

## Who are we?

Aqua-Nu is a company dedicated to providing clean, safe water at an affordable cost to individuals in both developed and developing countries. Based in Dundalk, Ireland, Aqua-Nu is an innovator of commercial point-of-use ceramic water filtration systems. The company's filtration innovation - in the form of its *Purity Capsule*, ultra-high flow rate ceramic filter and other proprietary products - represents a major leap forward in commercial water purification techniques. Aqua-Nu's uniquely efficient, flexible and durable water filtration technology has performed well above industry standards and competing technologies in scientific tests conducted by independent laboratories.

### ***Aqua-Nu's Vision is to enable:***

- The provision of clean, safe water to people and organizations worldwide at a very low cost
- Substantial individual and collective health and environmental benefits worldwide.

### ***Aqua-Nu's Mission is to achieve:***

- Global recognition for the revolutionary nature of the company's filtration technology and its potential to make a substantial contribution to the alleviation of the impending global water crisis
- Global accessibility for Governmental, NGO, corporate and private use of this filtration technology, at an early date
- A substantial reduction in the impact of plastic bottle waste on the environment.

Aqua-Nu's filtration technology has the potential to make a significant contribution to addressing one of the world's most urgent health problems, access to clean, safe water, in a sustainable and environmentally friendly way.

Aqua-Nu, with its expertise in the development, testing and provision of innovative water filtration technologies, is positioned to be a central part of the solution to this problem. The company recently (October 2009) announced that it is making its advanced solutions available in the United States. Aqua-Nu is currently seeking to form partnerships around the world to market its advanced clean water ceramic filtration technology and to ensure that the full potential of its solution is realized in both the developing and developed worlds.

Aqua-Nu considers itself to be a 'triple bottom line' company, with a focus on:

- financial returns in the form of sustainable profits
- social returns from increasing access to clean, safe water, and
- environmental returns from reducing the impact of plastic bottle waste.

Aqua-Nu is a dynamic, fast-moving company, which has just recently switched its focus from product design and research and development to production and distribution. There are multiple parallel strands of interdependent activities underway, including articulation of the company's humanitarian strategy, of which this briefing document comprises an initial step. This document summarises what we see as the potential of our technology in the developing world. We outline our current assessment of the water problem, our view on interventions that will help solve the problem, Aqua-Nu's unique value add and our proposed approach to getting our solution to the people that most need it.

## What is the problem?

***Many people still do not have access to clean, safe water.....***

- Most drinking water in the world should be considered unsafe unless it is treated properly and then protected from recontamination until use (IFC, 2009)
- An estimated 3 billion people lack consistent household access to clean and safe piped water, with both developed and developing countries affected (IFC, 2009)
- Almost 900 million or one in eight people worldwide do not have access to an “improved source” of drinking water (defined as household connection, public standpipe, borehole, protected dug well, protected spring, rainwater) (WHO/UNICEF, 2008)
- Millions of those whose supplies meet the definition of “improved” still rely on water that is unsafe for consumption, as the term “improved” refers only to the type of supply, not the quality of that supply (WHO/UNICEF, 2005)
- Goal 7, target 10 of the UN’s Millennium Development Goals aims at halving by 2015 the proportion of people without sustainable access to safe drinking water (United Nations, 2000). Even if this goal is attained, hundreds of millions of people will not have access by the target date (WHO/UNICEF, 2006)

***.....leading to severe health and economic consequences***

- Unsafe drinking water is a main cause of the estimated 4 billion cases of diarrhoea each year, which kills 2.2 million people annually, including 17% of children under 5 years of age in developing countries (WHO, 2008a)
- At any given time, half of the world’s hospital beds are occupied by patients suffering from a water-related disease. (UNDP, 2006)
- Water, sanitation and hygiene issues cause at least 9.1% of the global disease burden (in disability-adjusted life years, a weighted measure of deaths and disability), or 6.3% of all deaths (WHO, 2008b)
- Drinking contaminated water reduces personal productive time, with widespread economic effects, especially affecting vulnerable groups such as women, children, poor people in rural areas, and slum dwellers (IFC, 2009)
- The economic and opportunity costs associated with water-related disease are significant. Waterborne diseases cause lost income and missed work or schooling opportunities for those who are ill and those who care for them. Sick children miss nearly 300 million school days a year from water-related causes, and an estimated 320 million productive work days are lost to illness resulting from unsafe drinking water and lack of access to sanitation (CSIS, 2009).

## How can it be solved?

### ***Point-of-use household solutions have a key role to play in resolving the problem.....***

- Innovative, affordable, appropriate water solutions at household level are needed, that can be implemented in poor communities (World Water Council, 2009).
- An estimated 3 billion people lack consistent household access to clean and safe piped water, and could benefit from decentralized safe water solutions (IFC, 2009)
- Providing a range of affordable technologies for poor households, including point-of-use household water treatment, is a specific pro-poor approach adopted by the US Government to target the needs of poor populations (US Department of State, 2009)
- Improvements in drinking water quality appear to be of significant benefit to health when improvement is secured close to the point of use—that is, in the household. In recent years, increasing evidence has become available that household water treatment and safe storage are associated with significant health gains where available water is contaminated (WHO, 2008b)
- The provision of safe water alone will reduce diarrhoeal disease by up to 50%, even in the absence of improved sanitation or other hygiene measures (Sobsey MD, 2002)
- Household water treatment and safe storage (HWTS) interventions can lead to dramatic improvements in drinking water quality and reductions in diarrhoeal disease—making an immediate difference to the lives of those who rely on water from polluted rivers, lakes and, in some cases, unsafe wells or piped water supplies (WHO, 2009)
- There is now conclusive evidence that simple, acceptable, low-cost interventions at the household and community level are capable of dramatically improving the microbial quality of household stored water and reducing the risks of diarrhoeal disease and death in populations of all ages in the developed and developing world (Sobsey MD, 2002)
- Unhygienic handling of water during transport or within the home can contaminate previously safe water. A high percentage of people could therefore benefit from effective household water treatment and safe storage practices. Such household-level interventions can be very effective in preventing disease if they are used correctly and consistently (WHO/UNICEF 2008).

### ***.....but point-of-use interventions to date have had only limited success for reasons including:***

- Supply does not meet consumer preferences: products (e.g. chemical disinfectants) that meet public health objectives but do not address user preferences for convenience, aesthetics, taste, reliability, aspirational quality, safety, and robustness (IFC, 2009)
- Inadequate consumer awareness: limited understanding of the need to treat water and uncertainty about how to do so (IFC, 2009)
- Inadequate distribution and financing: failure of conventional supply chains to reach the target population with effective, affordable & desirable water treatment products and to provide financing to cover their up-front cost (IFC, 2009)
- In the particular case of water filters, challenges with filter quality control, breakage, high up-front cost, slow flow rates and the need for regular cleaning and susceptibility to water recontamination have inhibited the scaling up of ceramic filter approaches to date (Clasen, Thomas F, 2009).

## What value does Aqua-Nu add?

***Aqua-Nu provides a breakthrough point-of-use clean water solution.....***

- Aqua-Nu has pioneered a novel water filtration technology which sets new standards in drinking water purity, specifically with regard to contaminant removal performance, flow rate and affordability
- We have designed a low cost, highly effective application of the technology – a point-of-use household water filter called the *Big Pitcher* - in response to what we see as a significant gap in the 'base of the pyramid' market, both rural and urban
- The Aqua-Nu solution is a significant improvement on existing water filtration technologies and is designed to address 21st century water filtration needs
- The Aqua-Nu solution enables the provision of cleaner, safer water than conventional water filtration technology and other alternative clean water provision approaches (e.g. solar disinfection, chlorination, boiling)
- The solution features an adjustable flow ceramic which can be tailored to meet the requirements of particular markets and regions
- Aqua-Nu's uniquely efficient, flexible and durable water filtration technology has performed well above industry standards and competing technologies in scientific tests conducted by independent laboratories, CAL Limited in Ireland, along with South East Water, Severn Trent and Eclipse in the UK
- The technology is highly adaptable for multiple applications and enables tap water to be safely used for drinking purposes, with consequent potential to dramatically reduce plastic bottle waste and impact on landfills.

***.....which directly addresses the shortcomings of current point-of-use products.....***

- Safe: Aqua-Nu's solution filters 99.99 percent of certain hazardous microbes such as Cryptosporidium, Giardia, Legionella and E.coli
- Effective: the technology delivers a breakthrough unassisted flow rate of 1.2 litres per minute at 100 millibar over a 32ml disc, which is 60 to 150 times faster than the closest competitor
- Desirable: Aqua-Nu has designed the *Big Pitcher* to be positioned as a desirable, 'must have' product, rather than positioned as a 'product for the poor'; we are offering something people need, but intend to market it like something people want
- Quality controlled / reliable: Aqua-Nu has selected Morgan Technical Ceramics as its global manufacturing, assembly and distribution partner, to ensure consistent product quality. Morgan Technical Ceramics is a division of Morgan Crucible, one of the world's leading advanced materials companies, specialising in the design, manufacture and marketing of ceramic and carbon products
- Robust / durable: Aqua-Nu's *Big Pitcher* is designed to withstand the rigours of daily use in challenging environments
- Easy to use: Our solution is intuitive and provides clean water as it is needed, with no delay.

***.....at an affordable price which demonstrates our sense of corporate social responsibility,***

- Aqua-Nu provides a high-end filter solution at an affordable price through its proprietary *Big Pitcher* POU product, which is offered at a reduced royalty



- We are also considering a profit share arrangement, with commercial operations to subsidise filter provision to those least able to afford it, potentially via the humanitarian / not for profit sector
- We expect our business model to evolve rapidly as the business grows, and we are open to ideas on how best to adapt it to maximize the benefit to the people most in need of clean, safe water, recognizing that any viable safe water technology must be affordable and accessible to users, ideally without on-going subsidies
- We will consider manufacturing some or all of our solution components in a developing country or countries, subject to achieving the required quality standards, as a means to further reduce cost
- Requiring end users to contribute to sustainable cost recovery for water services is fundamental to achieving financial sustainability in the water sector, as well as providing incentives to use water efficiently (OECD, 2009)
- Much of the target population already has a long tradition of taking charge of their own water supplies—digging their own wells, collecting water from distant rivers, or standing in long queues at urban tap stands. They should also be empowered to control the quality of water they drink. Putting control of clean water into the hands of people with limited disposable incomes enables them to prioritize clean water and invest in improving their families' health (IFC, 2009)
- As a guideline, 3% – 5% of net disposable household income is often quoted as the share of income that can be spent on water, though the actual share for lower income groups may be much higher (the percentage is lower in developed countries, where a larger number of people are in the middle to high income categories) (OECD, 2009)
- Poor people living in the slums often pay 5-10 times more per litre of water than wealthy people living in the same city. (UNDP, 2006)
- 2 billion people - 40 percent of urban residents - are expected to be living in slums by 2030, where inadequate access to safe water is often a feature (UNDP, 2009).

**.....serves the needs of both developed and developing markets.....**

- Our lower-cost product with high-end filtration technology, the *Big Pitcher*, fills a current gap in the 'base of the pyramid' market and provides a basis for reaching that population with a safe, effective, appropriate and affordable solution
- Aqua-Nu believes that the *Big Pitcher* and enabling technology can serve as the basis for effective, creative clean water programmes
- We believe this product will also enable us to grow rapidly in middle- and upper-income markets, including the large emerging markets in countries such as India, China, Brazil and Russia
- Aqua-Nu's solution is positioned to complement existing infrastructure development projects that improve the supply of water, but which cannot guarantee safe water quality at the household level
- Our aim is to create sustainable markets for our full product suite, which deliver shareholder value in tandem with significant social / humanitarian benefits.

**.....and can deliver significant economic returns for every \$ invested**

- Every \$1 invested in safe water and sanitation yields an economic return of between \$3 and \$34 (US Department of State, 2009)
- UNICEF estimates that achieving the MDG targets for water and sanitation would reap economic benefits of \$7.40 per \$1 invested (CSIS, 2009).

## How do we intend to bring our solution to market?

### *Aqua-Nu proposes a practical 'launch and learn' approach .....*

- We are a small company with a product set that has the potential to play a big part in the effort to bring clean, safe water to those who most need it
- We recognize that there are multiple interdependent components required to underpin any successful clean water initiative, including political, policy, marketing, communication, distribution and finance
- The company recognizes that a range of approaches and strategies are required to reach each of the different potential markets for its technology
- We believe that a concerted and comprehensive action programme involving the public and private sectors is required to bring about change and to scale up dissemination of point-of-use clean water solutions from tens of thousands per year to tens of millions
- We understand that, in order to scale up and realize the full potential of our solution, we must address not only the supply (ensuring that the solution reaches the target populations) but also the demand (promoting correct and consistent use)
- In particular, we know that innovation and investment are needed to reach the 'base of the pyramid' markets, where safe water is most desperately needed.
- We intend to engage with a broad range of stakeholders with an interest in clean, safe water and refine our approach as we learn from them.

### *.....working with the right partners to deliver success*

- We are focused on continued product innovation, in tandem with working with partners to support demand creation (through consumer education and promotion, social marketing) and develop creative delivery mechanisms, maximizing use of existing infrastructure and distribution systems
- Some of the most promising business models for safe water interventions with low-income populations draw on the strengths of NGOs and government (behaviour change, awareness raising, working with communities, families and individuals), integrated with a market-based approach to safe water (IFC, 2009)
- NGOs have existing programmes (e.g. microenterprise and microfinance, development, health, gender empowerment) that can reach vulnerable populations. Achieving significant coverage for household water treatment within this target population will require a collaborative effort between the private sector and NGOs to reach the underserved, and to provide them with the information and confidence to acquire and use products correctly and consistently (IFC, 2009)
- We anticipate working closely with the public sector and NGOs that have a special capacity and dedication to reach those population segments most in need
- Aqua-Nu seeks credible international and local market partners to facilitate piloting of the technologies in the field, with pilot objectives to include:
  - understanding and meeting an existing local demand for safe, clean water
  - proving the technology in the field
  - demonstrating the sustainability of the approach (filter supply, quality control, logistics, filter maintenance and replacement) in the pilot community
  - determining the optimum funding strategy / strategies and ensuring that products are affordable and acceptable
  - establishing a basic operating model(s) which can then be scaled up / applied to multiple communities.

## Next steps

***Initiate discussion with potential clean water partner stakeholders with the aim of achieving the following specific outcomes:***

- Create / raise awareness of Aqua-Nu's potential to be a central part of the solution to the problem of safe, clean water provision, based on our core solution's contaminant removal performance, high flow rate, low cost and ease of use
- Identify existing and planned clean water programmes / projects / pilots in which Aqua-Nu can play a role
- Identify contacts in each stakeholder organisation for detailed follow-up discussions, where appropriate (e.g. those responsible for water policy / strategy within the organisation)
- Identify other organisations / contacts in the clean water area with whom Aqua-Nu should meet
- Determine potential partners and funding sources for
  - pilot projects in the developing world
  - further R&D into the humanitarian and commercial applications of the technology
  - humanitarian and commercial expansion
- Obtain guidance and feedback from stakeholders to help us articulate and finalise the company's humanitarian strategy, with a view to quickly moving to planning and execution.

## References

- Clasen, Thomas F (2009). *Scaling Up Household Water Treatment Among Low-Income Populations*. Geneva, World Health Organization (WHO/HSE/WSH/09.02)
- CSIS (2009). *Enhancing U.S. Leadership on Drinking Water and Sanitation*. Washington DC, Center for Strategic and International Studies
- Sobsey MD (2002). *Managing water in the home: Accelerated health gains from improved water supply*. Geneva, World Health Organization (WHO/SDE/WSH/02.07).
- IFC (2009). *Safe Water for All - Harnessing the Private Sector to Reach the Underserved*. International Finance Corporation, a member of the World Bank Group
- OECD (2009). *Managing Water For All: An OECD Perspective On Pricing And Financing – Key Messages For Policy Makers*.
- UNDP (2006). *Beyond scarcity: Power, poverty and the global water crisis*. United Nations Development Programme (Human Development Report 2006)
- UNDP (2009). *Overcoming barriers: Human mobility and development*. United Nations Development Programme (Human Development Report 2009)
- United Nations (2000). *United Nations Millennium Declaration*. General Assembly Resolution 55/2, 18 September 2000 (<http://www1.umn.edu/humanrts/instreet/millennium.html>).
- USAID/US Department of State (2008). *Addressing Water Challenges in the Developing World: A Framework For Action*. An Annex of the 2008 Report to Congress for the Senator Paul Simon Water for the Poor Act
- US Department of State (2009). *Senator Paul Simon Water for the Poor Act. Report to Congress, June 2009*
- WHO (2008a). *The global burden of disease: 2004 update*. Geneva, World Health Organization ([http://www.who.int/healthinfo/global\\_burden\\_disease/2004\\_report\\_update/en/index.html](http://www.who.int/healthinfo/global_burden_disease/2004_report_update/en/index.html)).
- WHO (2008b). *Safer water, better health: Costs, benefits and sustainability of interventions to protect and promote health*. Geneva, World Health Organization
- WHO (2009). *Household Water Treatment and Safe Storage*. World Health Organization Programmes and Projects ([http://www.who.int/household\\_water/en/](http://www.who.int/household_water/en/))
- WHO/UNICEF (2005). *Water for life: Decade for action 2005–2015*. Geneva, World Health Organization and United Nations Children's Fund, Joint Monitoring Programme for Water Supply and Sanitation.
- WHO/UNICEF (2006). *Meeting the MDG drinking water and sanitation target: The urban and rural challenge of the decade*. Geneva, World Health Organization and United Nations Children's Fund.
- WHO/UNICEF (2008). *Progress on drinking water and sanitation: Special focus on sanitation*. Geneva, World Health Organization; and New York, United Nations Children's Fund
- World Water Council (2009). *Outcomes of the 5th World Water Forum Istanbul 2009*