity should apply, as there is no "development" of the Pit Lake (as a dam or other structure), but rather the use of mine end use topography for water management. If the pit lake is located within a sensitive area, Activity 14 of Listing Notice 3 will apply if a pit lake is considered a dam or not.

Minerals and Petroleum Resources Development Act (MPRDA)

Section 56 of the MPRDA discusses the principles for mine closure. One of these principles is that "(e) the land is rehabilitated, as far as is practicable, to its natural state, or to a pre-determined and agreed standard or land use which conforms with the concept of sustainable development". This allows for discussion with the authority on the feasibility of implementing Pit Lakes for water management and final land use. In this regard, what needs to be investigated and managed is the residual and latent environmental impacts, as well as the safety and health implications of pitlakes in terms of the Mine Health and Safety Act (Act 29 of 1996).

Associated project:
An investigation to determine if South African coal mine pitlakes are a viable closure option (**WRC Project no. K5/2577**). For more information, contact WRC Research Manager, Dr John Zvimba at Tel: (012) 761 9300 or Email: johnz@wrc.org.za)