



# Taking on the challenges of AMD through horticulture

*Through his dedication to the environment, Alusani Emmanuel Maphorogo, Parks Manager for Johannesburg City Parks, is committed to the development of a remediation and sustainable rehabilitation strategy for a park located in the West Rand of Johannesburg. Maphorogo speaks to Debbie Besseling about his career in horticulture, and how he became involved in the project.*

**M**anuel Street Park is situated in the area of Davidsonville, Roodepoort West. The park is in close vicinity to the Princess Dump, a largely unrehabilitated mine dump. Mine run-off contaminates the park frequently. The impact of contaminated mine run-off water flowing through the Manuel Street Park and into the wetland is a great risk, in addition to the dust and water run-off which poses a health and safety risk.

As the area is not fenced, children play in the park and walk through the wetlands to school. There have also been reports in the media of the residents in Davidsonville suffering from severe asthma from air-borne dust from the mine dumps.

In past rainy seasons heavy rains have washed mine tailings through houses in the vicinity. Although there is a boundary wall to protect the houses from dust and run-off, it is just 1.5 m high and does not effectively serve its purpose. Interim precautions have been taken to avoid another flood in the park during heavy rains.

Maphorogo became involved in this project through his current position, where he is responsible for horticultural maintenance at Manuel Street Park, which falls within his geographic area of responsibility. "In 2012 there was an overflow of what was believed to be acid mine drainage (AMD), which

caused serious concerns. I then developed an interest in mine tailings remediation and rehabilitation using microbial treatment, landscaping and public needs assessment," he explains.

This project seeks to establish a remediation and rehabilitation strategy for the park. According to Maphorogo, the first stage will involve performing a soil profile analysis, public needs assessment, and finding a good formulation for the mine run-off contaminated soil. Thereafter the results will be analysed and a remediation and rehabilitation strategy will be drafted.

## PROPOSED STUDY AT MANUEL STREET PARK

**M**aphorogo's study includes the investigation of the usefulness of a treatment using a commercially available microbial preparation (Effective Microorganisms® or EM®) in remediating the soil in Manuel Street Park. EM® is a blend of beneficial microorganisms that exist in nature and can increase the quality, soil structure and productivity of soil and the growth and quality of plants. The product also suppresses germination of weeds and can be used for solving environmental problems such as soil pollution.

The technology was developed by Prof Teruo Hinga in Japan. It basically comprises beneficial bacteria, fungi, lactic acid and molasses. All these are brewed to a formulation which has many uses.

The study will primarily undertake greenhouse trials with samples of soil removed from the park and tested using different treatment protocols. The planned use of microbial preparations is intended to explore a type of low cost environmental biotechnology, which can contribute new solutions to remediation and rehabilitation

challenges for contaminated environments. Once the results are analysed and plans put in place, it is envisaged that the study will contribute positively towards the rehabilitation of the park in the long term.

Johannesburg City Parks has other parks that are near unrehabilitated mine tailings that have the same risk of being polluted. The outcomes of this study could be helpful in developing remediation and rehabilitation strategies for these other parks.

A community survey will be conducted to establish how the Davidsonville community use the Manuel Street Park; what their needs are and what their required uses of the local parks are in general. Maphorogo explains that a researcher at Johannesburg City Parks will be conducting the field survey with his assistance. He will analyse the results. "I will be drafting the remediation and rehabilitation plan using the findings of the study, which will meet the requirements for the MSc Horticulture, which I anticipate concluding by December 2014," he comments.

With regards to the remediation and rehabilitation of Manuel Street Park, a remediation plan will be needed to deal with the contaminated soil, and a rehabilitation plan to improve the park once the soil is no longer regarded as toxic.

## CURRENT POSITION

**I**n his current position as Parks Manager, Maphorogo has various responsibilities some of which include: weekly site visits, the overall enhancement of customer satisfaction, improving financial management and control, operational systems and the management of operational effectiveness, as well as the improvement of information and knowledge management. Procurement and management of horticulture services

forms an important part of his responsibilities, as does asset management and human capital management.

Compliance with the core delivery mandate and enhancement of service delivery and quality control, as well as the integration of management solutions with corporate strategy are key to the overall objectives. Compliance with legislation including the Municipal Finance Management Act No. 56 of 2003 (MFMA), Public Finance Management Act (PFMA), National Environmental Management Act (NEMA) and the National Water Act (NWA) form an integral part of his function.

The mandate of the Johannesburg City Parks and Zoo is set out in the Shareholder Agreement and is defined as: The provision, preservation and management of open spaces, biodiversity, environmental and conservation services through education, research, direct conservation action and recreation with a focus on the zoo, parks and cemeteries.

## FARMING AND HORTICULTURE

Maphorogo grew up in a family of people who are passionate about the environment. "My mother, Selina, has worked tirelessly towards addressing the problem of food security and health in Limpopo Province since the 1970s. My father, William, has been a farmer all his life. He was raised by his grandfather, Mukondeleli, who was also a farmer.

I have farming and horticulture flowing in my blood, and growing up around people who are passionate has influenced me to appreciate nature and give back to what we – humankind – have taken from nature," reiterates Maphorogo.

When he matriculated in 1997, he chose to study horticulture as a career, and since then has enjoyed each and every level of studying and work. "I was also motivated by my mentor and godmother, Dr Erika Sutter, who worked as a botanist and an ophthalmologist," he comments.

## CAREER HISTORY

In 2001, Maphorogo graduated with a National Diploma in Horticulture from Technikon Natal (now Durban University of Technology). In 2002 he worked as a general worker at Leitch Landscapes in Durban where he completed his experiential training. In 2003 he was employed by Real Landscapes as a supervisor of the maintenance team. From the period 2004 to 2007 he worked as a horticulturist at eThekweni Municipality, and later progressed to Senior Horticulturist.

"I have done many short courses to enhance my skills such as health and safety, project management, BS OHSAS 18001, permaculture, herbarium techniques, performance management and public administration," he comments. From June 2007 to date he has worked for Johannesburg City Parks.

In 2012, Maphorogo graduated with a B.Tech degree in Horticulture from UNISA. He is currently busy with his thesis towards a Master of Science in Horticulture at the same university. "My ambition is to also complete a PhD in Environmental Science and LLB Environmental Law," he states.

## CAREER MILESTONES

Maphorogo discusses the milestones of his career: "In 2004, I was selected on a skills exchange programme between eThekweni Municipality and the Leeds City Council, London, England. The same year I established new contacts with Stadtgärtnerei in Basel Switzerland where I undertook further training in horticulture. I was also part of the team (training) on artificial pollination for *Encephalartos woodii*, which was a special project for the Durban Botanical Gardens in that it is one of the rarest in the world, being extinct in the wild.

"In 2004, I got my 15 minutes of fame when I was interviewed by BBC for the gardening programme and as a build-up to the Royal Horticultural Society Chelsea Flower Show 2004. I am part of the Gauteng Institute of Environment and



Recreation Management (IERM) Branch, chairing a sub-committee on Environment and Conservation."

## ACHIEVEMENTS

Maphorogo highlights some of the most significant accomplishments of his career: "In 2001 I received a Bronze Award from the National Examination Board for Horticulture. In 2004, I was fortunate to be part of the team that went to Leeds City Council for a period of four months for training. This provided me with the opportunity of gaining physical experience and to enhance my managerial skills, whilst gaining knowledge of the wide range of systems and procedures.

"I was involved in the construction of an exhibition at the Royal Horticultural Society Chelsea Flower Show. The garden won a Bronze Award at that exhibition. The design of this garden entitled: *From Freedom to the Future*, was inspired by the life of Nelson Mandela in fighting oppression of the black majority by the white minority, and how the rainbow nation was formed," he comments proudly.

At Johannesburg City Parks, Maphorogo has received various recognitions, including the Managing Director's Achievers Award of Excellence, for his work in landscaping projects. More recently he received the Nyamuofhe Achievement Award for the achievement of a B.Tech in Horticulture from the Ramaphosa Family Trust, another of his fine accomplishments. □

*Alusani Emmanuel Maphorogo (centre) with two of the awards he received during the Johannesburg City Parks Environmental Awards in 2009.*