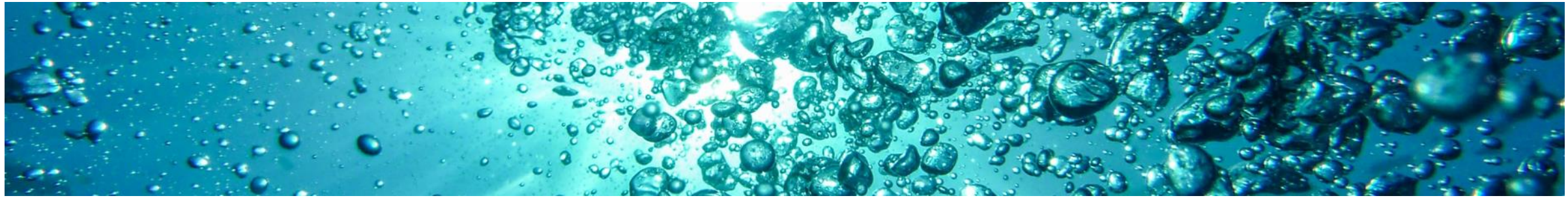
BNAQUA solutions

COMPANY PROFILE



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BACKGROUND

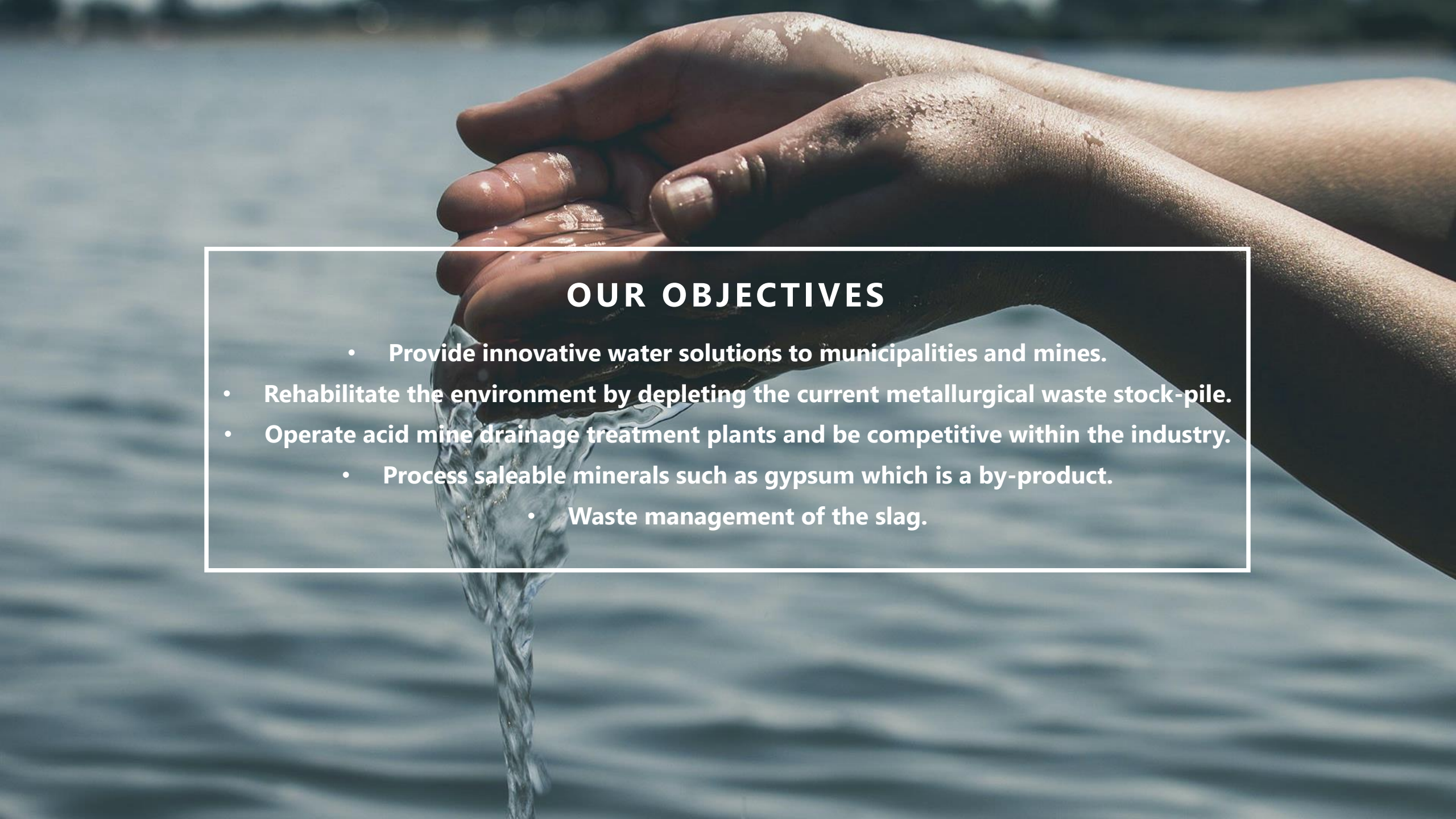
BN Aqua Solutions is a 100% black owned water treatment company which was established in 2016. The company was created to alleviate water shortages facing the country by treating contaminated water from Municipalities, Boreholes, Perennial Streams and Acid Mine Drainage (AMD) to SANS 241 drinking stage.

The long-term business plan is to build small scale modular treatment plants (5 - 10 mega-litres per day) within the mining sites in order to treat this water and sell to the operating mines with the intention to further grow and be competitive in treating more volume of acid mine drainage. The excess treated water from the mines can increase the water-stressed municipalities to benefit the surrounding communities in both rural/urban areas. This potable water can be used for agricultural purposes and this will increase the country's food security and improve the livelihoods and hygiene of the communities.

FOUNDER & DIRECTOR

Boitumelo Nkatlo is a Chemical Engineering graduate from the University of Johannesburg with over 12 years' metallurgical experience. He has worked for Gold Fields, Sibanye Stillwater and Minersa Group.

Boitumelo has been successfully involved in some of the most challenging mine and processing developments. This includes acid mine drainage project from 2014 to date, under laboratory conditions with the support of the University of Johannesburg as the intellectual property owner and CSIR as the prototype builder and the relationship still exist with the stakeholders of the project.



OUR OBJECTIVES

- Provide innovative water solutions to municipalities and mines.
- Rehabilitate the environment by depleting the current metallurgical waste stock-pile.
- Operate acid mine drainage treatment plants and be competitive within the industry.
- Process saleable minerals such as gypsum which is a by-product.
- Waste management of the slag.

> **The biggest threat to a sustainable water supply in South Africa is not a lack of storage but the contamination of available water resources through pollution.**

CLAASSEEN - 2010

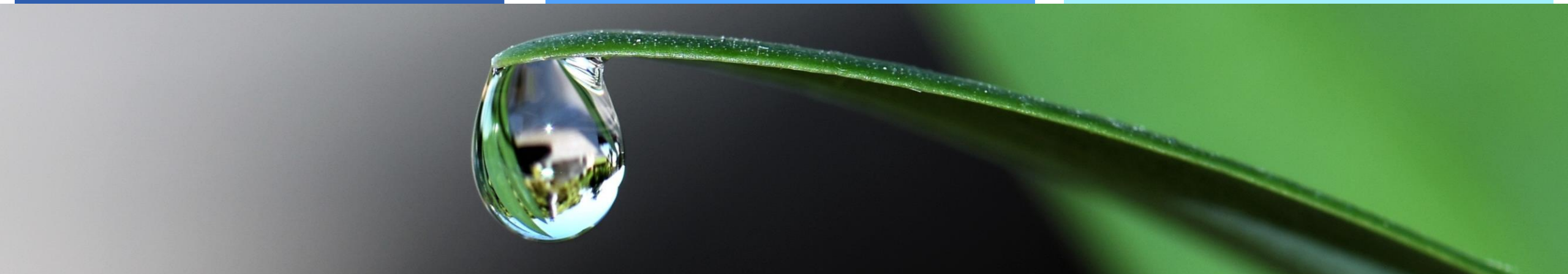
OUR SERVICES

1 DESIGN, DEVELOPMENT & SUPPLY OF TREATMENT SOLUTIONS

2 TREATMENT OF ACID MINE DRAINAGE

3 MUNICIPAL WATER TREATMENT

PROBLEM	SOLUTION	BENEFITS
Water Scarcity	Increase Drinking Water Capacity	Increase S.A Water Footprint
		Reduce water Restrictions
Acid Mine Drainage	Treat Contaminated Water To Potable Stage	Recovery Of Sealable Minerals
		Social Responsibility
Environmental Damage	Reduce Environmental Impact	Clean, Drinkable Water
		Environmental Sustainability



METHODOLOGY

1. Acid mine drainage will be extracted from underground settlers using pumps to the treatment plant which will be on the surface.
2. The acidic water will be treated to remove heavy metals and then pumped to the water softening stage before going to the reverse osmosis membrane for brine removal.
3. The product of the reverse osmosis unit is the drinkable water as tested using the prototype.
4. The residual slag contains a considerable amount of gypsum which is saleable, and this will help to reduce the operating costs of the plant.

“Acid mine drainage (AMD) is recognised globally as one of the most challenging environmental problems in the mining industry.”

MOODLEY, ET AL - 2018

PROTOTYPE

BN Aqua has built and commissioned a prototype based at the Council for Scientific and Industrial Research (CSIR) to treat the acidic water from the gold and coal mines to potable stage which is suitable for human consumption.

The prototype can treat 20 000 litres per day of contaminated water to drinking water. This was also confirmed by the obtained laboratory water quality results, which positively exceeded the SANS 241 drinking water standards. The project is supported by the University of Johannesburg Technology Transfer Office, which holds the Intellectual Property for the invention and licensed it to the inventor. The prototype uses a metallurgical waste product to treat this acidic water and this innovative solution is our unique selling point. This innovative process will lead towards pollution remediation of the waste material and recover saleable minerals such as gypsum, magnetite and synthesized lime while increasing South Africa's drinking water capacity.

PROTOTYPE AT CSIR

PROTOTYPE PRODUCT (RAW TO TREATED WATER)

HEALTH & SAFETY

We recognize safety as a priority and will introduce people-based safety, a 'beyond zero' process that strives for a total safety culture by making the workplace people-driven rather than behaviour-driven. We are committed to be the industry leaders in the safety of our people, and that of our clients and partners.

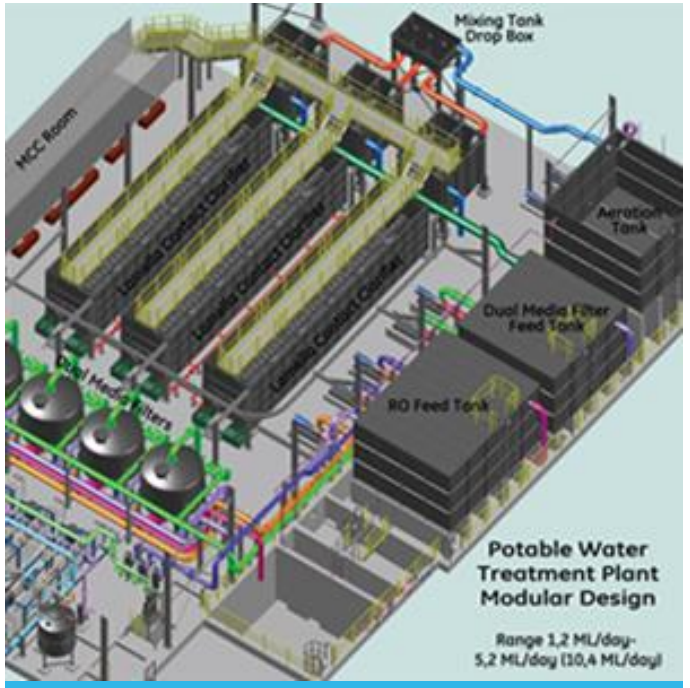
PROJECTS IN PROGRESS

CITY DEEP MODULAR TREATMENT PLANT

1 Applied for funds from Industrial Development Corporation.

TRAILER-MOUNTED TREATMENT PLANT

2 Applied for funds from Technology Innovation Agency.

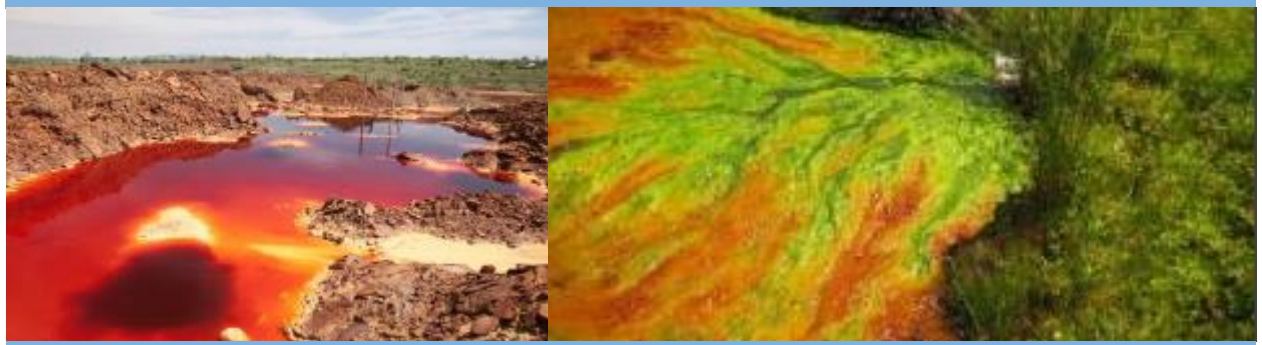


SEAM COAL TREATMENT PLANT

3 Applied for funds from National Empowerment Fund.

Commissioning team of the prototype from left: representative from University of Johannesburg, IP Lawyer Tebogo Machete; middle: BN Aqua Director, Boitumelo Nkatlo and right: Thabiso Letsebe from Technology Innovation Agency (TIA).

Off Loading of acid mine drainage into the prototype



Acid Mine Drainage

CONTACT US

Mr. Boitumelo Nkatlo

082 361 4737/066 485 0869

Tumi@bnaqua.co.za