



Annual Report 2016 AquaMinerals

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Circular, actually quite natural

Year after year, the drinking water sector has successfully recovered more and more value from its residuals. In this report for 2016 we showcase this value – in euros and in sustainability. We also walk you through the steps we're taking to close loops by means of circular applications. Something that children incidentally see as quite natural...

Sustainable or circular? Companies use both words to show that they are 'green'. But the terms aren't at all interchangeable. Sustainability is a relative concept that's difficult to measure; it means different things to different people. A number of systems have been developed to render it objective and comparable. However, the methodologies and system boundaries then became so complex that they end up producing different interpretations. As a result, 'sustainability' has lost force: it's become a victim of its own success.

For its part, circular is clearer: a raw material either is or is not circular, it either returns to the loop or it doesn't. Michael Braungart, co-author of the well-known book *Cradle to Cradle* says: 'The solution is not to make a product a little less damaging but to return it completely to the loop.' One could say that circular is the ultimate in sustainability.

Unfortunately, in many instances circular operations are not (yet!) actually sustainable because, for example, they consume too much energy in the regeneration of a material. But this is a matter of time. As these chains are further developed, they will inevitably become more efficient and sustainable. This is one of the most fascinating issues we work on at AquaMinerals.

Nothing new

Recently I gave a little talk about my work to a class of grade 6 primary school pupils – children aged 9 and 10. Full of pride, I spoke of what we had already accomplished. I showed them a number of products which contained materials from the drinking water sector. But the children asked me questions about all sorts of other things. Why did I choose this line of work? What had I studied?



They basically took in the story of the residuals and the products made from them as a matter of record. They saw it as very obvious, as nothing new. It was only then that it really hit me: circular is actually quite natural.

In fact, our ancestors were also aware of this – at least those who lived before the throwaway society. They knew no abundance of cheap raw materials and of products not worth repairing or reusing. You had your milk bottle refilled, the peel farmer came to your door, and every village had a clockmaker and furniture repairer.

Back to the past then? No, of course not. Today we have the best technology available to make the world a better and healthier place. But isn't it wonderful to look for solutions through the eyes of a child? Simply discovering, with no mind for legal constraints or other obstacles. Without judgement. The future belongs to children. Ideally in a circular society.

Olaf van der Kolk
Managing Director



This is who we are

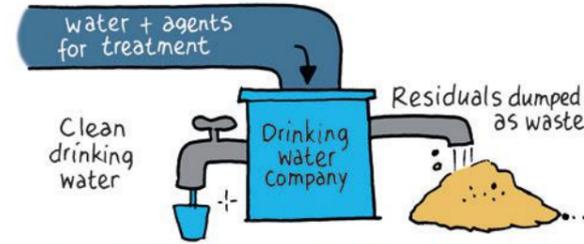
History

In 1991, in its Environmental Plan, the Dutch water branch association Vewin concluded that a clean environment was essential for the drinking water companies and that the companies themselves could contribute. Concretely, they could start disposing of their residuals in an environmentally sound fashion. This notion was well received by the entire Dutch water sector. But because the management of residuals was not part of the sector's core business, in 1995, a specialist organisation was set up to do the job: Reststoffenuie Waterleidingbedrijven.

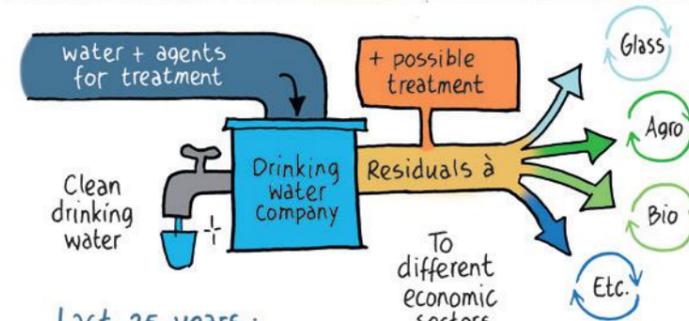
This marked the beginning of a completely different perception of residuals. Up until then, the materials just piled up all over the country. Getting rid of them was after all very costly. But by working together – for instance in research, quality management, and purchasing and sales – costs quickly came down. The chains became transparent and efforts to increase quality and supply assurance produced results. For the environment, first and foremost. But then, gradually, the new destinations found for the residuals also became more and more attractive economically. Over the last few years the applications have become steadily more valuable. On 1 July 2016, Reststoffenuie changed its name to AquaMinerals.

Today

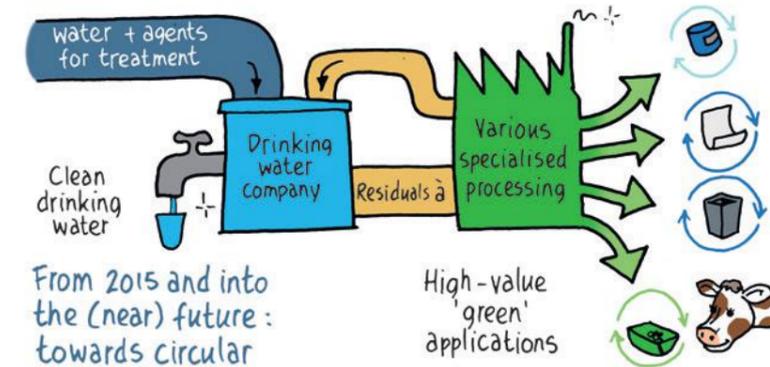
Nowadays most of the residuals have a positive sales value. Money is even being made from a growing number of them! By reusing residuals, and thereby preserving the natural sources of raw materials, we're also contributing to shrinking the water sector's environmental footprint.



Up until the 90s: residuals



Last 25 years: new destinations for residuals



From 2015 and into the (near) future: towards circular applications

This is what we do

For and in the name of our participants we:

- direct the chain;
- procure logistical services;
- sell the residuals and by-products;
- innovate and valorise through joint research with participants, clients and knowledge institutions;
- monitor, ensure and (if necessary) increase the quality of the residuals;
- 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 streams;
- provide requested and unrequested advice.

This is how we go about our work

In our daily activities and plans for the future these are our core values:

Joint pursuit of shared interest – We can only succeed together.

Social entrepreneurship – We take the interests of humans and the environment very seriously.

Innovation – We are constantly on the look-out for new applications; the possibilities are limitless.

Reliability – This is self-evident. Reliability is in our genes.



Joint pursuit of shared interest



Social entrepreneurship



Innovation



Reliability

Our participants

All ten of the Dutch water companies are shareholders in AquaMinerals. In 2015 we welcomed our first foreign participant: De Watergroep from Belgium. The size of each shareholding is based on the volume of drinking water the company produces annually.

Vitens N.V.	26.9 %
Brabant Water N.V.	18.8 %
Evides N.V.	11.9 %
De Watergroep	9.8 %
N.V. PWN Waterleidingbedrijf Noord-Holland	7.7 %
N.V. Waterleiding Maatschappij Limburg	5.9 %
Dunea N.V.	5.5 %
Waternet Foundation	5.0 %
N.V. Waterleidingbedrijf Groningen	3.4 %
Oasen N.V.	2.6 %
WMD Drinkwater B.V.	2.4 %

The total rounds out to 99.9%

AquaMinerals acts on behalf of the *collective* with regard to the purchase, sale, innovation and valorisation of residuals. However, the earnings and expenses of the residuals are settled with the *individual* participant. This means that each water company can, in practice, see its efforts at improving its quality and supply assurance reflected in its higher earnings and lower expenses.

De Watergroep

At the end of 2015 we welcomed De Watergroep as a new participant. Over 2016 we became even better acquainted and harmonised our processes. Although we are neighbours, in practice we've encountered a number of differences in work methods and laws and regulations; differences we're quite capable of resolving. Existing obligations have been smoothly wound down and/or transferred. Despite the recentness of the collaboration, the benefits of purchases and sales are already evident. Beyond this is the mutual added value produced by innovations, such as the development of iron pellets, the recovery of fulvic acids and assurance of quality.



Retrospective 2016

Milestones!

- In 2016, once more, a record volume of residuals was disposed of via AquaMinerals: 208,500 tons.
- For the first time a water company earned 'below-the-line' money from its residuals; thus, the sum of all expenses and all benefits from all residuals, including the expenses of AquaMinerals.
- Earnings exceeded disposal expenses for struvite, dewatered aquafer, liquid aquafer and lime pellets.
- We managed to keep organisation expenses in 2016 so low that 18 % of the shareholders' contribution could be refunded.
- Net costs per shareholder per ton have never been lower.

Sand Testbed with the waterboards

AquaMinerals has set up the Sand Testbed together with the Energy & Raw Materials Factory and fifteen waterboards. In 2017 we will jointly examine how much value we can extract from the sand at several WWTPs – for example, by establishing new chains in which sand can be used as a (secondary) raw material in other sectors. This will involve surveying the market, researching legal and regulatory frameworks, and determining product quality and the optimal logistics.



Reuse of own residuals as inputs; in 2016 we made great progress towards the ultimate loop!

(Read more on page 8)

Key figures

	2016	2015	2014	2013
Results				
Earnings	€ 5,105,800	€ 4,989,100	€ 4,965,800	€ 4,256,300
Non-shareholder turnover in %	4.1	2.9	2.7	2.4
Total disposal expenses	€ 3,245,100	€ 3,290,300	€ 3,322,700	€ 3,019,500
Gross margin in % of turnover	36	34	33	29
Net operating result	€ 1,200	€ 18,200	€ 6,600	€ 107,300
Net shareholder expenses per ton ¹	€ 11,86	€ 12,90	€ 14,41	€ 14,37
Assets				
Balance sheet total	€ 2,431,100	€ 1,822,700	€ 1,536,100	€ 1,622,600
Shareholders' equity	€ 787,500	€ 786,600	€ 692,700	€ 686,100
Liquidity (quick ratio)	1.5	1.7	1.8	1.7
Residuals figures				
Supply in tons	208,500	204,100	187,500	175,700
Recycle percentage	87	81	81	87
Transport kilometres per residual ton ²	3.1	2.7	3.1	3.3
Personnel				
Number of employees FTE per 31.12.2016	7.7	7.2	7.1	7.1
Absenteeism in %	2	2	5	1
Average net sales value per FTE	€ 178,200	€ 173,600	€ 185,000	€ 163,500

¹ incl. net operating result ² calculated from the participants' water production sites

A year of (green) deals

Many of our current supply chains (and those we still want to create) are new, never having been set up before. This necessarily brings new challenges with it. But in most cases, we're able to resolve them as a sector and with our stakeholders. Things are more difficult when it comes to the legal and regulatory frameworks, which often obstruct the process. The government realises that modifying these constraining laws and regulations takes (too) much time and therefore has made a number of 'green deals' possible.

In certain instances, and acting in line with the law, we're able to get fast-track approval to organise new circular chains. For example, in 2016 AquaMinerals was part of the effort to include struvite in the Green Deal North Sea Resources Roundabout. In October 2016, we signed the Nutrient Ambition collaboration within the framework of the national 'Circular Netherlands 2050' programme. Additional new green deals are on the programme for 2017.

Relations day 2016: looking over the fence

On 24 November, AquaMinerals organised an inspirational meeting day for our relations: from drinking water companies to clients, from operational service providers to research organisations. We sought inspiration from organisations and from activities which are not part of our daily operations, which was why the day's theme was 'looking over the fence'. We learned about nanotechnology, reuse of ICT hardware and the plastic soup in the oceans, and we also saw some wonderful works of art made from ceramics produced from residuals. In the morning the group visited the sludge dewatering works at the Cornelis Biemond (Waternet) water production facility or the Leidsche Rijn (De Stichtse Rijnlanden Waterboard) water treatment plant. The day exceeded all expectations, both in terms of its substance and the number of visitors.



Drinking Water Residuals Roadmap 2030

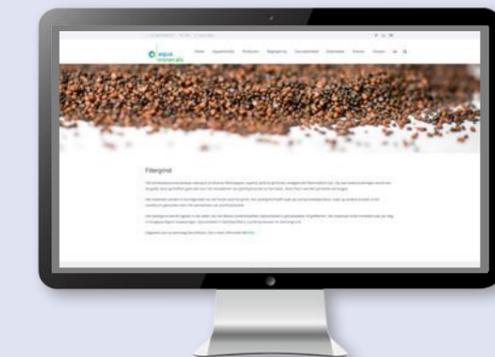
The world around us is constantly changing. Technological developments, boundaries that are vanishing (but sometimes even reinforced), laws and regulations, and societal issues force us to comprehend and respond to these trends in a timely manner. The complexity means that the time-to-market for the use of residuals in new applications is becoming longer and longer. The large investments of the different stakeholders go hand in hand with long(er)-term delivery obligations. A desirable situation, but also one that requires a sound long-term vision.

The collective Drinking Water Residuals Roadmap 2030 has been drawn up at the initiative of AquaMinerals jointly with the sector. Collective ambitious goals have been defined under the themes of financing, sustainability, disposal and image. These are framed over time periods of 3, 7 and 15 years. Working with the sector, in early 2017 we'll be formulating a number of actions and projects to realise these ambitions. Later in the year we'll then elaborate the collective roadmap in the form of eleven individual routes, each focused on the residual streams and ambitions of each of our participants.

Modern communications

On 1 July Reststoffennie acquired a new name: AquaMinerals. This was announced through a digital animation, which also referred to our renewed, interactive website. Since then, we regularly report news on our website and draw extra attention to it through the social media. This has worked well: each news item is read on LinkedIn at least 1,000 times. The most popular news items in 2016 were those about our name change, the struvite green deal and the research into humic acids of PWN. Visitors who land on our website's home page, frequently go

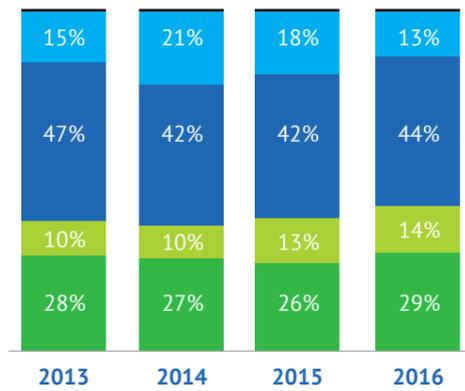
first to our staff members' page, followed closely by the news pages. Almost 80% of visitors look at the website via a desktop, 16% via a mobile phone and 4% via a tablet.



Sustainable results

The climate and environmental benefits are the greatest when the residuals can actually replace high-value primary raw materials. This is possible in applications in which the residual is (re)used once again. The ideal, however, is when the residual ends up in a closed loop and its reuse is unlimited. This ideal drives AquaMinerals to develop ever more circular applications.

Recycling: linear and circular



- landfill
- construction material
- one-time recycling
- technological loop
- biological loop

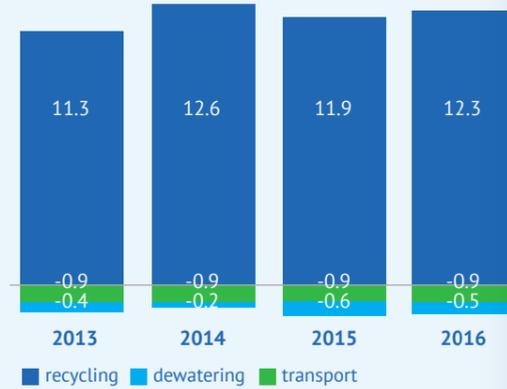
The ideal is when the residual ends up in a closed loop

Reducing drinking water sector's footprint

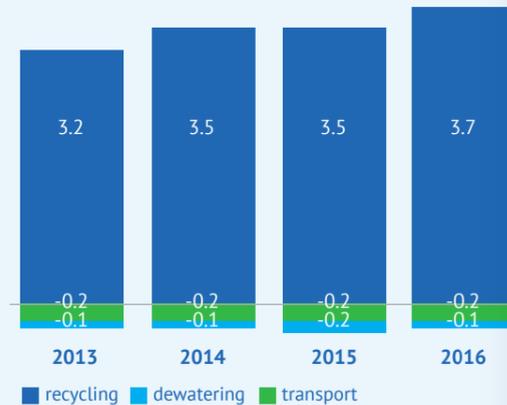
The reuse of residuals, and thus the preservation of natural sources and primary raw materials, produces demonstrable environmental and climate benefits. Using life-cycle analysis (LCA), together with sales and transport data, one can calculate the impact of the residuals chain from the water production process up to and including application by the client. The benefits of replacing common raw materials with drinking- and process-water residuals are however many times greater than the negative impact associated with the residuals' transport, storage and dewatering. On balance, in 2016 the use of residuals lowered emissions by more than 10 million kg CO₂ equivalent, which is about 5% of the CO₂ emissions from Dutch drinking water production processes.

Measured in terms of eco-costs, more than € 3 million in environmental damages were prevented. Eco-costs are the costs incurred to prevent environmental damage, for example, by acidification, fine dust and climate change.

Residuals climate benefits (avoided CO₂ emissions in Mkg CO₂ equivalent)



Residuals environmental benefits (avoided eco-costs in M€)



More and more high-value and circular applications

Of the residuals we currently receive, 99.9% find useful applications and only 0.1% end up as landfill. In 2016, 13% of the residuals still served as construction material, but no less than 87% was recycled in high-value applications: a huge improvement over 2015.

Circular

The drinking water sector is becoming increasingly ambitious with regard to the circular application of its own residuals, that is, in its own processes. We work with the sector in identifying those residuals that offer such opportunities. In 2016 major steps were made to this end:

- New seeding material is made from calcite pellets, and the application was realised in April 2017.
- A new coagulant made from aquafer is already ready for the fertiliser sector. We are studying its use in the drinking water sector.
- The use of pellets made from aquafer for arsenic removal. This application is also ready; we are studying its implementation in the treatment process.

AquaMinerals works on these projects with partners like the Nutrient Platform, the Energy & Raw Materials Factory (waterboards), market players and, of course, the drinking water companies themselves. These high-value secondary products are of interest not only to the drinking water sector but also to various other economic sectors. Alongside these new circular applications, an increasing amount of the residuals go to businesses which use them as raw materials in their recyclable products – for example, Desso carpets and glass industry products. And in agricultural applications we also see that the residuals are reintegrated into the (biological) loop.

Efficient and sustainable transport

Minimising interim storage

We sell the residuals locally whenever possible. We work with the drinking water companies on achieving the right quality for the aquafer at the production site, so that it can be transported directly to the client. Less interim storage in depots also means less transport. Of course our planning also aims at achieving the most efficient transport possible. The percentage of aquafer delivered via a depot remained stable in 2016 at 23%. This won't drop much further, because some latitude is needed to balance supply and demand and, when necessary, to bring the material to the client's specifications.



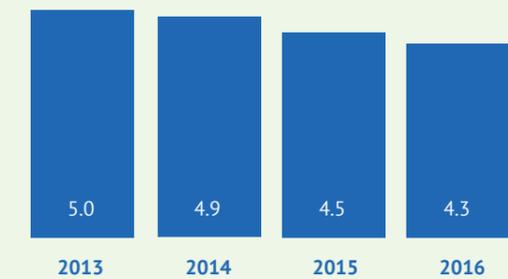
Less CO₂ per transported ton

In 2016 the CO₂ emissions per ton of transported residuals dropped further. This was thanks mostly to a larger share transported by ship.

Use of interim storage for aquafer



Transport climate footprint (kg CO₂ equivalent per residuals ton)



Lime pellets

More pellets, lower expenses

In 2025, we had already achieved a positive result on lime pellets; in 2016 this trend continued. The volume grew from 73,000 tons in 2015 to 79,000 tons in 2016. This reflected the new participation of De Watergroep, as well as the fact that nearly all water companies produced slightly more lime pellets in 2016.

For the poultry sector

In 2016 the first loads of lime pellets were delivered to the poultry sector to replace ground limestone in poultry feed. Thanks in part to the effort of Vitens, GMP+ certification was obtained for the lime pellets from a number of water softening sites. This is a big step towards

opening the door to other high-value applications in the feed industry. We're studying these opportunities together with the drinking water companies. We expect to deliver larger volumes of lime pellets for this application during the course of 2017.



And in Desso carpets

For some time now, we've supplied lime pellets to Desso for use in wholly recyclable carpet tiles. But we always ran into the problem that the pellets from different sites behaved differently during the grinding process – the pellets were for example sometimes too fine and sometimes too rough. These problems were solved in the fourth quarter of 2016 thanks to the persistence, energy and patience of all the parties involved. Since then, all of Brabant Water's production is shipped to Desso. Moreover, all of this process provided us with valuable information about the grinding behaviour of the pellets, which we'll benefit from in the future.

Lime pellets to control acidification at home and abroad

Last year we supplied several companies with lime pellets for use in the soil. Lime is applied to the soil to regulate pH: both in the Netherlands and abroad it's applied to control acidification. The problem of soil acidity occurs more frequently abroad than in the Netherlands, and we have observed an increased demand for lime pellets. The hardness of the pellet is an important property for this application. An associated advantage is that the lime pellets don't pulverise as do other lime products, and are therefore easier to transport.



Good for the soil

Aquafer liquid and dewatered

Biodigesting in France

The biodigesting sector is not as active in France as it is in the Netherlands, Germany and Belgium, but we notice that the number of biodigesters there is on the rise. These digesters will also need to control their sulphur, a task for which aquafer is ideally suited. Because the quality of the aquafer in France is considerably inferior to that of the Dutch product, there are opportunities for supplying part of this market from Belgium. Via our partners Biogas Plus and SEDE Benelux, the first loads of dewatered aquafer have been delivered to French digesters.

Aquafer in biodigesting, from liquid to dewatered?

In the Netherlands it is liquid aquafer that is mostly used in biodigesters as a sulphur-binding agent. But the Netherlands is an exception in this regard: neighbouring countries typically make use of dewatered aquafer for the task. Because of the short transport distances in our country, it makes economic sense to use liquid aquafer. Nevertheless, we have observed an increase in the use of dewatered aquafer here as well, and are currently studying whether this marks a structural change.

Higher earnings than expenses

The volumes of liquid and dewatered aquafer both increased. This is attributable entirely to the Dutch drinking water companies; the increased volume of dewatered aquafer is largely a result of the batch disposal of historical stocks. The earnings exceeded expenses for both streams, which is a positive result. In 2017, the supply of aquafer will be greater because of the Belgian sludge from De Watergroep that AquaMinerals will be marketing. In 2016, this sludge was still mostly disposed of within the framework of existing De Watergroep contracts (and thus not through AquaMinerals' books).

Temporarily more liquid aquafer in depots

In 2016 we experienced a drop in the quality of the liquid aquafer. One of the reasons was a decreased alertness at the production sites, caused partly by personnel turnover, reduced physical presence and delayed follow-up, for instance of storage in the depots. This meant that more tonnage was sent via depots in order to bring the aquafer to the clients' specifications. This implied extra expenses and more transport kilometres, elements that we, for environmental reasons, are actually trying to diminish.

Volumes of liquid aquafer delivered via depots
tons per year



Agne Kucerenkaite, a Lithuanian student at the Design Academy in Eindhoven, used aquafer as a colouring agent in linen, glass and ceramic in her final project. Her work was exhibited during the Dutch Design Week.



Aquafer as colouring agent

Other residual streams

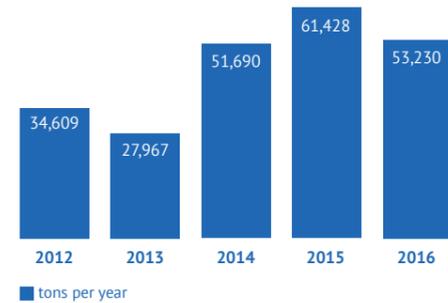
Other residual streams include:

- carbon sludge
- (iron-)lime sludge
- lagoon-bed sludge
- aluminium sludge
- river sediment
- filter sand and gravel
- struvite

The 'other residual streams' often consist of several physical and chemical components, which makes handling them more complex. Of course, we are constantly in search of the highest possible quality application for these streams as well. In the case of river sediment and struvite, for instance, valuable applications have already been found.

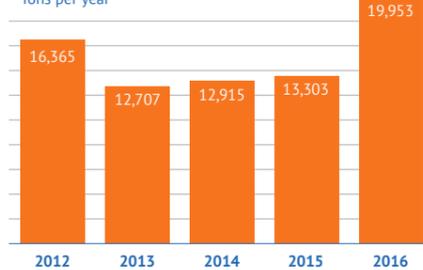
Significantly smaller volume

Total other residuals

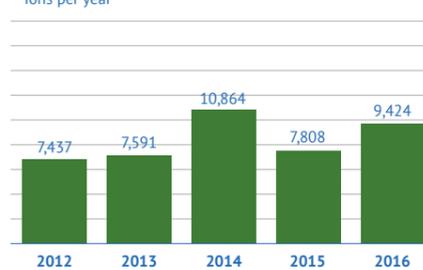


For the first time in three years the volume of other residuals decreased: by a significant 13%. The main reason for this was that hardly any lagoon-bed sludge was disposed of in 2016: in 2015 the volume was 17,000 tons, while in 2016 it was 1,000 tons.

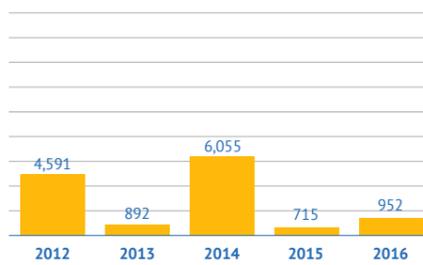
Aluminium sludge
Tons per year



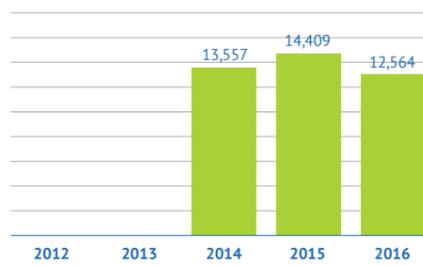
Iron-/lime sludge
Tons per year



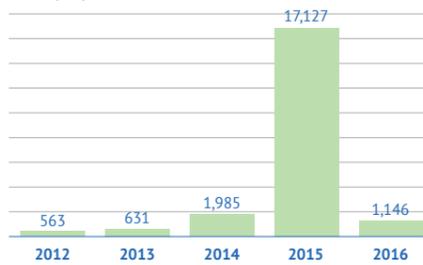
Carbon sludge
Tons per year



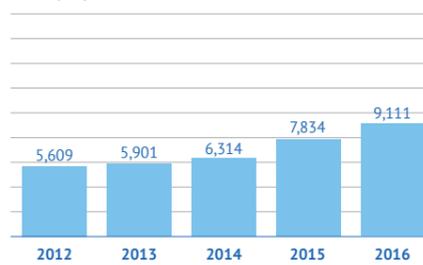
River sediment
Tons per year



Lagoon-bed sludge
Tons per year



Filter sand and gravel
Tons per year



Filter gravel is doing well

In 2016, an important volume of filter gravel was used in a self-cleaning hard shoulder and as a phosphate-binding agent in helophyte filters. We might be applying filter gravel in a number of projects next year as well. In addition, together with our partner Koers from Hoogersmilde, we've developed the capability of sieving filter gravel according to its diameter, which makes deliveries to specification possible.

Pulverised carbon in a sea-salt battery?

In 2013, Dr Ten, a company specialising in product and process innovation, won the Jan Terlouw Innovation Award for its development of a sea-salt battery. This kind of battery is an extremely clean and economical way of storing energy. And our society is in great need of energy storage capacity, as we make the transition from fossil-fuel to renewable energy sources. The battery is made of minerals, salts and carbon. In late 2016, research got under way to see whether pulverised carbon from the drinking water sector can be made into a suitable source of carbon in these batteries.

Surprising results



Financial developments: other residual streams

While volumes dropped, the financial developments were less positive. The acceptance expenses per ton rose from € 7.78 in 2015 to € 8.85 in 2016. This is the result of the disappearance of one source-site of lagoon-bed sludge residual, which was of positive value.

A further reason is that there are fewer (infrastructural) works in which residuals are being used as construction material, so that their processing costs have increased.

Iron pellet market

Last year two TKI research projects were completed on the application of WRAP®, the iron pellets made from aquafer. Both projects revealed good market development opportunities for these products. The first showed that the pellets can be used in the gas phase in which they bind H2S, but that they bind other substances as well. This makes it an ideal product to control odour.

The other TKI project was also successful: the pellets can also be used in water to bind phosphorus and arsenic. What's good about this research is that we already have concrete requests for all these applications; the prospects for these products are therefore positive. Our challenge now is to ensure we get a good production site.

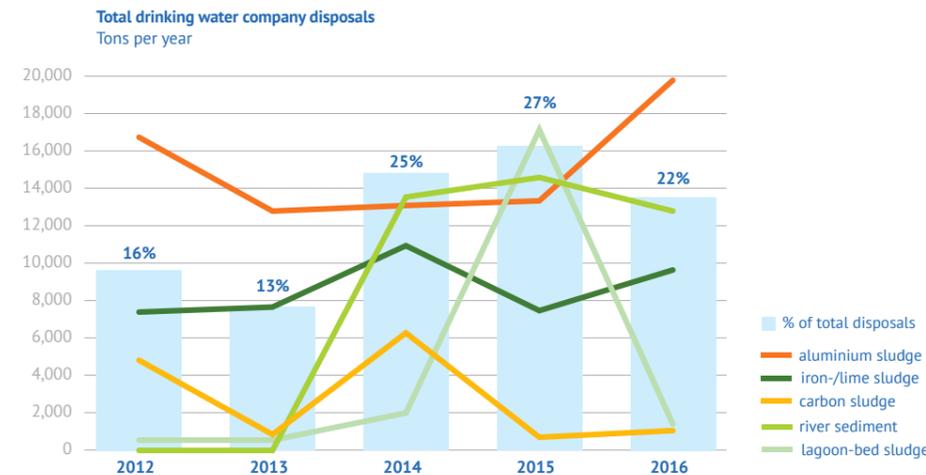
Positive developments for lime sludge and iron-lime sludge

The sales of lime sludge and iron-lime sludge developed positively, which was not the case of all sludge streams. Depending on their chemical composition, there are some sludge streams that could find higher-value applications. We are at an advanced stage in developing these in collaboration with a number of potential clients – for example: processing sludge into a product to counter soil subsidence, directly supplying lime sludge to agriculture, and supplying the lime sandstone industry.

Aluminium sludge as third largest residual stream

In 2016 we sold considerably more aluminium sludge than in 2015: an increase of no less than 50%! This made it the third largest of our residual streams, behind lime pellets and liquid aquafer, even surpassing dewatered aquafer. The first reason for this growth was the accession of De Watergroep, which uses aluminium as a flocculent at its Kluizen site; the second reason was the increased volumes of aluminium sludge produced by Waterbedrijf Groningen.

All of the aluminium sludge finds useful applications, but we believe there's still room for improvement: on the one hand, in selling it for higher-value applications and, on the other, in achieving better financial results. Improvement potential lies in using the sludge for nature development, selling it as briquettes to the aluminium industry or returning it to the bauxite processing industry.



Successful struvite

AquaMinerals is now marketing the struvite of four waterboards; in 2015 we only did it for Waternet. Struvite is a magnesium ammonium phosphate crystal which is extracted (among others) from municipal wastewater and separately-collected urine. Phosphorus is essential to global food supply, but the reserves are being depleted. By using struvite as a fertiliser we can contribute to relieving the shortage.

This increase in the number of waterboards disposing of their struvite not only strengthens the position of the waterboards, but also offers the clients greater supply assurance.



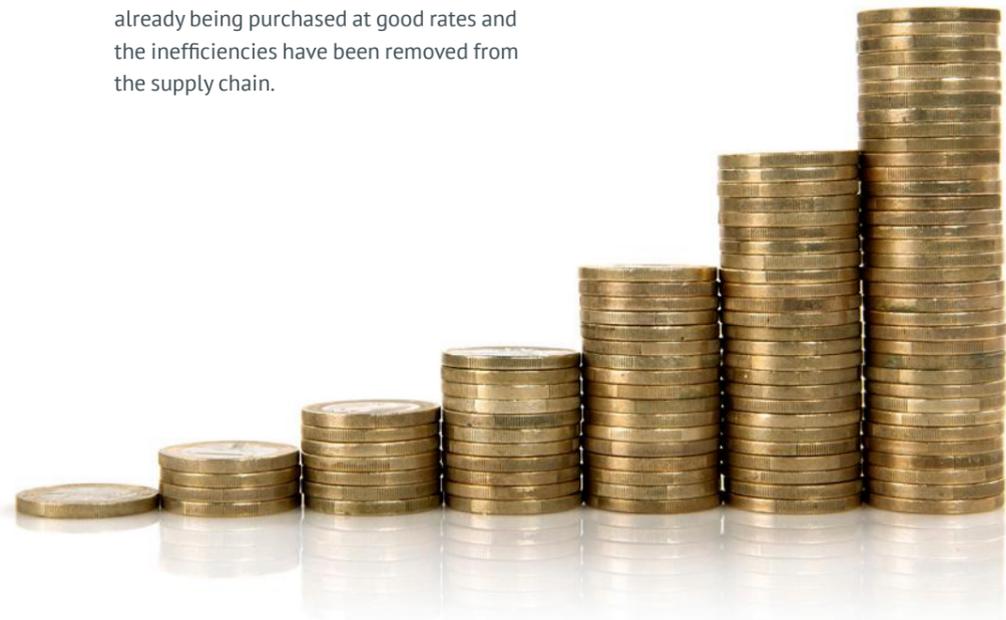
Peeing sustainably
for struvite

Expectations 2017

Rising trend in financial result

We expect that the operational financial result for the participants will continue to rise in the years ahead. Through innovations, quality assurance and intensive collaboration with the market, the sales value of the materials will increase. The operational expenses, particularly for transport and storage, cannot decrease much further. Many of these services are already being purchased at good rates and the inefficiencies have been removed from the supply chain.

But the expenses that AquaMinerals incurs for its participants 'within the gate' at the production sites are expected to rise sharply. These involve dredging, dewatering and cleaning; activities that in the past were conducted by the drinking water companies themselves. Nowadays they are increasingly taken on by AquaMinerals.



Market development

The market for secondary raw materials is becoming increasingly mature, both in terms of supply and demand. The negative image of residuals has been definitively erased. A potential client takes rational decisions based on a product's price, functional properties, environmental profile, quality assurance and supply assurance. This naturally has a positive impact on the value of the residuals. At the same time it means that delivery is no longer non-binding or experimental, but brings with it obligations for the sector.

Drinking Water Residuals Roadmap 2030

At the end of 2016, the water sector drew up a collective Roadmap 2030 for its drinking water residuals (see page 7). We expect this to have three key results: acceleration of the valorisation of the residuals, lower expenses and improved environmental profiles. Working with the water sector, we will continuously set and adjust our priorities whenever necessary to fulfil the ambitions. A working group will meet periodically to this end.

Growing supply of residuals

The supply of residuals will continue to increase by a few percentage points every year. This growth relates to only a few of the current participants. For the most part, we expect larger supply volumes from other parts of the water chain, such as industrial and municipal wastewater treatment.

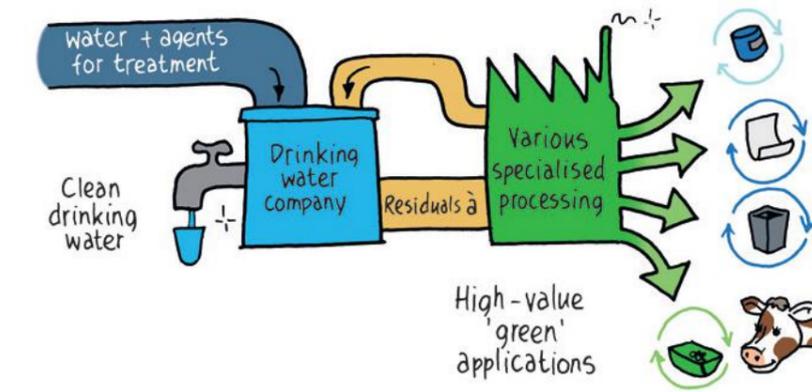
Supply is of course not only a question of volume, but also of quality and supply assurance. The entire chain is working hard to raise these elements to a higher level through efforts in the areas of quality assurance, product development and chain management.

Investing in innovation

Innovation remains the most important driver for the continual improvement and valorisation of the residuals. In the years ahead, AquaMinerals will make considerable investments in innovation projects. The projects will preferably be collaborations, involving drinking water companies, market parties and research institutes. As is our usual practice, in the case of large innovations, we draw up a project plan and budget separate from our normal annual planning. Participants can thus decide for themselves whether to participate in a particular project.

Drinking water companies are becoming increasingly circular

The drinking water sector has a strong ambition to make its purchasing practices circular. This opens up attractive opportunities for the processing or regeneration of the companies' own residuals into new feedstock for the production of drinking water. This raises a broad range of questions for the next few years in the areas of technology, quality, financing and legislation. We will need to solve these questions together with the water sector and other stakeholders. Certainly a challenge, but we're already on the right path. The switch of seeding material from sand to circular calcite has already shown what the possibilities are.



More responsibilities for AquaMinerals

For years, the drinking water companies have themselves been responsible for the quality and quantity of supply. We took over responsibility once our transporter picked up the materials. But we notice that more and more drinking water companies (wish to) transfer the responsibility for the quality, quantity and supply assurance at the production sites to AquaMinerals. This includes for instance managing the storage silos, bunkers or lagoons. Using modern means of measurement and communication, we expect in the future to monitor and safeguard this partly through the use of remote means.

Even more efficient ICT and automation

Although we've made great strides in the recent past, we want the financial and product streams to flow even more efficiently. The participants now have online access to information about the streams; this tool will later also be made available to clients. There are many benefits to be gained from the (increasing) automatic entry of data to the database: the further roll-out of our transport app to replace paperwork and, for example, digital requests for the pickup and shipment of materials. ICT also plays a support role in chain management. Knowledge – both timely and offsite – about the residuals' quality and volumes at all drinking water production sites, makes for a more efficient performance and fewer delivery errors, in terms of quality, quantity and planning.



Governance, financial policy & 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 Shareholders' 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 of 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 the objectives and operational management of AquaMinerals. 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.

Also within the context of corporate governance, in 2016 the SB carried out an evaluation of its own functioning (see page 22).

Financial policy

Treasury

In accordance with the treasury statute, the distribution test has been established. 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. Business operations have resulted in a positive cash flow. In accordance with the implementation of the treasury statute, the entire amount was added to savings.

Liquidity risk

The current ratio per 31 December 2016 was 1.5; this is 0.2 lower than the figure at year-end 2015, and is far above the standard of 1.2. The solvency ratio at the reporting date had dropped from 43% in 2015 to 32%, which is 2% above the standard. The average settlement period by clients was 46 days, which is unchanged from 2015. AquaMinerals payment period dropped by 1 day to 34.

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 2016, this amounted to € 718,000, while shareholders' equity was to € 787,000.

Risk management

Risk management forms part of the company's management model. The risk profile of AquaMinerals reflects our obligation to always remove the residuals from our shareholders and then sell or find a destination for them in an efficient, effective and environmentally responsible manner.

It was agreed with the SB that we would carry out a risk inventory every year, which would always be evaluated at the first SB meeting of the year. It was also agreed that risks would be listed in the annual report of AquaMinerals. For 2016, the following are the main operational risks identified.

Risk 1:

AquaMinerals isn't able to fulfil the expectations of new shareholder(s).

Together with the new shareholders, we've devoted a lot of time to coordinate the pattern of expectations. Financing, governance, organisation, technology, innovation and business development, regulations and compliance, were coordinated and described in detail. We periodically discuss whether the assumptions are still valid. So far, the expectations have been more or less fulfilled. Whenever this is unexpectedly not the case, we examine whether an adjustment needs to be made or whether a greater effort on our part is actually called for.

Risk 2:

The structural collaboration with the waterboards doesn't get off the ground.

If the collaboration with the waterboards unexpectedly doesn't get off the ground, it would mean that one of our strategic growth options would not be realised. To prevent this from happening, we're acting along two lines to ensure success. One is preventive: we're researching the nature of the legal and organisational opportunities or risks. The second is captured by the proverb: *the proof of the pudding is in the eating*. That is, we see that in practice the collaboration is worthwhile: AquaMinerals already sells struvite for several companies, provides advice on a number of issues, and proposed a Sand Testbed, which has already attracted the participation of fifteen waterboards.

Risk 3:

The means to deal with growing demand for AquaMinerals' services 'within the gate' are insufficient.

Activities within the gate refer to: the dredging of lagoons, dewatering of sludge and cleaning of depots at the production sites. The drinking water companies are increasingly wondering (certainly with natural wastage) whether to continue carrying out these activities themselves or to have AquaMinerals take over. If we are to look after them, our organisation needs to have the right people in the right numbers. Our current earnings model does not provide the means for this. We have for this reason described the consequences of these non-regular activities in a policy paper, which has been approved by the GMS. This allows us to reach effective agreements with the participants concerning the personnel deployment and cost settlement.

Supervisory Board

The 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.

Chairperson Roelof Kruize looks back on a successful 2016

Hugely successful: that's how Kruize sees last year. 'For the first time we were able to return money to the shareholders; proof that we are truly capable of extracting value from the residuals. We no longer dispose of them at a high cost, but actually make money from them. It's a big step!

Another comparable breakthrough is our collaboration with the waterboards, the benefits of which we're experiencing in practice. For instance, the marketing of struvite is valuable for all the parties involved, not only financially, but certainly also because it means we're contributing to solving a global problem: the shortage of phosphorus. Moreover, we're working together in the Sand Testbed to explore the opportunities for the sand from WWTPs.

Cross-border expansion was AquaMinerals' third ambition. At the end of 2015, we welcomed our first foreign participant, De Watergroep from Belgium. More than a year later we can confirm that this collaboration is also running to our entire, mutual satisfaction.

As AquaMinerals seeks to broaden its scope, so too does the Supervisory Board, which up until last year consisted almost exclusively of

representatives from drinking water companies. We are therefore happy with the new board membership of individuals from outside the water sector: Marjolein Demmers, who brings with her an extensive sustainability expertise and a large network, and Jan Erik Janssen who, thanks to his broad legal experience, plays an important role in the assimilation of new activities into the organisation.

In 2016, the SB also decided to begin carrying out an annual analysis of our own functioning. One important result of the exercise was a better structuring of our risk management, which is why the present Annual Report pays extra attention to the business risks. Also, as members of the SB, we would like to get an even better feel for the organisation's work. From now on, a member of AquaMinerals' staff will attend each of our meetings to talk to us about a current and substantive theme. This not only increases our understanding, but it's also extremely interesting.

In short, a great year, for which we would like to congratulate the team and especially Olaf van der Kolk, who performed exceptionally well in his first year as managing director of AquaMinerals.

Roelof Kruize

SB composition

Per 31 December 2016, the SB's composition was as follows:

Mr R. Kruize (1956)	Chairperson, drinking water company profile
Mr P. Fransman (1962)	Vice-chairperson, financial profile
Mr J.E. Janssen (1969)	Member, legal profile
Ms M. Demmers (1967)	Member, business and innovation profile

(Re)appointment schedule

	appointed	reappointed	resignation
R. Kruize	31 December 2014	(possible) 31 December 2017	-
P. Fransman	31 December 2012	31 December 2015	31 December 2018
J.E. Janssen	1 July 2016	(possible) 1 July 2019	-
M. Demmers	31 December 2016	(possible) 31 December 2019	-

SB activities in 2016

The Supervisory Board met on four occasions in 2016. The items the SB addressed included the following:

- the financial developments and results of the organisation in light of the budget and other objectives;
- the profit appropriation;
- the communications plan and name-change of AquaMinerals;
- the strategic growth options of AquaMinerals;
- the procedure and subsequent appointments of Mr J.E. Janssen, per 1 July 2016, and Ms M. Demmers, per 31 December 2016;
- collaboration between AquaMinerals and participants on the basis of open innovation;
- earnings model for non-regular activities of AquaMinerals;
- the corporate tax obligation (since January 2016, AquaMinerals is subject to corporate tax);
- budget and annual plan for 2017;
- Drinking Water Residuals Roadmap 2030;
- evaluation of functioning of the SB and the managing director;
- risk assessment and risk management.

GMS activities in 2016

The General Meeting of Shareholders was held twice in 2016, during which the following was decided:

- approval of the Annual Report and financial statements for 2015;
- the discharge of the managing director for his management and the members of the SB for their supervision during fiscal year 2015;
- the profit appropriation for 2015;
- approval of the Drinking Water Residuals Roadmap 2030;
- approval of the earnings model for non-regular activities;
- approval of the name change, per 1 July 2016, from Reststoffenuinie to AquaMinerals;
- appointment of Mr J.E. Janssen and Ms M. Demmers as members of the SB;
- approval of the annual plan and budget for 2017.



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

Financial Statements 2016

Principles of evaluation

General

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

Comparative 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 results

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 its receipt is irrevocably established. The coverage ratio of the pension fund (ABP), per 31 March 2017, was 98.8%. The recovery plan aims to achieve a coverage ratio of 128% at the end of 2026. This will not require taking any drastic recovery measures.

Corporate Tax

As a consequence of a change in the law AquaMinerals is subject to corporate tax starting 01-01-2016.

Balance Sheet per 31 December 2016

(after profit appropriation following recommendation)

	31-Dec-2016 €	31-Dec-2015 €
ASSETS		
Fixed assets		
Intangible fixed assets	40,000	50,000
Tangible fixed assets	7,474	9,365
Current assets		
Receivables and accrued income	1,485,041	1,073,961
Cash and cash equivalents	898,560	689,348
	2,431,075	1,822,674
LIABILITIES		
Shareholders' equity		
Issued and paid-up capital	475,202	475,202
Share discount	11,923-	11,923-
Share premium	35,055	35,055
Legal reserves	40,000	50,000
Other reserves	249,191	238,271
	787,525	786,605
Current liabilities		
Current liabilities and accrued liabilities	1,643,550	1,036,069
	2,431,075	1,822,674

Profit and Loss Account for 2016

	2016 €	2015 €
Earnings		
Turnover residuals	5,064,043	4,982,358
Consulting	41,798	6,745
	5,105,841	4,989,103
Shareholders' annual contribution	919,900	897,100
Other earnings	1,745	69,342
Total earnings	6,027,486	5,955,545
Operating expenses		
Direct disposal expenses	2,722,383	2,791,381
Acceptance expenses	522,753	498,875
Earnings distributed to shareholders	1,578,557	1,419,655
Pre-netted earnings for shareholders	20,000-	35,200
	4,803,693	4,745,111
Gross turnover result	1,223,793	1,210,434
Operating expenses		
Personnel	748,245	692,706
Depreciation	13,479	3,589
Cost of sales and PR	91,098	93,341
Research and consulting costs	200,552	219,315
Premises	43,215	40,140
Supervisory Board	20,367	7,400
Other operating expenses	108,185	139,803
	1,225,141	1,196,294
Total expenses	6,028,834	5,941,405
Operating result before interest	1,348-	14,140
Interest income	2,498	4,097
Pre-tax result	1,150	18,237
Corporate tax	230	-
Result	920	18,237

Explanatory notes on the Profit and Loss Account

	2016 €	2015 €	2016 €	2015 €
Earnings				
Turnover residuals				
Settled disposal expenses shareholders	3,072,794	3,174,322		
Settled disposal expenses non-shareholders	48,619	25,376		
Earnings residuals sales shareholders	1,824,367	1,664,026		
Earnings residuals sales non-shareholders	118,263	118,634		
	5,064,043	4,982,358		
Consulting				
Consultancy for shareholders	-	6,745		
Consultancy for non-shareholders	41,798	-		
	41,798	6,745		
	5,105,841	4,989,103		
Direct disposal and acceptance expenses	3,245,136	3,290,256		
Turnover of non-shareholders of AquaMinerals B.V.	208,680	144,010		
Idem as percentage	4,1%	2,9%		
Other earnings				
Earnings iron-gravel	1,745	-		
Earnings from re-destination of stored lime pellets	-	69,342		
	1,745	69,342		
Operating expenses				
Personnel				
Direct salary expenses			546,232	533,010
National insurance contributions			92,507	87,858
Pension contributions			64,237	57,870
Indirect salary expenses			20,927	10,968
Short-term staff			24,342	3,000
			748,245	692,706
Staff				
In 2016 there were nine staff members (7.7 fte), all of whom held permanent positions; in 2015 there were eight (7.2 fte).				
Cost of sales				
Travel and accommodation			54,009	48,157
Contributions			8,309	8,225
PR			28,780	36,959
			91,098	93,341
Research and Consulting costs				
Perspective: Financial			25,660	134,454
Perspective: Client			62,031	39,786
Perspective: Internal Processes			10,842	32,859
Perspective: Innovation/Learning			102,019	82,216
			200,552	289,315
Debited from research and consulting reserve			-	20,000-
Debited from Intangible Assets R&D			-	50,000-
			200,552	219,315

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 2016 result

In anticipation of the decision to be taken in this regard by the General Meeting of Shareholders, the 2016 result has been added to other reserves.

This decision, which has yet to be taken, has already been incorporated into the 2016 financial statements.

Audit Report

AUDIT REPORT BY THE INDEPENDANT AUDITOR

To: The General Meeting of Shareholders of AquaMinerals B.V.

A. Report on the financial statements included in the Annual Report 2016

Our opinion

We have audited the 2016 financial statements of AquaMinerals B.V., located in Nieuwegein.

In our opinion, the financial statements included in this annual report provide a faithful representation of the size and composition of the capital of AquaMinerals B.V. per 31 December 2016 and the result over 2016, in accordance with the provisions of Title 9, Book 2 of the Dutch Civil Code.

The financial statements consist of:

1. the balance sheet per 31 December 2016;
2. the profit and loss statement for 2016; and
3. the explanatory notes, including a summary of the principles applied in the evaluation of the financial reporting and other notes.

The basis for our opinion

We conducted our audit in accordance with Dutch law, including the Dutch Standards on Auditing. Our responsibility on this basis is described in the section 'Our responsibilities for auditing the financial statements'.

We are independent of AquaMinerals B.V., as required under the Regulation Concerning the Independence of Auditors in Assurance Services (ViO) and other relevant Dutch impartiality regulations. Furthermore, we have abided by the Code for Ethics for Professional Accountants (VGBA).

We believe that the auditing information we obtained is sufficient and suitable to provide a basis for our opinion.

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

Besides the financial statements and our audit report on them, the annual report includes further details in the form of other information.



On the basis of the procedures below, it is our opinion that the other information:

- is consistent with the financial statements and contains no material misstatements;
- contains all the information required in Title 9, Book 2 of the Dutch Civil Code.

We have read the other information and, on the basis of our knowledge and understanding, acquired from the financial statement audit or otherwise, have considered whether the other information contains material misstatements.

With our procedures, we have complied with the provisions of Title 9, Book 2 of the Dutch Civil Code and the Dutch Standard 720. These procedures do not have the same thoroughness of our auditing of the financial statements. The management is responsible for drafting the other information in accordance with Title 9, Book 2 of the Dutch Civil Code.

C. Description of the responsibilities regarding the financial statements

Responsibilities of management for the financial statements

The management is responsible for the preparation and faithful reproduction of the financial statements in accordance with Title 9, Book 2 of the Dutch Civil Code. In this context, the management is responsible for such internal control as it deems necessary for the preparation of financial statements that are free from material misstatements due to fraud or error.

In preparing the financial statements, the management must consider whether the enterprise is in a position to continue its activities into the future. On the basis of the reporting system referred to, the management must prepare the financial statements assuming continuity, unless the management intends to liquidate the company or if the termination of the business activities is the only realistic alternative.

Our responsibilities for auditing the financial statements

Our responsibility is to plan and conduct an audit in a manner that we acquire sufficient and suitable audit information upon which to base our opinion.

Our audit has been conducted with a high, but not absolute, level of certainty, so that it is possible that we might not have discovered all material errors and fraud during our audit.

Misstatements might arise as a consequence of fraud or errors and are material if it can be reasonably expected that these, individually or jointly, might influence the economic decisions taken by users on the basis of these financial statements. The materiality influences the nature, timing and extent of our auditing procedures and the evaluation of the effect of identified misstatements upon our opinion.



We have conducted this audit professionally and critically and, where relevant, have applied professional judgement in accordance with the Dutch auditing standards, and ethical and independence requirements.

Among other elements, our audit consisted of the following:

- the identification and assessment of the risks that the financial statements contain material misstatements as a result of fraud or error, the definition and execution of audit activities in response to these risks, and the acquisition of audit information that is sufficient and suitable to provide a basis for our opinion. The risk of non-discovery of a material misstatement is greater in the case of fraud than it is in the case of error. Fraud might involve conspiracy, falsification of documents, intentional failure to record transactions, intentional misrepresentation of activities, or breach of internal control;
- the gaining of insight into the internal control that is of relevance to the audit, with the objective of selecting control activities that suit the circumstances. It is not the objective of these activities to express an opinion about the effectiveness of the entity's internal control;
- the evaluation of the suitability of the principles used in the financial reporting, and the evaluation of the reasonableness of management estimates and of the associated explanatory notes contained in the financial statements;
- the determination that the management's continuity assumption is acceptable. Also, on the basis of the audit information obtained, the determination as to whether events or circumstances exist that could allow for reasonable doubt as to whether the enterprise can continue its operational activities. If we conclude that there exists an uncertainty of material importance, we are obligated in our audit report to draw attention to the relevant associated explanatory notes in the financial statements. If the explanatory notes are inadequate, we must adjust our report. Our conclusions are based on the audit information that was obtained up until the date of our audit report. Future events or circumstances might however mean that an enterprise can no longer sustain its continuity;
- the evaluation of the presentation, structure and contents of the financial reports and their explanatory notes;
- the assessment as to whether the financial statements provide a faithful representation of the underlying transactions and events.



We communicate with the management of the company, among others, about the planned range and timing of the audit, and about the significant findings that arise from our audit, including any significant shortcomings in the internal control.

Lelystad, 1 June 2017
MTH accountants & adviseurs B.V.

Signed

drs. B. Tinge RA

Colophon

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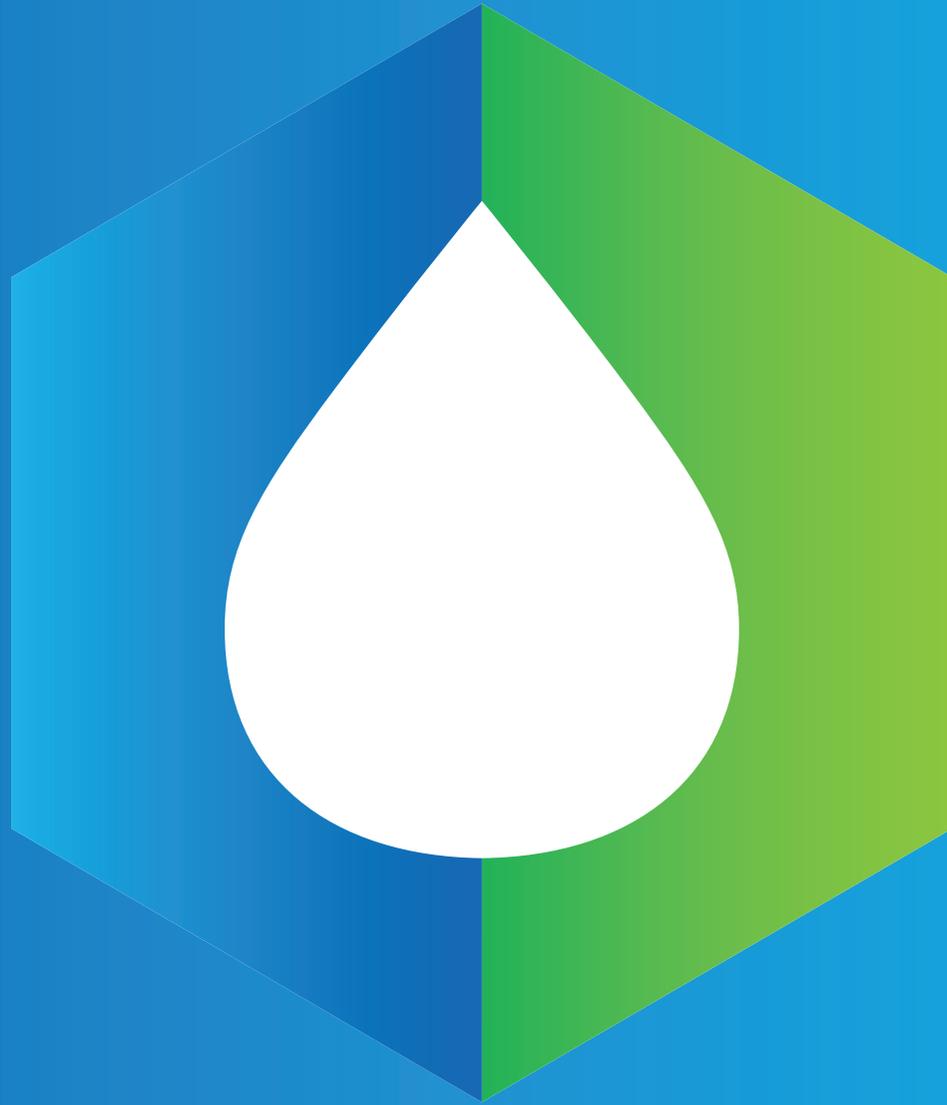
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