May 16, 2014

Mr. Dennis Brown
Aquamira Technologies, Inc.
917 West 600 North Ste 105
Logan, Utah 84321
P: (360) 306-5586

Re: Biological contaminant filtration efficacy testing of the Aquamira Green Line filters-G4098; BCS ID 1404168 and 1404169

To whom it may concern,

We have conducted the requested biological filtration efficacy study on the provided "Green Line" filters. The experimental set up and challenge of the water filters was designed to evaluate the filters' biological contaminants removal efficacy. The contaminant species and water parameters selected were based on client's request and NSF/ANSI water purifier testing protocols.

Following, you will find our report on the results of the challenge study. Should you have any questions, please do not hesitate to contact me.

Sincerely,

George Lukasik, Ph.D.
Laboratory Director

BCS LABORATORIES INC.-GAINESVILLE
4609 NW 6TH STREET, STE. A, GAINESVILLE, FLORIDA 32609
TEL. (352) 377-9272, FAX. (352) 377-5630
WWW.MICROBIOSERVICES.COM
FL DOH LABORATORY #E82924, EPA# FL01147

Project: Green Line Filters' Efficacy Test
Study Sponsor: Aquamira Technologies Inc.
Sample(s): BCS 1403168 and 1403169 received March 19, 2014
Test: Filtration Efficacy
Test Parameter: *Raoultella terrigena* (Bacteria) and *Cryptosporidium parvum* oocyst
Performed and Analyzed by: George Lukasik, Ph.D.; April 17, 2014

Filter	Filter influent average concentration	Average concentration of the challenge species* (per milliliter) in the filter effluent following the passage of the indicated volumes (gallons)					
		Bacteria: *Raoultella terrigena*[1]			Parasite: *Cryptosporidium parvum* oocyst[2]		
		1	**40**	**80**	**1**	**40**	**80**
BCS 1403168 Filter A	*Raoultella terrigena*[1] 3.9×10^5 / ml *Cryptosporidium parvum* oocyst[2] 6.1×10^3 / ml	< .5*	< .5*	< .5*	< 1.0*	< 1.0*	< 1.0*
BCS 1403169 Filter B		<.5*	<.5*	5.9*	< 1.0*	< 1.0*	< 1.0*

[1] *Raoultella terrigena* (ATCC 33257) was obtained from ATCC and propagated on Tryptic Soy Agar (TSA, Becton Dickinson, USA). It is used to evaluate filters' bacterial removal efficacy. Bacteria was enumerated as colony forming units (cfu) following incubation at 36.5°C for 24 hours as per Standard method 9215C (APHA, 2012).
[2] *Cryptosporidium parvum* Oocysts were obtained from Bunch Grass Farms (Deary, ID). The oocysts were enumerated as per EPA 1623.1 using an immuno-fluorescent assay (Aquaglo, Waterborne, LA)
* No species were detected in the filter effluent for the total volume analyzed (<0.45 cfu or pfu/ml). Filter effluent samples were analyzed in duplicates at the minimum following collection.

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Filter	Filter influent average concentration	Average percent removal** of the challenge species by filters following the passage of the indicated volumes (gallons)					
		Bacteria: *Raoultella terrigena*[1]			*Cryptosporidium parvum* oocyst[2]		
		1	40	80	1	30	60
BCS 1403168 Filter A	*Raoultella terrigena*[1] 3.9×10^5 / ml	> 99.9999%	> 99.9999%	> 99.9999%	> 99.98%	> 99.98%	> 99.98%
BCS 1403169 Filter B	*Cryptosporidium parvum* oocyst[2] 6.0×10^3 / ml	> 99.9999%	> 99.9999%	99.999%	> 99.98%	> 99.98%	> 99.98%

[1] *Raoultella terrigena* (ATCC 33257) was obtained from ATCC and propagated on Tryptic Soy Agar (TSA, Becton Dickinson, USA). It is used to evaluate filters' bacterial removal efficacy. Bacteria was enumerated as colony forming units (cfu) following incubation at 36.5°C for 24 hours as per Standard method 9215C (APHA, 2012).
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***** Biological filtration challenge study description: Initially, one liter of laboratory grade reagent water was passed through each of the provided filters using 1.8-2.0 PSI pressure. The indicated species were added to laboratory reagent water (pH 7.5±0.5) and the solution was passed through using pressure filtration. One half liter of the challenge solution was passed through each filter. The filter effluent was collected in a sterile container. The flow rate was validated using a NIST traceable timer. The flow rate of the filters was 400-500 ml/min. The effluent was assayed for the respective species as per Standard Methods (APHA 2012) and Lab Standard Operating Procedures (SOP F-1). A sample of the influent was removed prior to the beginning of the challenge study and at the end of the study and assayed to determine the concentration of the filters influent challenge. Following, each of the filters was connected to a City of Gainesville pressure regulated (2 PSI) water supply source and the indicated volume of water was passed through each of the filters. The above described challenge was then repeated. The process was repeated for additional volumes and challenges were performed following each water passage. The number of microorganisms was determined in each sample. The respective percent reductions were determined based on the concentration obtained in the filter influent and effluent. The tables report the average reduction of the filters tested.

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Study data are summarized in the provided table(s). The results presented pertain only to the study conducted on the test articles/samples provided by the client (or client representative). The study was authorized and commissioned by the client. The results presented pertain only to the samples analyzed and identifier number(s) indicated. The data provided is strictly representative of the study conducted using the material/samples/articles provided by the client (or client's representative) and its (their) condition at the time of test. The study and data are obtained under laboratory conditions and may not be representative or indicative of a real-life process and/or application. Positive, negative, and neutralization controls were performed as outlined in the method and as per Good Laboratory Practices. All analyses were performed in accordance with laboratory practices and procedures set-forth by our NELAP/TNI accreditation standards (ISO 17025) unless otherwise noted. BCS makes no claims with regards to the express or implied warranty regarding the ownership, merchantability, safety or fitness for a particular purpose of any such property or product.

Signature of Laboratory Director/Authorized Rep. _____ Date: May 16, 2014

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