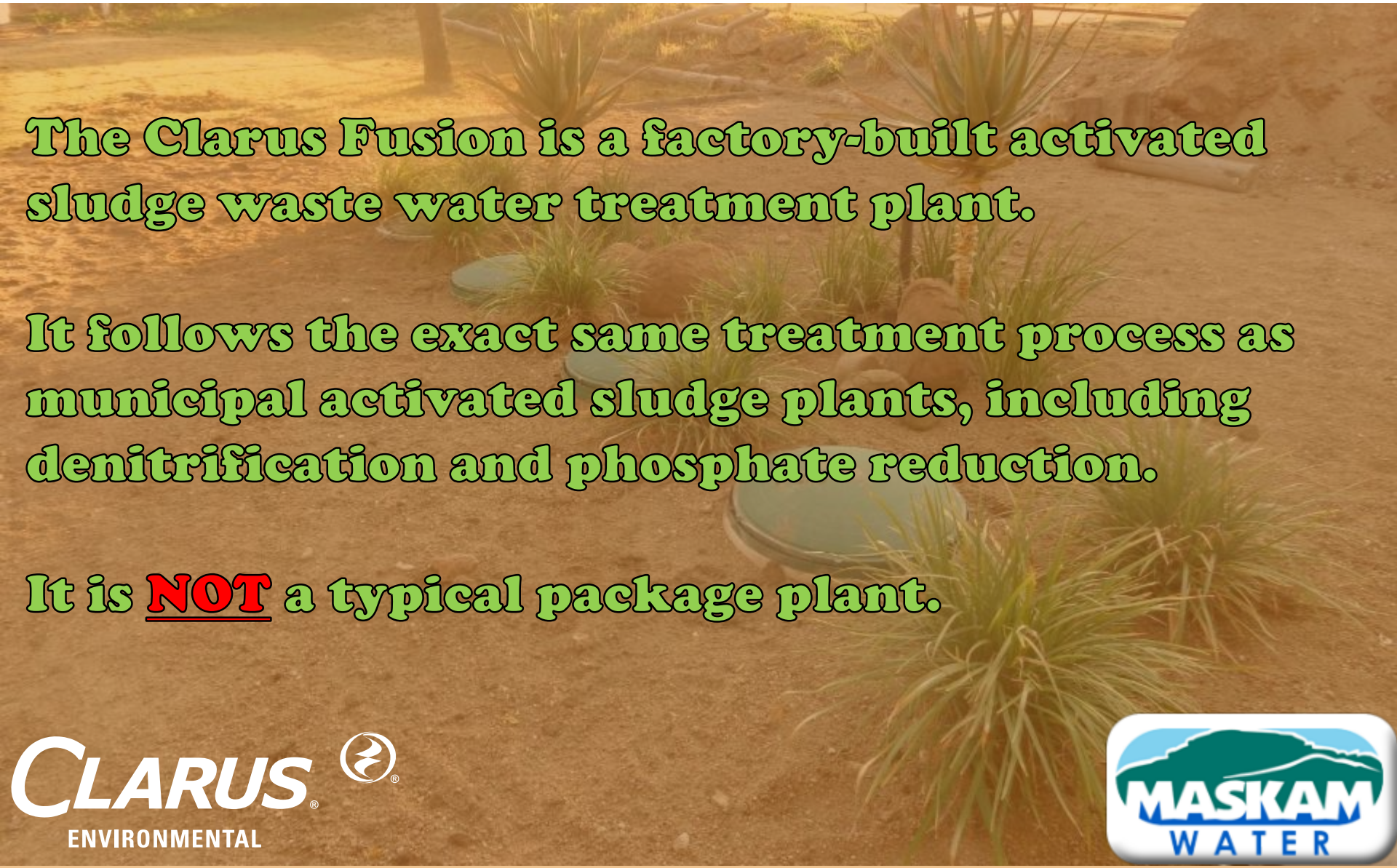

10 JAAR • YEARS
MASKAM
WATER

This presentation on the Clarus Fusion Waste Water Treatment Plant has four main parts:

1. Technical / how it works
2. Case studies
3. Developments in the water re-use market place
4. Calculating true cost of ownership

Clarus Fusion - Technical

Clarus Fusion Decentralised WWTP



The Clarus Fusion is a factory-built activated sludge waste water treatment plant.

It follows the exact same treatment process as municipal activated sludge plants, including denitrification and phosphate reduction.

It is **NOT** a typical package plant.

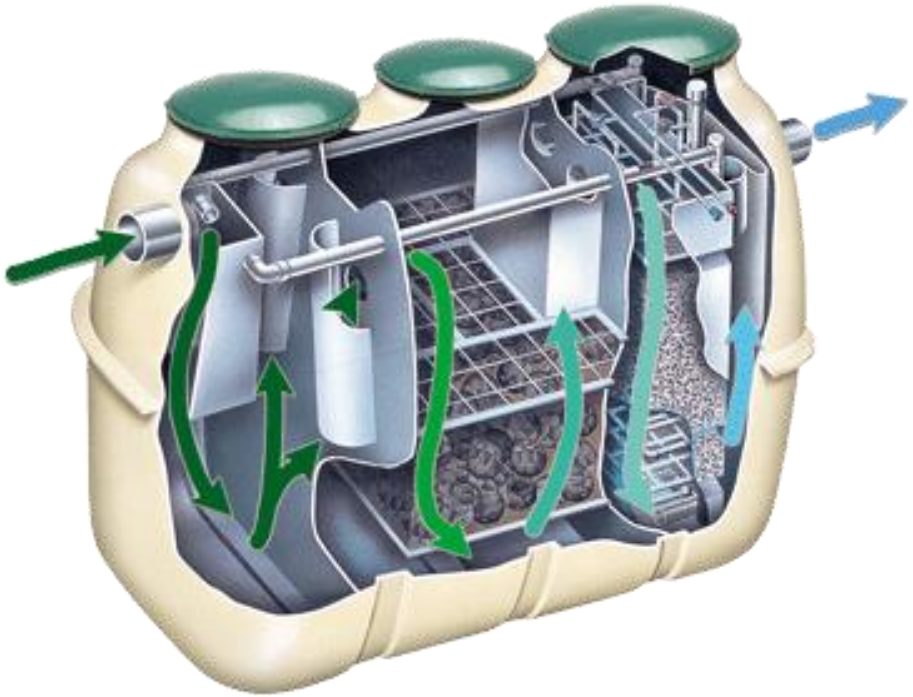
CLARUS ENVIRONMENTAL

MASKAM WATER

The Fusion System

The Clarus Fusion WWTP has three main components:

1. Bioreactor
2. Electrical panel
3. Air pump



- Treat your sewage from as little as 60 watts
- Different models available, from 1.5 to 15 kl per day
- Parallel installations can cater for bigger communities

What differentiates the Fusion from other plants?

- ✓ Low power consumption – up to 90% less than most other plants
- ✓ Single tank construction
- ✓ Tank installed completely underground
- ✓ Low noise factor
- ✓ Easy installation
- ✓ Low maintenance
- ✓ No downtime during service / maintenance
- ✓ Alarm panel – self monitoring
- ✓ Nitrification & de-nitrification
- ✓ Organic phosphate reduction
- ✓ Small Footprint
- ✓ Solar options available

Lowest operating cost in its class

CLARUS® ENVIRONMENTAL

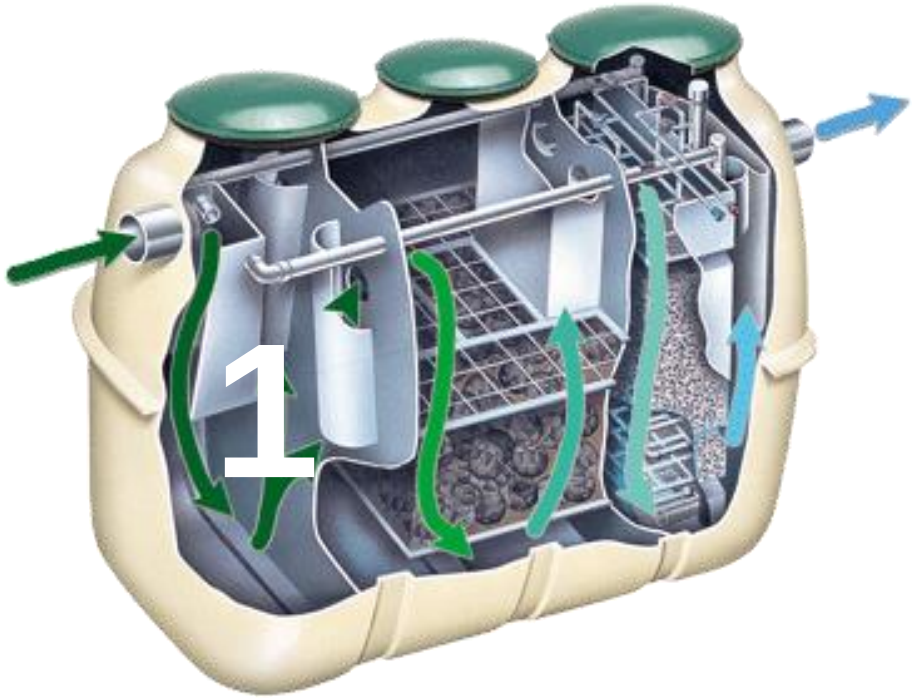
MASKAM WATER

1. Sedimentation Chamber

Raw sewage enters this chamber

1. Sedimentation of solids
2. Fatty matter float to top
3. Bacteria breaks solids down

➢ Water from the “clear zone” flows to the anoxic chamber under gravity



$$CH_2O + O_2 \xrightarrow{\text{bacterias}} CO_2 + H_2O$$

organic substrate + oxygen → bacterias → carbondioxide + water

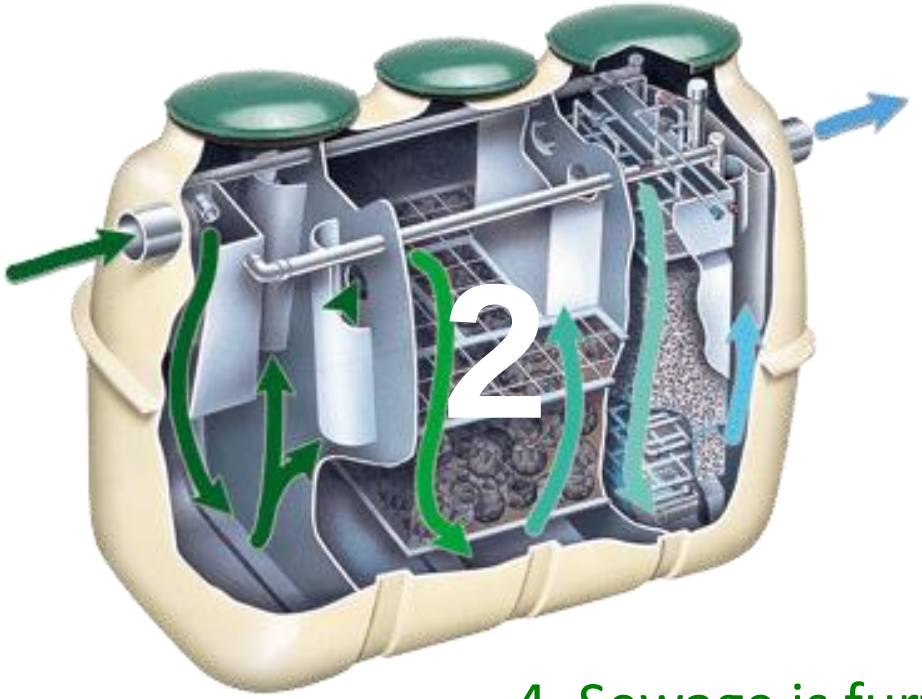
+ anorganic substances [N, P] + anorganic substances [N, P] + excess sludge

CLARUS® ENVIRONMENTAL

MASKAM WATER

2. Second Chamber

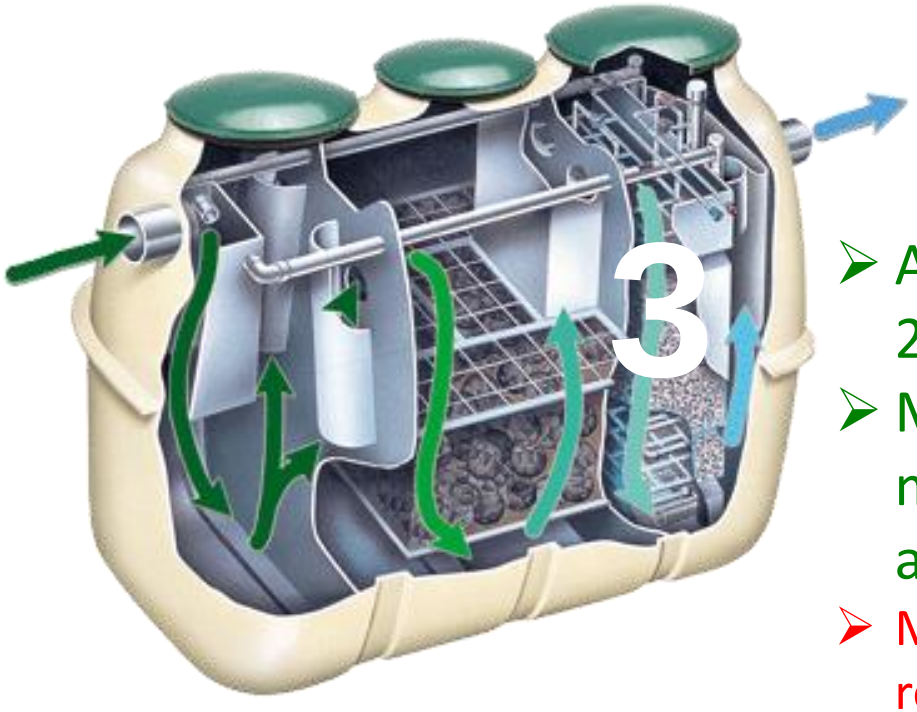
CLARUS ENVIRONMENTAL



4. Sewage is further digested by anaerobic bacteria
   - "Bio Balls" (filter media) creates maximum surface contact area for bacterial growth
   - Media is suspended in a cage, allowing non-degradable solids to fall through
   - Non-degradable solids can be pumped out.
   - Media never needs to be removed or replaced

MASKAM WATER

3. Aeration chamber



- Air is introduced into this chamber 24/7 by means of diaphragm air pump
- MBBR self-cleaning media ensures maximum growth and contact area for aerobic bacteria.
- Media never needs to be removed or replaced

5. COD reduction
6. Nitrification

Filter media

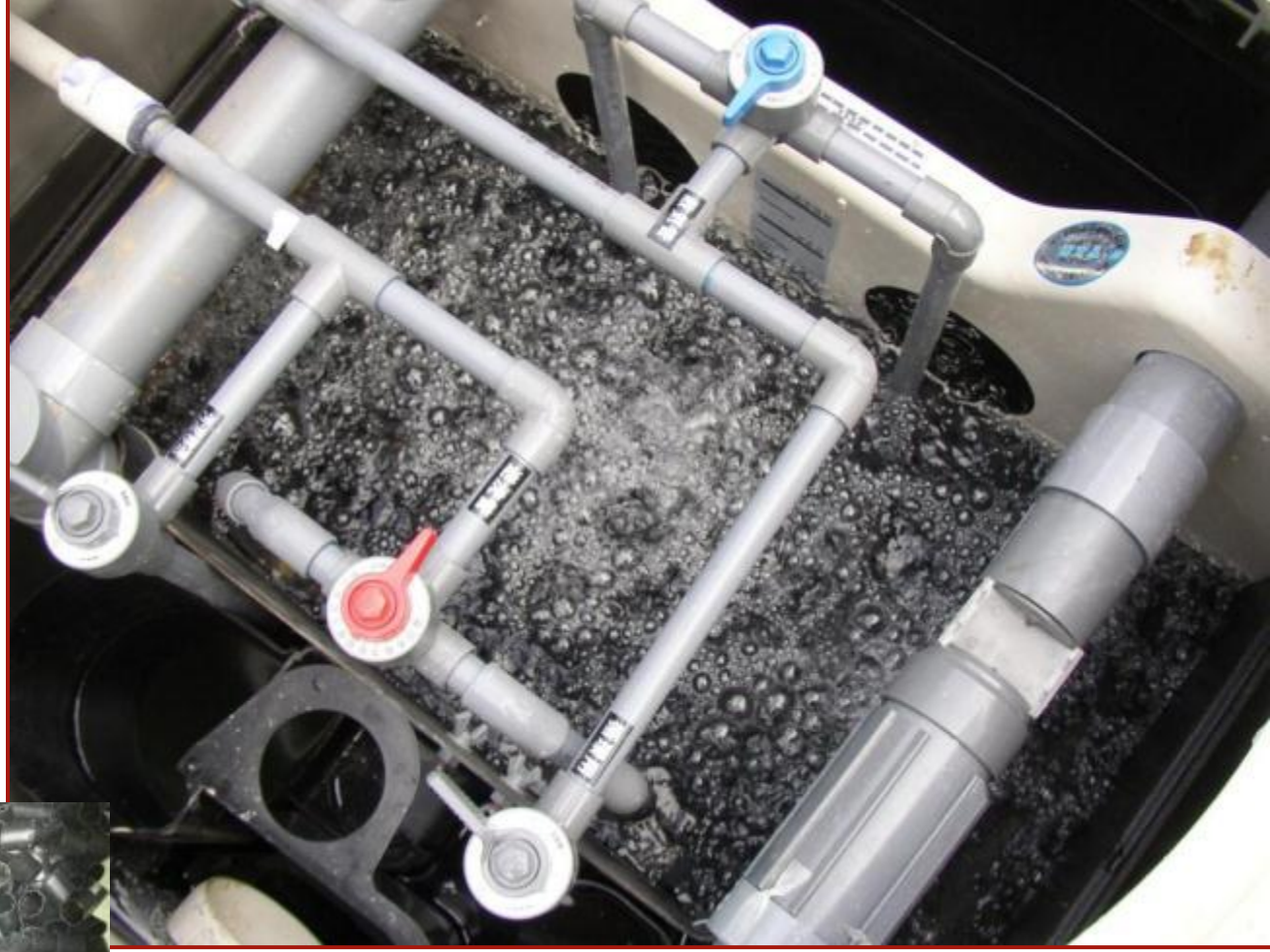
Nitrification (aerobic conditions/ aerated)

NH_4 (ammonium) + O_2 (oxygen) → NO_3 (nitrate)

CLARUS® ENVIRONMENTAL

MASKAM WATER

CLARUS ENVIRONMENTAL



Filter media

Aeration chamber
in operation

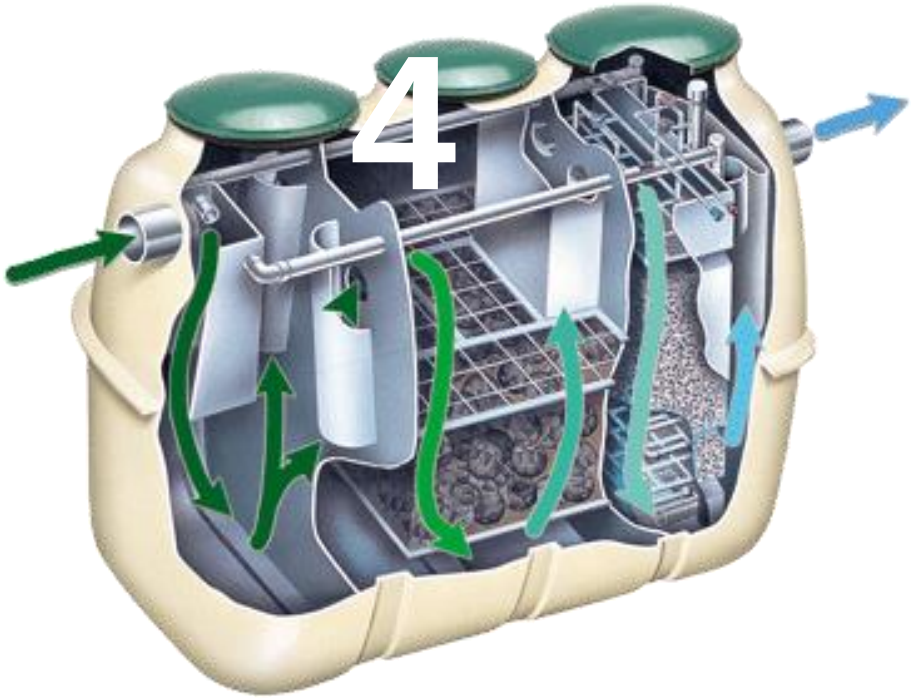
MASKAM WATER

4. Recirculation

CLARUS ENVIRONMENTAL

- Recirculation is done by means of air lift.

7. Dentrification
8. Inoculation of first chamber
9. Pre-treatment of entire plant volume during low flow periods
10. Organic binding of phosphates



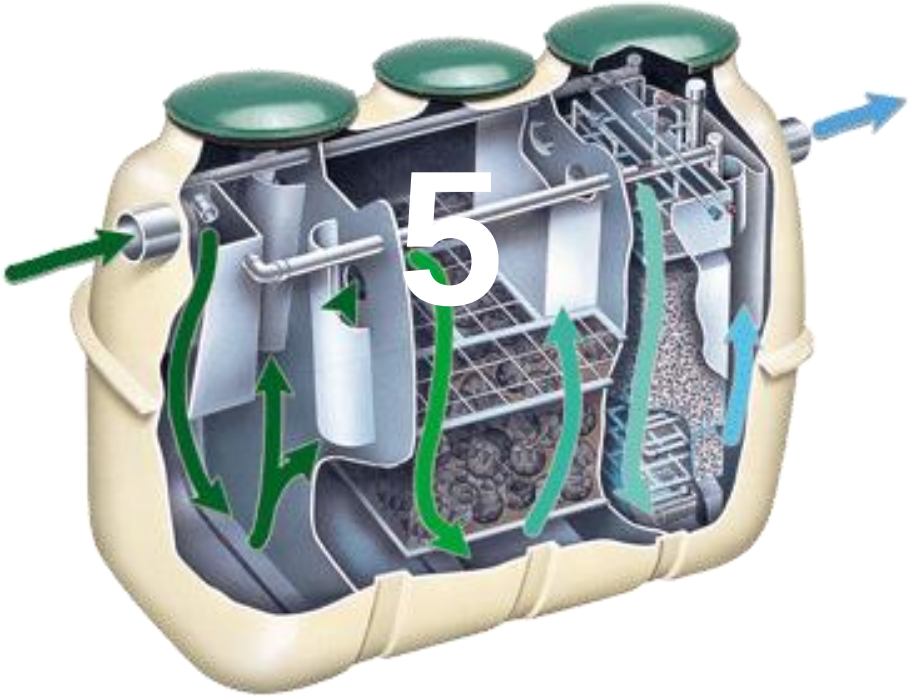
Denitrification (anaerobic conditions/ without aeration)

NO_3 (nitrate) - O_2 (oxygen) → N_2 (nitrogen (gas))

MASKAM WATER

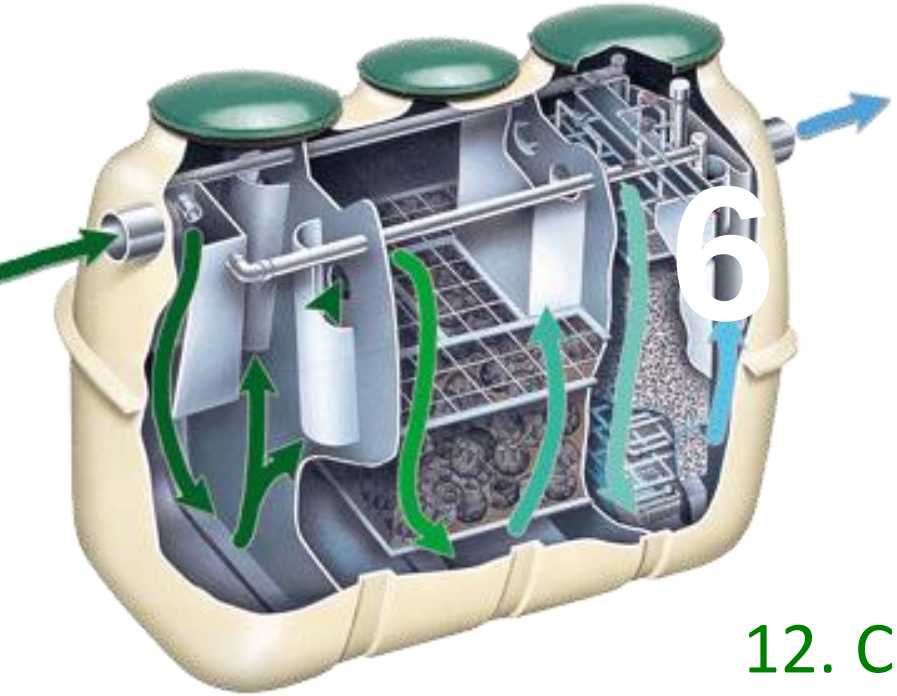
5. Automatic RAS

CLARUS ENVIRONMENTAL



11. Return of activated sludge is done by means of air lift.
- Food source for bacteria at times of low inflow
- Reduce desludging intervals

MASKAM WATER



6. Clarifier

12. Clarifying of treated effluent.

- Sludge from this chamber is also returned to the head of the system by means of air lift, during the RAS cycle

CLARUS® ENVIRONMENTAL

MASKAM WATER

7. Disinfection

- Treated effluent from the plant needs to be disinfected
- UV, Ozone or chlorine can be used for disinfection
- UV is safe, reliable and has very low running costs
- Chlorine has a residual effect downstream
- Only use good quality stainless steel UV systems

MASKAM WATER

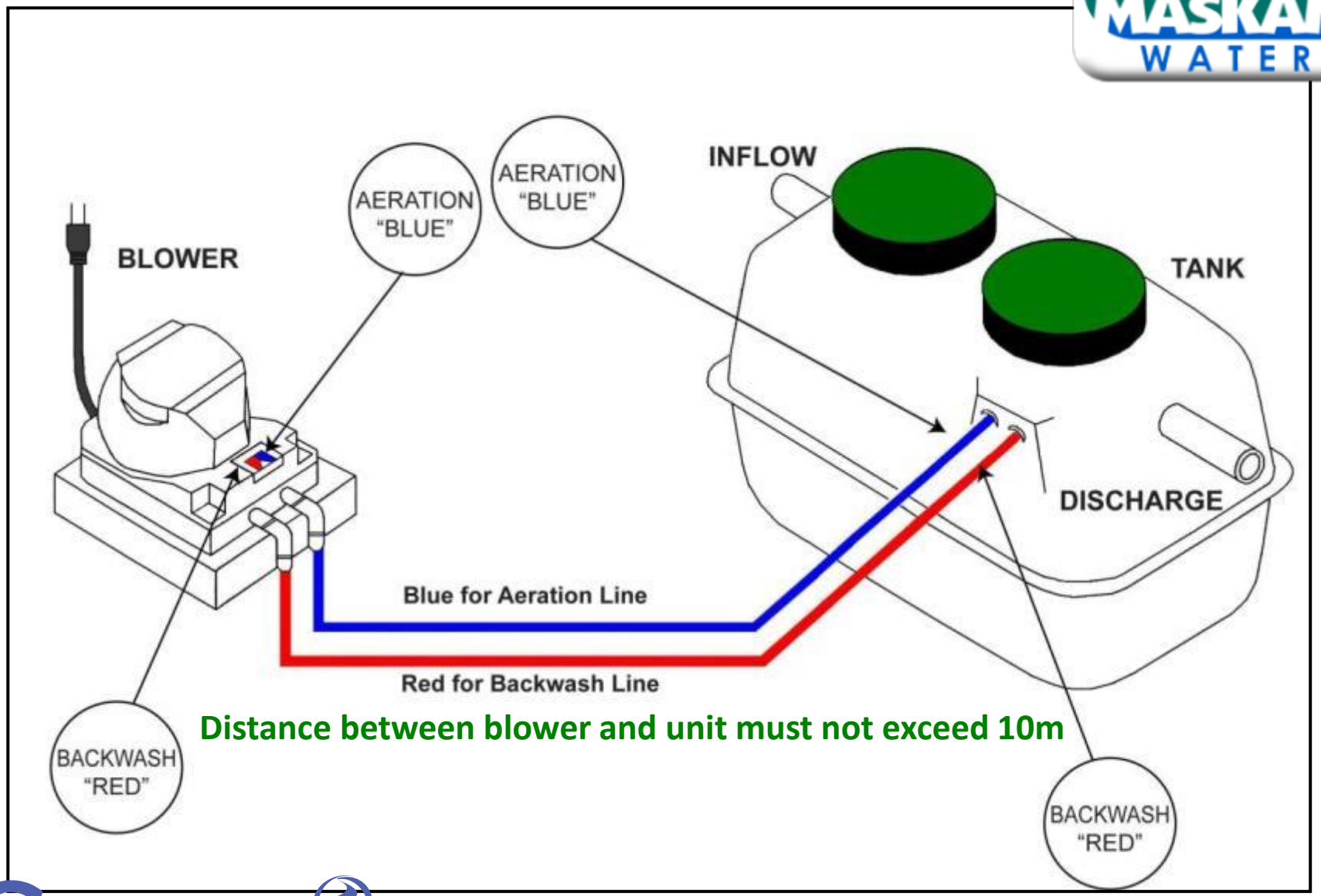
Diaphragm air pump & Elecrical panel

- Aerates Fusion 24/7
- Air lift water for internal recirculation
- Air lift sludge during backwash cycle
- Very low power consumption (from 60watts)

- Supply power to the air pump, UV and pumps (where pumps are required to pump the sewage or effluent)
- Monitors system 24/7.
- Warning light and siren will notify user if a problem occurs
- Panel lights on the front panel will tell user the reason for alarm condition
- IP65
- GSM module optional

MASKAM WATER

Dual Air Supplying System



Distance between blower and unit must not exceed 10m

CLARUS® ENVIRONMENTAL

Clarus Fusion – Case Studies

The WCG is setting the standard in sustainable water usage.

Recently the Western Cape Government revamped the building of DEA&DP, situated in the Cape Town CBD. This included the installation of an on-site Waste Water Treatment Plant.

Treated effluent is used for toilet flushing, saving more than 1 million litres of potable water per year!

The WCG is certainly setting a standard for others to follow!

MASKAM WATER

This case study shows how easy it is to become more water resilient without sacrificing any comfort.

On-site Wastewater recycling in Cape Town CBD

MASKAM WATER

Close-up of building

MASKAM WATER

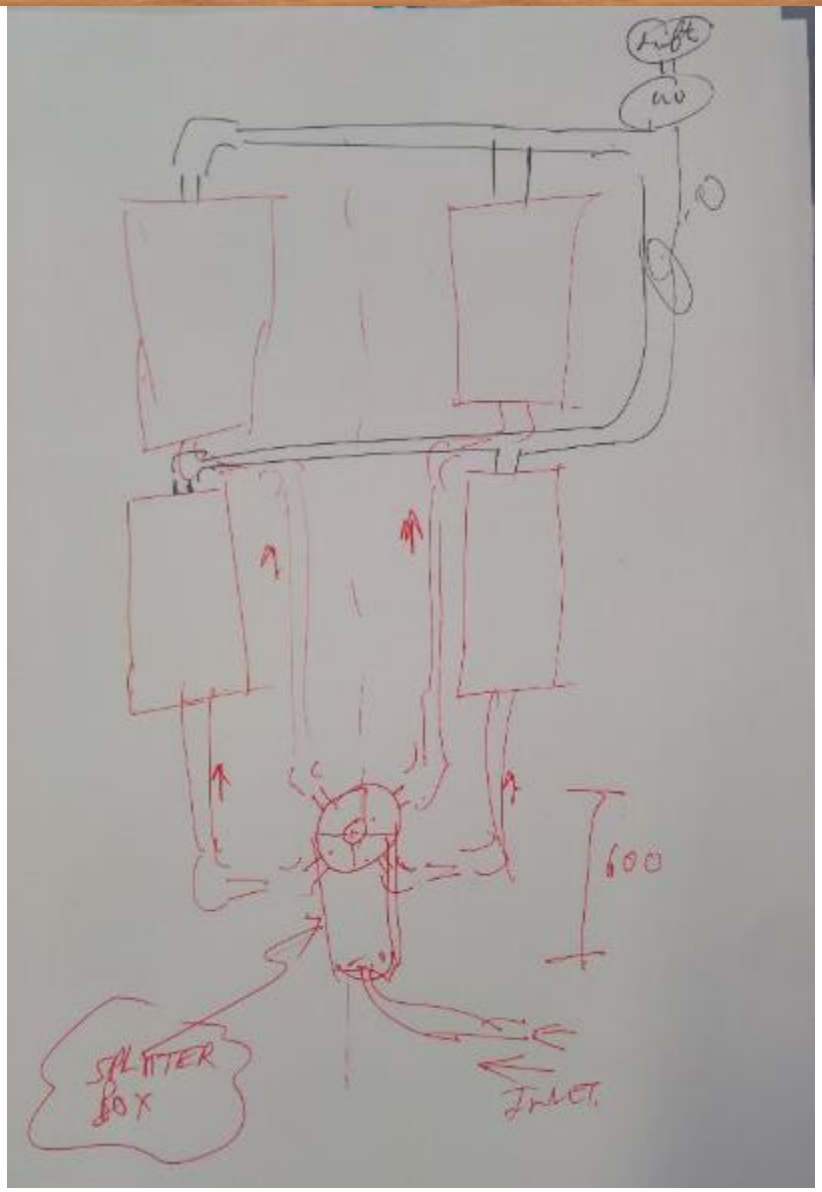
Street view

Available space for installation

MASKAM WATER

Planning

Due to limited access 4 x smaller plants had to be installed to cater for the total daily treatment capacity



MASKAM WATER

Start of construction

The only access was through this opening, during construction

MASKAM WATER

Placement of 4 x Clarus Fusion ZF800 WWTPs

CLARUS ENVIRONMENTAL

MASKAM WATER

Nearing completion

CLARUS ENVIRONMENTAL

MASKAM WATER

Final Grade

CLARUS ENVIRONMENTAL

MASKAM WATER

Electrical Panels and air pumps

CLARUS® ENVIRONMENTAL

MASKAM WATER

Access for servicing of Fusions

50% of waste water is treated on-site. This caters for the entire toilet flushing need while the excess waste water still goes to municipal sewer.

CLARUS® ENVIRONMENTAL

MASKAM WATER

Treated effluent used for toilet flusshing

This building is **saving one million litres of water per year** by treating waste water on site and re-using it for toilet flushing.

MASKAM WATER

Basic layout of system

1. When a toilet is flushed, the booster pump will start and deliver water from the tank to the toilet under pressure. A small amount of chlorine is dosed into the system, ensuring the water in the toilet is bacteria free.

2. As the tank level drops, a float switch in the tank will demand water from LS4. The pump will start and transfer water to the storage tank.

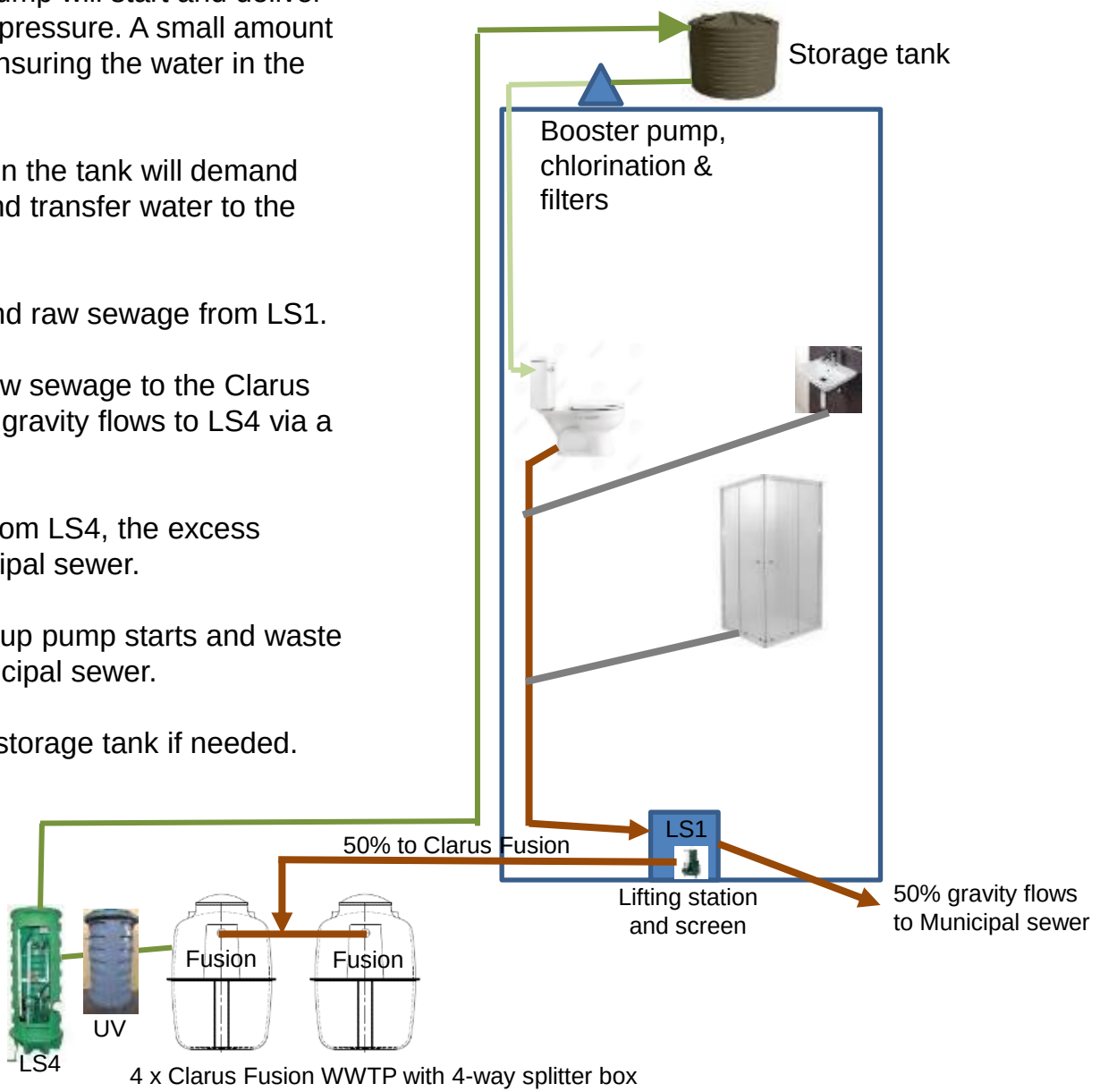
3. As the level in LS4 drops, it will demand raw sewage from LS1.

4. The pump at LS1 will start and feed raw sewage to the Clarus Fusion WWTP, where it is treated and gravity flows to LS4 via a UV for sterilization.

5. If LS1 is full and there is no demand from LS4, the excess sewage gravity overflows to the municipal sewer.

6. If there is a high level in LS4, the backup pump starts and waste the excess treated effluent to the municipal sewer.

7. There is a municipal backup to fill the storage tank if needed.



4 x Clarus Fusion WWTP with 4-way splitter box

MASKAM WATER

Small holding, Upington

Air pump covered with artificial rock to blend in with garden (ensure enough air flow to prevent overheating)

MASKAM WATER

Commercial Buildings

(Barloworld Maputo)

Treated effluent is used for garden irrigation

Clarus Fusion Sewage Treatment Plant

Irrigation water pump and ozone system

Guest Houses

Treated effluent is used to top up the irrigation dam

Farms & private residences

MASKAM WATER

Old conservancy tank cost R9000 per month to empty

Saving Money

(Conservancy Tanks are not "green")

(Farm, Stellenbosch)

Clarus Fusion STP

Treated effluent is discharged to the pond

MASKAM WATER

Lodges and Tented Camps
(Ongava Anderson Camp, Namibia)

Schools

(Curro Bloemfontein)

Treated effluent is used for irrigation of sports fields

MASKAM WATER

Above ground installations

Under driveways

Weight bearing slab ensures there is no vehicle weight on the Fusions

MASKAM WATER

New developments (decentralised)

Fusions installed in POS

Residential development

Each phase will discharge 45kl per day, hence 3 x ZF4000 per phase installed

Equal flow splitter
(can accommodate 6 plants)

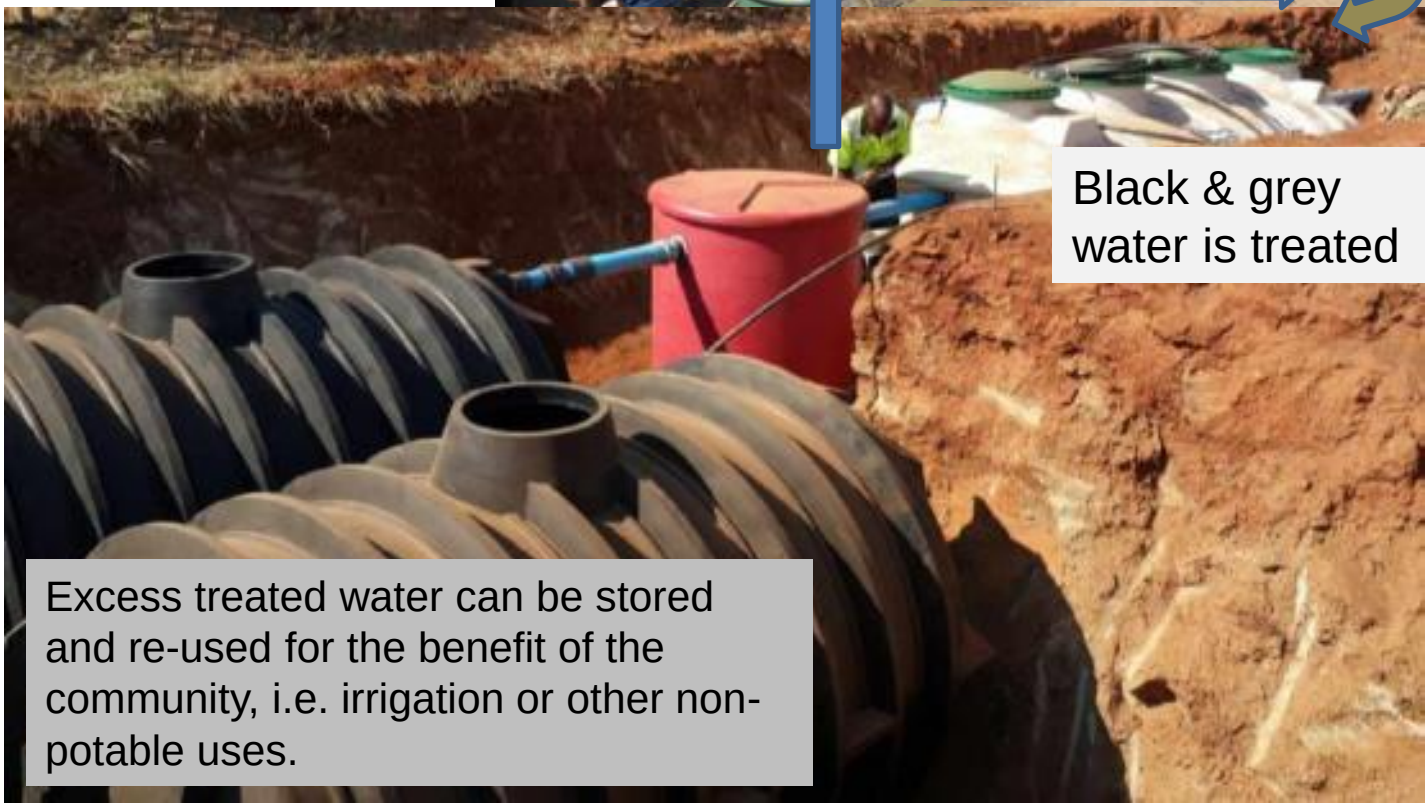
CLARUS® ENVIRONMENTAL

Settlements

No more chemical toilets, VIPs or bucket systems!

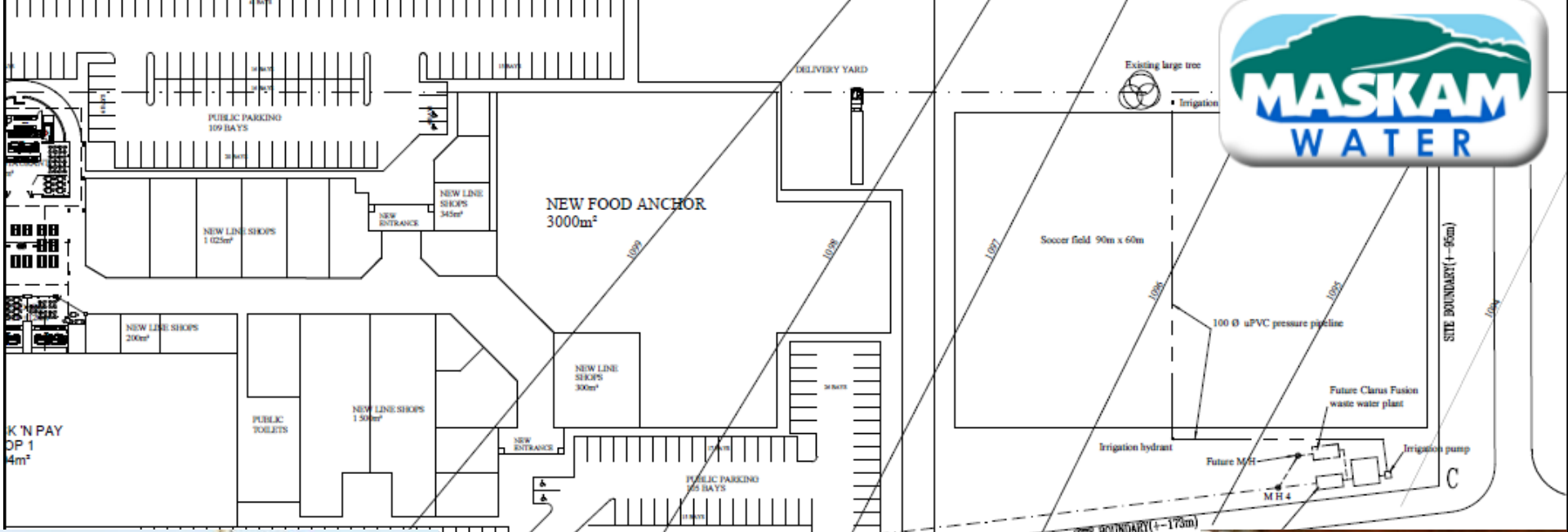
Treated effluent is used for toilet flushing

Black & grey water is treated



Excess treated water can be stored and re-used for the benefit of the community, i.e. irrigation or other non-potable uses.

MASKAM WATER



Shopping centres

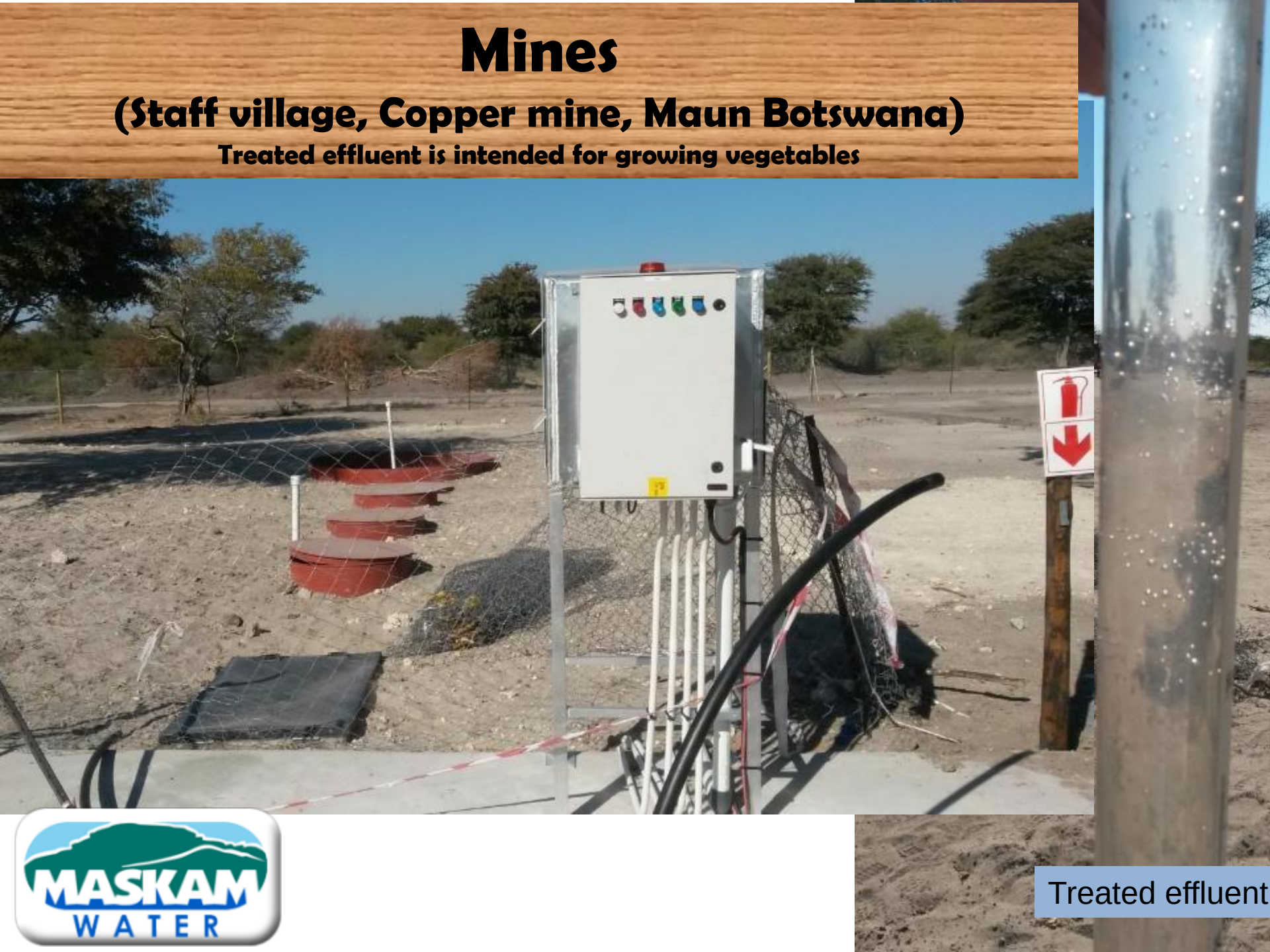
(Treated effluent is used for irrigation)

Petrol stations (Shell Ultra City Lobatse, Botswana)

Mines

(Staff village, Copper mine, Maun Botswana)

Treated effluent is intended for growing vegetables



Treated effluent

Agriculture

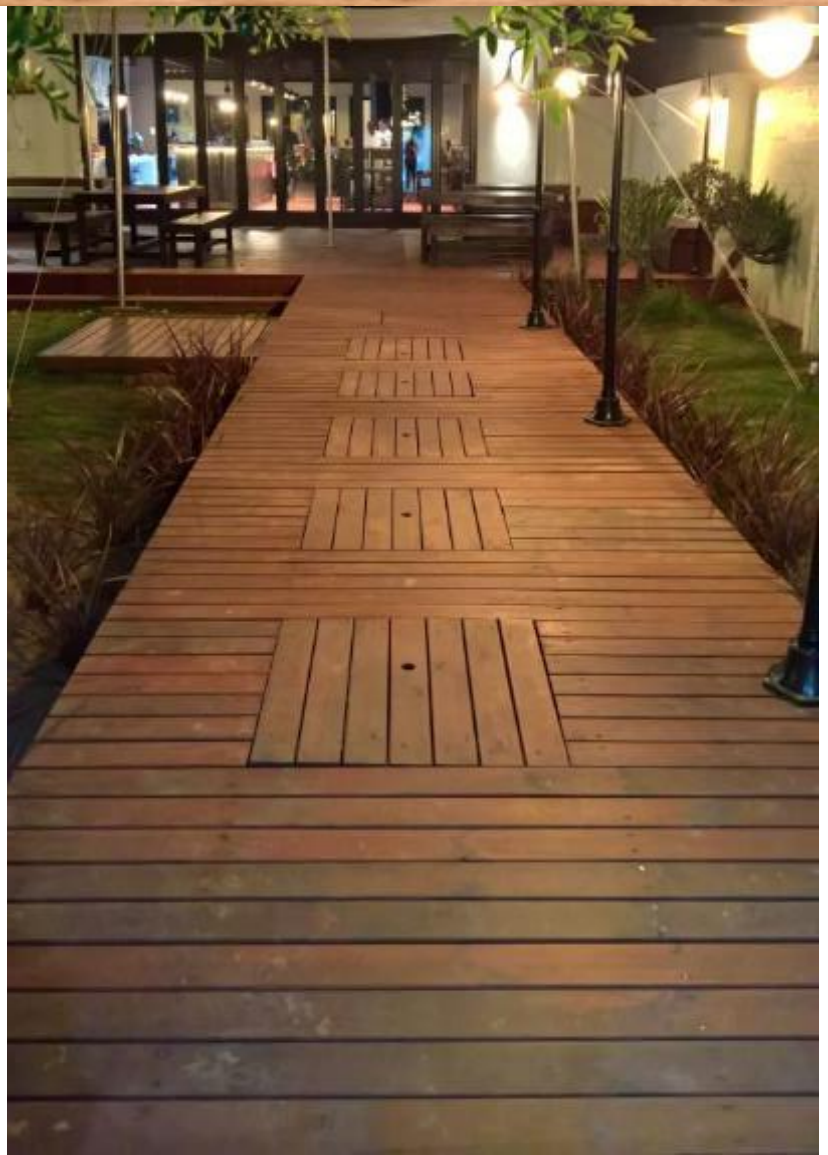
Treated effluent from offices, restaurant and tasting room goes to irrigation dam, saving 1,5 million litres per year

MASKAM WATER

Restaurant

(Synergy Grove, Mc Gregor)

Customers walk over the Fusion to the ablution facilities and the garden is being irrigated, using treated effluent, while the guests are eating.



MASKAM WATER

Campsites

Heritage Sites – Cango Caves

Heritage Sites – Cango Caves

Vrolijkheid Nature Reserve

MASKAM WATER

De Hoop Nature Reserve

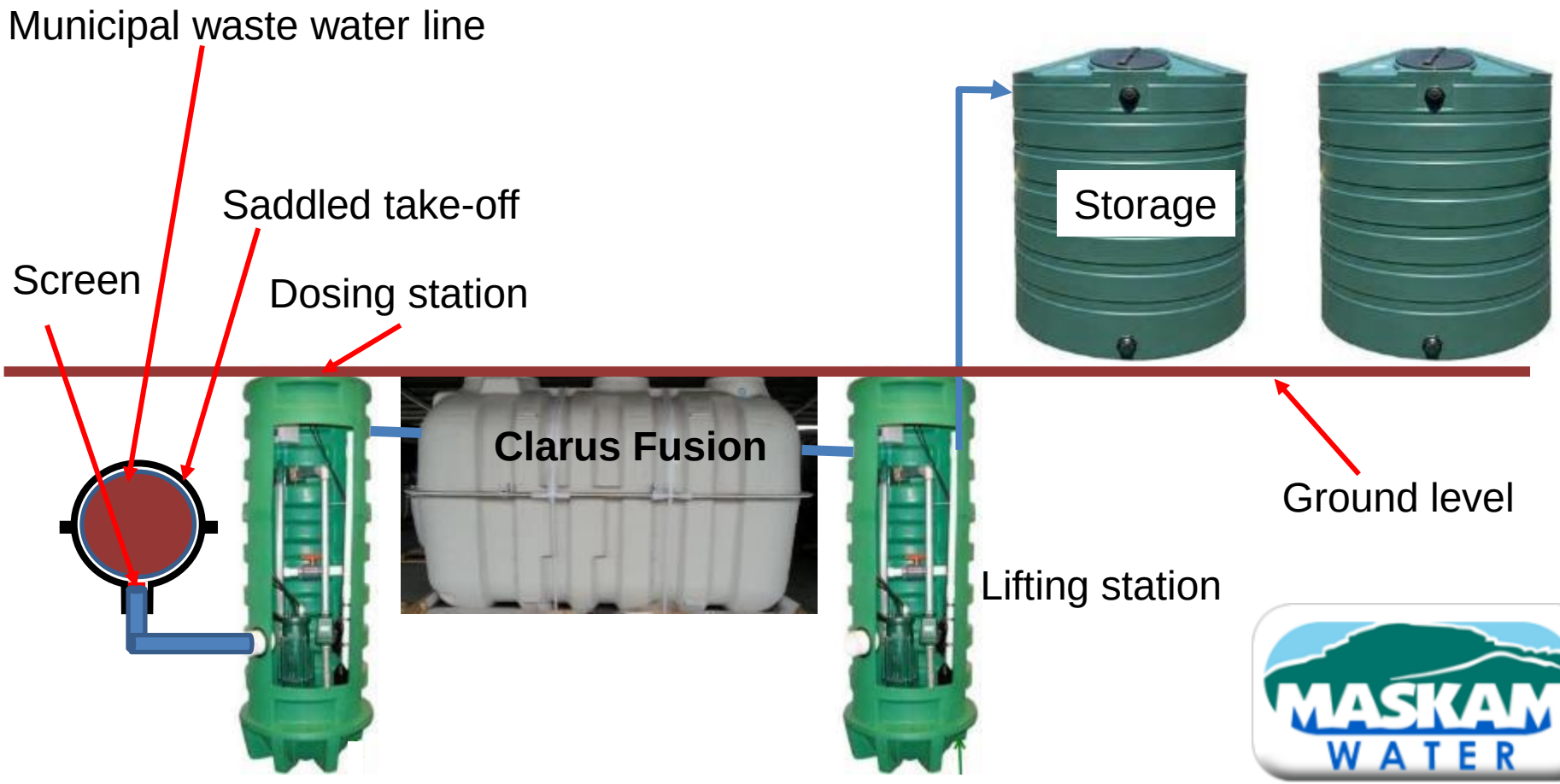
MASKAM WATER

Bunny Park Benoni - solar powered

MASKAM WATER

Alternative supply: Municipal sewer system

Irrigate sports fields and parks with reclaimed water



Taking waste water out of the municipal network saves potable water, reduces the load on municipal WWTWs and WW networks. It frees up space for new development to take place.

- On-site treatment is a game changer in the economy.

- There can be more jobs created in manufacturing, selling, installation and maintenance of these kinds of systems.

- **The bigger advantage is for the communities, though.** They have the benefit of the water for generations to come. That can sustain small scale farming, sports facilities, etc, etc.

- We need to look at this more inclusively. **If we look at one fraction – the plant – only, we miss the bigger picture.**

Clarus Fusion –
Developments in the water re-use market place

In 2010, when we introduced the Clarus Fusion into the South African market, we were pretty much ahead of our time.

As of 2020 we manufacture all models for Africa and the Middle East in South Africa. Maskam Water also manufactures the large Fusions for North- and South America in South Africa, as part of a JV with Zoeller from the USA

For the first 7 years we were working “against the tide”. We had a solution for a market that was not ready for it.

This started to change when the Western Cape Government sent out a circular to municipalities in 2017, recommending that they look at on-site wastewater treatment as a method of unlocking economic opportunities and reducing water consumption.

Western Cape Government Circular to municipalites, 2017

"***Waste water treatment closer to source becomes a cost effective and energy efficient alternative to unlock economic opportunities, eradicate the housing backlog, fast track access to sanitation services in informal settlements and at the same time reducing the potable water consumption by 60% by the re-use of effluent for flushing toilets, food gardening and the irrigation of neighbourhood landscapes."***

- **Marius Brand: Director, Municipal Infrastructure, Western Cape Government**

Pushed by the drought and looming “day zero”, the City of Cape Town amended their water bylaws in 2018.

(c) by the substitution for subsection (5) of the following subsection:

“(5) Where renovations to an existing building triggers a building plan approval process, full details of any **[proposed]** water conservation and demand management system or alternative water systems **[such as a grey water system, air conditioner or bleed-off]** for flushing toilets, irrigation, swimming pool filling or top-up or other non – domestic purposes must accompany the building plans.”; and

City of Cape Town updated bylaws, July 2018

(d) by the addition after subsection (5) of the following subsections:

"(6) All new developments must provide for the installation of water conservation and demand management systems or alternative water systems for non-domestic purposes and full details thereof must accompany the building plans.

As dam levels improved, it was as if everyone was back to the old way of doing, with only a few actively pursuing sustainable water usage.

In 2020 it looks like someone opened all the flood gates. All of a sudden we get regular e-mails talking about on-site treatment and re-use as a sustainable solution.

With the exception of the next slide, which I found on LinkedIn, all the others arrived in my mailbox. I did not search for any topic. I believe there will be many more.

This tells me that the market is opening up to the idea of onsite wastewater treatment and re-use as a sustainable way going forward and to bring dignified sanitation to all.

10 JAAR • YEARS
MASKAM
WATER

WRC South Africa • 1st
Water Research Commission
4d •

"We need to ensure there is no further degradation of our water resources to ensure small businesses survive, especially those created by women" writes **Bonani Madikizela**

Water crisis

South Africa has already allocated about 98% of her water supply and is moving towards surpassing the available water supply by an estimated 17% in 2030. Noting that there is no economic development that can flourish without relying on the guaranteed supply of water and of acceptable quality fit for use, then the job creation efforts are facing a huge challenge, perhaps worse than the energy crisis we currently experience!

It is for this reason that economies around the world are looking for opportunities within the green economy - characterised by resource recovery or circular economy principles. This is sometimes called regenerative economy, which is based on zero waste generation by design.

Zero waste indirectly means more cleaner water will be left in the environment that continues to support, directly and indirectly, business and society.

The mainstreaming of a green economy in the country's economic development, legislation and politics must become more urgent than ever before.

https://www.news24.com/news24/columnists/guestcolumn/opinion-green-economy-recovery-women-leading-their-emancipation-20200807

The United Nations Environmental Programme (UNEP) defines Green Economy "as an economy that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities" or, simply put, one that is low in carbon footprints, resource efficient and socially inclusive (UNEP, 2011). This is regarded as a sustainable and equitable economy that:

- provides social and economic benefits for current and future generations, by contributing to food security, poverty eradication, livelihoods, income, employment, health, safety, well-being, equity, and political stability;
- restores, protects, and maintains the biodiversity, productivity, resilience, core functions, and intrinsic value of ecosystems – the natural capital upon which the economic prosperity depends;
- is based on circular material flows, clean technologies, and renewable energy, to secure economic and social stability over time, while keeping within the limits of one planet.

https://www.news24.com/news24/columnists/guestcolumn/opinion-green-economy-recovery-women-leading-their-emancipation-20200807

Daily Dispatch, Thursday, 23 July 2020

Dhesigen Naidoo Insight

Water innovations hold promise for post-pandemic SA

The Nelson Mandela lecture by UN secretary-general Antonio Guterres on Saturday was sobering.

Even amid an unprecedented global pandemic, combined with the most difficult economic outlook since the height of the Great Depression, our greatest challenge in 2020 is inequality.

It is significant to note that, using the Gini-Coefficient as a measure of income inequality, SA is the second most unequal in the world behind Lesotho.

The richest 10% of South Africans own 71% of the wealth while the poorest 60% own only 7%.

This inequality is further segmented on the basis of race, gender, ethnicity, urban vs rural location and levels of disability. This is the core of our adversity.

But adversity has always been a theatre for invention and innovation.

Our late statesman Madiba's story of leadership of the liberation movement, as well as that of inaugural president of democratic SA, was based on a series of brave decisions that almost always went against the status quo and the norms of the time.

His innovation was evident from a moment of supreme leadership after the Boipatong massacre to taking the stage in a transitional moment at the 1995 Rugby World Cup finals.

When Mandela and his then water minister Kader Asmal introduced the notion of water as a basic human right in 1996, they stimulated a global momentum that resulted in the UN adopting resolution 64/292 on July 28 2010, recognising the human right to water and sanitation.

It is in this spirit of innovation that we must engage the instruments of recovery and redress simultaneously, one of the more important being the UN SDG6 Global Acceleration Framework.

The UN system led by UN Water has launched this as the principal strategy vehicle to achieve universal access to clean water and safe sanitation by 2030.

The five pillars of the framework include the familiar and much-needed drivers of success, namely, finance, governance and capacity.

Two further drivers put this initiative firmly into the 21st century — data and information, and innovation.

SEEING THE FUTURE: Innovations in the management of water and sanitation have the power to transform settlements and lives. Picture: SUPPLIED

In the spirit of Mandela's legacy we need to embrace and harness the vast knowledge repository of the SA Water Science and Technology sector, whose research efforts have ensured that the country continues to be in the top 20 of research performers in this domain in the world.

We are witnessing this in the Water Research Commission-Salga led partnership of networks on Covid-19 wastewater surveillance, building on recent global leadership in developing an ISO standard for non-sewered sanitation.

The significance of introducing non-sewered sanitation can be revolutionary in moving forward in this component of SDG6 that is proving to be the most challenging.

Non-sewered sanitation and low water use toilets are recognised as the world's best pathway to reach the goal of universal access to safe and dignified sanitation in 10 years.

This noble venture of putting our best technology foot forward, supported by the strengths of big data management and intelligent control systems to meet the SDGs as well our basic needs agenda, has an important upside beyond the social agenda.

Non-sewered sanitation and low water use toilets are recognised as the world's best pathway to reach the goal of universal access to safe sanitation in 10 years

It can be an important component of SA's economic recovery in the short term with the exciting possibility of new industrial platforms in the long term.

These products emanating from new industrial platforms for water, wastewater and sanitation solutions with applications across all sectors will create jobs, develop enterprises and positively affect our balance of payments.

This principal challenge with SA's extreme inequality is based on the older notion that we have two distinct economies operating in the system.

The wealthier among us are international, operating as significant players in the global economy, while the vast majority of South Africans operate on the margins of the breadline, with increasing numbers joining this cohort during the Covid-19 lockdown, as evidenced by the increased claims for economic rescue.

These new industrialisation opportunities on the back of new innovations in water and sanitation can be transformative and catalytic.

It holds promise for an acceleration in economic recovery while simultaneously creating more opportunities for new entrants to the economy which will have a positive impact in decreasing the inequality, move closer to eradicating poverty and creating better chances for sustainable livelihoods.

There are many reasons why this journey will be difficult, but let us be reminded by the wise words of our founding president — "its always seems impossible, until it is done".

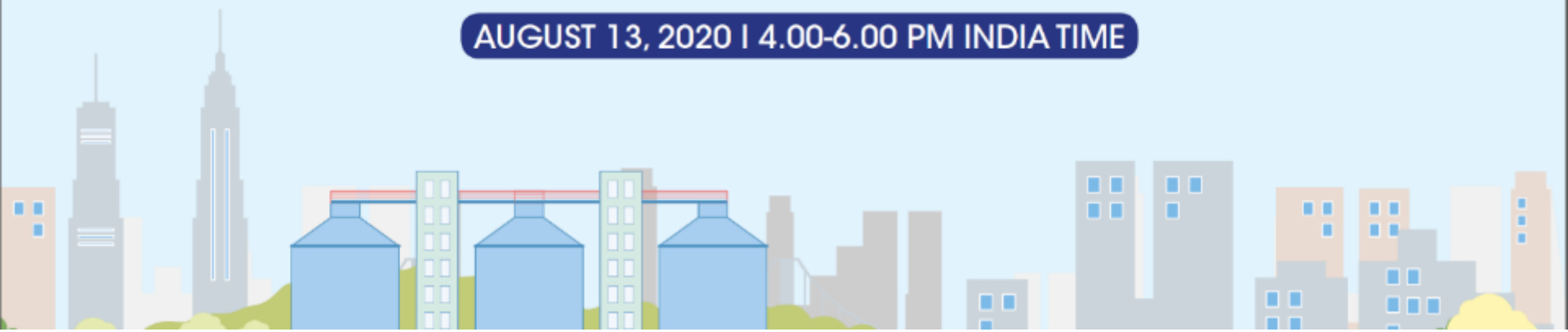
Dhesigen Naidoo is CEO of the Water Research Commission and president of HumanrightsWater

CSE SCHOOL OF WATER AND WASTE AAETI

WEBINAR

DECENTRALIZED WASTEWATER TREATMENT AND LOCAL REUSE FOR CITYWIDE SANITATION AND IMPROVED RIVER HEALTH

AUGUST 13, 2020 I 4.00-6.00 PM INDIA TIME



https://www.greencape.co.za/assets/WASTEWATER_TREATMENT_INDUSTRY_BRIEF_WEB.pdf

Trade & Industrial Policy Strategies (TIPS)
is a research organisation that facilitates policy development and dialogue across three focus areas: trade and industrial policy, inequality and economic inclusion,
and sustainable growth

info@tips.org.za
+27 12 433 9340
www.tips.org.za

WORKING PAPER

A CASE FOR WATER AND SANITATION IN SOUTH AFRICA'S POST-LOCKDOWN ECONOMIC RECOVERY STIMULUS PACKAGE

Shakespear Mudombi

In this context, next generation sanitation (NGS) or non-sewered sanitation systems are relevant. There are three key types of technology toolboxes that this new industry will introduce, namely: water efficient front end technology (pedestals); modular and innovative backend technologies that are SANS 30500 compliant; and various centralised, decentralised and on-site sludge treatment technologies that remove the threat of pathogens and pollutants from people (SASTEP 2020). Some of the specific available technologies include: low flush systems; full reclamation toilet units; community ablution blocks; decentralised wastewater systems; and greywater treatment systems (WRC and TBC 2018).

YONELA DIKO: MUNICIPAL WATER INFRASTRUCTURE - THE ELEPHANT IN THE ROOM

Lindiwe Sisulu | Department of Water and Sanitation | Water infrastructure | Wastewater

Email Print Tweet

OPINION

On 6 August 2020, Minister of Human Settlements, Water and Sanitation, Lindiwe Sisulu, handed over the Randfontein Wastewater Treatment Works after it was revitalised and re-engineered so that the effluent it discharged met the quality standards of the Departments specifications. It was an expensive project that went through two phases of technical revitalisation and refurbishment.

South Africa has just over 824 wastewater treatment facilities, and according to the Green Drop Report, (as early as 2013), almost half (49.6%) of wastewater treatment facilities were in a critical or poor condition requiring urgent attention. Over the years, this has resulted in untreated sewage discharging into water streams and destroying the quality of water.

https://ewn.co.za/2020/08/11/yonela-diko-municipal-water-infrastructure-the-elephant-in-the-room

While wastewater reuse presents a sustainable solution in supporting food security amid looming water shortages, the infrastructure costs present a barrier to widespread adoption in South Africa. Manufacturing plants, particularly local branches of international food and beverage producers, are, however, increasingly investing in treatment facilities, enabling them to reuse their own wastewater and achieve zero liquid discharge status.

This is according to Hennie Pretorius, industry manager: water and wastewater at Endress+Hauser South Africa, who will participate in IFAT Africa next year. Endress+Hauser is seeing growing adoption of wastewater treatment and analysis solutions in the South African private sector.

https://www.cbn.co.za/featured/how-optimal-water-use-can-support-food-security-reduce-waste-in-africa/?utm_source=mailpoet&utm_medium=email&utm_campaign=cbn-daily-home-buying-in-the-unforgiving-2020-it-s-good-news-if-you-have-your-affairs-in-order_1221

Event Details

The Helderberg Chapter invites you to a virtual networking event with Ntobeko Boyana as guest speaker.

Ntobeko will talk on sustainable solutions for water waste treatment and how waste water technology is contributing to sustainability through partnering with business.

New study: Alleviating CT's water scarcity woes through retention, recycling

13 OCT 2020 SAVE | EMAIL | PRINT | PDF

The City of Cape Town Metropolitan Municipality's water woes is not a thing of the past, despite the good rainfall this winter. The issue of water scarcity over the long term still looms, however, water retention and recycling initiatives can be implemented to address the problem, according to a recent study.

https://www.bizcommunity.com/Article/196/700/209194.html

The foundation is laid.

What we worked to achieve for 10 years is now beginning to become a reality.

With the best product on the market, and 10 year's history on the continent, now is the time to embrace this trend and make a real difference in the way we see water.

Future generations will thank us.

Clarus Fusion –
Calculating true cost of ownership

The real cost of owning an on-site wastewater treatment plant

The cost of ownership is made up of:

- Capital outlay
- Installation and related cost
- Power consumption
- Daily, weekly and monthly check-ups
- Additives (bacteria or chemicals)
- Services
- Desludging
- Repairs / spare parts

CLARUS ENVIRONMENTAL

MASKAM WATER

Capital outlay

- Capital outlay is often the smallest cost factor
- Unfortunately that is all that many people look at
- This approach costs them in the long run. Let us see why…

?

Installation and hidden cost

- The cost of the plant, “work done by others” and installation combined is the true capital outlay for the customer.
- “Work done by others” (such as civil works) may not form part of the plant quote, but still the customer needs to pay for that. It is thus important to take this into account when comparing different technologies
- Fusion is factory-built and there is no hidden cost. There are only four pipe connections to make on site.

MASKAM WATER

Power consumption

- Power consumption makes up a huge part of the operating cost and **is a life-long commitment** to the plant.
- Fusion has the lowest power consumption in its class by far

CLARUS ENVIRONMENTAL

MASKAM WATER

No daily, weekly and monthly check-ups

- Regular checking of the system is seen as standard in the industry.
- Even if your own staff do these check-ups, you still need to pay them.
- *Your focus should be on running your business, not running your* wastewater treatment plant.
- The Fusion's alarm panel will warn the user if there is a problem at the plant. GSM or BMS link is optional.
- **NO** daily, weekly or monthly check-ups are required.

CLARUS ENVIRONMENTAL

MASKAM WATER

Services

- Fusion only needs a service every six months and that takes only one hour.

CLARUS ENVIRONMENTAL

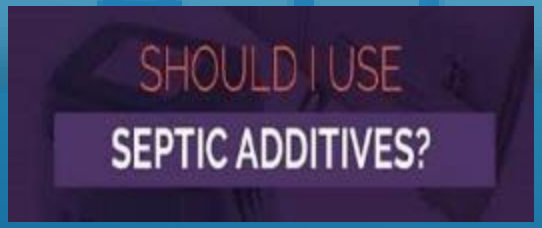
MASKAM WATER

Desludging

- While desludging every 6 – 12 months is seen as “normal” in the industry, desludging a Fusion is only required every 4 – 6 years under normal use.

Additives

- While many a plant relies on the addition of bacteria or other "special mixes" to conform to standards, the Fusion's design is of such a nature that it populates its own bacterial colonies. There is NO need to add anything to the system, i.e. **NO monthly cost…**



CLARUS ENVIRONMENTAL

MASKAM WATER

Repairs / spare parts

- Fusion has one moving part only, the air pump.
- Diaphragms needs replacing only every 4 years.

CLARUS ENVIRONMENTAL

MASKAM WATER

Summary

In summary, the Fusion is designed to have minimal operating cost. That not only makes up for paying a bit more initially, but you will have money to spare.

The next few slides, which compares the total cost of owning a Fusion tot that of other systems in the industry, will illustrate how the operational cost can make or break your budget.

CLARUS ENVIRONMENTAL

MASKAM WATER

Notes for comparing the systems

- All data was obtained from quotes or brochures of different manufacturers.
- Operational cost on all systems have been escalated by 5,5% p.a.
- All prices in the comparisons were actual prices at the time of quoting and may differ from current pricing for both systems.
- Detailed calculations are available for verification with all case studies.

CLARUS ENVIRONMENTAL

MASKAM WATER

Cost comparison between wastewater treatment plants.

Fusion 2 x ZF2400 - 18kl per day		Wastewater Treatement Plant "A" - 20kl per day
Capital Cost		
R 1 028 477,89		R 872 300,00
R -		R 325 000,00
R 1 028 477,89		R 1 197 300,00
Operational Cost Year 1		
R 27 154,20		R 158 273,00
Operational cost over 20 years		
R 946 821,28		R 5 363 392,54
Total Cost of Owership (CAPEX + OPEX)		
R 1 975 299,17		R 6 560 692,54

- "Plant A" had additional cost after year 3, adding to 20-year total cost.

Case study 1:

Clarus Fusion is the cheapest wastewater treatment plant you can buy!

The amount of R325 000,00 is the civils cost, not included in the quotation and only mentioned as "work done by others"

CLARUS ENVIRONMENTAL

MASKAM WATER

Cost comparison between wastewater treatment plants.

Fusion 3 x ZF4000 - 45kl per day		Wastewater Treatement Plant "B" - 40kl per day
Capital Cost		
P 1 462 524,00		P 873 000,00
Operational Cost Year 1		
P 71 068,59		P 219 956,08
Operational cost over 20 years		
P 2 478 042,20		P 6 981 511,76
Total Cost of Owership (CAPEX + OPEX)		
P 3 940 566,20		P 7 854 511,76

Case study 2:

Clarus Fusion is the cheapest wastewater treatment plant you can buy!

(Pricing in Botswana Pula)

* All data was obtained from quotes or brochures of different manufacturers.

CLARUS ENVIRONMENTAL

MASKAM WATER

Cost comparison between wastewater treatment plants.

Fusion 8 x ZF4000 - 120kl per day		Wastewater Treatement Plant "C" - 120kl per day
Capital Cost		
R 3 407 000,00		R 1 255 000,00
Operational Cost Year 1		
R 57 093,76		R 155 580,00
Operational cost over 20 years		
R 1 990 763,38		R 4 736 826,13
Total Cost of Owership (CAPEX + OPEX)		
R 5 397 763,38		R 5 991 826,13

* Detailed calculations are available for verification with all case studies.

Case study 3:

Clarus Fusion is the cheapest wastewater treatment plant you can buy!

CLARUS ENVIRONMENTAL

MASKAM WATER

Cost comparison.

Fusion 1 x ZF4000 - 15kl per day		Conservancy tank and honey sucker, pumping 15kl per day
Capital Cost		
R 654 016,96		R 75 000,00
Operational Cost Year 1		
R 17 029,12		R 1 642 500,00
Operational cost over 20 years		
R 593 776,77		R 56 583 225,55
Total Cost of Owership (CAPEX + OPEX)		
R 1 247 793,73		R56 658 225,55

Case study 4:

Clarus Fusion is by far cheaper compared to the cost of owning a conservancy tank!

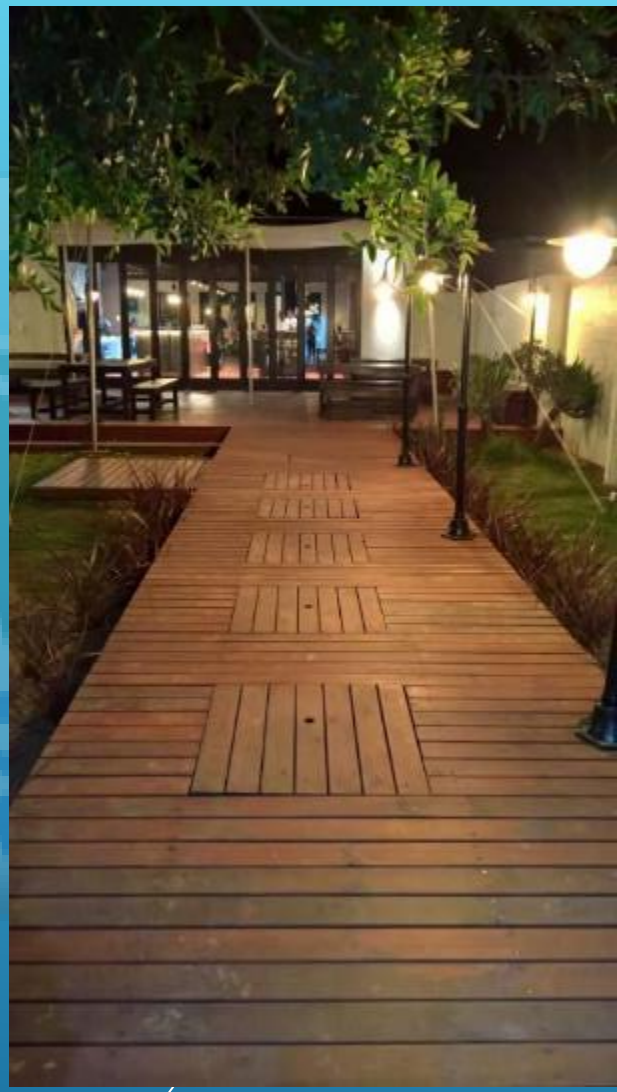
* Cost of honey sucker in the town of Stellenbosch. This will vary from town to town.

CLARUS ENVIRONMENTAL

MASKAM WATER

Other savings….

- Being underground Fusion does not take up space. It can be installed in public open spaces, under walkways, etc.
- No offensive odour, can thus be installed close to buildings (saving on pipe runs)
- No fencing off required
- Single phase power supply
- Can run off solar



CLARUS ENVIRONMENTAL

MASKAM WATER

Are you penny wise?

With the worldwide economic lockdown due to Covid-19 many a company and household has come to terms with the cash flow issue created due to high operational expenses at times of low or no income.

The Clarus Fusion may cost a little more to buy, but it saves you mega bucks in the long run. The initial cost is an investment in world-class technology.

The pain of high operational cost and maintenance will remain with you long after the hype of paying less for a cheaper wastewater treatment plant has gone.

CLARUS ENVIRONMENTAL

MASKAM WATER

For more information:

www.maskamwater.com

086 12 WATER

info@maskam.co.za