

Health Impact Study – BioSand Water Filter – Dominican Republic

By

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A very important study documenting the impact of the introduction of the concrete household BioSand Water Filter technology on the health of individuals and families was recently reported. Many interested in using the BioSand Water Filter (BSF) to provide safe drinking water to disadvantaged communities around the world may never have known that it has been in progress for several years. The study was designed and performed by Dr. Mark Sobsey of the University of North Carolina. Funding came from a wide variety of government and nongovernmental organizations including many Rotary International clubs across the United States and Canada. Other groups including Samaritan's Purse Canada and the Centre for Affordable Water and Sanitation Technology of Calgary, Alberta, Canada had helped fund preliminary laboratory and field work. The results of the study were announced at a the recent Thirsting to Serve Conference sponsored by District 6290 of Rotary International in Grand Rapids Michigan on February 2007.

The study was performed in the Dominican Republic where several thousands of concrete BSF's are installed. The water filter project in the Dominican Republic that ultimately lead to the 'Health Impact Study' was originally developed by Dr. Janet Tollefson of Calgary, Alberta, Canada with funding from a variety individuals and church organizations, service clubs and the government of Canada and herself by the sheer dedication of effort and resourcefulness. My involvement was to bring the BSF technology to the Dominican Republic under Jan's careful guidance. The generous and continuous support of Rotary International in the Dominican Republic, Canada and the United States have resulted in the establishment of several healthy BSF commercial enterprises that have built and installed approximately 12,000 concrete BSF's at the time of writing.

The results reported by Dr. Sobsey at the Thirsting to Serve Conference were very good! He reported that preliminary analysis of health impact data collected from the project in the Dominican Republic indicated a decrease of more than 50% in the incidence of diarrhea related diseases in the population who used the BioSand Water Filter without the use of any other treatment technologies – such as post filtration disinfection using sodium hypochlorite (bleach). Dr. Sobsey indicated that the final report on this study will be published later this year and the numbers he presented would vary from those he originally presented. The BioSand Water Filter is perhaps the most positive, single intervention, affecting the health of people living in disadvantaged communities worldwide. The work reported is of a type and quality that can be accepted by the World Health Organization and the Centers for Disease Control. Once Dr. Sobsey

publishes the final reports it will possible to provide an adequate review of his protocols, project implementation and method of analysis.

It must be recognized that here have been several other studies on the effectiveness of the BioSand Water Filter. The original work started in the laboratories in the Department of Civil Engineering at the University of Calgary with my undergraduate student, David Lee, my graduate student Byron Buzunis and many other undergraduate students and graduate students who just wanted to work on a project that promised to improve the well being of the world's poor. The support staff of the Department of Civil Engineering volunteered time and help whenever they could. The Division of International Development under the leadership of Dr. Mel Kerr believed enough in the development of the BSF that he championed the first field introductions of the BSF technology into Nicaragua in 1993 and later in 1994. The BSF was always being evaluated. The BSF technology always performed well (in circumstances where the technology was appropriately introduced). People's health improved dramatically (elimination of cholera) and they frequently reported that they 'loved their filters'. The evaluation of the BioSand Water Filter performed by the National Water Research Institute of the Government of Canada (published on this web site) was the first serious independent research effort that documented the effectiveness of the BSF technology.

The first major NGO to embrace the BSF technology was Samaritan's Purse Canada. Their project in Ethiopia was funded by a very skeptical Canadian Rotary International Club, 'Calgary South'. My role was to provide the appropriate BSF training to the individuals who would eventually be going to Ethiopia. The project was very successful, has grown, and continues to grow. Samaritan's Purse Canada expanded the water filter initiative around the world and launched a major international evaluation of the BSF technology – six countries in three continents, Africa, Latin America and Asia. The results were astounding. The laboratory reports were very good, BSF use almost 100%, and the reported health improvements incredible. The recent performance evaluation on the BSF's installed in Ethiopia with funding from the Canadian International Development Agency was equally positive. Samaritan's Purse Canada is responsible for the implementation of projects that deliver safe water to more than half a million people worldwide. No other organization can as yet make this claim – at least regarding the BSF. "Calgary South" and many other Rotary Clubs have subsequently funded many other BSF projects throughout the world.

The significance of the success of the BSF technology and its impact on community health was not lost. A company, Davnor Water Treatment Technology Ltd. (founded by David and Nora Manz), was set up in 1995 to promote the commercial opportunities available with the use of the BSF and continue to develop and support its humanitarian use. The original workshops and instructional material on the need, design, construction, operation and maintenance were held in the Davnor premises. Many individuals and organizations were trained over the following years and these organizations established humanitarian BSF projects around the world. These projects were funded by numerous individuals and organizations. The dedication of the project implementers, supporters and funders and the apparent effectiveness of the low cost BSF

eventually resulted in the construction and use of between two and three hundred thousand household scale BSF's, concrete (humanitarian) and plastic (commercial and humanitarian) in more than 70 countries (a million or so healthy consumers). Many thousands of individuals can take credit for this work. Several other studies were performed on the BSF technology and its apparent impact on the health of people who were using it – people who never had access to abundant quantities of water safe for drinking, food preparation and serving, and personal hygiene. Unfortunately, these studies on the effectiveness of the BSF were not up to the standards of the WHO and funding agencies with the resources to really take the BSF technology to the many billions of people that would benefit. The installation of the many thousands of household BSF's and their apparent positive health impact did attract the attention of serious concerned bureaucrats and scientists, (domestic and international), and the 'Health Impact Study on the Introduction of the BSF' was envisaged. Thanks must go to all those who ever participated in the development of the BSF technology, took a workshop, funded a filter, or reported on the success of the technology.

The combination of humanitarian and the commercial development of the BSF technology have worked very well. The concrete household filter (humanitarian) remains available royalty free – the only requirement is to take appropriate training. Davnor is no longer an operating company; but as the first serious commercial initiative, it served to advance the development of the BSF technology in a very rapid way. BSF technology is available to treat water tens of litres per hour to millions of litres per hour, (households to the very large cities), constructed using a variety of materials and methods, operated using manual and automated methods to treat virtually any type of water found (alone or with other technologies), within the budgets of intended consumers. The BSF technology is subject to several patents in Canada, the United States and other countries around the world. These patents are now held by the company, Pure Filtered Water Ltd., of Calgary, Alberta, Canada, that is owned by me and business partner, Mr. Fred Richards who is also the President of the company. Pure Filtered Water manages the commercialization of the BSF technology including licensing the technology to qualified interested parties.

Occasionally, some individuals decide 'to improve' or 'ignore' aspects of the BSF technology without the requisite testing and evaluation and some avoidable, unfortunate failures have resulted. The recently completed 'Health Impact Study' does not apply to these modified BSF technologies. **I strongly recommend that if there is any doubt regarding whether a particular water filter design is or is not a variation of BSF that I be contacted immediately for a written opinion.**

As well, 'knock-offs', approximations of the BSF technology, have been developed – the first ones popped up in Nicaragua, Bolivia and Cuba. There are several others. They are frustrating for everyone who wishes to promote good health through the provision of safe water. 'Knock-offs' are typically inferior in design and construction. It is disturbing to think about their associated promotional and intervention programs. Invariably they disappear, because they are inferior and not accepted by the people; but

they do damage the reputation of legitimate BSF technology and slow its introduction in unpredictable ways.

The recently reported 'Health Impact Study' is actually the result of close to 20 years of work by me, my family and thousands of other people who participated in the development and implementation of the BSF technology.

Thanks and congratulations to all!

Personal Note

I continue to work with my business partner and friend, Mr. Fred Richards, in Pure Filtered Water Ltd., through my consulting engineering firm, Manz Engineering Ltd. and privately as required. Every day I spend a minimum of two to three hours working on some initiative concerning the BioSand Water Filter or its big sister technology that has been given the awkward name, Low Operating Head Polishing Sand Filter (patent pending) that promises to solve the water treatment challenges of major world cities.

I am no longer directly affiliated with the University of Calgary though I do give a number of courses there through their Faculty of Continuing Education.

Davnor Water Treatment Technologies Ltd. does not exist as an operating company.

I prefer to be known as Dr. David H. Manz from Calgary, Alberta, Canada, Professional Engineer, Professional Agrologist and inventor and supporter of the BioSand Water Filter, (formerly professor of environmental and water resources engineering at the University of Calgary and formerly president and owner of Davnor Water Treatment Technologies Ltd.)