2019-09-26

Ulrich Weise
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+49 (0) 330 203 1455
u.weise@weise-water.de
Client ID: AQQA bag 1, AQQA bag 2

BCS ID: 1909302, 1909303

Project Name: WW09232019 E.Coli 11229 Initial Filtration Efficacy Testing

Dear Ulrich Weise,

We have completed the filtration efficacy study on the submitted units as outlined below. The contaminant species, study conditions, and water parameters utilized were based on client's request and adaptation of the guidance documents and protocols listed below:

Validation of Water Purifier Microbiological Filtration Efficacy: Screening of initial performance as per client request; BCS SOP-F1 (ISO17025 accredited)

Report Conclusion: Study completed as per clients request.

Following, you will find our report on the results of the study conducted on the referenced samples. 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 #E82924, ISO/IEC 17025:2017 L2422 (ANAB), PA DEP# 68-03950, EPA# FL01147

Analysis: *E. coli Filtration Efficacy* Test Water: General Test Water I

Analysis Method: Spread Plating (Standard Method 9215)

Test Point: Initial Performance **Test Point Conclusion: PASS**

Challenge Date: 2019-09-24 Challenge Analysts: Molly Vise, B.S.

Initial Pres. (PSI): N/A Temp: 24.8 C

pH: 8.2 Turbidity: 0.11NTU TOC: 0.98 ppm TDS: 213.3 ppm Hardness: 115.0ppm

Alkalinity: 82.0ppm Total Chlorine: 0.02ppm Polyphosphate (as phosphorus): N/A

Influent Conc: 4.1E+05 cfu/mL Ambient Temp: 24.9C

Analysis Date: 2019-09-24 Analysts: Molly Vise, B.S.

Test Notes: Challenge water was allowed to filter through the test units by gravity. *E. coli* bacteria was not detected in units' effluent water. Units effectively filtered bacterial contamination from test water when tested as described in report notes.

BCS Sample ID 1: 1909302 Client ID 1: AQQA bag 1 Flow Rate 1: 0.11 LPM Press 1(psi): N/A

Eff Conc 1: <3.0E-01 cfu/mL % Reduct 1: >99.99993 Log10 Reduct 1: >6.1

BCS Sample ID 2: 1909303 Client ID 2: AQQA bag 2 Flow Rate 2: 0.11 LPM Press 2(psi): N/A

Eff Conc 2: <3.0E-01 cfu/mL % Reduct 2: >99.99993 Log10 Reduct 2: >6.1

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Project: WW09232019 E.Coli 11229 Initial Filtration Efficacy Testing

Date Received: 2019-09-23 13:33 Test Start Date: 2019-09-24 Test End Date: 2019-09-24

System Type: 5 Liter Membrane Water Filter Bag; Gravity filtration Est. Capacity: N/A

Performance Indicating Device: N/A Batch Volume: N/A Batch, number per day: N/A

Test Cycle (min): N/A Cycle On/Off (%): N/A Restricted Flow Rate: No

Test Duration (hr per day): N/A Test Conditioning: 5L of Dechlorinated Tap Water

Report Notes:

The provided water purifier units were received from the study sponsor and given the BCS identifiers 1909301-303. Three units were receive and two were randomly chosen for the study. The test was conducted to detrmine the units' initial use filtration efficacy. Each unit consisted of a clear plastic bag that contained an internal membrane. Each unit, was conditioned by filling with 5 Liters of General Test Water 1 (GTW1, NSF P231; dechlorinated municipal water). The water was allowed to flow the unit. Following cessation of flow, the challenge was initiated. Briefly, the indicated challenge species was added to 10 Liters of GTW1. The water was homogenized and 5 Liters were transferred into each bag. Following the passage of 500mL of test water, a 1 Liter sample of each filter bags' effluent was collected in a sterile container. A sample of the influent test water was collected at the start and end of the challenge. Influent and effluent sample analysis was conducted in triplicate at minimum. All water characteristics, test parameters, and challenge species analysis were performed as per standard laboratory operating procedure. Study & analysis was conducted as per laboratory's accredited ISO17025:2017 methodology: E.coli was analyzed as per SM 9215C (APHA 2012), turbidity as per SM2130B, pH as per SM4500HB, TDS as per SM2540, chlorine as per SM4500-Cl G, & hardness as per SM2340C (if needed). All analysis was conducted using calibrated and/or validated Instruments to traceable standards (NIST). All Quality Control (QC) data were was within acceptance range. No general environmental conditions are specified in the standard or have been identified that could affect the test results or measurements. End of Report Notes.

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*I certify that I have examined and I am familiar with the information submitted herein. The results pertain only to the sample(s) tested, associated identifier #(s), and condition at receipt. Based on my inquiry of the individuals responsible for the analysis, I believe the data to be true, accurate, and complete. Unit descriptions and names were obtained from the submitted documents. The analysis was authorized and commissioned by the client or client's representative. The resulting data are representative of the analysis conducted on the collected samples and it's/their condition at the time of analysis. The data provided is strictly representative of the study conducted under laboratory conditions using the material/samples/articles provided by the client (or client's representative) and it's (their) condition at the time of test following receipt. The data obtained may not be representative or indicative of a real-life process and/or application. The sample(s) were analyzed in accordance with the appropriate method, however due to the inherent limitations of methods, microorganisms may avoid detection. BCS Laboratories offers no express or implied warranties concerning the quality, safety, and/or purity of any sample, batch, source, or the process they are derived from. Quality assurance controls were performed as outlined in the method and as per Good Laboratory Practices. Analyses were performed in accordance with laboratory practices and procedures set-forth by ISO 17025-2005 and NELAP/TNI accreditation standards unless otherwise noted. BCS makes no 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: 2019-09-26

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Pictures:

Client: Weise Water

Project: WW09232019 E.Coli 11229 Initial Filtration Efficacy Testing

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*Balance ID: BL-10 Description: Sartorius Practum Precision Balance

Range of Function: 0-3100 g Instrument Reporting Limit: 0.01g

Last Servive Date: 2019-08-07 Service Due Date: 2020-08-31

Service Type: NIST Calibration NIST Validation Instrument: External Provided

*pH Meter ID: PH-09 Description: Orion Versa Star Pro Meter w/pH and Conductivity Modules

Range of Function: 0.001-12.000 Instrument Reporting Limit: 0.001

Last Service Date: 2018-09-07 Service Due Date: 2019-09-30

Service Type: Manufactuer OEM NIST Validation Instrument: NIST Standard Solution

*Conductivity Meter ID: CM-08 Description: Orion Versa Star Pro Meter w/pH and Conductivity Modules

Range of Function: 0.01-2400 ppm Instrument Reporting Limit: 0.01ppm

Last Service Date: 2018-09-07 Service Due Date: 2019-09-30

Service Type: Manufactuer OEM NIST Validation Instrument: NIST Standard Soutions

*Alkalinity Meter ID: ALK-04 Description: Alkaline Meter

Range of Function: 10-4000 mg/L Instrument Reporting Limit: 10 mg/L

Last Service Date: 2018-07-01 Service Due Date: 2019-09-01

Service Type: Manifacturer OEM NIST Validation Instrument: NIST standard

*Hardness Meter ID: HARD-02 Description: Hach Total Hardness Test Kit 10-4,000 mg/L

Range of Function: 10-4000mg/L Instrument Reporting Limit: 10 mg/L

Last Service Date: 2019-05-20 Service Due Date: 2020-05-20

Service Type: Validation to NIST NIST Validation Instrument: NIST Standard solutions

*Turbidity Meter ID: TM-05 Description: Hach Turbidimeter

Range of Function: 0.00-999NTU Instrument Reporting Limit: 0.01NTU

Last Service Date: 2019-08-29 Service Due Date: 2020-08-29

Service Type: Manufactuer OEM NIST Validation Instrument: NIST Standard Solutions

*Spectrophotometer ID: SPEC-02 Description: Hach DR 3900 Spectrophotometer Colorimeter

Range of Function: 320-1000nm Instrument Reporting Limit: 0.01nm

Last Service Date: 2019-09-13 Service Due Date: 2020-09-13

Service Type: Manufacturer service NIST Validation Instrument: NIST Standard Solutions

Incubator ID: I-20 Description: Thermo Fisher Forma 29 cu. ft. Reach-In Incubator

Range of Function: 10-65C Instrument Reporting Limit: 0.1C

Last Service Date: 2018-08-31 Service Due Date: 2019-09-30

Service Type: Annual Service NIST Validation Instrument: IR-09

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**Flow Meter ID 1: N/A Description:

Range of Function: Instrument Reporting Limit:

Last Service Date: Service Due Date:

Service Type: NIST Validation Instrument:

**Flow Meter ID 2: N/A Description:

Range of Function: Instrument Reporting Limit:

Last Service Date: Service Due Date:

Service Type: NIST Validation Instrument:

**Flow Meter ID 3: N/A Description:

Range of Function: Instrument Reporting Limit:

Last Service Date: Service Due Date:

Service Type: NIST Validation Instrument:

Microscope ID: N/A Description:

Range of Function: Instrument Reporting Limit:

Last Service Date: Service Due Date:

Service Type: NIST Validation Instrument:

Refigerator ID: FR-11 Description: Migali B Series Glass Door Refrigerator

Range of Function: 1-8C Instrument Reporting Limit: N/A

Last Service Date: 2018-08-28 Service Due Date: 2019-09-30

Service Type: Annual Service NIST Validation Instrument: External Provided

Centrifuge ID: C-12 Description: Eppendorf centrifuge w/ cell culture package

Range of Function: 0-4400 RPM Instrument Reporting Limit: 1 RPM

Last Service Date: 2018-08-28 Service Due Date: 2019-09-30

Service Type: Annual Service NIST Validation Instrument: TA-01

Pressure Source Pump ID: N/A Description:

Range of Function: Instrument Reporting Limit:

Last Service Date: Service Due Date:

Service Type: NIST Validation Instrument:

Pressure Meter ID: N/A Description:

Range of Function: Instrument Reporting Limit:

Last Service Date: Service Due Date:

Service Type: NIST Validation Instrument:

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Cert. Pressure Meter ID: N/A Description:

Range of Function: Instrument Reporting Limit:

Last Service Date: Service Due Date:

Service Type: NIST Validation Instrument:

TOC Analyzer ID: TOC-01 Description: GE M5310C Lab TOC Analyzer

Range of Function: 40ppb-50ppm Instrument Reporting Limit: 0.01ppb

Last Service Date: 2019-05-29 Service Due Date: 2020-05-29

Service Type: Manufacuter Cal. NIST Validation Instrument: NIST Standard Solutions

ICP-MS ID: N/A Description:

Range of Function: Instrument Reporting Limit:

Last Service Date: Service Due Date:

Service Type: NIST Validation Instrument:

Thermometer ID: IR-09 NIST Description: VWR Traceable Infrared Thermometer

Range of Function: -60-500C Instrument Reporting Limit: 0.01C

Last Service Date: 2018-04-30 Service Due Date: 2020-04-30

Service Type: Calibration NIST Validation Instrument: Manufactuer calibration

Timer ID: T-37 Traceable Jumbo Timer

NIST Expiration Date: 2021-02-19

*Validated at each day of use using NIST traceable standards. Other major equipment validated quarterly.

**Validated at each use using traceable volume and time measurements.

All above equipment with completed fields were used from Test Start Date through Test End Date unless otherwise noted. Service Date indicates PM and/or calibration by accredited service provider. Service Dates reported for latest period. If Last Service Date occurs during study duration, please contact us for the previous period's validation information.

END OF REPORT

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