LEPELLE NORTHERN WATER
Water is our passion

# ON A PIONEERING PATH

# Sand Water Extraction project sets Lepelle Northern Water off on pioneering path

The pin location on a map that constitutes the village of Skhiming in the Limpopo heartland appears to be a tranquil but dusty hollow where kids can still play unencumbered, only stopping to wave at visitors passing by in air-conditioned smart cars. Weathered cow bells are audible from a distance and goats lazily graze in the late afternoon sun, disregarding the whistle of their herder. Around there ubuntu is still a thing that binds a community.

As life generally unravels in a village, the people of Skhiming have never been used to the same creature comforts as their urban siblings. For as long as residents can remember, this has also been the case with water provision.

Co-habiting in a water-scarce area, the community had been dependent on two boreholes reliant on by more than 1 300 households scattered along the dry Molototsi River. A similar dictate counted in the adjacent settlement of Ga-Kuranta with its estimated 700 households on the other side of the river. In addition to the boreholes in operation, the water sources that were laboriously dug deep into the soil of the riverbed by members of the community themselves had to be shared with livestock. Depending on the distance from their homes to the riverbank, villagers were used to carting filled containers, loaded in wheelbarrows back to their abodes 500 metres to 2 kilometres away.

*The Molototsi riverbed.*

Until a day in April 2020 when it all changed. Marked as the date set aside for the inception meeting of a project that perceived to be bringing a life-changing project to their doorstep, it re-introduced the promise of development to an area that had earlier faced the risk of having lost its human capital to the lack of adequate resources providing in the basic needs of the people from the area.

Eight months later a silver storage tank and a huge reservoir alongside two indigo blue cylinders reaching high up into the sky on the edge of the river served as testimony to intervention by Lepelle Northern Water (LNW), tasked by the Department of Water and Sanitation to provide a reliable water source to the two villages.



*The facility on the edge of the dry Molototsi River.*

## Tale of two villages

It is a story worthy of sharing, the tale of two settlements having been provided with a resource measured at more than 700 000 litres of fresh, potable water daily through the application of Sand Water Extraction (SWE) technology put to the test for the sake of determining future sustainability.The two villages were considered ideally located for the feasible implementation of such technology, provided by Gauteng-based Empowering Water Solutions (EWS).

EWS had been appointed by LNW to install systems at villages in Mogalakwena Local Municipality due to drought conditions in November 2019, explained EWS Chief Executive Stephan Pretorius. “The area experienced large amounts of rain at the time of installation and the call was made to move the systems to Mopani District Municipality to address the urgent need for water at villages on the Molototsi River.

“After various consultations between LNW and relevant parties, the implementation of the systems at Skhiming and Ga-Kuranta was approved at the end of March 2020.”Residents of the two villages were dependent on boreholes, which supplied low volumes of saline water in the past. It could take up to an average of three weeks for villagers to get water in their taps and the water was too salty to cook with. The situation forced community members to buy water from vendors or to collect water themselves by digging holes in the riverbed. The water from the sand was of much better quality than the borehole water, but it took a few hours to get enough water from the sand to fill a drum of water, according to Pretorius.

Installation of the systems commenced on 14 April 2020. Within a week the communities of the two villages were already able to collect water extracted from an emergency supply unit installed in the river while the systems were being completed. During the installation period the villagers collected close to 60 000 litres per day from the emergency supply unit.The project was planned for completion in June 2020, but due to various factors such as the national lockdown alert level 5 and, most significantly, Eskom’s power supply only being completed at the end of November 2020, the systems were completed in the beginning of December 2020.

The communities were able to collect water from the emergency supply units throughout this period. The two systems are a first of its kind for South Africa where systems dedicated to specific villages are installed to extract water from river sand, purifying the water and then supplying clean water to the village and allowing the community access to this valuable resource directly from their taps.

The scope of the project entailed

- the installation of pumps and lines;
- construction of water storage tanks;
- construction of treatment works;
- construction of electrical MV supply lines;
- material and labour; and
- testing and commissioning.

## About sand rivers

Limpopo is blessed with many sand rivers throughout the province. On the surface these rivers are dry for most part of the year, but large volumes of water are stored within the sand.Sand rivers have the following advantages:

- It acts as a dam storing water, which eliminates the need for expensive civil construction of facilities such as dams
- The water stored in the sand is protected against evaporation and contamination (for example caused by animals)
- Water extracted from the sand is already filtered by the sand and contains minimal bacteria
- The recharge rate of sand rivers is significantly faster than the ground water table.

A vast number of villages in Limpopo are situated next to or near sand rivers which also translates into close proximity to quality water resources. The main challenge is to deliver the resource to a community efficiently, reliably and in sufficient volumes.

## Technology applied

The patented SWE technology is ideal for extraction of water from sand and is designed and manufactured in South Africa by a South African. The system's unique design allows for optimal extraction of available water resources within the sand and deliver the valuable resource to communities in need.

The SWE system consists of

- extraction of water from river sand;
- purification of extracted water;
- storage of purified water; and
- supply of water into existing village networks.

The volume supplied from the SWE system is designed to meet the needs of the specific village. Each village can be supplied with its own system which allows the community to manage their own water usage.

The SWE system is quick to install with a completion time of around 90 days. Water can be supplied to the community within the first week of the installation process to address water shortages experienced while the project is being completed.


*Infrastructure on the edge of the Molototsi River in Skhiming.*

## Impact on community

As mentioned by Pretorius, EWS's main focus with the SWE System is to supply communities in need with quality water at sufficient volumes. "Water is at the centre of economic and social development and in many rural communities people, especially women, spend most of their day collecting water. With the implementation of the SWE System water is accessible within the village, reducing the time spent collecting water.

"It is rewarding to see the impact of the systems on the two villages and hearing the testimonies of how the availability of water has already changed the lives of the communities. The knowledge that tomorrow they will again be able to get clean water and not have to wait three weeks for their supply as they have become used to for more than a decade."

Initially there was scepticism around the implementation of the system as the perception existed that it was another borehole and was doomed to fail like many other projects around the area, explained Pretorius.

"The views of the sceptics were justified as projects of this nature would end up failing and communities would still be left with no water despite millions of Rands spent on projects. "EWS set out to prove that it would deliver quality water within budget and in less than three months, he remarked. EWS achieved all of this, except that the lockdown and the delivery of electricity that was exclusively in the control of Eskom extended the delivery of the project to just under nine months.

As a result of the successful implementation of the two projects, villages within the area of the Molototsi River have since petitioned LNW on the implementation of the system in their surrounds. Ever since implementation of the system in that area, EWS has been inundated with calls to assist in other villages. "We are humbled by this response," he concluded.

## Petitioning for expansion of system reach

LNW's acting Chief Executive, Ahuiwi Netshidaulu underscored petition copies with an estimated 400 signatures presented to LNW by the community of Botshabela calling for the introduction of a similar project in their area in future.

He takes one back to August 2019 when Minister Sisulu called on LNW to urgently attend to the water needs of the people of Limpopo and directed the water board to provide water to 188 villages without access to the basic human right.

The board committed itself to responding positively to the Minister's directive by ensuring that they did everything possible to provide basic services to the people of Limpopo. In the same vein he reiterated the contents of the Provincial Water Master Plan crafted by LNW and stressing the need for alternative water sources to supplement available surface water

in different areas. Although boreholes were an option, the source dried up and the quaity of water was not acceptable for human consumption, as was the case in the Giyani area, he indicated. In addition, boreholes were very expensive to operate, treat and specialised skills were required to operate advanced technology in the maintenance thereof, Netshidaulu added.

In facing those challenges, LNW welcomed the SWE option of sourcing water, a project supported through a directive by the Minister given at a time when it was being weighed up against the financial implications.

Netshidaulu expressed the view that Minister Sisulu's directive was indicative of the political will supporting LNW to adopt the technology.

By then LNW had already engaged with the Water Research Commission whose research was implemented of a project that was well received by the community. This despite an initial dispute being lodged by opposing local entrepreneurs.

## LNW Interim Board Chairperson sees LNW on pioneering path

*LNW Interim Board Chairperson Joe Mathebula and acting Chief Executive Ahuiwi Netshidaulu put the system to the test.*

LNW Interim Board Chairperson Joe Mathebula raised the opinion that the SWE project set LNW off on a pioneering path.

The successful roll-out of the project was indicative of the strides jointly achieved by the board and management of LNW upon new energy having been introduced and of what awaits in future, he remarked.

It depicts the fervour with which LNW delivers on its mandate to render an excellent service to communities in Limpopo and the passion with which it does so.

He expressed pride in Team Lepelle Northern Water for managing the roll-out under difficult circumstances posed by national lockdown restrictions.

Mathebula stressed that the team at LNW was geared to intervene in similar situations elsewhere in the province and possessed the skills and knowledge to successfully roll out the same project in other areas in dire need of a reliable life-giving source.



*LNW Interim Board Chairperson Joe Mathebula on site raising a glass with Gerrit Pretorius from EWS, LNW acting Chief Executive Ahuiwi Netshidaulu and interim board member, Dr Ndweleni Mphephu during the launch event in December 2020.*

Of the hardships endured during the construction phase and in the run-up to the introduction of the project, LNW Scientific Services Manager Lebo Sebola who is also project manager can attest to. The completion date for the project was set for 29 April 2020, but due to the realities brought about by national Covid-19 lockdown restrictions it had to be extended to 30 November 2020.

Eleven days later, representatives of EWS joined Minister Lindiwe Sisulu as well as interim board members, management and officials of Lepelle Northern Water and community members in celebrating an achievement worthy of being noted in the history books of rural South Africa during a launch programme in Skhiming Village.

*Minister Lindiwe Sisulu cuts the bold red ribbon granting access to the facility in Skhiming Village. To the right is Co-operative Governance, Human Settlements and Traditional Affairs MEC Basikopo Makamu.*

*Selfie time as Minister Sisulu meets excited community members during the launch occasion.*

## LNW makes star appearance

On 22 January 2021 a handful of Lepelle Northern Water officials returned to the site in Skhiming Village to meet up with a production crew filming for SABC2 programme Breaking New Ground for the recording of a feature on the project, which was screened about a month later.

Under a hot African sun and armed with umbrellas, the production team set up beside the plant on the edge of the dry Molotosi River for shots of the impressive structure.

*Filming underway in Skhiming Village in January 2021.*



## Difficulties experienced in project roll-out

Prior to the arrival of the party in the village that day Lebo Sebola, who was delegated to take popular screen presenter Nimrod Nkosi through the statistics of the project, explained the difficulties of having to roll out the project amid the country in the first phase of lockdown.

*Lebo Sebola on site prior to the arrival of the production team filming for Breaking New Ground programme.*

She mentioned the project got rolled out in April 2020 just after the announcement of lockdown restrictions in South Africa and was completed during lockdown. Upon commencement thereof the restrictions necessitated travel permits to be issued to the contractor's team.She described the project as a true blessing for the community, which has been welcoming thereof.

According to Sebola the project at Skhiming gave a new meaning to the word Science. "As an organisation we're looking for science to help solve problems to fulfil basic human needs. Seeing it through gives one a sense of satisfaction and the impact of science on the lives of people is really incredible."

She further explained that it was the first project of its magnitude she was involved in. It was being investigated for a few years without the necessary financial back-up available to bring it to fruition and it was a blessing when the Minister added financial muscle to the implementation thereof, she reckoned.

According to Sebola, who referred to the project being aligned to research of the Water Research Commission done in the past, the system was being put to the test to determine how the river reacted to processes.

Little over a month later her colleagues at LNW shared the excitement about the screening of the clip put together from the recordings that day.

## Mopani District Municipality to support further intervention

Mopani District Municipality Water and Sanitation Mayoral Committee Member Maditshego Sefufi said they took the project as a permanent solution to the challenges of the past, citing the use of boreholes, that were easy to vandalise, before. She emphasised the need for the role players to join hands and ensure that the project was protected as the infrastructure was for the benefit of the community.

*Mopani District Municipality Water and Sanitation Mayoral Committee Member Maditshego Sefufi on site for filming of the television programme in January 2021.*

Stressing required intervention amid the shortage of rains for several years and related water problems in more than 100 villages affected by the same problem, it was indicated that they would be looking at rolling out the project elsewhere in future if sustainable.

## Confidence in project, local economy

Skhiming Community Liaison Officer Lucky Theka, who arrived before filming action got into full swing that day, shared a recollection of villagers laboriously digging for water in the riverbed before the installation of the water source and having to cart filled canisters home. In the dry season they had to dig deep into the earth, at times up to around 3,5 metres, to reach the source. He referred to the occasional discovery of animals drinking from the same sources.

*Skhiming Community Liaison Officer Lucky Theka on site ahead of filming proceeding.*

He expressed the opinion that the project has changed lives and that life could now go on. In the spirit of ubuntu the community members who have tap connections in their yards share with those who do not, he explained.

He echoed what Skhiming Community Development Forum Chairperson Benjamin Malatji said about development having come to the village now that there was a reliable water source to depend on and of migration patterns seen to be leading back to the area.

The activity on the riverbank that morning took the outsider back to late afternoon on the launch day. Upon conclusion of the ceremony the visitors returned to their respective destinations and the community members all went home. When the sun set in pinks and blues over a peaceful landscape, the ululations and expressions of excitement had died down.

The stars that appeared in the evening sky were indicative of a future shining bright for a community divided by a dry riverbed that runs through it. Still, it is a landmark on the Limpopo map that holds the promise of a life-changing resource.

- Produced by Lepelle Northern Water Communications Unit

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