



LEGIONELLA TEST RESULTS SUMMARY LOG

Summary Log Date:	5.11.2023	Customer Number:	6880209	Sampling Date:	5.2.2023
Prepared By:	Joseph Mahfet	Customer Name:	DGS	Legionella Analysis Lab Report Date:	5.10.2023
Territory Number:	0302	City, State:	San Diego, CA 92108	New/Retest (select from dropdown):	Retest

Point of Entry (POE) pH:	Select	Disinfectant:	Monochloramine	Supplemental Disinfectant:	Select
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Sample Number	Location/Sample Description	Disinfectant Residual (ppm)		HW Temp (°F, sec)	Sample Type	Legionella Results (water as CFU/mL, swab as CFU/swab)							
		Total Cl2	Select			L. pneumophila SGI ¹	L. pneumophila SG2-14 ¹	Other L. spp ¹	Total ²	Action Level ³	HPC ^{2,4}	Action Level ⁴	
1	1st Floor, Mens RR, Center Sink, Pre, West, CW				Water	Potable - CW	ND	ND	ND	ND	0.1	ND	500
2	1st Floor, Mens RR, West, Center Sink, CW, Post, TCL .12	0.12			Water	Potable - CW	ND	ND	ND	ND	0.1	20	500
3	1st Floor, Mens RR, West, Center Sink, HW, Post, TCL .02, 50s, 114	0.02			Water	Potable - HW	ND	1.0	ND	1.0	0.1	10	500
4	107, Sink, CW, Post, TCL .03	0.03		123.6,45s	Water	Potable - CW	ND	ND	ND	ND	0.1	0	500
5	100-3, Sink, CW, Post, TCL 1.2	1.20			Water	Potable - CW	ND	ND	ND	ND	0.1	0	500
6	103-7, Sink, CW, Post, TCL 1.4	1.40			Water	Potable - CW	ND	ND	ND	ND	0.1	0	500
7	2nd Floor, West, Mens RR, Pre, CW				Water	Potable - CW	ND	ND	ND	ND	0.1	0	500
8	2nd Floor, West, Mens RR, Post, CW				Water	Potable - CW	ND	ND	ND	ND	0.1	0	500
9	2nd Floor, West, Mens RR, Post, HW, 109s 110°, TCL .03	0.03			Water	Potable - HW	ND	2.0	ND	2.0	0.1	0	500
10	2nd Floor, East, Womens RR, CW, Pre, Left Sink				Water	Potable - CW	ND	ND	ND	ND	0.1	0	500
11	2nd Floor, East, Womens RR, CW, Post, TCL 1.6, Left Sink	1.60			Water	Potable - CW	ND	ND	ND	ND	0.1	20	500
12	2nd Floor, East, Womens RR, Hot, Post, 55s, 123°, TCL .02, Left Sink	0.02		129.7,47s	Water	Potable - HW	ND	ND	ND	ND	0.1	0	500
13	2nd Floor, East, Womens RR, CW, Pre, Right Sink				Water	Potable - CW	ND	6.0	ND	6.0	0.1	0	500
14	2nd Floor, East, Womens RR, CW, Post, Right Sink, TCL 1.4	1.40			Swab	Potable - CW	ND	3.0	ND	3.0	0.1	0	N/A
15	2nd Floor, East, Womens RR, HW, Post, Right Sink, 40s 124°, TCL .02	0.02			Water	Potable - HW	ND	3.0	ND	3.0	0.1	0	500

¹ Results - NEVER enter a result of "0" - When "Not Detected" is reported, use "ND" in this spreadsheet.

² Formats - Blue numbers indicate positive, below action level. Red numbers indicate positive, at or above action level. "ND" and "0" always appear Black. A result of "<1" will be counted as "1" in the Legionella total (e.g. <1 + <1 + 10 = 12).

³ Legionella Action Levels - based on CDC Limits of 0 CFU/mL for potable water, OSHA limit of 100 CFU/mL for cooling water, the State of New York limit of 20 CFU/mL for cooling water and the New York City limit of 10 CFU/mL for cooling water.

⁴ HPC Action Levels - heterotrophic plate count, CFU/mL. Action Level References: 200 CFU/ml for Whirlpool/Spa & Decorative Fountain - ANSI-APSP Document page 36, 500 CFU/ml for Potable (POE, CW, HW, Mixed), Humidifier/Air Washer, Ice Machine (Ice - potable), Ice Machine (MU Water - potable) & Other (Potable) - Federal Regulatory Limit/MCL per 67 FR 1811; U.S. EPA, 2002, 10,000 CFU/ml for Cooling Towers - CTI Guideline July 2008



LEGIONELLA TEST RESULTS SUMMARY LOG

Summary Log Date: Prepared By: Territory Number:	5.11.2023 Joseph Mahfet 0302
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Customer Number:	6880209
Customer Name:	DGS
City, State:	San Diego, CA 92108

Sampling Date:	5.2.2023
Legionella Analysis Lab Report Date:	5.10.2023
New/Retest (select from dropdown)?:	Retest

Sample Number	Location/Sample Description	Disinfectant Residual (ppm)		HW Temp (°F, sec)	Sample Type	Legionella Results (water as CFU/mL, swab as CFU/swab)							
		Total Cl2	Select			L. pneumophila SGI ¹	L. pneumophila SG2-14 ¹	Other L. spp ¹	Total ²	Action Level ³	HPC ^{2,4}	Action Level ⁴	
16	330-8, Sink, CW, TCL .04	0.04			Water	Potable - CW	ND	ND	ND	ND	0.1	0	500
17	301-35, Sink, CW, TCL 1.2	1.20			Water	Potable - CW	ND	ND	ND	ND	0.1	0	500
18	301-34, Sink, CW, TCL 1.24	1.24			Water	Potable - CW	ND	ND	ND	ND	0.1	0	500
19	Roof, CW, Expansion Tank, Post				Water	Potable - CW	ND	ND	98.0	98.0	0.1	0	500
20	Roof, HW Tank, Post, TCL				Water	Potable - HW	ND	ND	ND	ND	0.1	0	500
21					Water	Select							
22					Water	Select							
23					Water	Select							
24					Water	Select							
25					Water	Select							
26					Water	Select							
27					Water	Select							
28					Water	Select							
29					Water	Select							
30					Water	Select							

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³ Legionella Action Levels - based on CDC Limits of 0 CFU/mL for potable water, OSHA limit of 100 CFU/mL for cooling water, the State of New York limit of 20 CFU/mL for cooling water and the New York City limit of 10 CFU/mL for cooling water.

⁴ HPC Action Levels - heterotrophic plate count, CFU/mL. Action Level References: 200 CFU/ml for Whirlpool/Spa & Decorative Fountain - ANSI-APSP Document page 36, 500 CFU/ml for Potable (POE, CW, HW, Mixed), Humidifier/Air Washer, Ice Machine (Ice - potable), Ice Machine (MU Water - potable) & Other (Potable) - Federal Regulatory Limit/MCL per 67 FR 1811; U.S. EPA, 2002, 10,000 CFU/ml for Cooling Towers - CTI Guideline July 2008



LEGIONELLA TEST RESULTS SUMMARY LOG

Summary Log Date:	5.11.2023
Prepared By:	Joseph Mahfet
Territory Number:	0302

Customer Number:	6880209
Customer Name:	DGS
City, State:	San Diego, CA 92108

Sampling Date:	5.2.2023
Legionella Analysis Lab Report Date:	5.10.2023
New/Retest (select from dropdown):	Retest

MANAGEMENT VALIDATION

A	Concentration	<i>Potable water action level/control limit is exceeded if any Legionella is present per CDC. Cooling Tower action level/control limit is 100 cfu/ml per OSHA. Other Authorities having jurisdiction (AHJs) may have other restrictions.</i>		
B	Percent Positive (Potable Water Samples)	Total Positive	Total Samples	% Positive
	Potable - CW	3	15	20%
	Potable - HW	3	5	60%
	Select			
	Select			
	Select			
	Select			
	Select			
	Overall Total	6	20	30%
C	Legionella Strains Present	<i>L. pneumophila serotype 2-14, other Legionella strains)</i>		
D	Breakdown of Findings	<i>Both Occupied and Non-occupied areas as well as Hot Water Expansion Tank, and Hot & Cold samples show signs of Legionella contamination.</i>		
E	Equipment Specific Recommendations	<i>The legionella levels have decreased significantly after the chlorine dioxide mitigation. Secondary disinfection can be supplied if disinfectant residuals decrease. Filters are in place at all POU at this time.</i>		
F	Occupant Susceptibility	Moderate		

Percent Positive gives an overall rating of a building's "health". Having >30% Positive potable water samples indicates higher than acceptable Legionella levels throughout a building and actions should be taken to lower below 30%. Some AHJs require that Percent Positives to be under 30%. The best way to achieve this is to have an ANSI/ASHRAE Standard 188-2015 compliant Water Management Program in place and implemented.

COMMENTS, SUMMARY OF FINDINGS AND RECOMMENDATIONS:

Filters were bypassed for the sampling. Positivity is high at 30% of all samples testing positive for legionella. Cold samples tested positivity at 70% with the previous samples before mitigation. After Mitigation Cold samples now show 20% positivity. Hot samples tested positivity at 88% before the mitigation. After Mitigation hot samples now show 60% positivity. These percentages are indicative of biofilm and bacteria fouling in the cold and hot water potable systems.

The Chlorine Dioxide remediation proved effective against biofilm and legionella based on the lower positive percentage.

It is highly recommended to start a flushing program for the entire building to move the disinfectant provided from the water supply to all POU

Recommended to install a continuous secondary disinfection system to inject disinfectant into the hot water system. This secondary disinfection system combined with a comprehensive flushing program can help control the growth of biofilms and legionella.

Recommended to implement a water safety plan to help control the growth of legionella.

Disclaimer: The *Legionella* analytical test and explanative results provided do not necessarily assure that hazards from pathogenic microorganisms have been eliminated or controlled nor that risk of harm from such hazards has been reduced. Garratt-Callahan provides no warranties with respect to the *Legionella* analytical test and explanative results. Garratt-Callahan is not liable to Customer for damages arising out of or relating to use by Customer of the *Legionella* analytical tests, interpretations, explanations, nor summary of findings and recommendations. Test results are intended to be interpreted by Customer as part of a properly designed *Legionella* Water Management Program, including proper maintenance and operation of all equipment, including chemical treatment, to be performed by Customer, unless such work is to be performed by Garratt-Callahan pursuant to a separate contract between Customer and Garratt Callahan.

Company Information
Garratt Callahan Company
50 Ingold Rd.
Burlingame, CA 94010-2206

Job Site:
DGS
7575 Metropolitan Dr. STE 101
San Diego, CA 92108

Batch Number: 230503017
Sampled By: Joseph Mahfet
P.O. Number: 416113
Customer Number: 6880209
Report Status: Original

Client Sample ID: 1

Lab Sample ID: 370358

Collection Date: 5/2/2023

Receive Date: 5/3/2023

Location: 1st Floor, Mens RR, Center Sink, Pre, West, CW

Analyte	Test Code	Media Type	Sample Result	Units	Detection Limit	Analysis Date	Priority
Legionella pneumophila SG1	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella pneumophila SG2-15	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella non-pneumophila	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard

Client Sample ID: 2

Lab Sample ID: 370359

Collection Date: 5/2/2023

Receive Date: 5/3/2023

Location: 1st Floor, Mens RR, West, Center Sink, CW, Post, TCL .12

Analyte	Test Code	Media Type	Sample Result	Units	Detection Limit	Analysis Date	Priority
Legionella pneumophila SG1	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella pneumophila SG2-15	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella non-pneumophila	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard

Client Sample ID: 3

Lab Sample ID: 370360

Collection Date: 5/2/2023

Receive Date: 5/3/2023

Location: 1st Floor, Mens RR, West, Center Sink, HW, Post, TCL .02, 50s, 114

Analyte	Test Code	Media Type	Sample Result	Units	Detection Limit	Analysis Date	Priority
Legionella pneumophila SG1	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella pneumophila SG2-15	L011 - Legionella Potable Water	BCYE & GVPC	1	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella non-pneumophila	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard

Client Sample ID: 4

Lab Sample ID: 370361

Collection Date: 5/2/2023

Receive Date: 5/3/2023

Location: 107, Sink, CW, Post, TCL .03

Analyte	Test Code	Media Type	Sample Result	Units	Detection Limit	Analysis Date	Priority
Legionella pneumophila SG1	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella pneumophila SG2-15	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella non-pneumophila	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard

Client Sample ID: 5

Lab Sample ID: 370362

Collection Date: 5/2/2023

Receive Date: 5/3/2023

Location: 100-3, Sink, CW, Post, TCL 1.2

Analyte	Test Code	Media Type	Sample Result	Units	Detection Limit	Analysis Date	Priority
Legionella pneumophila SG1	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella pneumophila SG2-15	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella non-pneumophila	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard

Client Sample ID: 6

Lab Sample ID: 370363

Collection Date: 5/2/2023

Receive Date: 5/3/2023

Location: 103-7, Sink, CW, Post, TCL 1.4

Analyte	Test Code	Media Type	Sample Result	Units	Detection Limit	Analysis Date	Priority
Legionella pneumophila SG1	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella pneumophila SG2-15	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella non-pneumophila	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard



Client Sample ID: 7
Location: 2nd Floor, West, Mens RR, Pre, CW

Lab Sample ID: 370364

Collection Date: 5/2/2023

Receive Date: 5/3/2023

Analyte	Test Code	Media Type	Sample Result	Units	Detection Limit	Analysis Date	Priority
Legionella pneumophila SG1	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella pneumophila SG2-15	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella non-pneumophila	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard

Client Sample ID: 8
Location: 2nd Floor, West, Mens RR, Post, CW

Lab Sample ID: 370365

Collection Date: 5/2/2023

Receive Date: 5/3/2023

Analyte	Test Code	Media Type	Sample Result	Units	Detection Limit	Analysis Date	Priority
Legionella pneumophila SG1	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella pneumophila SG2-15	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella non-pneumophila	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard

Client Sample ID: 9
Location: 2nd Floor, West, Mens RR, Post, HW, 109s 110°, TCL .03

Lab Sample ID: 370366

Collection Date: 5/2/2023

Receive Date: 5/3/2023

Analyte	Test Code	Media Type	Sample Result	Units	Detection Limit	Analysis Date	Priority
Legionella pneumophila SG1	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella pneumophila SG2-15	L011 - Legionella Potable Water	BCYE & GVPC	2	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella non-pneumophila	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard

Client Sample ID: 10
Location: 2nd Floor, East, Womens RR, CW, Pre, Left Sink

Lab Sample ID: 370367

Collection Date: 5/2/2023

Receive Date: 5/3/2023

Analyte	Test Code	Media Type	Sample Result	Units	Detection Limit	Analysis Date	Priority
Legionella pneumophila SG1	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella pneumophila SG2-15	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella non-pneumophila	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard



Client Sample ID: 11

Lab Sample ID: 370368

Collection Date: 5/2/2023

Receive Date: 5/3/2023

Location: 2nd Floor, East, Womens RR, CW, Post, TCL 1.6, Left Sink

Analyte	Test Code	Media Type	Sample Result	Units	Detection Limit	Analysis Date	Priority
Legionella pneumophila SG1	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella pneumophila SG2-15	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella non-pneumophila	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard

Client Sample ID: 12

Lab Sample ID: 370369

Collection Date: 5/2/2023

Receive Date: 5/3/2023

Location: 2nd Floor, East, Womens RR, Hot, Post, 55s, 123°, TCL .02, Left Sink

Analyte	Test Code	Media Type	Sample Result	Units	Detection Limit	Analysis Date	Priority
Legionella pneumophila SG1	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella pneumophila SG2-15	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella non-pneumophila	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard

Client Sample ID: 13

Lab Sample ID: 370370

Collection Date: 5/2/2023

Receive Date: 5/3/2023

Location: 2nd Floor, East, Womens RR, CW, Pre, Right Sink

Analyte	Test Code	Media Type	Sample Result	Units	Detection Limit	Analysis Date	Priority
Legionella pneumophila SG1	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella pneumophila SG2-15	L011 - Legionella Potable Water	BCYE & GVPC	6	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella non-pneumophila	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard

Client Sample ID: 14

Lab Sample ID: 370371

Collection Date: 5/2/2023

Receive Date: 5/3/2023

Location: 2nd Floor, East, Womens RR, CW, Post, Right Sink, TCL 1.4

Analyte	Test Code	Media Type	Sample Result	Units	Detection Limit	Analysis Date	Priority
Legionella pneumophila SG1	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella pneumophila SG2-15	L011 - Legionella Potable Water	BCYE & GVPC	3	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella non-pneumophila	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard



Client Sample ID: 15

Lab Sample ID: 370372

Collection Date: 5/2/2023

Receive Date: 5/3/2023

Location: 2nd Floor, East, Womens RR, HW, Post, Right Sink, 40s 124°, TCL .02

Analyte	Test Code	Media Type	Sample Result	Units	Detection Limit	Analysis Date	Priority
Legionella pneumophila SG1	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella pneumophila SG2-15	L011 - Legionella Potable Water	BCYE & GVPC	3	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella non-pneumophila	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard

Client Sample ID: 16

Lab Sample ID: 370373

Collection Date: 5/2/2023

Receive Date: 5/3/2023

Location: 330-8, Sink, CW, TCL .04

Analyte	Test Code	Media Type	Sample Result	Units	Detection Limit	Analysis Date	Priority
Legionella pneumophila SG1	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella pneumophila SG2-15	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella non-pneumophila	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard

Client Sample ID: 17

Lab Sample ID: 370374

Collection Date: 5/2/2023

Receive Date: 5/3/2023

Location: 301-35, Sink, CW, TCL 1.2

Analyte	Test Code	Media Type	Sample Result	Units	Detection Limit	Analysis Date	Priority
Legionella pneumophila SG1	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella pneumophila SG2-15	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella non-pneumophila	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard

Client Sample ID: 18

Lab Sample ID: 370375

Collection Date: 5/2/2023

Receive Date: 5/3/2023

Location: 301-34, Sink, CW, TCL 1.24

Analyte	Test Code	Media Type	Sample Result	Units	Detection Limit	Analysis Date	Priority
Legionella pneumophila SG1	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella pneumophila SG2-15	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella non-pneumophila	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard



Client Sample ID: 19
Location: Roof, CW, Expansion Tank, Post

Lab Sample ID: 370376

Collection Date: 5/2/2023

Receive Date: 5/3/2023

Analyte	Test Code	Media Type	Sample Result	Units	Detection Limit	Analysis Date	Priority
Legionella pneumophila SG1	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella pneumophila SG2-15	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella non-pneumophila	L011 - Legionella Potable Water	BCYE & GVPC	98	CFU/mL	0.1 CFU/mL	5/10/2023	Standard

Client Sample ID: 20
Location: Roof, HW Tank, Post, TCL

Lab Sample ID: 370377

Collection Date: 5/2/2023

Receive Date: 5/3/2023

Analyte	Test Code	Media Type	Sample Result	Units	Detection Limit	Analysis Date	Priority
Legionella pneumophila SG1	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella pneumophila SG2-15	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard
Legionella non-pneumophila	L011 - Legionella Potable Water	BCYE & GVPC	None Detected	CFU/mL	0.1 CFU/mL	5/10/2023	Standard

Brandon "Smitty" Smith

Brandon Smith, M.S.
Vice President of Laboratory Operations &
Director of Research and Development
Contact for Reporting Issues, Services & Testing: bsmith@estechlab.com

Richard D. Miller

Dr. Richard Miller, Ph.D.
President & Chief Scientific Officer

Contact for Results Interpretations & Risk Management: rmiller@estechlab.com



Report Notes Applicable to All Analyses

- Sample transit delays occurring between the time of collection and receipt at the laboratory can affect the validity of test results. EST's recommendations for the collection, transport, and shipping of microbiological samples are located at www.estechlab.com. See the document titled "Sample Collection Guidelines" for analysis-specified recommendations. EST does not recommend transit exceeding referenced guidelines. In the event of a sample transit delay, designated account contacts are notified, and samples are analyzed only upon documented processing requests.
- Data are not corrected based on results for blank samples. Results relate only to items tested. Results apply to samples as received.
- Raw counts (available upon request) are used to calculate test results using all significant figures. Results found at or above the analytical sensitivity are reported to three significant figures; amounts below the analytical sensitivity are listed as None Detected.
- Analytical Sensitivity is defined as the lowest concentration that can be detected by a test method based on the amount or portion of sample analyzed and is reported without rounding. For qualitative samples, results found at or above this level are reported as "Present" and amounts below this limit are reported as "Absent".
- Samples collected by EST's Industrial Hygiene Department are indicated on reports by the suffix, /EST, appearing after the "Sampled By" field. EST is responsible for all the information provided on issued reports unless information is provided by the customer. Chain of Custody (COC) records accompanying samples submitted to laboratory are scanned and included with issued reports; see COC records for traceability of provided information including but not limited to sample collection time, sample rate, transport conditions, sampling media, and lot numbers. If pertinent information needed for sample processing or calculation of reported results is omitted from a COC record, customers are contacted for verification and information is recorded on the submitted COC record or a proxy COC record if one has not been provided.

Abbreviations

- ANAB = ANSI National Accreditation Board; accreditation fulfills the requirements of ISO/IEC 17025:2017.
- Media Types: BART = Biological Activity Reaction Tester, BCSA = *Burkholderia cepacia* Selective Agar, BCYE = *Legionella* Buffered Charcoal Yeast Extract Agar, Cetrimide = *Pseudomonas aeruginosa* Selective Agar, GVPC = *Legionella* BCYE Selective Agar with antibiotics (Glycine, Vancomycin, Polymyxin, and Cycloheximide), Chromogenic Media = chromogenic differential media for presumptive pathogen detection (*E. coli*, *Klebsiella/Enterobacter/Serratia* spp., *Enterococcus* spp., *Proteus/Morganella/Providencia* spp., *Staphylococcus aureus*, *Pseudomonas* spp., *Staphylococcus saprophyticus*, *Candida* spp., *Citrobacter* spp.), Leeds Medium = *Acinetobacter* Selective Medium, ME* = Malt Extract fungal Identification Agar with 0.01% Chloramphenicol, MHA = Mueller Hinton Agar, Microfilm EBEC = Enterobacteriaceae/*E. coli* Selective Media, Microfilm TCEC = Total Coliform/*E. coli* Selective Media, Microfilm YMC = Yeast and Mold Count Media, R2A = Reasoner's 2A Bacterial Agar, SMA = Standard Methods Agar (a.k.a. Plate Count Agar), SSA = *Stenotrophomonas* Selective Agar, TSA = Tryptic Soy Agar, TSA* = Tryptic Soy Agar with 0.005% Cycloheximide, TSLT = Tryptic Soy Agar Contact Plate with Lecithin and Tween 80, Selective 7H11 = Middlebrook 7H11 Selective Agar for *Mycobacterium* species.
- Miscellaneous: C= Celsius, CFU = Colony Forming Unit, F = Fahrenheit, g = gram, L = liter, m = meter, ml = milliliter, SG = serogroup, HPC = Heterotrophic Plate Count, NTM = non-tuberculosis mycobacteria, N/A = Not Applicable, N/R = Not Requested.

Bacteria – Standard Heterotrophic Plate Counts for Water Samples

- Test Code B010: Aerobic, heterotrophic plate bacteria counts using Microfilm APC standard methods agar (AOAC Method 051702).
- Test Code B100: Aerobic, heterotrophic plate counts are obtained using SMA plates (Standard Methods 9215C).
- Test Code B011: Anaerobic, heterotrophic plate counts are obtained using SMA agar plates (Standard Methods 9215C) under anaerobic gas generating systems.

Bacteria – Plate Counts for Air, Swab, Bulk-Solid, and Contact Plates

- Test Codes: B002 (Air), B004 (Swab), B007 (Bulk-solid), B027 (Contact)
- Plate counts are routinely obtained utilizing SMA agar plates for air, swab, and bulk-solid samples as described above.
- Other agars may be utilized upon customer request (e.g., TSA plates incubated for 3-5 days at 35°C or R2A plates incubated for 5-7 days at 30°C).
- Bacteria plate counts are obtained for bulk-liquid and bulk-solid samples using the spread plate method.
- Surface contact plates (e.g., TSLT) are incubated directly at room temperature for 3-5 days unless otherwise requested and noted.

Legionella Culture Analysis

- Test Codes: Non-potable L001 (Bulk-Liquid/Water), L002 (Swab), L003 (Bulk-Solid), L099 (Air)
 - Test Codes: Potable L011, LCMS (Bulk-Liquid/Water), L012 (Swab), L013 (Bulk-Solid)
 - Total Viable *Legionella*: Viable *Legionella* counts (*Legionella pneumophila* SG1, *Legionella pneumophila* SG2-15, or *Legionella non-pneumophila* species) are obtained using an in-house modified method based on CDC and ISO 11731:2017(E) procedures for the recovery of *Legionella* from the environment.
- Legionella non-pneumophila* species include *L. anisa*, *L. bozemanii* 1 & 2, *L. dumoffii*, *L. feelei*, *L. gormanii*, *L. jordanis*, *L. longbeachae* 1 & 2, and *L. micdadei*.



Environmental Pathogen Monitoring - Listeria and Salmonella Immunoassay Tests

- Test Code B041: *Listeria*. Swabs are enriched in PDX-LIB™ indicator broth for enhanced recovery and selection.
- Test Code B042: *Salmonella*. Swabs are enriched in PDX-SIB™ indicator broth for enhanced recovery and selection.
- Test methods AOAC Research Institute approved for monitoring environmental surfaces.
- Presumptive positive cultures are confirmed using pathogen specific selective agars.

Fungi

- Test Codes Count & Identification: F003 (Swab), F005 (Bulk-Solid), F007 (Bulk-Liquid), F014 (Contact Plate)
- Test Codes Count Only: F004 (Swab), F006 (Bulk-Solid), F008 (Bulk-Liquid), F013 (Contact Plate)
- Fungal samples processed for counts and identification are obtained directly from listed processing agars.
- Fungal counts only (no identification) are obtained using Fungal Count Yeast and Mold Count (YMC) Microfilm™
- All samples are incubated aerobically at 29°C for 7 days unless otherwise requested.

Pathogen Screen Culture Analysis – Potable Water Samples

- Test Code CMS1: Waterborne pathogen screen.
- Test Code LCMS: Waterborne pathogen screen accompanying *Legionella* analysis on BCYE and GVPC agar.
- Analyses on pathogen specific selective agars for the following organisms: *Acinetobacter* species, *Burkholderia cepacia*, *Pseudomonas aeruginosa*, *Stenotrophomonas maltophilia*, Rapidly-growing non-tuberculosis mycobacteria, Fungal Count (mold and yeast) and Mold Identification (Genus-level; common *Aspergillus* species).
- Incubations at optimal growth temperatures for each pathogen and presumptive positive cultures are confirmed utilizing pathogenic specific biochemical tests.

Non-tuberculous Mycobacteria (NTM) Rapid-growing Mycobacteria (RGM) Screen – Culture Method

- Test Code: CMS1, LCMS, B043 – Culture method
- Detection of rapid-growing (≤ 7 -day) non-tuberculous mycobacteria on 7H11 Selective agar with acid-fast stain confirmation.

Non-tuberculous Mycobacteria (NTM) vPCR Analysis

- Test Code: P002 - Viable PCR*
- Detection of *Mycobacteria* in environmental water samples. This rapid vPCR screen provides a total count for all non-tuberculous mycobacteria species and for each of the two most clinically relevant slow-growing mycobacteria (SGM) species, *avium* and *intracellulare*, which would require a four-week incubation by the culture method.
- Results obtained using an in-house modified method by concentration and genic amplification by quantitative polymerase chain reaction (qPCR).
- Analysis by vPCR includes viable but non-culturable (VBNC) *Mycobacteria* not detected by routine viable culture analysis. In addition,
- VBNC *Mycobacteria* may be present in a damaged state in response to disinfectants or other toxic conditions, but they may be unable to recover and grow on the surface of an agar petri dish (i.e., non-culturable), and appear as a none detected viable *Mycobacteria* culture result.
- If damaged *Mycobacteria* are introduced to a more favorable environment, such as an amoeba living in an environmental water source or into a human lung macrophage, they may be able to recover and even proliferate. In humans, following inhalation of *Mycobacteria* from a contaminated source, recovery and growth in lung tissue may result in a pulmonary disease infection.
- Analysis by vPCR allows the simultaneous detection of both culturable and VNBC *Mycobacteria* from environmental samples to ensure an accurate risk assessment.
- vPCR NTM analyses is pending ANAB scope of accreditation for test methods.

Pseudomonas aeruginosa and other *Pseudomonas* species Culture Analysis

- Test Codes: B018 (Water), B019 (Swab); *Pseudomonas aeruginosa* isolation and identification on or chromogenic Agar or Cetrimide selective agar incubated for 3-5 days at 41°C; presumptive positive cultures are confirmed by biochemical tests.
- Test Codes: B062 (Water), B063 (Swab); *Pseudomonas* species screen on or chromogenic Agar or Cetrimide selective agar incubated for 3-5 days at 30°C.

Sewage Contamination Screen - Total Coliform & *E. coli*

- Tests are applicable for the detection of environmental fecal contamination, not for potable drinking water certification.
- Test Codes: B022 (Water), B023 (Swab)

Legionella vPCR

- Test Code: P001 - Viable PCR
- Detection of non-viable discrimination of *Legionella pneumophila* SG1-15 and *Legionella pneumophila* SG1 from environmental water samples.
- Results obtained using an in-house modified method based on ISO 12869:2019; Water quality – Detection and quantification of *Legionella* spp. and/or *Legionella pneumophila* by concentration and genic amplification by quantitative polymerase chain reaction (qPCR).
- *Legionella* detected by vPCR include those that are viable but non-culturable (VBNC) bacteria not detected by routine viable culture analysis.
- VBNC *Legionella* may be present in a damaged (but not dead) state in response to disinfectants or other toxic conditions, where the bacteria were unable to recover and grow on the surface of an agar petri dish (i.e., non-culturable), and appear as a none detected viable *Legionella* result.
- If damaged *Legionella* are introduced to a more favorable environment, either an amoeba in an environmental water source or into a human lung macrophage by inhalation, they may be able to recover and even proliferate. In humans, recovery in lung tissue may result in a Legionnaire's disease infection.
- vPCR allows the simultaneous detection of both culturable and non-culturable *Legionella* from environmental samples to ensure a more accurate risk assessment.

Microbial Corrosion Screen (Water, Swab, or Solid/Sludge)

- Biological Activity Reaction Test (BART) biotestors, manufactured by Drycon Bioconcepts Inc. (DBI), monitor biological activity of specific groups of bacteria as listed in the table below. Organism specific biotestors are inoculated with sample and are monitored for reaction changes described by manufacturer's certificates of analysis (COA) for each lot until activity is positive or determined to be not aggressive. Upon observation of a positive reaction, a semi-quantitative approximation (CFU/ml) of the microbial population being tested is matched and aggressivity is assigned as either aggressive, moderately aggressive, or not aggressive.

BART™ Biotestor	BART™ Microbial Population	Test Codes (Water/Swab/Bulk)	Aggressive	Moderate	Not Aggressive
APB	Acid Producing Bacteria	M001, M011, M021	475,000 - 14,000	4,500 - 75	10 - <2
IRB	Iron Related Bacteria	M003, M013, M033	570,000 - 9,000	2,200 - 25	8 - <1
SLYM	Slime Forming Bacteria	M004, M014, M024	1,750,000 - 67,000	13,000 - 500	100 - <20
SRB	Sulfate Reducing Bacteria	M005, M015, M025	2,200,2000 - 6,000	1,400 - 75	20 - <1
FLOR	Fluorescent Pseudomonads	M006, M016, M026	2,000,000 - 4,000	800 - 35	7 - <1
ALGE2	Algae	M008, M018, M028	500,000 - 10,000	1,000 - 100	<100
BART™ Test	BART™ Microbial Population	Test Codes (Water/Swab/Bulk)	Aggressive	Moderate	Not Aggressive
DN2	Denitrifying Bacteria	M002, M012, M022	>100,000 - 1,001	1,000 - 1	<1
N2	Nitrifying Bacteria	M007, M017, M027	>100,000 - 1,001	1,000 - 1	<1

*DBI BART™ screens are not covered under ANAB scope of accreditation for test methods.

Endotoxin (Water)

- Test Codes E010 Endotoxin Limit 10 EU/ml, E020 Endotoxin Limit 20 EU/ml.
- Test result less than test limit = Endotoxin Absent. Test result greater than or equal to test limit = Endotoxin Present.
- Assay performed using gel clot limulus amoebocyte lysate (LAL) test for bacterial endotoxin.
- Endotoxin Gel-Clot analyses is pending ANAB scope of accreditation for test methods.

<797> Pharmaceutical Compounding Testing Compliance Only

- Test Code B061 Personal Aseptic Technique Media Fill. Samples incubate first at 30-35°C for ≥ 7 days, then move to 20-25°C for additional ≥ 7 days.
- Test Code C002 Surface Contact. Samples incubated at 30-35°C for ≥ 48 hr. for bacteria count & characterization workup and then move to 20-25°C for ≥ 5 days for fungal count and identification.
- Test Code C003 Fingertip Dab. Samples incubated at 30-35°C for ≥ 48 hr. for bacteria count & characterization workup and then move to 20-25°C for ≥ 5 days for fungal count and identification.
- The recorded Analysis Date on reports documents the date of final verification of required hold times and completion of workup for bacterial characterizations and fungal identification have followed <797> requirements prior to final data approval.

Microbiological Analyses Endnotes Revision 1-7



CONTACT INFORMATION		PROJECT INFORMATION	
Garratt-Callahan Company 50 Ingold Rd, Burlingame CA 94010 (650) 697 - 5811		G-C P.O. #:	416113
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Territory Number:	0301	Customer Name:	DG-S
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Sampler (if different from G-C Rep above):		City:	San Diego
E-mail Report to:	labreports@g-c.com	State:	CA
		Zip:	92108
		Copy Report to (optional):	

Page: 1 of 2

FOR LAB USE ONLY:	SPECIAL INSTRUCTIONS/COMMENTS:		LEGIONELLA ANALYSIS										OTHER MISC. TESTING										
	Batch No.:	Log-In By:	Turn Around Time <input type="checkbox"/> Normal (7-10 days) <input type="checkbox"/> Rush (4 business days - additional fees apply)										vPCR Lp SGI & SG2-14		B010 - HPC Asorobic Bacteria	B011 - HPC Anaerobic Bacteria	CM51 - CMS Waterborne Pathogen Screen	B022 - Total Coliform/E Coli	B018 - Pseudomonas aeruginosa	B062 - Pseudomonas spp.	GC04 - Bacteria Corrosion Screen Bundle (Acid, Iron, Slime, Sulfite)	Potable Water Post-Disinfection Verification Testing (Next-day vPCR)	P003, HPC B010, Pseudomonas
Laboratory Number:	Sample No.	Sample Location/Description	L011 - Water Potable	L001 - Water Cooling Tower	L001 - Water Decorative Fountain	L010 - Water Whirlpool/Spas	L002 - SWAB Potable	L002 - SWAB Cooling Tower	L002 - SWAB Decorative Fountain	L002 - SWAB Whirlpool/Spas	P003 - Bulk Water Sample (Next Day)	P004 - Bulk Water Sample (Same Day)	B010 - HPC Asorobic Bacteria	B011 - HPC Anaerobic Bacteria	CM51 - CMS Waterborne Pathogen Screen	B022 - Total Coliform/E Coli	B018 - Pseudomonas aeruginosa	B062 - Pseudomonas spp.	GC04 - Bacteria Corrosion Screen Bundle (Acid, Iron, Slime, Sulfite)	Potable Water Post-Disinfection Verification Testing (Next-day vPCR)	P003, HPC B010, Pseudomonas	Other - Specify Lab Code*	
	1	1st Floor, Mens RA, Center Sink, PRE WEST, CW	X																				
	2	1st Floor, Mens RA, WEST, Center Sink, CW, POST, TCL 1.2																					
	3	1st Floor, Mens RA, WEST, Center Sink, HW, POST, TCL 0.7, 50s, 104																					
	4	107, Sink, CW, POST, TCL 0.3																					
	5	100-3, Sink, CW, POST, TCL 1.2																					
	6	103-7, Sink, CW, POST, TCL 1.4																					
	7	2nd Floor, West, Mens RA, PRE, CW																					
	8	2nd Floor, West, Mens RA, POST, CW, TCL 0.9																					
	9	2nd Floor, West, Mens RA, POST, HW, 109s, 110, TCL 0.3																					
	10	2nd Floor, East, Mens RA, CW, PRE LEFT SINK																					

FOR LAB USE ONLY:	SPECIAL INSTRUCTIONS/COMMENTS:		LEGIONELLA ANALYSIS													OTHER MISC. TESTING										
	Batch No.:	Log-In By:	Turn Around Time <input type="checkbox"/> Normal (7-10 days) <input type="checkbox"/> Rush (4 business days - additional fees apply)													vPCR Lp SGI & SG2-14										
Laboratory Number:	Sample No.	Sample Location/Description	L011 - Water Potable	L001 - Water Cooling Tower	L001 - Water Decorative Fountain	L010 - Water Whirlpool/Spas	L012 - SWAB Potable	L002 - SWAB Cooling Tower	L002 - SWAB Decorative Fountain	L002 - SWAB Whirlpool/Spas	P003 - Bulk Water Sample (Next Day)	P004 - Bulk Water Sample (Same Day)	B010 - HPC Aerobic Bacteria	B011 - HPC Anaerobic Bacteria	CMS1 - CMS Waterborne Pathogen Screen	B022 - Total Coliform/E.Coli	B018 - Pseudomonas aeruginosa	B062 - Pseudomonas spp.	GC04 - Bacteria Corrosion Screen Bundle (Acid, Iron, Slime, Sulfate)	Potable Water Post-Disinfection Verification Testing (Next-day vPCR)	P003 - HPC B010, Pseudomonas	Other - Specify Lab Code*				
	11	2nd FLOOR, EAST, WOMANS RR, CW, POST, TCL 1.6 LEFT SINK,	X																							
	12	2nd FLOOR, EAST, WOMANS RR, HOT, POST, S.S., 123, TCL 02 LEFT SINK	X																							
	13	2nd FLOOR, EAST, WOMANS RR, CW, PRE, RIGHT SINK	X																							
	14	2nd FLOOR, EAST, WOMANS RR, CW, POST, RIGHT SINK, TCL 1.4	X																							
	15	2nd FLOOR, EAST, WOMANS RR, HW POST, RIGHT SINK, 402, 124, TCL 02	X																							
	16	3RD-F, SINK, CW, TCL 04	X																							
	17	301-35, SINK, CW, TCL 1.2	X																							
	18	301-34, SINK, CW, TCL 1.24	X																							
		ROOF, HW TRNK, POST, TCL	X																							
	20	ROOF, HW TRNK, POST, TCL	X																							

***Lab Codes (Bulk Water Samples):** B010 - HPC Aerobic Bacteria, B011 - HPC Anaerobic Bacteria, B022 - Total Coliform/E.Coli, B018 - Pseudomonas aeruginosa, B062 - Pseudomonas spp., GC04 - Bacteria Corrosion Screen Bundle (Acid, Iron, Slime, Sulfate), M001 (Acid-Producing), M002 (Denitrifying), M003 (Iron-Related), M004 (Slime-Forming), M005 (Sulfate-Reducing), M006 (Fluorescent Pseudomonas), B018 (Pseudomonas aeruginosa), B062 (Pseudomonas species), CMS1 (CMS Healthcare Pathogen Screen), B026 (Endotoxin Screening), F018 (Aspergillus Culture), F019 (Fusarium Culture), B014 (Staphylococcus aureus)

NOTE: Unlike for water samples, SWAB samples submitted for Legionella testing cannot be processed for HPC on the same sample due to differing sample preparation protocols. If HPC is needed, a separate SWAB sample must be submitted for an additional fee.

Relinquished by: Joseph Mahfey	Received by: JD	Lab Comments:
Date/Time: 5-2-23 8:36 AM	Date/Time: 5/3/23 10:47 AM	

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