aqua minerals

Annual Report 2018 AquaMinerals

Contents

What are *you* doing?

'Connection' was the theme of our annual report last year. Connection is in our genes and we actively promote it. In close connection with the drinking water companies, Water Authorities, research institutes, service providers and clients, we have achieved great results over the last few years. The transition to a sustainable and circular economy calls for collective responsibility. But how do you achieve collective responsibility? After all, every collective is made up of unique individuals.

Despite our firm belief in the power of the collective, we also see the individuals who make the difference in bringing about real breakthroughs. People who know how to set innovations in motion, but also people who successfully keep the new raw material chains operating effectively – day in, day out. That's why we're focusing this year on the question: What are *you* doing?

What are **YOU** doing? Nobody can deny that a better environment begins with oneself. You can, as an individual, worry a lot about global environmental problems, but they are pretty much beyond your circle of influence. So, just begin with where you do have an influence: with what you're doing and, most of all, with what you're not doing. And there is another reason to begin with oneself. Because if society, that is, all of us, succeed in meeting challenges like the resource scarcity problem – bottom up – it will prevent the implementation of annoying and usually poorly-accepted top-down measures, such as taxation initiatives or prohibitions.

People who don't simply wait and see, but who break down entrenched habits. People who make a difference.

What are you **DOING**? For many of us, the complex story behind resource scarcity is simply too abstract and difficult to comprehend. The Norwegian psychologist and economist, Per Espen Stoknes, points out that conveying this not very uplifting story does not incite the collective to take action. In fact, it turns people off. It is actually individual people, taking small, concrete steps, who can get the larger collective whole to move. People who don't simply wait and see, but who break down entrenched habits. People who make a difference. Like the sixteen-year-old Swede, Greta Thunberg, who last year became the icon of climate protest, and got people all over the world to start thinking. She showed that things can be done: she lowered the threshold for taking action.

WHAT are you doing? This is a question one hears all the time: 'But *what* can I do about it?' It's a fair question of course. It is not always easy for you, as an individual, to get a sense of the impact the choices you make will have on the environment. In our daily lives we make choices all the time, without doing any prior complex life-cycle or CO_2-footprint analyses. But asking yourself the question is itself a good start. No complex calculations are needed to know that strawberries in the winter and cosmetics containing microplastics don't really contribute to a healthy and better environment. It's simply a matter of common sense.

Let us then, as individuals, make the right, sustainable choices, and in this way push the collective in the right direction.

Olaf van der Kolk
Managing Director

aqua minerals

This is who we are

AquaMinerals looks for destinations for the material streams that are generated by water treatment processes. Once these are identified, we set up suitable chains, which we then operate and/or support. Originally, our organisation was established for all of the Dutch drinking water companies. Then, in 2016, the Belgian De Watergroep water company joined us. Since then, we have also started acting for two Dutch Water Authorities.

We began operating in 1995 with the aim of solving the waste problem, but it has been a long time since we have considered residuals to be waste, let alone a problem. Today, most residual streams find functional applications, indeed a number of materials even generate financial returns. So we have made great strides, both financially but also in terms of sustainability. Our ultimate ambition is to operate in a circular manner.

We're succeeding more and more in reusing the materials in the same processes that produced them, or to supply them to fully circular chains. We do not work on this alone. We frequently brainstorm with our participants, research institutes, clients and service providers, not only in research and development initiatives, but also in making our daily activities run as sustainably and efficiently as possible.

Staff

Number of staff members 10

Age 26–35	2
Age 36–45	4
Age 46–55	2
Age 56–65	2

University (WO+)	3
Higher Vocational Education (HBO)	6
Vocational Education (MBO)	1

Our core values

Joint pursuit of shared interest

Social entrepreneurship

Innovation

Reliability

For and in the name of our participants, we:

- ✓ direct the chain
- ✓ procure logistical services
- ✓ sell the residuals and raw materials
- ✓ innovate and valorise through joint research with participants, clients and knowledge institutes
- ✓ carry out quality management
- ✓ arrange and maintain the required certificates and declarations
- ✓ monitor, lobby and advise in the areas of policy, and legal and regulatory frameworks
- ✓ provide transparency in financial and product flows

Our participants

At the end of 2018, AquaMinerals had thirteen shareholders, which are shown below. New shares were issued upon the accession of the Water Authorities. We have 'WS' shares (Water Authorities) and 'DWB' shares (drinking water companies), so that specific decisions, proposed by the SB, can be made by the shareholders concerned.

Organisation	Shares	Shareholding	Interest
Vitens	DWB	2,808	23.9%
Brabant Water	DWB	1,968	16.7%
Evides	DWB	1,242	10.6%
De Watergroep	DWB	1,028	8.7%
PWN	DWB	802	6.8%
WML	DWB	614	5.2%
Dunea	DWB	574	4.9%
Waternet (DWB)	DWB	527	4.5%
WB Groningen	DWB	354	3.0%
Oasen	DWB	275	2.3%
WMD	DWB	252	2.1%
	sub-total	*10,444*	*88.7%*
Waternet (WS)*	WS	773	6.6%
Aa and Maas**	WS	546	11.2%
	sub-total	*1,319*	*4.6%*
	total	***11,763***	***99.9%#***

* acceded on 1/1/2018 ** acceded on 1/11/2018 # not 100% because of rounding

Portrait of a chain
Ferrous sand in flower bulb cultivation

From research to application, each link in the chain adds value. The chains are always different. They involve different materials, research projects, partners, and legal and regulatory frameworks. But also, and above all, they present different challenges. But what does a chain actually look like?
We're happy to answer this by portraying one of our most recent applications: ferrous-sand lined drains in flower bulb cultivation.
The flower bulb sector produces a lovely product – our national pride! – while also making an important contribution to employment and innovation in our agriculture and horticulture. But unfortunately, it also produces emissions of plant protection products and nutrients (nitrogen and phosphorus) which end up in surface water. This discharge has to be contained as a contribution to achieving the European objectives for improved surface water quality.

It is well known that ferrous sand has a phosphorus-binding property. This idea was at the origin of a new innovation: lining the drainage systems in the bulb fields with ferrous sand, so that the phosphorus is trapped before it ends up in the surface water. **In the following pages, those involved talk about their role in the chain.**

AquaMinerals is the spider at the centre of the web that brought the different links together in the initiation phase, and that looks after the daily organisation of the chain, thus making it possible for the idea to flourish.

Highlights 2018

Growth and records on all fronts

- We disposed of the highest tonnage ever: 247,800 tonnes, which is 1,150 tonnes more than in 2017.
- The sale of materials with a positive economic value rose from € 2,666,000 in 2017 to € 3,002,000 in 2018.
- Operationals costs were more than € 1 million higher than in 2017. This is mainly a reflection of the fact that we carry out more activities, such as dredging and dewatering, at the participants' production sites.
- The earnings increased to € 8.7 million, especially due to 1) increased sales value, 2) increased services to participants and third parties, and 3) the passed-on supply chain costs.

Key Figures

	2018	2017	2016	2015
Results				
Earnings	€ 8,670,780	€ 7,216,400	€ 5,105,800	€ 4,989,100
Non-shareholder turnover in %	7.2	4.0	4.1	2.9
Total operational costs	€ 5,588,800	€ 4,563,500	€ 3,245,100	€ 3,290,300
Gross margin in % of turnover	36	37	36	34
Net operating result	€ 203,800	€ 74,800	€ 1,200	€ 18,200
Net shareholder expenses per tonne [1]	€ 15.63	€ 12.86	€ 11.86	€ 12.90
Assets				
Balance sheet total	€ 3,554,400	€ 2,864,400	€ 2,431,100	€ 1,822,700
Shareholders' equity	€ 1,117,300	€ 847,400	€ 787,500	€ 786,600
Liquidity (quick ratio)	1.4	1.4	1.5	1.7
Materials figures				
Supply in tonnes	247,800	246,650	208,500	204,109
Recycle percentage	87	83	87	81
Transport kilometres per residual tonne	2.9	2.8	3.1	2.7
Personnel				
Number of employees FTE at report-year end	8.6	8.5	7.7	7.2
Absenteeism in % [2]	5.4	1.4	1.8	1.0
Average net sales value per FTE	€ 243,200	€ 239,100	€ 178,200	€ 173,600

[1] Includes net operating result. [2] For 2018, includes long-term sick leave and excludes maternity leave.

Two Water Authorities join AquaMinerals

In 2018 we welcomed two Water Authorities as new participants: on 1 January, the Aa and Maas Water Authority, and on 1 November, Waternet, representing the Amstel, Gooi and Vecht Water Authority. By joining AquaMinerals, the Water Authorities intend to accelerate the valorisation of their recovered materials. The Water Authorities can be assured that the development and operation of new chains is in good hands with us. Moreover, our collective model offers scale and other benefits, both in the procurement of services and in the sale of the materials. These accessions fit in with AquaMinerals' ambition of strengthening the collaboration between drinking water companies and Water Authorities in the area of material streams.

CREW: joint quest for circular chains

The Circular REsiduals in the Water Chain (CREW) working group organised a number of meetings for drinking water companies, Water Authorities and other stakeholders in the water chain in 2018. The goal was to generate ideas for new, circular chains. The turnout was great, and the ideas exceeded all expectations, both in terms of their number and of their creativity. We are currently developing several interesting ideas into project proposals or incorporating them into our regular work (see also page 22). Other ideas that we found promising, but didn't belong in our field of work, we passed on to other organisations.

Refurbishing old rules and agreements

The collaboration between AquaMinerals and the participants is laid out, among others, in the participation agreement, supply agreement, and purchasing terms and conditions. These clearly establish what we can expect from each other. There are agreements, for example, about the governance structure, rights and obligations, and the division of costs and benefits. Many of our (old) agreements now require updating. To begin with, in 2018 a new earnings model was agreed with the participants. The main change this involved was that AquaMinerals, starting in 2019, will pay out the entire sales value without any longer retaining a commission. This loss is to be compensated by a higher, fixed shareholder contribution. In net terms nothing changes, but it makes a difference for the administration department in particular. In addition, the participation agreement (from 1995) and all subsequent addenda were updated, approved by the GMS and integrated into a single document.

Partner in European projects: P-TRAP and NextGen

In 2018, two European subsidies were approved for research projects in which we, as AquaMinerals, play a role. The first project is **P-TRAP**, which is an initiative of Utrecht University. Phosphorus is simultaneously harmful and useful – a subject discussed in the interviews contained in this report. We have too much of it (in surface water for instance) and (globally) too little of it. P-TRAP is conducting extensive research into the possibilities of a combined response to these problems.
The aquafer residual generated by drinking water companies can play an important role here, because it is highly suitable in binding phosphorus in the water phase, and thereby removing it from water systems.
The second project is **NextGen**, the purpose of which is to learn from local, successful projects at different locations in Europe, and subsequently to scale them up and implement them elsewhere in the continent.

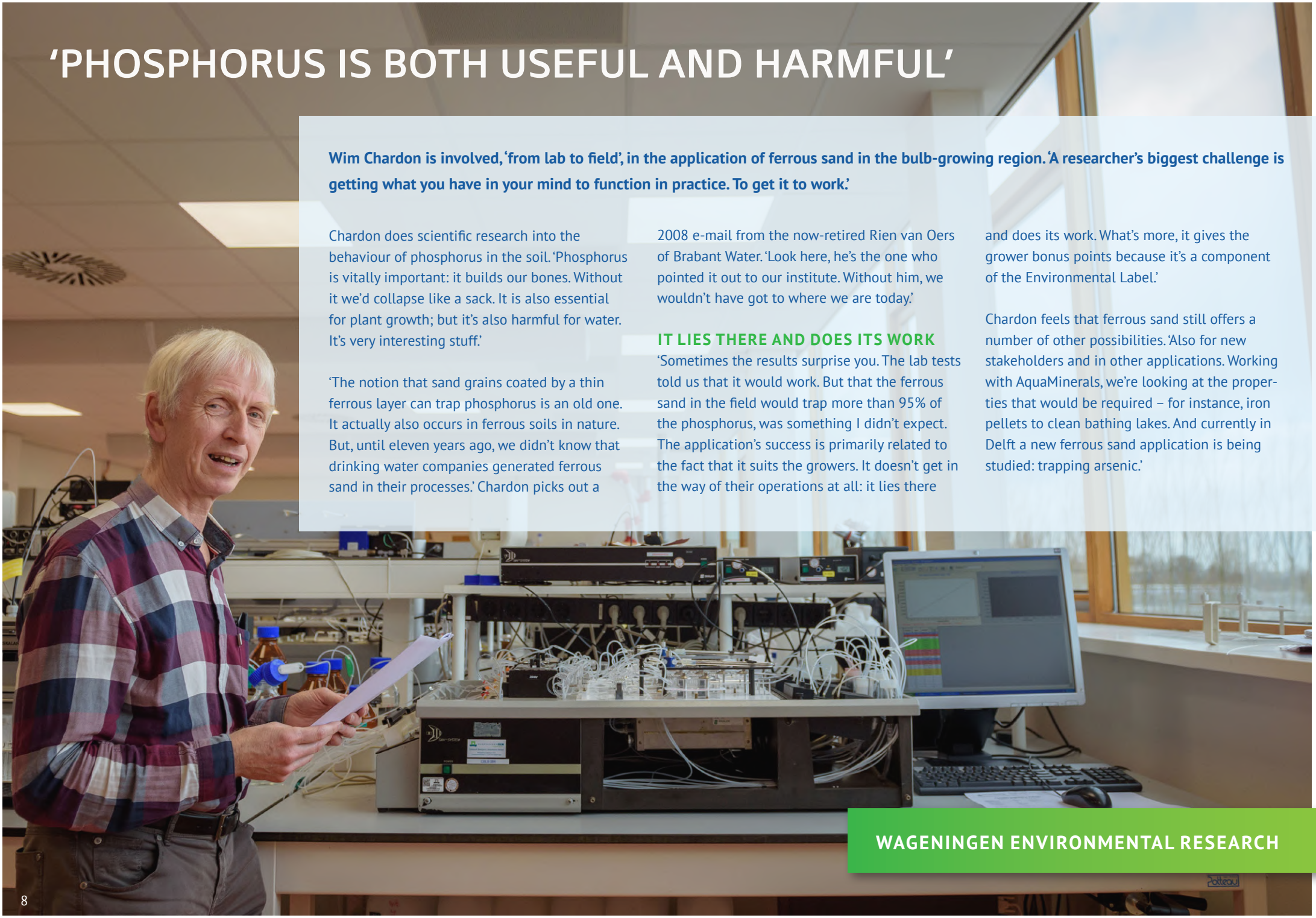
Waterschap Aa en Maas

waterschap amstel gooi en vecht

Relations day connects!

Our 'Connection' annual theme was successfully manifested in June 2018, on the occasion of the AquaMinerals Relations Day. Thanks to visits to the Aa and Maas wastewater treatment plant, the Ardagh glass factory, and the Tarkett (formerly Desso) carpet-tile manufacturer, the guests could see, with their own eyes, the origin and new destination of the products. The guests all gathered at Kasteel Maurick in Vught around midday. Besides listening to some inspiring talks and presentations, they themselves 'connected' during an enjoyable intermezzo with two jugglers.

‘PHOSPHORUS IS BOTH USEFUL AND HARMFUL’



Wim Chardon is involved, ‘from lab to field’, in the application of ferrous sand in the bulb-growing region. ‘A researcher’s biggest challenge is getting what you have in your mind to function in practice. To get it to work.’

Chardon does scientific research into the behaviour of phosphorus in the soil. ‘Phosphorus is vitally important: it builds our bones. Without it we’d collapse like a sack. It is also essential for plant growth; but it’s also harmful for water. It’s very interesting stuff.’

‘The notion that sand grains coated by a thin ferrous layer can trap phosphorus is an old one. It actually also occurs in ferrous soils in nature. But, until eleven years ago, we didn’t know that drinking water companies generated ferrous sand in their processes.’ Chardon picks out a 2008 e-mail from the now-retired Rien van Oers of Brabant Water. ‘Look here, he’s the one who pointed it out to our institute. Without him, we wouldn’t have got to where we are today.’

IT LIES THERE AND DOES ITS WORK

‘Sometimes the results surprise you. The lab tests told us that it would work. But that the ferrous sand in the field would trap more than 95% of the phosphorus, was something I didn’t expect. The application’s success is primarily related to the fact that it suits the growers. It doesn’t get in the way of their operations at all: it lies there and does its work. What’s more, it gives the grower bonus points because it’s a component of the Environmental Label.’

Chardon feels that ferrous sand still offers a number of other possibilities. ‘Also for new stakeholders and in other applications. Working with AquaMinerals, we’re looking at the properties that would be required – for instance, iron pellets to clean bathing lakes. And currently in Delft a new ferrous sand application is being studied: trapping arsenic.’

WAGENINGEN ENVIRONMENTAL RESEARCH

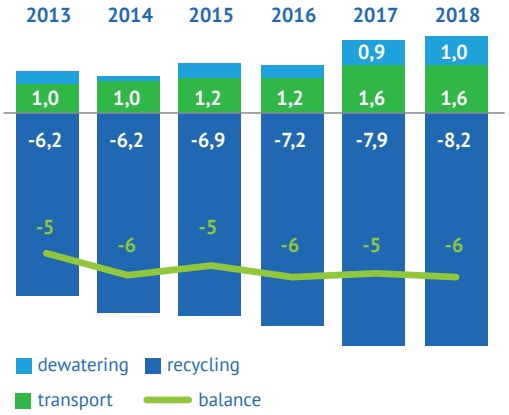
Contributing to a sustainable world

A negative CO_2 footprint – and therefore a climate benefit!

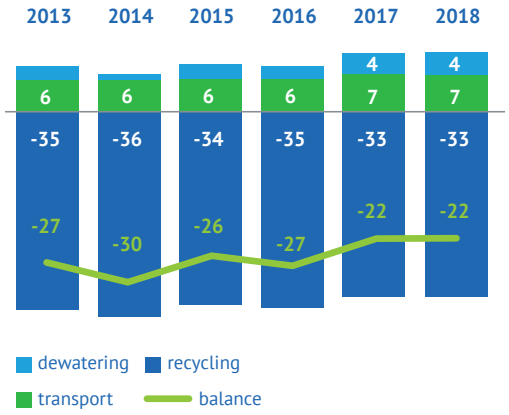
Every year we determine the footprint of the residuals chain. We do this through life-cycle analysis (LCA): from the production process up to and including application by the clients. This footprint is negative, which is a positive result. The climate benefit from recycling is therefore much bigger than the negative impact associated with transport and dewatering. In 2018 the climate benefit increased slightly compared to 2017, because more tonnes were disposed of.

Emission factors are also part of these calculations. In 2018 these factors were brought up to date, with the result that a number of chemicals, such as ferric chloride, received a smaller footprint. This means that the climate benefit resulting from the substitution of natural primary residuals by our clients dropped significantly. To make comparisons possible with past years, we have recalculated the results for the years 2013-2017 using the new emission factors.

Total footprint (M kg CO_2-e)



Footprint per tonne (kg CO_2-e)



Climate benefits for new materials from wastewater materials too

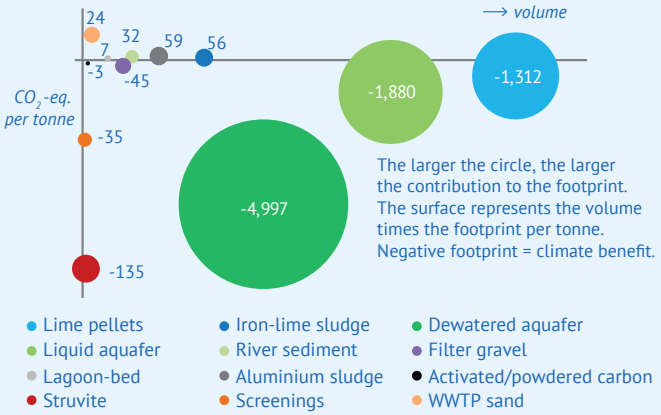
In 2018 we disposed of sand, struvite and screenings for a number of Water Authorities. You can read all about this on page 20. The sand is cleaned and used as construction material; the struvite is used to make phosphorus fertiliser, thereby replacing primary phosphorus; and the screenings are digested into biogas for electricity and heat production. Especially struvite and screenings deliver a substantial climate benefit.

Increasing number of climate-positive materials

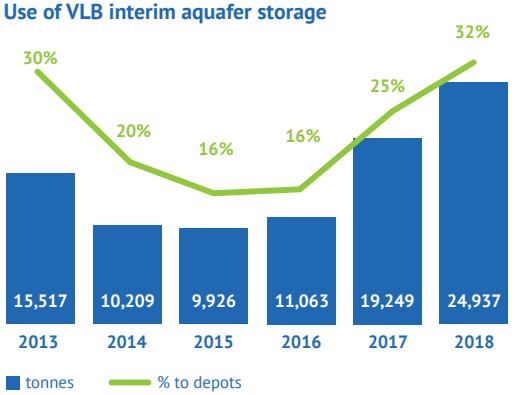
Calcite pellets, aquafer, filter sand, activated carbon, struvite and screenings all produce a net climate benefit (i.e., a negative footprint). The biggest contribution comes from dewatered aquafer which, as a sulphur-binding agent in digesters, saves a lot of ferrous chloride. However, as shown in the graphic below, this is still not the case for all materials. For example, in the case of the sand from WWTPs, river sediment and aluminium sludge, the impact of transport and processing is bigger than the savings in primary raw materials by the clients. We strive to make every residual material climate-positive.

In 2018, for the first time, filter gravel recorded a climate benefit. Obviously, the cost of processing filter gravel into ferrous sand and clean gravel consumes more energy and water than when we use it, unprocessed, in an embankment or noise barrier. But, on the other hand, this application involves saving high-value primary raw materials. The clean sand is reused as sand, while the ferrous sand replaces ferrous granules, ferrous chloride, hydrogen peroxide and other phosphorus-binding and anti-blue-green-algae agents. This last process is among the things that occur in the 'ferrous sand in flower bulb cultivation' chain described above.

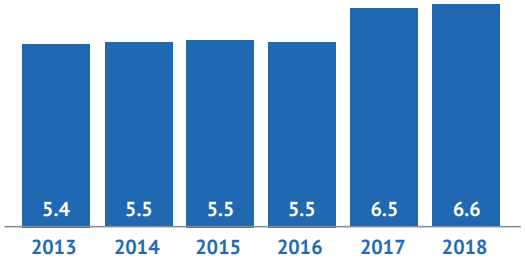
Materials' contribution to total footprint (tonne CO_2-eq)



Use of VLB interim aquafer storage



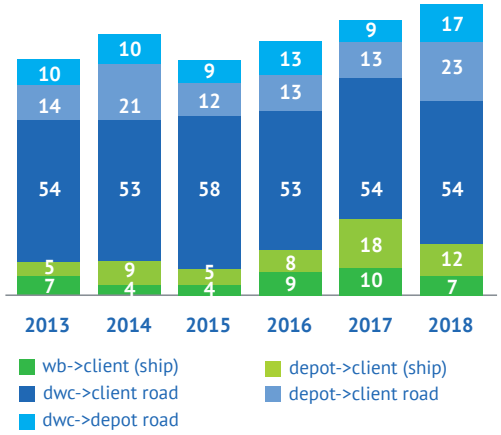
Transport climate footprint
(kg CO_2-e per residuals tonne)



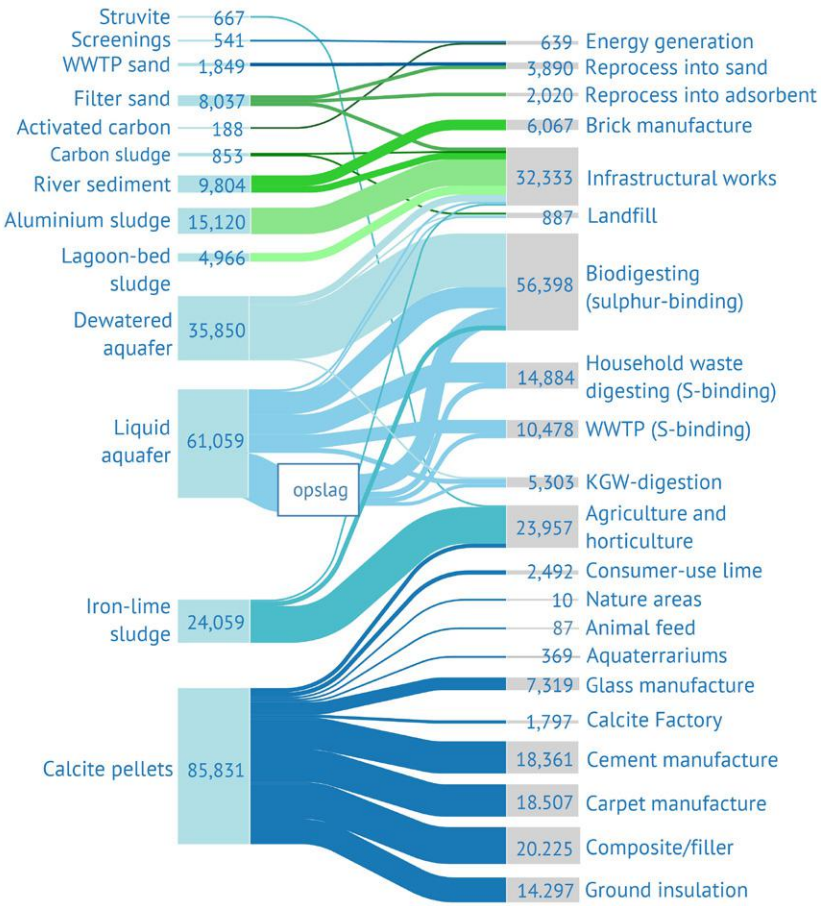
Transport footprint remains about the same

We try to limit the number of transport kilometres whenever possible. Nevertheless, transport still accounts for a large part of the climate footprint; in 2018 it remained, per residual tonne, about the same as it was in 2017. We transport as efficiently as possible, using high load levels, modern trucks, employing ships as much as possible, and disposing of the residuals as closely as possible to the production sites. Over the last few years we have tried whenever possible to transport the liquid aquafer directly from the drinking water company to the client. Unfortunately, however, since 2017, we have had to increasingly use interim storage depots, where the aquafer can be further dewatered to have it meet client specifications. We have also become more alert to overloading, so that the average load level has dropped a little.

Average transport distance (km) per tonne



In 2019 we'll be getting to work on a number of interesting new ideas for a circular water sector. Read more about this on page 23, 'Expectations for 2019'.



Material streams in all sorts of applications
This Sankey diagram shows where the different material streams are applied (in tonnes). The width of the line indicates the volume of the relevant stream.

‘WATER AS BY-PRODUCT’

With this phrase Helmuth Lenting puts his colleagues on edge, when it comes to Vitens’s ambition to operate in a circular manner. ‘They don’t think it’s much fun of course, but I do get their attention.’

Helmuth Lenting was responsible for process management at a number of production sites, when Vitens launched a separate cluster for the residual streams. Lenting was asked to take care of the coordination. ‘At first, it didn’t seem to be that interesting, but I was wrong. After five water companies were merged, we ended up having about 60,000 tonnes of residuals on our hands: that was something we could do something with. We set up a valorisation team with a number of influential and energetic people, and we very quickly achieved some great results.’

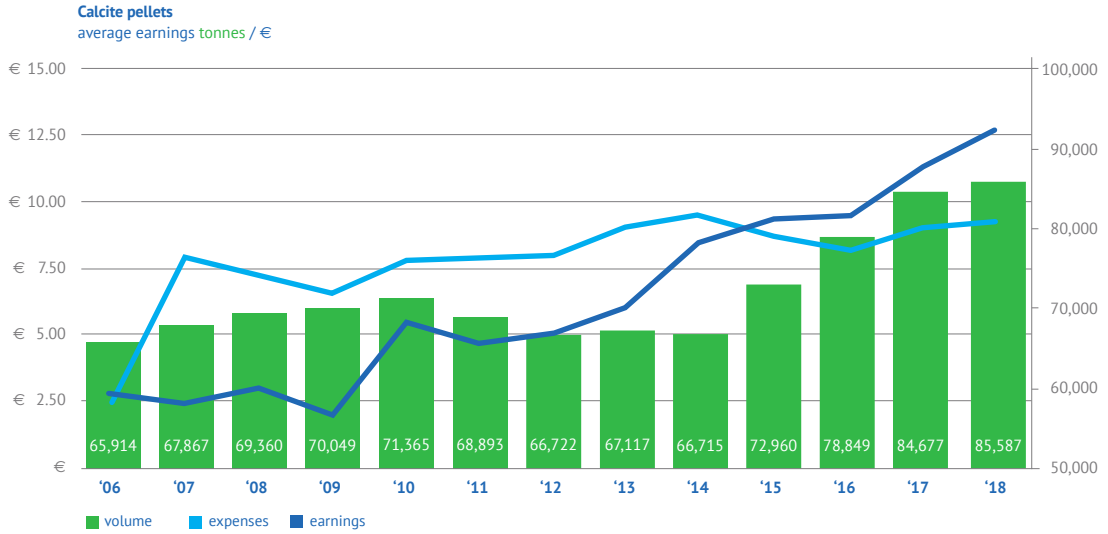
A SEPARATE RESIDUAL STREAM

How the filter sand accretes on iron and is then released, is a technical story. Lenting explains: ‘The raw oxygen-free water is aerated for the sand filter. In this process, the iron reacts with the oxygen producing iron oxides. A small portion of these iron oxides attach to the filter gravel thus accumulating on it. The iron-coated sand grains then become available in three ways: when flushed out during backwashing, when manually skimmed off (whenever the filter medium is too heavy to be flushed out), but also when the sand filter is completely replaced. Sometimes the filter medium is ‘exhausted’ because of the accretion, and the entire sandbed needs to be replaced. Although the demand for ferrous sand is growing, there are therefore no possibilities of producing more of it. This is why it remains one of our smaller streams.’

‘We transfer the materials to AquaMinerals quickly and with complete satisfaction; we see them as an agent who frees us of the burden of transport, permits, analyses and so on. This is a necessary collaboration if we are to achieve our big ambitions: to excel as a circular enterprise and to reuse 100% of our residuals in high-value applications. Our calcite pellets are used in poultry feed and glass, our humic acid is found in soil improvement products, and we reuse our own calcite in areas where the water is too soft. Our goal is to return everything back to the chain.’

Calcite pellets

In 2018 our shareholders supplied a total of 85,587 tonnes of calcite pellets. The water softening process generates lime in the form of pellets ($CaCO_3$), which can be used in multiple ways in various sustainable applications. Thanks to new application possibilities, we managed to increase turnover by 13% while expenses only grew by 3%.



The Calcite Factory

The Calcite Factory in Amsterdam, an initiative of AquaMinerals and Waternet, is operated by the British company Advanced Minerals. The factory dries, grinds, sieves and/or sterilises the calcite pellets from the softening reactors. The pure, sand-free pellets can then be used in various sectors, but also as new seeding material in the water softening process – that is, as a circular application in drinking water production. The latter is already taking place at three drinking water companies: Waternet, De Watergroep and Waterleidingmaatschappij Limburg (WML). Moreover, in 2018 lots of work was put into special processing of the pellets for other sectors. At the moment the final tests are being run for two clients interested in the entire volume.

At the end of 2017, we expected that the seeding material would soon be granted Kiwa Water Mark certification. An internal/external audit showed that the process satisfied the requirements. The certification has however not yet gone through because circular calcite is a new material in drinking water production, so that a number of committees still have to examine the matter.

This will happen in the first half of 2019, so we expect that the material will be certified and granted the Kiwa Water Mark in June.

Pellets to order

The calcite volumes are used in a wide variety of applications in different industries. Each client has its own set of requirements. It is a challenge to satisfy all these specific requirements, which include colour, size, chemical parameters, certification and seed-material type. In 2018 we attracted several new clients, which meant more fine new products.

NAÏF, from soft water to soft skin

A special new collaboration on a lovely product! Together with the cosmetics company Naïf, we developed a face scrub using ground calcite as a raw material – the calcite is produced by The Calcite Factory. This application confirms the high quality of the calcite, since the standards of the cosmetics branch are of course particularly high. And we have to thank the great effort made by the water chain partners for this quality. But there's more. As the water sector, we would like to see the many microplastics in cosmetics banned as soon as possible. Together with Naïf, which incidentally stopped using microplastics a long time ago, we have shown that there is a sustainable and completely harmless alternative.

Pecking stones for greater chicken wellbeing

We have worked with our participants for a long time on applications in the feed sector. In this context, together with Ca Minerals, we have developed a surprising innovation for poultry farming: pecking stones as a distraction for the chickens. As a result of an amendment to the law to improve animal welfare, since September 2018, the beaks of laying hens can no longer be trimmed or cut. The poultry sector therefore started looking for alternatives to prevent the chickens from injuring each other. We developed these pecking stones using lime pellets and ground pellets as a filler. The calcium is good for the animals' bones and also provides for good egg-shell formation. We selected pellets from a variety of sites in part to achieve a good mineral mix. The high magnesium content has a calming effect on the chickens.

GMP+ certification for quality and safety

The feed sector sets high quality and safety requirements for animal feed. To guarantee these, suppliers have to be certified GMP+, which stands for 'Good Manufacturing Practices'. This standard concerns the composition and manufacture of a product, from A to Z, including stipulations regarding hygiene and traceability. The 'plus' refers to the additional HACCP principles: a food safety hazard control system and thus a good complement to GMP. The Vitens drinking water company has received this certification for the humic acids and calcite pellets from a number of sites.
In 2018, the Limburg water company also received GMP+ certification; so now the very white and pure pellets from the IJzeren Kuilen production site can also be used in animal feed.

Transport by ship

In 2018 a total of 9,659 tonnes, 11% of the total calcite pellet volume, was transported by ship. This is a logistical choice and, for larger players, often the best solution. It also involves lower CO_2 emissions per tonne. Seven shipments of calcite pellets were delivered for ground insulation and composite applications.

Terrazzo floor

In the spring of 2018, the Groningen water company opened a multi-functional central warehouse at the Martenshoek industrial site in Hoogezand. The old Parker Hannifin building, following a radical refurbishment, was made energy-neutral and ready for the future. The project used as much sustainable material as possible. For example, the terrazzo floor in the entrance contains calcite pellets from the Nietap drinking water production site. Besides being sustainable it is, first and foremost, truly beautiful!

GMB has been a faithful partner to AquaMinerals from the start. Jan Pieter van de Pol, project leader of GMB's drinking water division: 'We surely know 70% of the drinking water stations inside out.'

Besides the maintenance of pumps, valves and filters, his division's tasks also include the collection of residuals – particularly iron sludge and ferrous sand. Van de Pol speaks enthusiastically about the two dry-vacuum trucks developed especially for this purpose: 'We can vacuum up the sand without using any water. A big leap in efficiency, both for the drinking water companies that don't need to use any extra water, and for the load capacity – and therefore for the environment! Our trucks run on euro 6 diesel, and we operate as sustainably as possible in every area.

As a result, we are on the top rung of the CO_2 performance ladder, something that is highly valued in the branch.'

HANDS-ON OPERATIVES

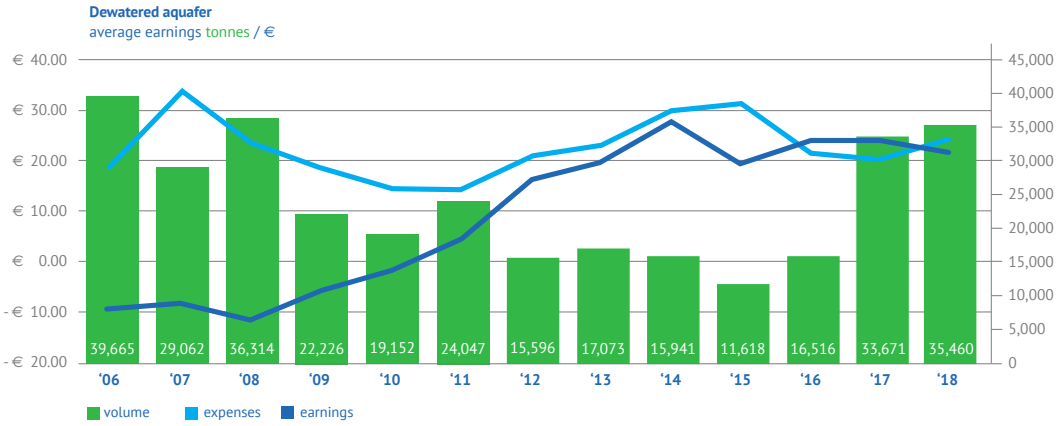
'We're actually the hands-on operatives for AquaMinerals. We know what to expect from each other, we know the history of the installations, which materials are recyclable, and how to get the best out of them. We then take care of their transport. I'm in daily contact with Tonnie Hemme at AquaMinerals, and every week we make a plan for what streams are available and where.'

Do those hands also make the difference when it comes to what ultimately happens to the iron? 'You bet! Thanks to the dry vacuuming, we can directly extract the usable material at-source. You'll find the largest grains where the sand deposits first. The grains with sufficient iron accretion are tradable for AquaMinerals.
For me, assessing the usability and being part of the thinking about where something could still be found is like a game. It's like looking for chestnuts in the old days: you're always trying to find the biggest and most beautiful one.'

'LIKE LOOKING FOR CHESTNUTS'

Dewatered aquafer

In 2018 35,460 tonnes of dewatered aquafer was supplied, 5% more than in 2017. Dewatered aquafer cannot always be delivered directly to the client. It is often first taken to depots for drying: the drier the aquafer, the better. By using depots, we can also make batch deliveries and respond to the continuous market demand.
Storage at the drinking water production sites themselves is frequently not possible, because of the lack of space, and legal and regulatory constraints. In many cases the aquafer is therefore taken up but not yet sold. Obviously, drying in depots results in moisture reduction and extra expenses. Because a number of batches in 2018 had to undergo lengthy drying – one big batch from the Andijk pumping station, for instance – the earnings grew less than did the supply.



Increasing sales in the French market

Over the last few years, large volumes of dewatered aquafer have been exported from the Netherlands to Germany, and this still remains the case. Because of the accession of De Watergroep in 2017, and the growing number of digesters in France, we are also seeing increased sales in that country. We would like to expand such sales, since, among other benefits, it reduces AquaMinerals' dependence on market developments in Germany.

Six ships with dewatered aquafer

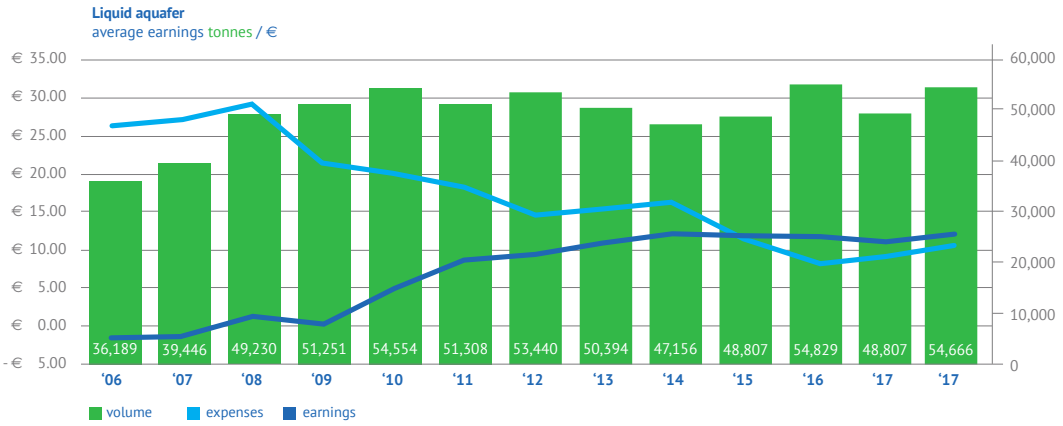
In 2018 six ships delivered a total of 7,567 tonnes of dewatered aquafer from PWN's Juliana site to biogas reactors in Germany, for use in sulphur removal. In total, 21% of the entire volume of dewatered aquafer was transported by ship.

More possibilities through processing

We have reached an agreement with our partner, Koers, for extra aquafer processing at the Bovensmilde depot. Besides the regular storage of dewatered aquafer, we can now also have the aquafer subsequently sieved at the depot. Batches that are contaminated, for instance with stones and overgrowth, were until recently used in low-value applications in infrastructural works. Thanks to this processing, the material can now be sold at a positive value.

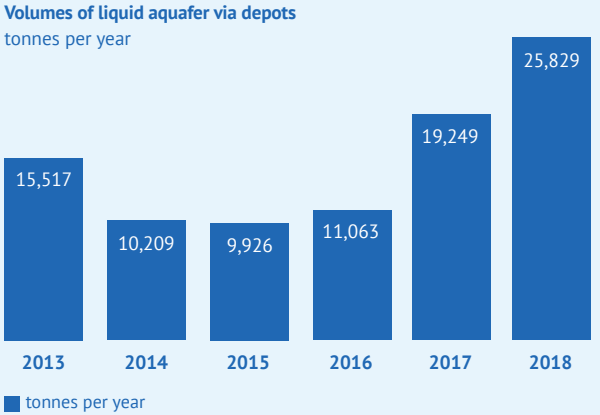
Liquid aquafer

In 2018 54,666 tonnes of liquid aquafer were supplied by our participants. The volume remained nicely stable in relation to 2017. Unfortunately, however, while turnover increased by 6%, expenses grew by 13%. This is due primarily to increased transport expenses, for example, because of the smaller loads for the Jumpstart project (see below on this page), which obviously involve higher costs than do fully loaded trucks. The returns grew less rapidly, since clients are increasingly paying on the basis of actual dry-matter content.



First dried in depot

As in the case of dewatered aquafer, liquid aquafer is not always of appropriate quality for a direct delivery to a client. Typically, it still contains too much moisture. The aquafer's dry-matter content can be increased by leaving it in place and allowing the surface water to flow off. In 2018, 32% of the aquafer was delivered via a depot, compared to 25% in 2017.



Jumpstart, green energy from manure

When manure is stored it produces methane. This harmful greenhouse gas can be converted in digesters into valuable fuel. Coöperatie Jumpstart (an initiative of Friesland Campina) helps dairy farmers to set up their own mono-digesters. They can then produce green energy on-site and also decrease greenhouse gas emissions. Liquid aquafer is used in the digesters to remove hazardous hydrogen sulphide (H_2S).

Drier aquafer, better prices

We can see in the market how important consistent quality is. Liquid aquafer is added to production processes and any fluctuations in quality make process management more difficult. In the case of some clients, we have made agreements based on the dry-matter content. Sales prices are graduated accordingly: the drier the aquafer, the higher the price.

KOERS BEHEER

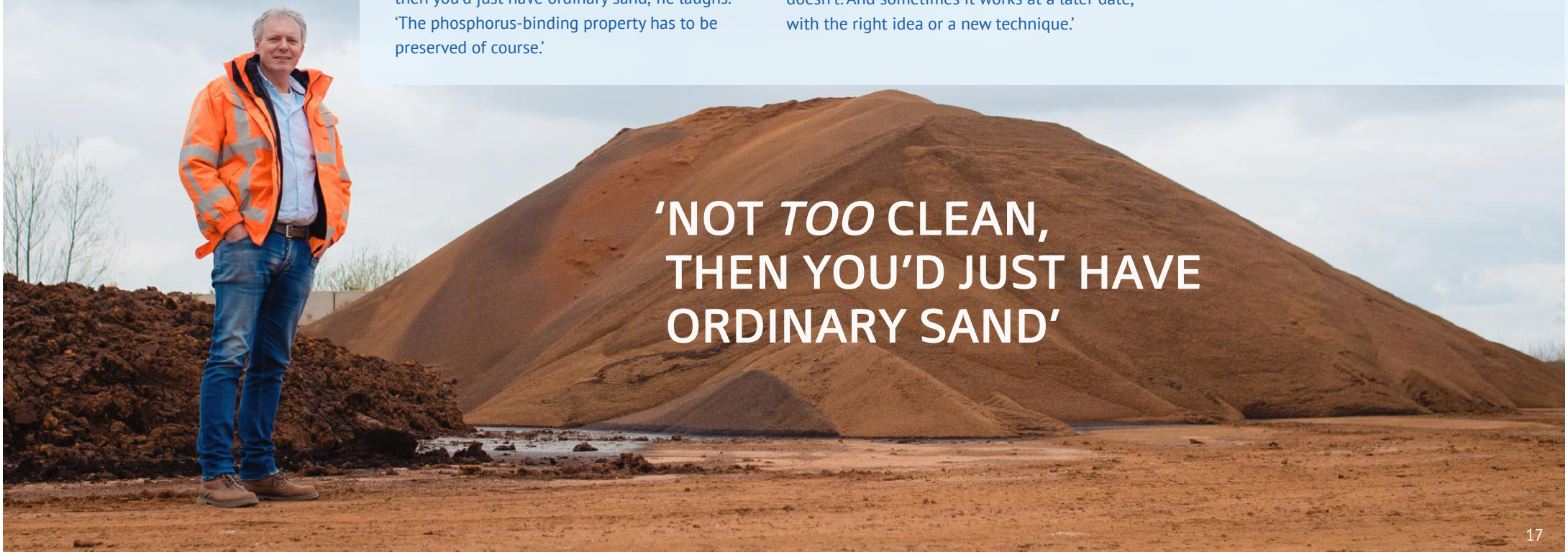
The family company, Koers, which began as a transport enterprise using tow-barges, was established 100 years ago. 'And we've recently become a Royal Warrant Holder,' adds Klaas Koers with pride. A company with a mission.

Today, it is an international trading and transport company. Klaas Koers points to the enormous depots. 'The materials arrive in loaded trucks; they're selected here and then stored by type. For AquaMinerals it is calcite pellets, dewatered and liquid aquafer, lagoon-bed material, and filter gravel or ferrous sand.' The company processes the materials so that they can find useful applications. The ferrous sand is sieved – only fractions thicker than 2 mm are usable – and then cleaned. 'The cleaning is critical, since the sand can become too clean, which means that the iron coating has been removed, and then you'd just have ordinary sand,' he laughs. 'The phosphorus-binding property has to be preserved of course.'

FROM RECYCLING TO UPCYCLING

He sees ferrous sand as a great example of Koers' mission: from recycling to upcycling. 'The sand could be recycled as sand, but because of the accretion of iron, we get an entirely new product – and without using any new raw materials or damaging the environment. On the contrary, it actually helps keep the environment cleaner. We're always on the lookout for new ideas and solutions. Sometimes we come up with something completely new for AquaMinerals, and we run the tests. Sometimes it works, sometimes it doesn't. And sometimes it works at a later date, with the right idea or a new technique.'

'Our company's objectives are based on contributing to a better climate, to circularity or to the energy transition. In everything we do and for every product. Every material finds a new destination. 'What AquaMinerals can't dispose of, we use as semi-manufactured product. For example, the minerals from lagoon-bed material go into semi-paving for walking or bike paths. All the bricks and asphalt in our country produce lots of heat stress; this environmentally-friendly alternative is water-permeable and also recyclable.'

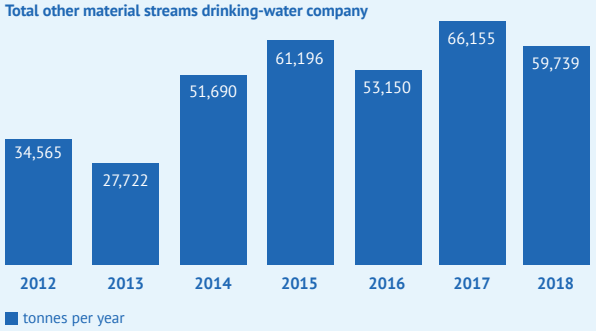


'NOT *TOO* CLEAN, THEN YOU'D JUST HAVE ORDINARY SAND'

Other material streams from drinking water companies

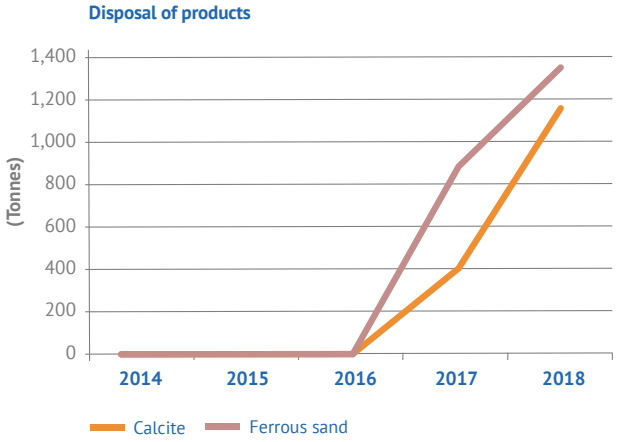
We are finding more and more high-value applications for calcite pellets and aquafer. Although it is more complicated for 'other material streams', we are making progress here also, in good coordination with the drinking water companies and clients. The materials concerned are carbon sludge, (iron) lime sludge, lagoon-bed sludge, aluminium sludge and river sediment. For filter sand and filter gravel, a great application was found last year as phosphorus-binding agents in flower bulb cultivation.

The volume of other material streams dropped slightly in 2018 compared to the previous year, and was thus in line with volumes over the last five years. The impact of the accession of the Water Authorities is not reflected here.



Sale of new products from residuals

The 'other' category also includes materials that we can sell as 'products'. These are usually products made by third-parties from the residuals, and which AquaMinerals then puts on the market. From economic and sustainability perspectives, these are in fact very valuable streams, in contrast with streams that are used in infrastructural works for instance. In 2018 the volume of these products rose considerably in response to greater demand. The products concerned are the calcite that is processed in The Calcite Factory, and the processed ferrous sand used in the flower bulb sector.



Thickening aluminium sludge

Various attempts have been made over the last few years to cut the transport and processing expenses for aluminium sludge. Commissioned by the Groningen water company, AquaMinerals succeeded in further thickening the sludge before it is transported. This resulted in a cost-saving for the company and the process will be continued in 2019. De Watergroep examined the possibilities of using the aluminium sludge in nature development projects in the Netherlands. Unfortunately, because of changing Dutch policy on the import and application of sludge from abroad, this initiative has not yet met with success. We are now studying the possibilities of making a construction material out of De Watergroep's aluminium sludge.

Higher expenses from pressure on low-value processing

The disposal expenses for other material streams continued to increase, and even exceeded the budgeted amounts. Because the government stimulates high-value recycling, the pressure is growing on low-value processing. This leads to price increases, for example, for applications in infrastructural works, upon which we (still) depend for these types of streams.

Filter gravel

Today's the day, then. On an unexpectedly sun-baked February day, the ferrous sand is going into the ground. Where a sea of flowers will soon arise, a chain trencher is digging trenches in the still bare fields in Vogelenzang.

Herman van der Geest, director and one of the 'gebroeders' or 'brothers', explains: 'Coating the drains is not new. In dune sand it's not needed, but in clay or black soils we often use shells; after all, we have enough of them here. The rough material increases the buffer, so that the drains remain clean for longer. This applies to ferrous sand too, but this sand also traps the phosphorus. The most practical approach is to apply the sand in a completely new drainage system, as we're doing here. But if you have a system already installed that still works well, then you can also apply the ferrous sand against the bank or in a basin into which the water flows. When the sand becomes saturated with phosphorus, you can easily just scoop it out.'

PICK THE PHOSPHORUS OFF

'The best would be if you could at a given point pick the phosphorus off the ferrous sand and then reuse it as fertiliser. Because the phosphorus is clearly a problem for the water quality, but it's really important for bulb growth. I expect that this will be possible within ten years. So, in that sense, this is a temporary solution.'

Van der Geest was asked early on in the process to take part in the thinking. 'We are not the inventors or the biochemists; just call us the practical thinkers. This is important, because an idea can be as great as you like, but if it is not implementable or affordable, then it won't get off the ground. It's interesting to be part of it: you always hear and see more than in other projects. And it's good for the environment as well. But I don't want to be pompous about it, because it's also just work. Though very satisfying work!'

'JUST CALL US THE PRACTICAL THINKERS'

Material streams from Water Authorities

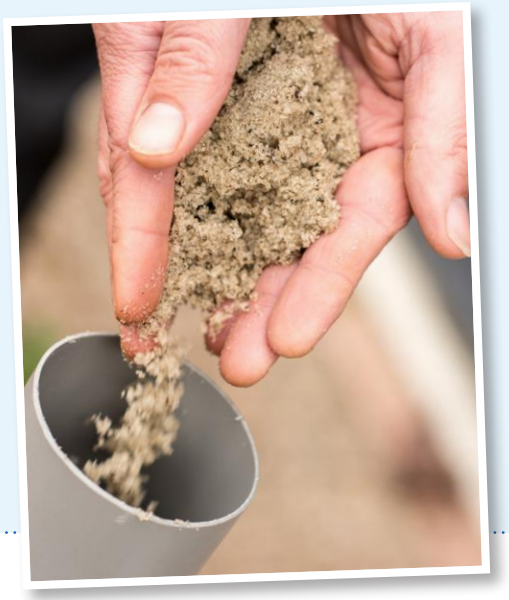
Last year two Water Authorities joined us as shareholders: Aa and Maas, and Amstel, Gooi and Vecht (AGV). This introduced new material streams to our portfolio – for instance, sand, finescreen screenings, fat, screenings and struvite. These streams are generated regularly by wastewater treatment processes, but the Water Authorities can also turn to us for the disposal of incidental streams. For example, we disposed of AGV's sludge from its dephosphorisation process at Muiderberg; we will do this again in 2019.

In 2018 we disposed of almost 5,000 tonnes of material streams for our shareholders in the wastewater sector.

Other residuals (tonnes)	2012	2013	2014	2015	2016	2017	2018
Struvite	0	0	0	232	80	171	339
Sand	0	0	0	0	0	0	426
Screenings	0	0	0	0	0	0	451
Dephosphorisation sludge	0	0	0	0	0	0	3,777
Total	0	0	0	232	80	171	4,993

The Dutch Water Authorities do not consider wastewater to be waste, but see it as a source of sustainable energy, raw materials and clean water. This fits in with the societal transition to a circular economy. The Water Authorities work in this area through a network organisation: the Energy and Raw Materials Factory (EFGF). Together with the individual Water Boards, we develop projects to recover marketable materials and energy from both the water system and wastewater treatment. The EFGF named six raw materials as being topical and relevant in 2018: cellulose, biomass, bioplastics, Kaumera®, phosphorus and, lastly, the water itself (the effluent). The EFGF and AquaMinerals collaborate on a project basis. For each of these raw materials, we provided support to Water Authorities and the EFGF on a cost-plus basis in 2018. For example, a market study was done on the disposal of dried sewage sludge.

In addition, a development path was created for the 'EFGF Cellulose lead-group' to select market players for screenings (cellulose). And, lastly, a project was launched for the disposal of struvite to new market players.



Struvite from a Water Authority

Constantly more wastewater chain materials

The expectation is that we will be disposing of constantly increasing tonnages in the years to come. This is because, on the one hand, more Water Authorities will be joining us and, on the other, they will be recovering more and more materials from wastewater treatment. These streams will find destinations in a growing number of economic sectors. We are for instance researching new disposal channels for struvite and screenings, as well as attempting to optimise the disposal of sand. Furthermore, we're solving current and anticipated problems; after all, many of these streams from the municipal wastewater chain still have no (high-value) disposal channels, as do the streams from the drinking water sector. This means that we still need to overcome the inevitable obstacles, in the technical, legal and contractual areas for instance. A number of issues are the subject of programmes or research projects, while we are already solving other problems in the course of our operations.

‘THIS MAKES ME PRETTY HAPPY’

That Water Authorities can effectively make use of the waste materials from drinking water companies is an attractive notion, finds Hesper Schutte of the Van Rijnland Water Authority.

‘In 2002 we set ourselves the goal of meeting the Framework Directive’s requirements – i.e., clean and healthy water by 2027 – in three stages,’ says Schutte, who has the area-specific approach taken in bulb cultivation among her tasks. ‘The Water Authorities are responsible for making this happen. But we can’t do it alone, certainly not when it comes to reducing the amount of phosphorus in water. We remove it in our own treatment, and simultaneously tackle emissions, among others, via the sewers. But it’s harder when one is dealing with an open system, such as in agriculture and horticulture, where the materials are present in the soil, in the air and in the water. Through our intercession, the ‘European’ flower bulb sector was granted a subsidy to help growers test this innovation on their parcels. That sounds a little easier that it was,’ she laughs, ‘because it was actually preceded by a huge consultation circus.’

A STEP FURTHER

Schutte is also present at the installation in Vogelenzang. ‘A Water Authority’s assignment is clean water; but that’s a broad concept. In this case it refers to the water’s physical-chemical composition, but the ecological water quality is surely just as important. That’s why, among other things, we stimulate the installation of nature-friendly banks, which favours biodiversity. As a Water Authority, we’re always busy working on a cleaner environment and sustainability. What you see here, goes a step further. That we can effectively make use of the waste materials from the drinking water companies, vindicates the notions of ‘waste is food’ or ‘cradle-to-cradle’. This makes me pretty happy. Only a drop in the ocean perhaps, but nevertheless… Too bad that ferrous sand supplies are limited, because it would be great if this could be fully scaled up. Given the tests, I even think that it would be possible to put a stop to eutrophication in this way.’

VAN RIJNLAND WATER AUTHORITY

Expectations for 2019

Sharp rise in turnover with slight tonnage increase

Total tonnage is expected to increase slightly in 2019. This will be due, firstly, to a limited autonomous growth at the drinking water companies and, secondly, to the supplies from the new Water Authority participants. But turnover should continue to rise sharply. This reflects higher sales value of the materials, an increase in the passed-on transport expenses, and more paid services to participants and third parties.

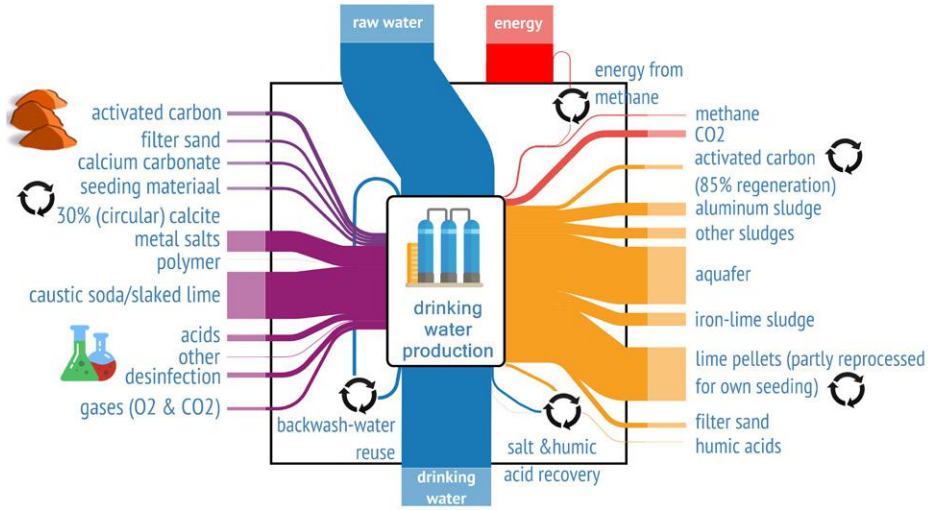
More collaboration with Water Authorities and the Energy and Raw Materials Factory

Our collaboration with the Water Authorities will develop further in 2019. As the number of recovered materials grows, so too will the volume of material streams we market for them. Moreover, we expect that one or more Water Authorities will be joining us.

AquaMinerals also supports a number of the Energy and Raw Materials Factory's working and lead-groups. We see this form of collaboration becoming stronger both in nature and scope.

Plenty of ideas for a circular water sector

During a workshop for stakeholders in the water chain (see also page 7, CREW meetings), the participants came up with no fewer than 170 ideas for a circular water sector. One of these ideas for reprocessing materials for own reuse, is to make slaked lime from calcite pellets. In 2019, we will be setting to work on this. Other great examples that are being applied in practice and/or under development are: seeding material from calcite, aquafer for sulphur-binding in wastewater treatment, flocculant from aquafer, iron pellets made from aquafer for arsenic removal in drinking water, and ferrous sand for phosphorus removal in surface water.



Focus on internal organisation

The nature and scope of AquaMinerals' activities continue to grow. New material streams, *more* material streams, higher-value products and support to individual participants are driving the organisation's growth. These challenges call for sound decisions regarding capacity and competences. In 2019 we will be looking for new staff and extending our external support structure. We will also be optimising our administrative processes, among others, by modernising the ICT infrastructure and through efficient work arrangements, both internally and externally (see also page 25).

A 'roadmap' for the Water Authorities too

In 2016 the Drinking Water Residuals Roadmap 2030 was drawn up expressing our collective ambitions: accelerating the valorisation of material streams, lowering costs and improving the environmental profile. This collective roadmap forms the basis of individual agreements with each participant. Since then, two Water Authorities have joined us and we expect more to follow. Because the materials recovered from the wastewater chain are so different in nature, we will be drawing up a specific Water Authorities Roadmap in 2019.

Supply agreement and purchasing terms and conditions update

In 2018 the participation agreement and the earnings model were updated (see also page 6). In 2019 we will also be adjusting the somewhat dated supply agreement and purchasing terms and conditions. Our participants' legal staff will be helping us in the task.

New applications and destinations

Over the last few years, working with various partners, we have researched and tested several new applications and destinations. This effort has been successful, so that we will now be able to organise and service a number of new chains. In 2019 we expect to present one or more new chains in the agro-, feed- and industry sector.

Governance, financial policy and risk management

Governance

According to the statutes of the AquaMinerals company, the most important powers are vested in the managing director and the Supervisory Board (SB). The General Meeting of Shareholders (GMS) appoints the SB members upon the recommendation of the SB; the SB appoints the managing director.

The managing director leads the company, is responsible for achieving its objectives, the strategy and associated risk profile, the financial results and societal aspects. In this regard, he is accountable to the SB in its role as supervisor, and to the GMS as the economic proprietors of the company. He provides both entities, in a timely manner, with all information they need to exercise their tasks.

AquaMinerals is not obligated to implement the principles and best practice provisions of the Dutch Corporate Governance Code. Nonetheless, the levels of transparency and responsibility established by the Code fit seamlessly with our objectives and operational management. To reflect in more detail the principles of the Governance Code, in 2011 various regulations and statutes were implemented or adjusted and, in 2012, the treasury statute was added.

Financial policy

Treasury

In accordance with the treasury statute, the final dividend distribution test has been instituted. On this basis, the management will assess whether the company, following a distribution made to the shareholders, is able to continue paying its due debts.
The positive cash flow from business operations was added to savings. In 2018 AquaMinerals had no deposits or investments, nor did it lend any funds to third parties. In 2018, a bank guarantee of € 143,240 was requested, and received, in connection with a planned export of waste materials. It is expected that in 2019 this will be released.

Liquidity risk

The quick ratio per 31 December 2018 was 1.4; which is the same as in the previous year and far above the standard target of 1.2. The solvency ratio at the reporting date was 31.4%, that is, 1.8% higher than a year earlier. The solvency ratio was therefore also above the standard target, which is 30%. The average settlement period by clients dropped from 49 days in 2017 to 46 days in 2018. The average settlement period of AquaMinerals rose by 2 days to 37 days.

Resilience

The resilience level of AquaMinerals is set at one annual salary of full-time employees, with a minimum of € 100,000. Per 31 December 2018, this amounted to € 1,004,000.
At the same time, shareholders' equity amounted to € 1,117,000.

Risk management

Risk management forms part of AquaMinerals' management model, and is discussed with fixed regularity with the SB. Since 2017, we have applied a new risk-inventory system, which gives us a better, more transparent and reproducible picture of the priority risks. In 2018 we identified the following two key risks.

Risk 1:

The organisation is unable to keep up with the (strategic) growth

The AquaMinerals organisation is experiencing strong growth in its volumes, turnover and activities. The frequently complicated product-market combinations require a lot of attention. This calls for an expansion of the organisation, but also more efficient processes. To get these changes on the right track, the Business Plan 2019-2021 provided room for greater personnel capacity. Also, in 2018, work was done on the creation of a flexible external support structure so that, in the event of staff shortfalls or demands for extra staff, temporary reinforcements can be quickly brought in. Also, the modernisation of the existing (ICT) structures will deliver considerable efficiency benefits and thus also extra capacity. Resources have been budgeted for these purposes in 2019. Lastly, the internal consultation structures have been modified to increase their effectiveness.

Risk 2:

Unexpected disparities in the quality and quantity of material streams

Every year the participants indicate which materials they will be generating in the forthcoming calendar year. Based on the indicated quality and quantity, AquaMinerals then arranges the disposal contracts. We contract the services needed to transport, and possibly also to process, the materials. Big quality of quantity disparities in the materials mean that we cannot comply with our commitments to the third parties. This can sometimes have financial consequences and, moreover, is not good for our reputation. This is why we build in a specific margin of uncertainty. We also remain in close contact with the production sites and quite regularly give 'toolbox measurements'. When there is an uncertainty about the agreed quality or quantity, we prefer to use external depots. We are also examining the possibility of monitoring the materials earlier, for instance, with on-site sensors.

Supervisory Board

The Supervisory Board (SB) oversees the policy of the managing director and provides him with advice. Its supervision mostly concerns the financial performance and developments, regulatory compliance and risk management.

"We can look back on another successful year for AquaMinerals. Key developments were the new activities for the Water Authorities, which provide for a more effective closing of the water cycle. AquaMinerals is strongly confirming the value it adds for the water sector. It also continues to improve the value of the residual products; the highlight here was the use of calcite in a cosmetic product to replace microplastics.'

Roelof Kruize, Chairperson

SB activities in 2018

The Supervisory Board met on four occasions in 2018 and addressed the following items:

- monitoring the results of the company in light of the budget and the Business Plan 2015-2018;
- recruitment of a new supervisor, following the departure – in accordance with the re-appointment schedule – of Mr P. Fransman (new appointment made in 2019);
- adoption of the Business Plan 2019-2021;
- accession to AquaMinerals of Waternet, representing the Amstel, Gooi and Vecht Water Authority;
- determination and monitoring actions related to priority risks;
- adoption of the 2017 annual figures and profit appropriation for that year;
- budget and annual plan for 2019;
- modification of the earnings model to make it a future-proof and, most of all, simpler model;
- the organisation development in relation to the growth in volume, turnover and activities;
- updating of the participation agreement.

SB composition on 31 December 2018

Name	Profile	appointed	reappointed	resignation	Position and *other functions*
Mr R. Kruize (1956), Chairperson	managerial	31 December 2014	31 December 2017	31 December 2020	General Director, Waternet Foundation*; Member SB, KWR; Chairperson/ Member SB, De Balie; Member of the Board, International Water Association; Chairperson, Aquatec Advisory Committee; Member of the Management Board, Amsterdam International Water Week; Member SB, Leading Utilities of the World; Secretary SB, World Waternet; Member of the Board, Vewin,*
Mr P. Fransman* (1962), Vice-chairperson	financial	31 December 2012	31 December 2015	31 December 2018	*Member SB, De Leeuw van Putten; Vice-chairperson/Member SB, LSR*
Mr J.E. Janssen (1969), Member	legal	1 July 2016	(possible) 1 July 2019	-	Lawyer/partner, Stek Advocaten
Ms M. Demmers (1967), Member	business and innovation	31 December 2016	(possible) 31 December 2019	-	Director-administrator, Natuur & Milieu*; Supervisor, Rli; Member SB, Drift; Manager SKAO; Member of Strategic Advisory Council, TNO SA&P*

*Mr P. Fransman (1962) resigned as supervisor per 31 December 2018, following the completion of his reappointment period.

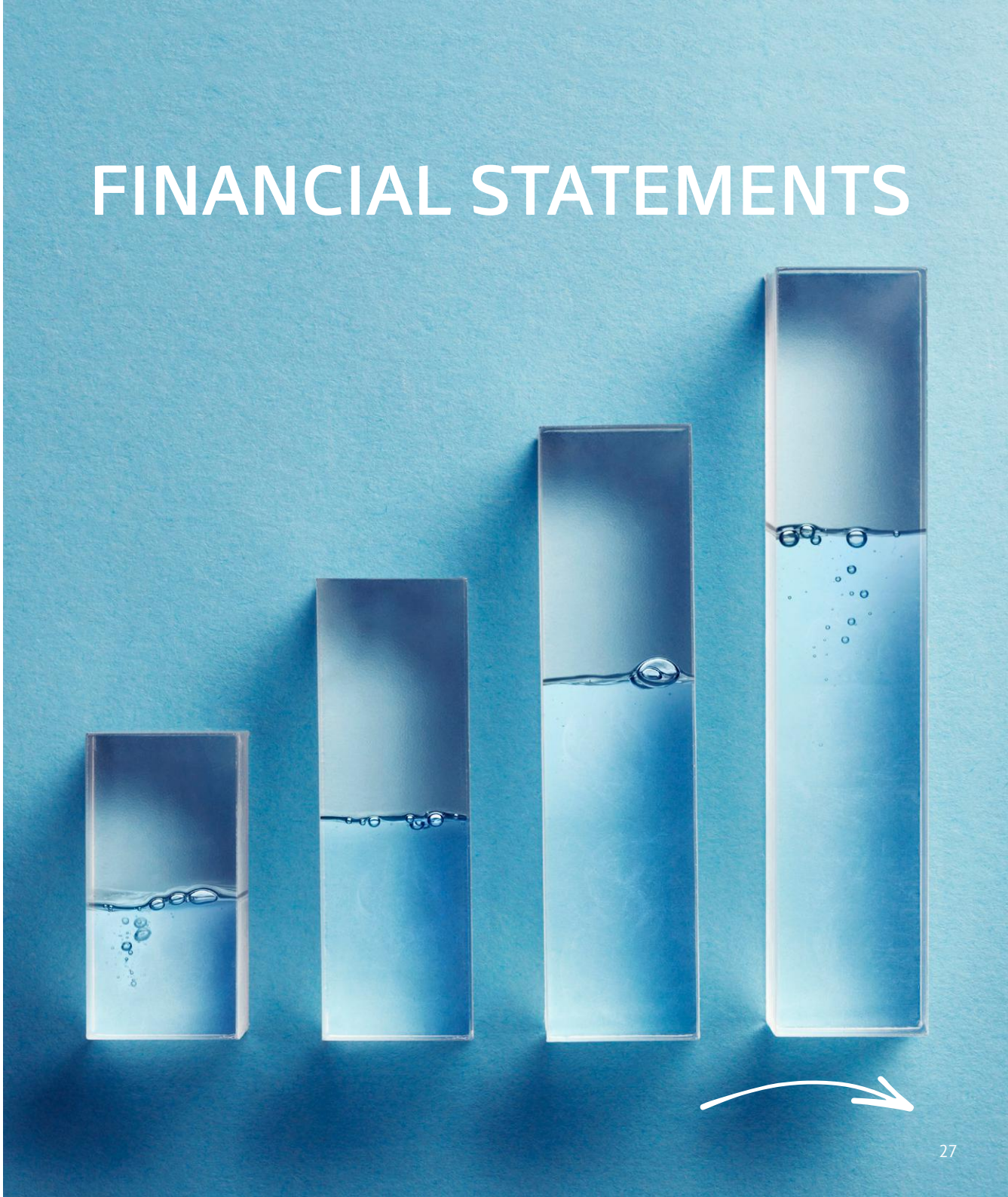
GMS activities in 2018

The General Meeting of Shareholders was held twice in 2018, and took the following decisions:

- approval of the Annual Report and financial statements for 2017;
- discharge of the managing director and his management and members of the SB for their supervision during fiscal year 2017;
- the profit appropriation for 2017;
- approval of the updated participation agreement, which includes the new and simplified earnings model;
- approval of the accession of Waternet, representing the Amstel, Gooi and Vecht Water Authority, and the issuance of new shares in the name of this new participant;
- approval of the Business Plan 2019-2021;
- approval of the annual plan and budget for 2019.

From left to right: Roelof Kruize, Peter Fransman, Jan Erik Janssen and Marjolein Demmers

FINANCIAL STATEMENTS



Explanatory notes on the Financial Statements

Principles of evaluation

General

AquaMinerals B.V. (with its registered office in Rijswijk ZH, Chamber of Commerce number 30130247) is domiciled at Nieuwegein, Groningenhaven 7, 3433 PE.
The company's most important activity is relieving the drinking water companies of the residuals generated by their production process.
The company has prepared its financial statements in accordance with the legal provisions of Title 9, Book 2 of the Dutch Civil Code.

Comparative figures

The comparasion figures are only restated for comparative purposes.

Intangible fixed assets

The intangible fixed assets are valued at acquisition price minus depreciation.
The depreciation period is five years.
A legal reserve equivalent to the capitalised costs is included.

Tangible fixed assets

The tangible fixed assets are valued at acquisition prices and depreciated straight-line on the basis of the expected operating life of the asset concerned.
The rate of depreciation applied is 20%.

Cash and cash equivalents

The cash and cash equivalents are valued at nominal value.
Unless otherwise indicated, these are freely available.

Other assets and liabilities

These are valued at nominal value.

Receivables

Receivables are stated initially at real value, including transaction expenses, and subsequently stated at the amortised cost price, less provisions for uncollectable debts.
The initially stated real value and the amortised cost price are equal to the nominal value, unless there is a question, in the initially stated value, of transaction expenses, premiums, or discounts, and other disparities between the real value and the nominal value.

Principles for the determination of the result

Earnings, expenses and interest are attributed to the period with which they are associated.
The earnings concern the passed-on disposal expenses plus the realised earnings (positive and negative) from clients and consulting services provided.
The direct disposal expenses concern outlays for extraction, transport, storage and analysis.

Pension expenses

The pension obligations towards employees fall under an industry pension fund. Payable pension contributions are incorporated into the profit and loss account in the year with which they are associated. Furthermore, an assessment is made as to whether, besides the premium, the employer has any other obligations related to the performance or insurance agreements, or to commitments to employees. In the event, a provision will be created. If the term of these obligations stretches over several years, the provision will be valued at cash value, calculated using an interest rate based on the average interest earned on high-grade corporate bonds.
Liabilities (other than premium settlements) related to the performance or insurance agreement, such as profit sharing and restitutions following a decision of the pension fund, will be included in the balance sheet only if their receipt is irrevocably established.
The coverage ratio of the pension fund (ABP), per 31 December 2018, was 97%.

The recovery plan aims to achieve a coverage ratio of 128% at the end of 2027. This will not require taking any drastic recovery measures.

Corporate tax

Taxes are calculated based on prevailing rates on the pre-tax result, according to the profit and loss account, taking into consideration the permanent differences between the fiscal profit calculation and the profit calculation according to the annual financial statements.

Balance Sheet per 31 December 2018

(after profit appropriation following recommendations)

	31-Dec-2018	31-Dec-2017
	€	€
ASSETS		
Fixed assets		
Intangible fixed assets	20,000	30,000
Tangible fixed assets	8,767	8,051
Current assets		
Receivables and accrued income	2,683,896	2,026,581
Cash and cash equivalents	841,747	799,809
	3,554,410	2,864,441
LIABILITIES		
Shareholders' equity		
Issued and paid-up capital	535,217	475,202
Share discount	11,923-	11,923-
Share premium	82,063	35,055
Legal reserves	20,000	30,000
Other reserves	491,905	319,061
	1,117,262	847,395
Current liabilities		
Current liabilities and accrued liabilities	2,437,148	2,017,046
	3,554,410	2,864,441

Explanatory notes on the Balance Sheet

	31-Dec-2018	31-Dec-2017
	€	€
ASSETS		
Fixed assets		
Intangible fixed assets		
Research and development costs		
Book value per 1 January	30,000	40,000
Plus: investments	-	-
	30,000	40,000
Minus: depreciation fiscal year	10,000	10,000
Book value per 31 December	20,000	30,000
Tangible fixed assets		
Inventory		
Book value per 1 January	8,051	7,474
Plus: investments	4,247	3,758
	12,298	11,232
Minus: depreciation fiscal year	3,531	3,181
Book value per 31 December	8,767	8,051
Total depreciation	12,773	11,227
Decommissioned assets	-	-1,985
Cumulative depreciation	12,773	9,242

	31-Dec-2018	31-Dec-2017
	€	€
Current assets		
Receivables and accrued income		
Receivables	2,574,481	2,008,248
Accrued income	109,415	18,333
	2,683,896	2,026,581
Receivables		
Nominal value	2,574,481	2,008,248

Receivables are due in less than one year.
Under the receivables position per 31-12-2018, there are receivables from other legal entities and companies that participate in the legal entity or within which the legal entity has a participation of € 1,550,000.

Accrued income		
Earnings yet to be received	15,584	-
Pre-paid contract costs	24,031	25,133
Pre-netted water companies' earnings	69,800	6,800-
	109,415	18,333

Per 31 December 2018, stocks of lime pellets and aquafer were stored in several depots.
The value is equal to the pre-calculated earnings on the stocks.

Cash and cash equivalent		
Deutsche Bank, current account	72,872	130,815
Deutsche Bank, savings account	166,535	66,535
ING payment account	97	216
ING savings account	602,243	602,243
	841,747	799,809

In 2018 a bank guarantee of € 143,240 was issued with an expiration date of 31-05-2020.

LIABILITIES	31-Dec-2018 €	31-Dec-2017 €
Shareholders' equity		
Issued and paid-up capital		
Status per 1 January (issued)	475,202	475,202
Share issue*	60,014	-
Status per 31 December (issued)	535,217	475,202

In 2014, this amount was adjusted in connection with the purchase of shares in 2003.
* In 2015, De Watergroep acquired 1028 shares in AquaMinerals B.V. for € 75,680.
In 2018, two Water Authorities acquired 1,319 shares in AquaMinerals B.V.

The authorised share capital amounts to € 910,000 divided into 20,000 shares of a nominal value of € 45.50.
Of this amount € 535,217 is paid up.

Share premium		
Status per 1 January	35,055	35,055
Change during fiscal year	47,008	-
Status per 31 December	82,063	35,055

The position per 1 January arose through the sale of:
1,242 shares in 2011, with a premium of € 4.95 per share
1,028 shares in 2015, with a premium of € 28.12 per share.

The change for 2018 arose through the sale of:
1,319 shares, with a premium of € 35.64 per share.

Share discount
This item arose through the sale of 568 shares with a discount of € 21.00 per share.

Legal reserves		
Research and development reserve		
Acquisition value	50,000	50,000
Addition to reserve	-	-
Withdrawal from reserve	30,000-	20,000-
Status per 31 December	20,000	30,000

	31-Dec-2018 €	31-Dec-2017 €
Other reserves		
Status per 1 January	319,061	249,191
Sale of own shares	-	-
Change in allocation of legal reserve R&D	10,000	10,000
Plus: profit allocation	162,844	59,870
Status per 31 December	491,905	319,061
Current liabilities		
Current liabilities and accrued liabilities		
Payables	2,018,670	1,774,823
Taxes and national insurance contributions	136,380	80,912
Other debt and accrued liabilities	282,098	161,311
	2,437,148	2,017,046

Under the payables position per 31-12-2018 there are payables to other legal entities and companies that have a participation in the legal entity of € 815,500.

Taxes and national insurance contributions		
Value added tax	48,398	25,728
Corporate tax	40,725	14,967
Pension contributions	9,871	9,242
Payroll tax and national insurance contributions	37,385	30,975
	136,380	80,912
Other debt and accrued liabilities		
Accrued expenses	37,169	53,021
Earnings yet to be settled	8,010	-
Revenues received in advance on depots	45,210	38,000
Received in advance in connection with future REACH registration	12,731	9,754
Received in advance for R&D projects	98,018	-
Holidays	23,728	16,332
Holiday pay reserve	9,689	7,221
Collective Labour Agreement obligations	47,543	36,983
	282,098	161,311

Off-balance-sheet items
AquaMinerals has signed a rental contract for its premises up until 30 June 2022, and contracts for lease cars.
Obligations for less than 1 year amount to € 92,000, for 1-5 years to € 110,600, and more than 5 years to € 0.00.

Profit and Loss Account for 2018

	2018	2017
	€	€
Earnings		
Turnover residuals	8,492,003	7,148,592
Consulting	178,778	67,844
	8,670,781	7,216,436
Shareholders' annual contribution	1,169,800	1,039,700
Total earnings	9,840,581	8,256,136
Operating expenses		
Direct disposal expenses	4,769,247	3,970,029
Acceptance expenses	819,567	593,454
Earnings distributed to shareholders	2,451,595	2,269,447
	8,040,409	6,832,930
Gross turnover result	1,800,172	1,423,206
Operating expenses		
Personnel	1,004,176	822,889
Depreciation	13,531	13,181
Cost of sales and PR	106,074	93,654
Research and consulting costs	261,574	220,722
Premises	48,137	43,313
Supervisory Board	36,000	36,000
Other operating expenses	126,884	118,928
	1,596,375	1,348,687
Total expenses	9,636,784	8,181,617
Operating result before interest	203,797	74,519
Interest income	3-	318
Pre-tax result	203,794	74,837
Corporate tax	40,950	14,967
Result	162,844	59,870

Explanatory notes on the Profit and Loss Account

	2018	2017
	€	€
Earnings		
Turnover residuals		
Settled disposal/acceptance expenses shareholders	5,179,937	4,384,588
Settled disposal/acceptance expenses non-shareholders	309,739	97,979
Earnings (post)sale residuals shareholders	2,780,034	2,540,931
Earnings (post)sale residuals non-shareholders	222,294	125,094
	8,492,003	7,148,592
Consulting		
Consulting for shareholders	84,019	-
Consulting for non-shareholders	94,759	67,844
	178,778	67,844
Total earnings	8,670,781	7,216,436
Direct disposal and acceptance expenses	5,588,814	4,563,483
Turnover of non-shareholders of AquaMinerals B.V.	626,792	290,917
Idem in percentage	**7.2%**	**4.0%**

	2018	2017
	€	€
Operating expenses		
Personnel		
Direct salary expenses	662,110	602,851
National insurance contributions	113,463	98,212
Pension contributions	86,089	78,987
Indirect salary expenses	19,678	20,211
Short-term staff	158,696	22,628
Sick-leave allowance	35,861-	-
	1,004,176	822,889

The remuneration of manager(s) and supervisors (including pension premiums) for 2018 amounted to € 177,800 (2017: € 157,000).

Staff

In 2018 there was an average of 13 staff members, 10 of whom were permanent staff and the remainder short-term.

Cost of sales		
Travel and accommodation costs	62,780	50,696
Contributions	7,717	8,324
PR	35,577	34,634
	106,074	93,654
Research and Consulting costs		
Perspective: Financial	20,660	52,292
Perspective: Client	122,963	78,850
Perspective: Internal processes	31,050	15,040
Perspective: Innovation/learning	86,901	74,540
	261,574	220,722

Other information

Statutory profit appropriation

Article 27 of the company statutes establishes the following provisions regarding the profit appropriation:

1 The profit shall be at the free disposal of the General Meeting of Shareholders. The General Meeting of Shareholders may reserve an amount from the profit established in the financial statements that it has approved.
2 The company may only make distributions to the extent that its shareholders' equity exceeds the amount of the issued and called-up part of the paid-up capital, plus the reserves to be maintained in accordance with the law.
3 Profit distribution shall only be made after the adoption of the financial statement from which it appears that such distribution is allowed.
4 Shares or certificates held by the company, or shares and certificates in which the company has right of usufruct, shall not be included in the profit appropriation calculation.
5 The General Meeting of Shareholders may decide to make interim distributions. The decision to pay an interim dividend from profits during the fiscal year in course can also be taken by management. Distributions referred to in this item may only be made if the provisions of item 2 of this article are met.
6 Unless the General Meeting of Shareholders establishes otherwise, the dividends shall be paid within 30 days after being approved.
7 The General Meeting of Shareholders may decide to pay dividends, in part or in whole, in a form other than cash.
8 A shortfall may only be settled through the reserves established by law inasmuch and to the extent that the law permits.
9 In the event that the total amount of the issued and called-up part of the capital, plus the reserves to be maintained in accordance with the law, is less than the most recently established legal minimum capital level, the company must maintain a reserve equal to the difference between the amounts.

Appropriation of 2018 result

In anticipation of the decision to be taken in this regard by the General Meeting of Shareholders, the 2018 result has been added to other reserves.
This decision, which has yet to be taken, has already been incorporated into the 2018 financial statements.

Audit Report

/mth

INDEPENDENT AUDITOR'S REPORT

To: The shareholders and supervisory board of AquaMinerals B.V.

A. Report on the audit of the financial statements 2018 included in the annual report

Our opinion

We have audited the financial statements 2018 of AquaMinerals B.V. based in Nieuwegein.

In our opinion, the accompanying financial statements give a true and fair view of the financial position of AquaMinerals B.V. as at 31 December 2018 and of its result for 2018 in accordance with Part 9 of Book 2 of the Dutch Civil Code.

The financial statements comprise:

1. the balance sheet as at 31 December 2018;
2. the profit and loss account for 2018; and
3. the notes comprising of a summary of the accounting policies and other explanatory information.

Basis for our opinion

We conducted our audit in accordance with Dutch law, including the Dutch Standards on Auditing. Our responsibilities under those standards are further described in the 'Our responsibilities for the audit of the financial statements' section of our report.

We are independent of AquaMinerals B.V. in accordance with the Verordening inzake de onafhankelijkheid van accountants bij assurance-opdrachten (ViO, Code of Ethics for Professional Accountants, a regulation with respect to independence) and other relevant independence regulations in the Netherlands. Furthermore we have complied with the Verordening gedrags- en beroepsregels accountants (VGBA, Dutch Code of Ethics).

We believe the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

B. Report on the other information included in the annual report

In addition to the financial statements and our auditor's report thereon, the annual report contains other information that consists of:

- the management report;
- other information as required by Part 9 of Book 2 of the Dutch Civil Code.

/mth

Based on the following procedures performed, we conclude that the other information:

- is consistent with the financial statements and does not contain material misstatements;
- contains the information as required by Part 9 of Book 2 of the Dutch Civil Code.

We have read the other information. Based on our knowledge and understanding obtained through our audit of the financial statements or otherwise, we have considered whether the other information contains material misstatements.

By performing these procedures, we comply with the requirements of Part 9 of Book 2 of the Dutch Civil Code and the Dutch Standard 720. The scope of the procedures performed is substantially less than the scope of those performed in our audit of the financial statements.

Management is responsible for the preparation of the management report in accordance with Part 9 of Book 2 of the Dutch Civil Code and other information as required by Part 9 of Book 2 of the Dutch Civil Code.

C. Description of responsibilities regarding the financial statements

Responsibilities of management and the supervisory board for the financial statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with Part 9 of Book 2 of the Dutch Civil Code. Furthermore, management is responsible for such internal control as management determines is necessary to enable the preparation of the financial statements that are free from material misstatement, whether due to fraud or error.

As part of the preparation of the financial statements, management is responsible for assessing the company's ability to continue as a going concern. Based on the financial reporting framework mentioned, management should prepare the financial statements using the going concern basis of accounting, unless management either intends to liquidate the company or to cease operations, or has no realistic alternative but to do so.

Management should disclose events and circumstances that may cast significant doubt on the company's ability to continue as a going concern in the financial statements.

The supervisory board is responsible for overseeing the company's financial reporting process.

Our responsibilities for the audit of the financial statements

Our objective is to plan and perform the audit engagement in a manner that allows us to obtain sufficient and appropriate audit evidence for our opinion.

Our audit has been performed with a high, but not absolute, level of assurance, which means we may not detect all material errors and fraud during our audit.

Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements. The materiality affects the nature, timing and extent of our audit procedures and the evaluation of the effect of identified misstatements on our opinion.

We have exercised professional judgement and have maintained professional scepticism throughout the audit, in accordance with Dutch Standards on Auditing, ethical requirements and independence requirements. Our audit included among others:

- identifying and assessing the risks of material misstatement of the financial statements, whether due to fraud or error, designing and performing audit procedures responsive to those risks, and obtaining audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control;
- obtaining an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control;
- evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management;
- concluding on the appropriateness of management's use of the going concern basis of accounting, and based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the company's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause a company to cease to continue as a going concern.
- evaluating the overall presentation, structure and content of the financial statements, including the disclosures; and
- evaluating whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with the supervisory board regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant findings in internal control that we identify during our audit.

We provide the supervisory board with a statement that we have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

Lelystad, 7 June 2019
mth accountants & adviseurs b.v.

Signed

drs. B.M. Tinge RA

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Colophon

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