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Follow-up Limited Legionella Assessment Report

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FACS Project #PJ76066

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Executive Summary

Forensic Analytical Consulting Services (FACS) was retained by the California Department of Industrial Relations (DIR) to provide environmental health services regarding a limited *Legionella* assessment of the potable water system serving the Mission Valley State Building located at 7575 Metropolitan Dr., San Diego, California, including the DIR leased space at the building. The assessment was performed as part of a due diligence investigation with respect to *Legionella* bacteria in response to a reported confirmed legionellosis case for one occupant. FACS performed the initial assessment on April 17 & 18, 2023, which included a visual assessment of selected components of the potable water system, collection of water samples for *Legionella* at representative site fixtures, and collection of supporting water chemistry data. Following implementation of hyperchlorination of the domestic hot water (DHW) and domestic cold water (DWC) systems in the building by a third-party water treatment contractor, follow-up assessments were performed by FACS on May 3 and June 6, 2023 to evaluate the efficacy of remediation efforts.

The current status of the water systems in the building following the June 6, 2023 sampling, as well as a summary of recommendations made to date, are provided in the tables below.

Water Systems Status Following 6/6/23 Sampling	
Water System	Status
Municipal Water	<i>The disinfectant level in the municipal water entering the building remains above the recommended level, and Legionella has not been detected in sampling. Continue to monitor and sample during ongoing validation sampling.</i>
Central Water Systems and Distribution Piping	<i>The disinfection appears to have been effective in reducing Legionella contamination in the central water systems and distribution piping, except as noted for the DCW expansion tank below. However additional sampling over time is needed for confirmation. As noted below, the continued use of point of use filters on sinks and showers is recommended until further validation sampling is conducted.</i>
Janitor Closet Sinks and Showers	<i>The disinfection appears to have been effective in reducing Legionella contamination in the janitor closet sinks and showers (both equipped with manual faucets). The continued use of point of use filters at these locations is recommended until further validation sampling is conducted.</i>
Restroom Automated Sinks	<i>Samples from restroom sinks (all equipped with automated faucets) continue to have elevated Legionella, although levels are substantially reduced from pre-disinfection sampling. It is recommended that all these fixtures be disinfected or replaced, followed by validation sampling. In the interim, all of these fixtures should be equipped with point of use filters or removed from service. It should be noted that while these fixtures have in-line filters in place between building piping and the fixture, such filters do not protect from Legionella in the fixture itself and associated lines after the filter.</i>
Drinking Fountains	<i>Some samples from drinking fountains were found to have elevated Legionella samples. Visible scale was also observed at multiple drinking fountains. It is recommended to thoroughly clean (including removal of scale and debris) and disinfect all drinking fountains, followed by validation sampling. In the interim, all of these fixtures should be removed from service, as installation of point of use filters is not feasible.</i>
DCW Expansion Tank	<i>The DCW expansion tank located on the roof shows positive results for Legionella, although not a type typically associated with disease. Due to potential risk of Legionella amplification, it is recommended that the tank be cleaned and disinfected. In addition, the location of this tank and its proximity to nearby hot water lines should be evaluated in order to reduce future risk of Legionella amplification.</i>

FACS Recommendations Summary		
#	Recommendations Made After the Initial Assessment (April 17 18, 2023)	Completion
1.	<i>Develop a corrective action plan within a reasonable timeframe (i.e., within about a week) to address Legionella amplification in the domestic hot and cold-water systems for the building.</i>	<input type="checkbox"/>
2.	<i>Remediation of the domestic hot and cold-water systems should be included in the corrective action plan. Consult with a qualified water treatment contractor regarding the most appropriate methods, however chemical treatment (e.g., with a chemical oxidant) is often referenced as an effective method for short-term remediation.</i>	<input type="checkbox"/>
3.	<i>If point of use (POU) and in-line filters are installed to control potential Legionella exposure while remediation efforts are completed and confirmed effective, a plan needs to be developed for regular inspection and replacement of filters.</i>	<input type="checkbox"/>
4.	<i>Additional recommendations for the building include ensuring the DHWST is supplying water consistently stored at 140°F or above. Where scalding concerns are present, delivery temperatures should be targeted as close to 120°F as possible.</i>	<input type="checkbox"/>
5.	<i>Perform a visual assessment of accessible point-of-use fixtures, aerators, and laminar flow devices to identify areas of excessive scale, corrosion, biofilm, or debris. Perform cleaning and disinfection of fixtures, aerators, and laminar flow devices exhibiting excessive scale, corrosion, biofilm, or debris. Alternatively, these fixtures, aerators, and laminator flow devices can be replaced.</i>	<input type="checkbox"/>
6.	<i>Following any additional remediation activities, perform validation sampling to ensure efficacy of remediation efforts to reduce Legionella concentrations in the building.</i>	<input type="checkbox"/>
7.	<i>Consider the development and implementation of a comprehensive water management plan to manage ongoing Legionella risk for the property in the future.</i>	<input type="checkbox"/>
#	Recommendations Made After the First Follow Up Assessment (May 3, 2023)	Completion
1.	<i>Develop a corrective action plan within a reasonable timeframe (i.e., within about a week) to address the identified localized contamination at fixtures represented by the sample results.</i>	<input type="checkbox"/>
2.	<i>Physically clean and disinfect, or alternatively replace, all fixtures represented by positive sample results. Filtration should remain in place until follow-up sampling demonstrates adequate control of localized Legionella contamination.</i>	<input type="checkbox"/>
3.	<i>Perform ongoing follow-up sampling at regular intervals (e.g., every two weeks for three months followed by every month for an additional three months) to validate continued control of Legionella amplification in the building.</i>	<input type="checkbox"/>
#	Recommendations Made After the Second Follow Up Assessment (June 6, 2023)	Completion
1.	<i>Develop a corrective action plan within a reasonable timeframe (i.e., within about a week) to address the identified localized contamination at fixtures represented by the sample results.</i>	<input type="checkbox"/>
2.	<i>It is recommended to thoroughly clean (including removal of scale and debris) and disinfect all drinking fountains, followed by validation sampling. In the interim, all of these fixtures should be removed from service, as installation of point of use filters is not feasible.</i>	<input type="checkbox"/>
3.	<i>It is recommended that all automated fixtures be disinfected or replaced, followed by validation sampling. In the interim, all of these fixtures should be equipped with point of use filters or removed from service. It should be noted that while these fixtures have in-line filters in place between building piping and the fixture, such filters do not protect from Legionella in the fixture itself and associated lines after the filter.</i>	<input type="checkbox"/>
4.	<i>It is recommended that the DCW expansion tank be cleaned and disinfected. In addition, the location of this tank and its proximity to nearby hot water lines should be evaluated in order to reduce future risk of Legionella amplification.</i>	<input type="checkbox"/>
5.	<i>Perform ongoing follow-up sampling at regular intervals (e.g., every two weeks for three months followed by every month for an additional three months) to validate continued control of Legionella amplification in the building.</i>	<input type="checkbox"/>

Introduction

Forensic Analytical Consulting Services (FACS) was retained by the California Department of Industrial Relations (DIR) to provide environmental health services regarding a limited *Legionella* assessment of the potable water system serving the Mission Valley State Building located at 7575 Metropolitan Dr., San Diego, California, including the DIR leased space at the building. The assessment was performed as part of a due diligence investigation with respect to *Legionella* bacteria in response to a reported confirmed legionellosis case for one occupant. FACS performed the initial assessment on April 17 & 18, 2023, which included a visual assessment of selected components of the potable water system, collection of water samples for *Legionella* at representative site fixtures, and collection of supporting water chemistry data. Following implementation of hyperchlorination of the domestic hot water (DHW) and domestic cold water (DWC) systems in the building by a third-party water treatment contractor, a follow-up assessments were performed by FACS on May 3 and June 6, 2023 to evaluate the efficacy of remediation efforts.

The purpose of the initial and follow-up assessments was to 1) perform a due diligence investigation and assess the water system and related components for potential sources of *Legionella* amplification; 2) make recommendations for corrective action, as necessary; and 3) provide information for consideration in assessing risk to building occupants.

Background

Legionella

Legionella bacteria are waterborne pathogens that may naturally be present, albeit typically in low concentrations, in various water system types including surface, ground, potable, and other water systems or reservoirs. While naturally occurring in the environment, *Legionella* bacteria can become a concern for public health when amplification, or growth, of the bacteria occurs in a water system, which results in subsequent human exposure. Exposure to *Legionella* bacteria can result in illness, specifically Legionnaires' Disease, Pontiac Fever, or extrapulmonary legionellosis. Immunocompromised individuals are more susceptible to developing *Legionella*-related illness following exposure to *Legionella*.

Available guidance documents have recognized several conditions that favor amplification of *Legionella* bacteria in water systems. In general, these conditions include:

- Lack of flow or water stagnation either by design (e.g., cap) or lack of use (e.g., unused fixture).
- Improper water chemistry, including low or no residual oxidant or available water treatment.
- Temperature within the growth range of the bacteria.
- The presence of backflow problems or cross-connection between water systems with different uses/purposes.
- The presence of scale, debris, algae, or other commensurate organisms in the water system or equipment served by the system.

To prevent potential exposure to *Legionella* bacteria, it is important to identify and control the source(s) of *Legionella* to limit growth and amplification. Amplification can impact downstream and upstream service connections and pipe work, resulting in increased contamination of the water system over time. Therefore, control of growth conditions within a water system with appropriate water management practices significantly reduces the risk of exposure to *Legionella* bacteria.

Available Guidance

The assessment technique and recommendations draw upon principles and concepts contained in the guidelines and references listed below, as well as other industry guidelines and documents:

- American Industrial Hygiene Association (AIHA): “Recognition, Evaluation and Control of *Legionella* in Building Water Systems, 2nd Ed. (2022)
- United States Centers for Disease Control (CDC) “Toolkit for Controlling *Legionella* in Common Sources of Exposure (*Legionella* Control Toolkit)” (2021)
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE): “ANSI/ASHRAE Standard 188-2021 Legionellosis: Risk Management for Building Water Systems” (2021)
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE): “ASHRAE Guideline 12-2020 Managing the Risk of Legionellosis Associated with Building Water Systems” (2020)
- United States Centers for Disease Control (CDC) “Developing a Water Management Program to Reduce *Legionella* Growth & Spread in Buildings: A Practical Guide to Implementing Industry Standards, Version 1.0” (2017)
- United States Environmental Protection Agency (EPA): “Technologies for *Legionella* Control in Premise Plumbing Systems: Scientific Literature Review” (2016)

Site Characterization

The subject property comprises of one three story building with a west wing and east wing containing office spaces and supporting amenities. The property is owned and managed by the California Department of General Services (DGS). California Department of Industrial Relations (DIR) lease space on the second floor of the building. Management and maintenance of building systems (including the water system) is performed by the DGS site-based employees.

Water Systems Characterization

Municipal Supply

Municipal water is supplied to the building by San Diego County Water Authority, which uses monochloramine for residual disinfection.

Municipal water is provided to the property by way of a Metropolitan Drive municipal connection at the north side of the property through a redundant reduced pressure zone back flow preventer.

Domestic Cold Water (DCW)

Domestic cold water (DCW) passes through a redundant reduced pressure zone backflow preventer to the building where it branches to serve DCW fixtures within the building and makeup water supply to the rooftop domestic hot water storage tank and domestic hot water boiler. A cold-water expansion tank and back flow prevention is in place at the DCW makeup line.

Industrial Cold Water (ICW) is served by a branch at the rooftop through a backflow prevention assembly and strainer. An additional ICW point of connection, serving the closed loop HVAC pipework, is in the west wing 3rd floor janitor closet where DCW pipework branches to serve a redundant reduce pressure zone backflow preventer providing two separate lines of ICW to the computer room humidifiers.

DCW entering the building branches to serve two separate east and west branches at the first floor as well as a central riser supplying the upper floor branches. Fixture and components served by DCW include restrooms, sensor and manual faucets, showers (first floor only), drinking fountains, mop sinks and electric point of use hot water heaters.

Domestic Hot Water (DHW)

DHW is heated at the rooftop DHW boiler with a set point of 132-135°F. The heated water is stored in the DHW storage tank and distributed down to the building through risers at the east and west wings to serve the DHW loops. DHW is returned to the rooftop boiler and storage tank through DHWR pipework with two circulation pumps and back flow prevention. DHW fixtures and components in place include the first-floor showers, sensor faucets and janitor mop sinks. Manual faucets in private restrooms and kitchen spaces are served by DCW only, with the water heated by electric point of use hot water heater.

Site History

Based on conversations with site representatives, FACS developed the following site history:

- In April 2023, DIR was notified of an employee with a legionellosis diagnosis.
- The employee worked on level 2 of the state building.
- DIR contacted FACS on April 14, 2023, to perform a due diligence limited *Legionella* assessment with a focus on previous positive locations, as sampled by a separate party (DGS' water treatment contractor). This assessment was also established to shadow the water treatment contractor for DGS for due diligence sampling.
- On April 17 & 18, 2023, FACS was on site to conduct an initial assessment and water sampling at the building.
- A professional water treatment contractor was retained by DGS, who performed hyperchlorination of the DHW & DCW systems serving the building. The hyperchlorination protocol was developed by DGS' water treatment contractor.
- On April 21, 2023, point of use (POU) or in-line filters were installed on sinks and showers by DGS and the water treatment contractor as an additional control measure. This was done only at locations where positive sample results were collected.
- On April 24, 2023, FACS received preliminary water sample results from the laboratory. Verbal recommendations were provided to DIR and included recommendations for remediation of the DHW and DCW systems at the property.
- FACS was onsite on May 3, 2023, to perform a follow-up assessment to evaluate the efficacy of remediation efforts. Following receipt of positive sampling results at various fixtures, FACS made recommendations for corrective actions, including addressing all fixtures that were represented by the positive sampling results, not just the specific fixtures sampled.
- On June 2, 2023, DGS replaced only the specific fixtures where positive Legionella samples were found and installed POU filters.
- FACS was onsite on June 6, 2023, to perform a follow-up assessment to evaluate the efficacy of remediation efforts. Following receipt of positive sampling results at various fixtures, FACS made recommendations for corrective actions, including addressing all fixtures that were represented by the positive sampling results, not just the specific fixtures sampled.

Scope of Work

In the course of this project, FACS conducted the following scope of work:

1. Development of a site characterization and history (see sections above).
2. Review of available plumbing plans and diagrams provided by DIR and DGS representatives where available.
3. Visual assessment of representative water systems and components including collection of environmental data (e.g., water temperature/oxidant/pH) from representative water systems and components.
4. Collection of water and swab samples for *Legionella* bacteria from representative water systems and components with a focus on locations that had previous positive results. Additionally, sampling was performed in similar locations to the DGS water treatment contractor on April 17, to further characterize and assess risk.

The following data collected in the course of the investigation is presented in the appendices of this report as follows:

- Photographs from site inspection
- Data summaries from environmental sampling

Sampling and Analytical Methods

***Legionella* Samples**

Water samples for *Legionella* analysis were collected from representative water systems and components at the facility during the assessment. Each water sample was selected based on review of the plumbing plans, building characteristics, and water systems distribution and related risk assessment to assess potential sources of *Legionella* amplification. Samples were also collected in locations that were similar to those selected by DGS' water treatment contractor.

FACS collected both pre-flush and post-flush samples from representative point-of-use fixtures throughout the property during the initial assessment (April 17 & 18, 2023) and follow-up assessments (May 3 & June 6, 2023). Pre-flush samples were collected without flushing the fixture to be representative of water in contact with the fixture since the previous use. Post-flush samples were collected after flushing until the water temperature was stable to represent water originating from the main distribution header. Each sample type was selected to provide information related to potential sources of *Legionella* in the water supply, pre-flush samples being heavily influenced by the fixture and local plumbing condition, and post-flush samples representing water quality from the municipal supply and main distribution pipes. Additionally, temperature, pH, and residual disinfectant (monochloramine) readings were collected at representative sampling locations.

Water samples were collected in 250 milliliter sterile plastic containers provided by the laboratory and pre-preserved with sodium thiosulfate. Water samples were shipped overnight to Special Pathogens Laboratory (SPL) for identification, enumeration and serotyping of *Legionella* bacteria. SPL is a Centers for Disease Control & Prevention (CDC) Environmental *Legionella* Isolation Techniques Evaluation (ELITE) Program certified laboratory.

A description of the materials and methods used for data and sample collection and analysis can be found in Appendix B.

Findings & Conclusions

General Observations

Backflow Protection

Backflow preventers are devices that are installed to allow water to flow only in one direction and prevent flow in the opposite direction. These devices prevent cross-contamination of bacteria or other contaminants from one water system to another. Backflow preventers are typically in place to separate municipal supply or non-potable water systems (e.g., irrigation or industrial water systems) from potable water systems.

A backflow protection device was observed at the incoming municipal supply on the street prior to entry to the property. Appropriate backflow protection was also observed at DCW connections to ICW supplies and relevant equipment.

Scale, Debris, and Biofilm

The presence of scale, biofilm, and other debris or particulate can serve as a nutrient source as well as surface area that can promote the growth of *Legionella* in water systems. Scale was observed at the following fixtures during the initial assessment:

Moderate levels of scale, sediment, or biofilm were observed at the following fixtures:

- Initial Assessment, April 17 & 18, 2023
 - 2nd floor, Women's RR 24, right faucet – moderate scale present at sink outlet and aerator
 - 3rd floor, Janitor J-30, mop sink – moderate scale and corrosion at fixture
- Follow-up Assessment, May 3, 2023
 - 1st floor, Drinking fountain 110-14 – moderate scale present at left and right bubbler
 - 2nd floor, Drinking fountain adj 201-17 – moderate scale on left bubbler
 - 3rd floor, Drinking fountain adj 301-32 – moderate scale on right bubbler
- Follow-up Assessment, June 6, 2023
 - 3rd floor, Drinking fountain adj 301-32 – moderate scale on right bubbler

Chemistry & Temperature

In domestic water, a residual monochloramine concentration of at least 0.5 ppm with a maximum of 3.0 ppm is typically recommended in the available guidance. The disinfection efficacy of monochloramine is less impacted by pH as compared with chlorine, with a recommended pH for domestic water system ranging from approximately 6.5 – 8.5.

Most available guidance documents regarding the control of *Legionella* in building water systems recommend that the temperature of cold-water systems be maintained below 68-77°F for the prevention of amplification of *Legionella*. Recommended domestic hot water temperatures are typically ≥120°F at the delivery point and ≥140°F for hot water storage. According to the CDC, the ideal temperatures for *Legionella* growth typically lie between 77-113°F.

FACS collected field samples for monochloramine, temperature, and pH at various components within the domestic water systems on the property during both the April 17 & 18, 2023, assessment and the May 3 and June 6, 2023, follow-up assessments.

Incoming Municipal Supply

The stabilized monochloramine measurements were 1.82 ppm (4/17/23), 1.52 ppm (4/18/23), 1.72 ppm (5/3/23) and 2.43 ppm (6/6/23) at the incoming point of entry into the building, which was above the recommended minimum monochloramine concentration for *Legionella* control in potable water of 0.5 ppm, indicating water entering the building is within the acceptable range. pH was measured at 7.8 – 8.0 and was within the acceptable range for monochloramine disinfection efficacy.

The domestic cold water (DCW) temperatures at the incoming point of entry were 62°F (4/17/23), 70°F (4/18/23), 62°F (5/3/23), and 70°F (6/6/23) which were below the recommended DCW delivery temperature of $\leq 77^\circ\text{F}$ and showed acceptable temperature.

Domestic Cold Water (DCW)

Temperature measurements at DCW sampling points ranged from 56-100°F (4/17/23), with one sample, collected at a cold water expansion tank lead line, above the maximum recommended temperature for DCW ($\leq 77^\circ\text{F}$). This elevated DCW temperature is likely due to the proximity of the cold water expansion tank lead to the domestic hot water return (DHWR) line connection to DCW makeup, warming of the DCW expansion tank lead line is likely to occur. Temperature measurements at DCW sampling points during the follow-up assessment (5/3/23) ranged from 59-100°F, with one sample above the maximum recommended temperature for DCW ($\leq 77^\circ\text{F}$), again recorded at the DCW expansion tank lead line on the roof. Temperature measurements at DCW sampling points during the second follow-up assessment (6/6/23) ranged from 68-80°F, with two samples above the maximum recommended temperature for DCW ($\leq 77^\circ\text{F}$), recorded at the Janitor closet J-11 and again at the DCW expansion tank lead line on the roof. Testing for residual disinfectant at the DCW sampling points found concentrations of monochloramine ranging from 0.06 - 1.88 ppm, with half of the samples below the target range for disinfection of domestic water systems (≥ 0.5 ppm). pH measurements at the DCW sampling points were within the recommended target range for potable water treated with monochloramine.

Domestic Hot Water (DHW)

Temperature measurements at DHW sampling points ranged from 118-134°F (4/17/23), 111-135°F (5/3/23), and 92-121°F (6/6/23) with seven temperatures below the minimum recommended temperature for DHW ($\geq 120^\circ\text{F}$). Testing for residual disinfectant at DHW sampling points found concentrations of monochloramine ranged from 0.08-0.99 ppm (4/17/23), 0.14-1.12 ppm (5/3/23), and 0.11-0.94 ppm (6/6/23) with four (4) locations below the target range for disinfection of domestic water systems (≥ 0.5 ppm). pH measurements at DHW sample points were within the recommended target range for potable water treated with monochloramine during both assessments.

Temperature measurements collected at the domestic hot water storage tank (DHWST) serving the building recorded 134°F (4/17/23), 135°F (5/3/23) and 121°F (6/6/23) and were below the recommended minimum temperature for hot water storage ($\geq 140^\circ\text{F}$). Residual disinfectant concentrations at the DHWST measured 0.19 ppm (4/17/23), 0.16 ppm (5/3/23) and 0.24 ppm (6/6/23) and were below the target range for disinfection of domestic water systems (≥ 0.5 ppm). pH measurements at the DHWST sample points were within the recommended target range for potable water treated with monochloramine during both assessments.

Legionella Sample Results

Limited guidance is available from several agencies and organizations for the interpretation of *Legionella* sample results. The CDC and AIHA provide some quantitative recommendations for interpreting sample results by water source as well as subsequent corrective actions to be taken based upon currently available guidance and knowledge. The CDC recommends a multi-factorial approach to sample interpretation that includes sample concentration, change in sample concentration over time, the extent of sample positivity, and the type or species of *Legionella* identified. The AIHA approach to interpretation

is based on sample concentration with recommendations based on concentration and whether legionellosis cases have been identified. The CDC and AIHA interpretation guidance are provided in Appendix E.

Domestic Cold Water (DCW)

Legionella was detected in eight (8) samples (31% positivity) collected during the initial assessment (April & 18, 2023) from the DCW systems serving the building. Concentrations of *Legionella* ranged from 10.0-60.0 CFU/mL with the following type identified: *Legionella pneumophila* not serogroups 1-6. *Legionella pneumophila* types are highly associated with *Legionella*-related illness according to the CDC. The remaining DCW samples collected from the building, including the sample collected at incoming municipal supply did not detect *Legionella*. The sample results from the building met criteria established by the CDC for a poorly controlled or uncontrolled water system based on concentration, extent of positivity, and types of *Legionella* identified.

Legionella was detected in two (2) samples (9% positivity) collected during the first follow-up assessment (5/3/23) from the DCW systems following hyperchlorination. Concentrations of *Legionella* ranged from 1.0-5.0 CFU/mL with the following type identified: *Legionella pneumophila* not serogroups 1-6. *Legionella pneumophila* types are highly associated with *Legionella*-related illness according to the CDC. However, these samples were collected at fixtures where in-line filtration was installed (see section "Fixtures" below). The overall results indicated that the disinfection was effective in reducing *Legionella* contamination in the DCW system, but that localized contamination of fixtures is present.

Legionella was detected in three (3) samples (16% positivity) collected during the second follow-up assessment (6/6/23) from the DCW system. Concentrations of *Legionella* ranged from 30.0-115.0 CFU/mL with the following types identified: *Legionella Anisa* and *Legionella pneumophila* not serogroups 1-6. *Legionella pneumophila* types are highly associated with *Legionella*-related illness according to the CDC. The remaining DCW samples collected from the building, including the samples collected at incoming municipal supply did not detect *Legionella*. The overall results indicate that the disinfection continues to be effective in reducing *Legionella* contamination in the DCW system, but that localized contamination of fixtures and drinking water fountains is present.

Domestic Hot Water (DHW)

Legionella was detected in ten (10) samples (77% positivity) collected during the initial assessment (April 17 & 18, 2023) from the DHW system, including the domestic hot water storage tank (DHWST). Concentrations of *Legionella* ranged from 5.0-900.0 CFU/mL with the following types identified: *Legionella pneumophila* not serogroups 1-6. *Legionella pneumophila* types are highly associated with *Legionella*-related illness according to the CDC. The remaining three (3) samples collected from the building did not detect *Legionella*. The sample results from the building met criteria established by the CDC for a poorly controlled or uncontrolled water systems based on concentration, extent of positivity, and types of *Legionella* identified.

Legionella was detected in three (3) samples (17% positivity) collected during the first follow-up assessment (5/3/23) from the DHW system following hyperchlorination. Concentrations of *Legionella* ranged from 0.5-10.0 CFU/mL with the following type identified: *Legionella pneumophila* not serogroups 1-6. *Legionella pneumophila* types are highly associated with *Legionella*-related illness according to the CDC. However, these samples were collected at fixtures where in-line filtration was installed (see section "Fixtures" below). The overall results indicate that the disinfection was effective in reducing *Legionella* contamination in the circulating DHW system, but that localized contamination of fixtures is present.

Legionella was detected in two (2) samples (12% positivity) collected during the second follow-up assessment (6/6/23) from the DHW system. Concentrations of *Legionella* ranged from 0.5-10.0 CFU/mL with the following type identified: *Legionella pneumophila* not serogroups 1-6. *Legionella pneumophila* types are highly associated with *Legionella*-related illness according to the CDC. Both samples were

collected from fixtures with the POU filters removed, indicating legionella contamination is still present in certain fixtures prior to the filters. It should be noted that POU filters have been installed at both locations and samples collected with the filters in place did not detect legionella. The overall results indicate that the disinfection continues to be effective in reducing *Legionella* contamination in the circulating DHW system, but that localized contamination of fixtures is present.

Fixtures

In addition to the water samples, four (4) swab samples were collected from fixtures during the initial assessment (April 17 & 18, 2023). All four swabs were positive for *Legionella* which matched the water sample results at the fixtures. These results indicate that localized contamination of the fixtures represented by those sampled was likely.

Five (5) of sixteen (16) samples (31% positivity) collected during the first follow-up assessment at fixtures where in-line filtration was in place were positive for *Legionella*. These results indicate that localized contamination of fixtures is present.

A summary of assessment findings, data, and sampling results is provided in Table 1 - Table 4 in Appendix C of this report. Laboratory reports and chain of custody documents are provided in Appendix D. The current status of the water systems in the building following the June 6, 2023 sampling is provided in the table below.

Water Systems Status Following 6/6/23 Sampling	
Water System	Status
Municipal Water	<i>The disinfectant level in the municipal water entering the building remains above the recommended level, and Legionella has not been detected in sampling. Continue to monitor and sample during ongoing validation sampling.</i>
Central Water Systems and Distribution Piping	<i>The disinfection appears to have been effective in reducing Legionella contamination in the central water systems and distribution piping, except as noted for the DCW expansion tank below. However additional sampling over time is needed for confirmation. As noted below, the continued use of point of use filters on sinks and showers is recommended until further validation sampling is conducted.</i>
Janitor Closet Sinks and Showers	<i>The disinfection appears to have been effective in reducing Legionella contamination in the janitor closet sinks and showers (both equipped with manual faucets). The continued use of point of use filters at these locations is recommended until further validation sampling is conducted.</i>
Restroom Automated Sinks	<i>Samples from restroom sinks (all equipped with automated faucets) continue to have elevated Legionella, although levels are substantially reduced from pre-disinfection sampling. It is recommended that all these fixtures be disinfected or replaced, followed by validation sampling. In the interim, all of these fixtures should be equipped with point of use filters or removed from service. It should be noted that while these fixtures have in-line filters in place between building piping and the fixture, such filters do not protect from Legionella in the fixture itself and associated lines after the filter.</i>
Drinking Fountains	<i>Some samples from drinking fountains were found to have elevated Legionella samples. Visible scale was also observed at multiple drinking fountains. It is recommended to thoroughly clean (including removal of scale and debris) and disinfect all drinking fountains, followed by validation sampling. In the interim, all of these fixtures should be removed from service, as installation of point of use filters is not feasible.</i>
DCW Expansion Tank	<i>The DCW expansion tank located on the roof shows positive results for Legionella, although not a type typically associated with disease. Due to potential risk of Legionella amplification, it is recommended that the tank be cleaned and disinfected. In addition, the location of this tank and its proximity to nearby hot water lines should be evaluated in order to reduce future risk of Legionella amplification.</i>

Recommendations

Following the initial assessment (April 17 & 18 2023) and each of the follow-up assessments (May 3 & June 6, 2023), verbal recommendations were provided to DIR for immediate implementation. It is understood DIR are not the property managers of the building therefore these recommendations may be implemented by another party such as DGS or a third-party contractor. The specific recommendations made were as follows:

Recommendations Provided Following April 17 & 18, 2023 Initial Assessment:

1. Develop a corrective action plan within a reasonable timeframe (i.e., within about a week) to address *Legionella* amplification in the domestic hot and cold-water systems for the building.
2. Remediation of the domestic hot and cold-water systems should be included in the corrective action plan. Consult with a qualified water treatment contractor regarding the most appropriate methods, however chemical treatment (e.g., with a chemical oxidant) is often referenced as an effective method for short-term remediation.
3. If point of use (POU) and in-line filters are installed to control potential *Legionella* exposure while remediation efforts are completed and confirmed effective, a plan needs to be developed for regular inspection and replacement of filters.
4. Additional recommendations for the building include ensuring the DHWST is supplying water consistently stored at 140°F or above. Where scalding concerns are present, delivery temperatures should be targeted as close to 120°F as possible.
5. Perform a visual assessment of accessible point-of-use fixtures, aerators, and laminar flow devices to identify areas of excessive scale, corrosion, biofilm, or debris. Perform cleaning and disinfection of fixtures, aerators, and laminar flow devices exhibiting excessive scale, corrosion, biofilm, or debris. Alternatively, these fixtures, aerators, and laminar flow devices can be replaced.
6. Following any additional remediation activities, perform validation sampling to ensure efficacy of remediation efforts to reduce *Legionella* concentrations in the building.
7. Consider the development and implementation of a comprehensive water management plan to manage ongoing *Legionella* risk for the property in the future.

Recommendations Provided Following May 3, 2023, Follow-Up Assessment:

1. Develop a corrective action plan within a reasonable timeframe (i.e., within about a week) to address the identified localized contamination at fixtures represented by the sample results.
2. Physically clean and disinfect, or alternatively replace, all fixtures represented by positive sample results. Filtration should remain in place until follow-up sampling demonstrates adequate control of localized *Legionella* contamination.
3. Perform ongoing follow-up sampling at regular intervals (e.g., every two weeks for three months followed by every month for an additional three months) to validate continued control of *Legionella* amplification in the building.

Recommendations Provided Following June 6, 2023, Follow-Up Assessment:

1. Develop a corrective action plan within a reasonable timeframe (i.e., within about a week) to address the identified localized contamination at fixtures represented by the sample results.
2. Thoroughly clean (including removal of scale and debris) and disinfect all drinking fountains, followed by validation sampling. In the interim, all of these fixtures should be removed from service, as installation of point of use filters is not feasible.
3. All automated fixtures should be disinfected or replaced, followed by validation sampling. In the interim, all of these fixtures should be equipped with point of use filters or removed from service. It should be noted that while these fixtures have in-line filters in place between building piping and the fixture, such filters do not protect from *Legionella* in the fixture itself and associated lines after the filter.

- 4. The DCW expansion tank be cleaned and disinfected. In addition, the location of this tank and its proximity to nearby hot water lines should be evaluated in order to reduce future risk of Legionella amplification.
- 5. Perform ongoing follow-up sampling at regular intervals (e.g., every two weeks for three months followed by every month for an additional three months) to validate continued control of Legionella amplification in the building.

Limitations

This investigation is limited to the conditions and practices observed and information made available to FACS. The methods, conclusions, and recommendations provided are based on FACS' judgment, experience and the standard of practice for professional service. They are subject to the limitations and variability inherent in the methodology employed. As with all environmental investigations, this investigation is limited to the defined scope and does not purport to set forth all hazards, nor indicate that other hazards do not exist.

Please do not hesitate to contact our office if you have any additional questions or concerns. Thank you for the opportunity to assist California Department of Industrial Relations (DIR) in promoting a more healthful environment.

Respectfully,
FORENSIC ANALYTICAL



Kristy Thornton, MS, COH
Local Director, San Diego

Reviewed by,
FORENSIC ANALYTICAL



Ben Kollmeyer, MPH, CIH
Chief Science Officer

Appendix A

Photographs



Photo #1: Municipal water connection



Photo #2: Evidence of scale on drinking fountain bubbler (Level 3)



Photo #3: DCW Expansion Tank



Photo #4: DHW Storage Tank



Photo #5: Hose bib located under sink in restrooms



Photo #6: In-Line filters installed 4.21.23 for sensor sinks in restrooms



Photo #7: Janitor Closet Mop Sink – POU filter removed for sampling

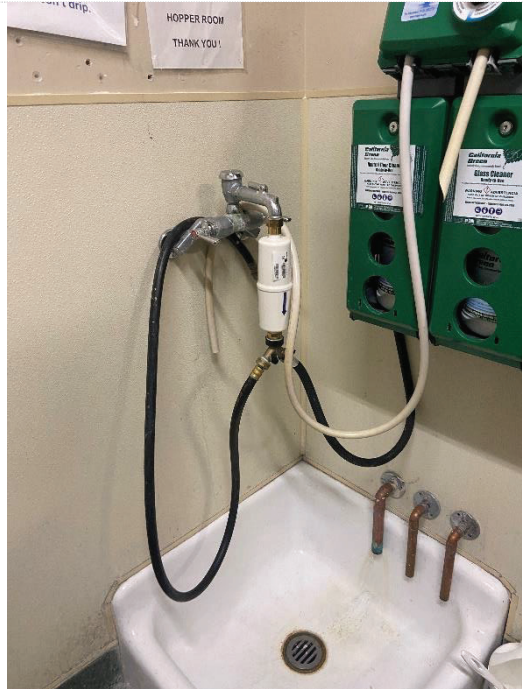


Photo #8: Janitor Closet Mop Sink – Filter



Photo #9: Women's RR 24 – POU filter installed (6.2.23) on fixtures in addition to In-line filter (4.21.23)



Photo #10: 1st Floor – Women's Shower – POU Filter removed for sampling



Photo #11: 1st Floor – Women's Shower – POU filter installed 4.21.23

Appendix B

Data Collection and Laboratory Methods

Legionella. Sample collection materials were provided by the laboratory performing the analysis. All bacterial samples were collected using aseptic technique. For water samples, approximately 250 milliliters (mL) of water were collected using wide-mouth sterile plastic containers containing sodium thiosulfate preservative. Collection of pre-flush (first-draw) water samples at fixtures was performed first, followed by collection of post-flush (late-draw) samples from fixtures when the water temperature had stabilized (typically after approximately one minute of flushing). Collection of water temperature, residual disinfectant, and pH measurements was performed alongside water sampling.

Water samples were collected in plastic containers provided by the laboratory and pre-preserved with sodium thiosulfate. The samples were sealed and labeled and placed in an insulated container for shipment. Samples were sent under chain of custody to Special Pathogens Laboratories (SPL) for culture analysis for *Legionella* using the International Organization for Standardization (ISO) Method 11731:2017 (E). SPL is a CDC Environmental *Legionella* Isolation Techniques Evaluate (ELITE) proficient laboratory for analysis of *Legionella*. Samples were transported in insulated packaging to the analytical laboratory and reached the laboratory within 24 hours of collection. Results are presented as a concentration of viable *Legionella* in colony forming units per milliliter of sample (CFU/mL).

Water Sampling Colorimetry. All colorimetric measurements were collected using a Hach DR900 colorimeter. A small volume of water was collected into a cuvette, which was used to blank correct the colorimeter with each new source of water sampled. Following blank adjustment, a reagent powder or liquid, specific to the type of measurement, was added to the sample and the sample was agitated to facilitate reaction. After a reaction period specified by the appropriate method (listed below), the cuvette was then inserted into the colorimeter and read for specific concentration.

Chemical	US EPA Method	Detectable Range (ppm)	Reagent Type/s	HACH #
Monochloramine	Indophenol 10171	0.04-4.50 Cl ₂	Monochlor F Reagent Pillows	DOC316.53.01015

Temperature. Temperature was measured using a National Institute of Standards and Technology (NIST) traceable thermometer. Water was collected in a satellite container and the temperature probe was inserted and swirled in the water to ensure adequate probe contact, mixing, and to reduce temperature stratification during temperature measurement.

pH. Measurements of pH were collected using a calibrated pen-type pH meter. Water was collected in a satellite container and the pH probe was inserted into the water to collect a measurement.

Appendix C

Data Summary Tables

Table 1: Water Chemistry and Sampling Data Summary Table – Initial Assessment (April 17, 2023)

Floor	Room/ Area	Fixture/ Component	Water Type	System Loc.	Sample Type	Sample #	Temp (F)	Ox. (ppm)	pH	Result (CFU/mL)	Types
W of Bldg, Metropolitan Drive		Municipal Backflow Preventer	City Water	Source	Post	W01	62	1.82	8.2	ND	/
1 – West	Mens RR 11-1	Right sink faucet	DCW	Near	Pre-Flush	W02	-	-	-	10.0	LP
1 – West	Mens RR 11-1	Right sink faucet	DCW	Near	Post-Flush	W03	70	0.10	7.8	ND	/
1 – West	Mens RR 11-1	Right sink faucet	DHW	Near	Post-Flush	W04	124	0.53	8.5	70.0	LP
2 – West	Mens RR 22	Right sink faucet	DCW	Mid	Pre-Flush	W05	-	-	-	60.0	LP
2 – West	Mens RR 22	Right sink faucet	DCW	Mid	Post-Flush	W06	69	0.19	7.9	20.0	LP
2 – West	Mens RR 22	Right sink faucet	DHW	Mid	Post-Flush	W07	127	0.42	8.5	25.0	LP
2 – East	Womens RR 24	Right sink faucet	DHW	Mid	Pre-Flush	W08	-	-	-	900.0	LP
2 – East	Womens RR 24	Right sink faucet	DHW	Mid	Post-Flush	W09	130	0.67	8.4	55.0	LP
2 – East	Womens RR 24	Right sink faucet	DCW	Mid	Post-Flush	W10	72	0.05	7.7	45.0	LP
3 – East	Janitor Closet J-30	Mop sink	DCW	Distal	Post-Flush	W11	67	0.11	7.1	ND	/
Roof	DCW Makeup Line	Hose bib	DCW	Distal	Post-Flush	W12	70	0.19	7.2	ND	/
Roof	DCW Expansion Tank	Inlet drain	DCW	Distal	Post-Flush	W13	100	0.14	7.7	10.0	LA
Roof	DHWST	Drain line	DHW	Near	Post-Flush	W14	134	0.19	7.6	5.0	LP
Roof West	Exterior Hose Bib	Hose bib	DCW	Distal	Post-Flush	W15	73	0.31	7.5	ND	/
1 – West	Janitor Closet J-11	Mop sink	DHW	Distal	Post-Flush	W16	125	0.99	8.0	ND	/
1 – West	Janitor Closet J-11	Mop sink	DCW	Near	Post-Flush	W17	70	0.00	8.0	ND	/

Notes:

DCW = domestic cold water

DHW = domestic hot water

DHWH = domestic hot water heater

ND = not detected

LP = *Legionella pneumophila*, not serogroups 1-6

LA = *Legionella anisa* (Blue-white *Legionella* sp.)

Table 2: Water Chemistry and Sampling Data Summary Table – Initial Assessment (April 18, 2023)

Floor	Room/ Area	Fixture/ Component	Water Type	System Loc.	Sample Type	Sample #	Temp (F)	Ox. (ppm)	pH	Result (CFU/mL)	Types
	W of Bldg, Metropolitan Drive	Municipal Backflow Preventer	City Water	Source	Post	W18	70	1.52	7.9	ND	/
1 – East	Womens RR 13-1	Shower	DHW	Distal	Pre-Flush	W19	-	-	-	255.0	LP
1 – East	Womens RR 13-1	Shower	DHW	Distal	Post-Flush	W20	130	0.08	7.3	95.0	LP
1 – East	Womens RR 13-1	Shower	DCW	Near	Post-Flush	W21	71	0.17	7.6	50.0	LP
1 – East	Mens RR 14-1	Shower	DCW	Near	Pre-Flush	W22	-	-	-	ND	/
1 – East	Mens RR 14-1	Shower	DCW	Near	Post-Flush	W23	71	0.33	7.8	ND	/
1 – West	Drinking Fountain adj Ste 109	Right bubbler	DCW	Near	Post-Flush	W24	56	1.04	7.7	ND	/
1 – West	Mens RR 11-1	Center sink – Filter	DHW	Distal	Pre-Flush	W25	-	-	-	45.0	LP
1 – West	Mens RR 11-1	Center sink – Filter	DHW	Distal	Post-Flush	W26	118	4.00	8.2	30.0	LP
1 – West	Mens RR 11-1	Center sink – Filter	DCW	Near	Post-Flush	W27	71	0.42	7.8	10.0	LP
1 – West	Janitor Closet J-11	Mop sink – POU filter	DCW	Near	Post-Flush	W28	69	-	-	ND	/
2 – East	Drinking Fountain adj 210-3	Left bubbler	DCW	Mid	Post-Flush	W29	58	-	-	ND	/
2 – West	Drinking Fountain adj 210-3	Right bubbler	DCW	Mid	Post-Flush	W30	59	-	-	ND	/
3 – East	Drinking Fountain adj 300-5	Left bubbler	DCW	Distal	Post-Flush	W31	68	-	-	ND	/
3 – West	Drinking Fountain adj 301-32	Right bubbler	DCW	Distal	Post-Flush	W32	58	-	-	10.0	LP
3 – West	Womens RR adj J-32	Center sink	DHW	Near	Pre-Flush	W33	-	-	-	ND	/
3 – West	Womens RR adj J-32	Center sink	DHW	Near	Post-Flush	W34	118	0.82	7.7	5.0	LP
3 – West	Womens RR adj J-32	Center sink	DCW	Distal	Post-Flush	W35	71	0.70	7.6	ND	/
3 – West	RR 301-8	Sink faucet	DHW	Near	Post-Flush	W36	127	-	-	ND	/
3 – West	RR 301-8	Sink faucet	DCW	Distal	Post-Flush	W37	71	-	-	ND	/
3 – West	S Coffee rm 301-35	Sink faucet	DCW	Distal	Pre-Flush	W38	-	-	-	ND	/
3 – West	S Coffee rm 301-35	Sink faucet	DCW	Distal	Post-Flush	W39	72	-	-	ND	/
3 – West	N Coffee rm 301-34	Sink Faucet	DCW	Distal	Pre-Flush	W40	-	-	-	ND	/
3 – West	N Coffee rm 301-34	Sink Faucet	DCW	Distal	Post-Flush	W41	71	-	-	ND	/

Notes:
DCW = domestic cold water
DHW = domestic hot water
DHW = domestic hot water heater
ND = not detected
LP = *Legionella pneumophila*, not serogroups 1-6

Table 3: Water Chemistry and Sampling Data Summary Table – Follow-Up Assessment (May 3, 2023)

Floor	Room/ Area	Fixture/ Component	Water Type	System Loc.	Sample Type	Sample #	Temp (F)	Ox. (ppm)	pH	Result (CFU/mL)	Types
1 – West	Drinking Fountain adj 110.14	Right bubbler	DCW	Near	Pre-Flush	W42	-	-	-	ND	/
1 – West	Drinking Fountain adj 110.14	Right bubbler	DCW	Near	Post-Flush	W43	59	1.04	8.0	ND	/
1 – West	Janitor Closet J-11	Mop sink – POU filter	DHW	Distal	Pre-Flush	W44	-	-	-	ND	/
1 – West	Janitor Closet J-11	Mop sink – POU filter	DHW	Distal	Post-Flush	W45	111	0.48	8.1	ND	/
1 – West	Janitor Closet J-11	Mop sink – POU filter	DCW	Near	Post-Flush	W46	72	0.18	7.7	ND	/
1 – West	Mens RR 11-1	Right sink – In-Line filter	DHW	Distal	Pre-Flush	W47	-	-	-	ND	/
1 – West	Mens RR 11-1	Right sink – In-Line filter	DHW	Distal	Post-Flush	W48	121	0.52	7.7	ND	/
1 – West	Mens RR 11-1	Center sink – In-Line filter	DCW	Near	Pre-Flush	W49	-	-	-	5.0	LP
1 – West	Mens RR 11-1	Center sink – In-Line filter	DCW	Near	Post-Flush	W50	70	0.51	7.9	1.0	LP
1 – East	Womens RR 13-1	Shower – POU filter	DHW	Distal	Pre-Flush	W51	128	0.14	7.4	ND	/
1 – East	Womens RR 13-1	Shower – POU filter	DHW	Distal	Post-Flush	W52	-	-	-	ND	/
1 – East	Womens RR 13-1	Shower – POU filter	DCW	Near	Post-Flush	W53	72	0.24	7.6	ND	/
1 – East	Mens RR 14-1	Shower – POU filter	DHW	Distal	Pre-Flush	W54	-	-	-	ND	/
1 – East	Mens RR 14-1	Shower – POU filter	DHW	Distal	Post-Flush	W55	130	0.42	7.4	ND	/
2 – West	Drinking Fountain adj 210	Left bubbler	DCW	Mid	Post-Flush	W56	-	-	-	ND	/
2 – West	Mens RR 22	Right sink – In-Line filter	DCW	Mid	Pre-Flush	W57	-	-	-	ND	/
2 – West	Mens RR 22	Right sink – In-Line filter	DCW	Mid	Post-Flush	W58	68	0.37	7.9	ND	/
2 – West	Mens RR 22	Right sink – In-Line filter	DHW	Mid	Post-Flush	W59	127	0.49	8.1	0.5	LP
2 – East	Womens RR 24	Right sink – In-Line filter	DHW	Mid	Pre-Flush	W60	-	-	-	10.0	LP
2 – East	Womens RR 24	Right sink – In-Line filter	DHW	Mid	Post-Flush	W61	129	0.71	8.2	5.0	LP
2 – East	Womens RR 24	Left sink – In-Line filter	DCW	Mid	Pre-Flush	W62	-	-	-	ND	/
2 – East	Womens RR 24	Left sink – In-Line filter	DCW	Mid	Post-Flush	W63	71	0.32	7.8	ND	/
2 – East	Womens RR 24	Hose bib	DCW	Mid	Pre-Flush	W64	-	-	-	ND	/
2 – East	Womens RR 24	Hose bib	DCW	Mid	Post-Flush	W65	73	0.20	7.7	ND	/
2 – East	Ste 208 Lounge	Sink faucet	DCW	Mid	Pre-Flush	W66	-	-	-	ND	/
2 – East	Ste 208 Lounge	Sink faucet	DCW	Mid	Post-Flush	W67	69	0.13	7.8	ND	/
2 – East	Ste 208 Lounge	Sink faucet	DHW	Mid	Post-Flush	W68	-	-	-	ND	/
3 – West	Janitor Closet J-21	Mop sink – POU filter	DCW	Distal	Pre-Flush	W69	68	0.16	7.8	ND	/
3 – West	Janitor Closet J-21	Mop sink – POU filter	DCW	Distal	Post-Flush	W70	-	-	-	ND	/

Floor	Room/ Area	Fixture/ Component	Water Type	System Loc.	Sample Type	Sample #	Temp (F)	Ox. (ppm)	pH	Result (CFU/mL)	Types
3 – West	Janitor Closet J-21	Mop sink – POU filter	DHW	Near	Post-Flush	W71	126	1.12	8.1	ND	/
3 – West	Womens RR adj J-32	Center sink – In-Line filter	DHW	Near	Pre-Flush	W72	-	-	-	ND	/
3 – West	Womens RR adj J-32	Center sink – In-Line filter	DHW	Near	Post-Flush	W73	119	0.48	7.9	ND	/
3 – West	Womens RR adj J-32	Center sink – In-Line filter	DCW	Distal	Post-Flush	W74	72	-	7.7	ND	/
3 – West	Womens RR adj J-32	Hose bib	DCW	Distal	Post-Flush	W75	71	0.30	7.9	ND	/
3 – West	Drinking Fountain 301-32	Right bubbler	DCW	Distal	Pre-Flush	W76	58	-	-	ND	/
3 – West	Drinking Fountain 301-32	Right bubbler	DCW	Distal	Post-Flush	W77	-	-	-	ND	/
3 – East	Mens RR adj 300-31	Left sink – In-Line filter	DHW	Near	Pre-Flush	W78	-	-	-	ND	/
3 – East	Mens RR adj 300-31	Left sink – In-Line filter	DHW	Near	Post-Flush	W79	117	0.28	8.1	ND	/
Roof	DHWST	Drain line	DHW	Near	Post-Flush	W80	135	0.16	7.6	ND	/
Roof	DCW Expansion Tank	Inlet drain	DCW	Distal	Post-Flush	W81	99	0.15	7.8	ND	/
Roof West	Exterior Hose Bib	Hose bib	DCW	Distal	Pre-Flush	W82	73	0.21	7.6	ND	/
Roof West	Exterior Hose Bib	Hose bib	DCW	Distal	Post-Flush	W83	-	-	-	ND	/
W of Bldg, Metropolitan Drive		Municipal Backflow Preventer	City Water	Source	Pre-Flush	W84	62	1.72	8.3	ND	/
W of Bldg, Metropolitan Drive		Municipal Backflow Preventer	City Water	Source	Post-Flush	W85	62	1.78	8.1	ND	/
Notes: DCW = domestic cold water DHW = domestic hot water DHWH = domestic hot water heater ND = not detected LP = <i>Legionella pneumophila</i> , not serogroups 1-6											



Table 4: Water Chemistry and Sampling Data Summary Table – Follow-Up Assessment (June 6, 2023)

Floor	Room/ Area	Fixture/ Component	Water Type	System Loc.	Sample Type	Sample #	Temp (F)	Ox. (ppm)	pH	Result (CFU/mL)	Types
1 – West	Janitor Closet J-11	Mop sink	DHW	Distal	Pre-Flush	W86	-	-	-	ND	/
1 – West	Janitor Closet J-11	Mop sink	DHW	Distal	Post-Flush	W87	103	0.72	8.0	ND	/
1 – West	Janitor Closet J-11	Mop sink	DCW	Near	Post-Flush	W88	78.2	0.48	7.8	ND	/
1 – West	Janitor Closet J-11	Mop sink – POU filter	DCW	Near	Post-Flush	W89	-	-	-	ND	/
1 – East	Womens RR 13-1	Shower	DHW	Distal	Pre-Flush	W90	-	-	-	10.0	LP
1 – East	Womens RR 13-1	Shower	DHW	Distal	Post-Flush	W91	108	0.94	8.3	ND	/
1 – East	Womens RR 13-1	Shower	DCW	Near	Post-Flush	W92	72	-	7.8	ND	/
1 – East	Womens RR 13-1	Shower – POU filter	DHW	Distal	Post-Flush	W93	-	-	-	ND	/
3 – West	Drinking Fountain adj 301-32	Right bubbler	DCW	Distal	Pre-Flush	W94	-	-	-	115.0	LP
3 – West	Drinking Fountain adj 301-32	Right bubbler	DCW	Distal	Post-Flush	W95	68	-	8.1	50.0	LP
3 – West	Womens RR adj J-32	Center sink – In-Line filter	DHW	Near	Pre-Flush	W96	-	-	-	ND	/
3 - West	Womens RR adj J-32	Center sink – In-Line filter	DHW	Near	Post-Flush	W97	92	0.61	8.1	ND	/
3 – West	Womens RR adj J-32	Hose bib	DCW	Distal	Post-Flush	W98	71	0.23	7.7	ND	/
3 – West	Janitor Closet J-32	Mop sink	DHW	Near	Pre-Flush	W99	103	0.17	8.6	0.5	LP
3 – East	Mens RR adj 300-31	Left sink – In-Line filter	DCW	Mid	Pre-Flush	W100	-	-	-	ND	/
3 - East	Mens RR adj 300-31	Left sink – In-Line filter	DCW	Mid	Post-Flush	W101	-	-	-	ND	/
3 – East	Mens RR adj 300-31	Hose bib	DCW	Mid	Post-Flush	W102	72	1.82	8.1	ND	/
2 – West	Janitor Closet J-21	Mop sink	DHW	Mid	Pre-Flush	W103	-	-	-	ND	/
2 – West	Janitor Closet J-21	Mop sink	DHW	Mid	Post-Flush	W104	117	0.11	8.1	ND	/
2 – West	Janitor Closet J-21	Mop sink	DCW	Mid	Post-Flush	W105	-	-	-	ND	/
2 – West	Janitor Closet J-21	Mop sink – POU Filter	DCW	Mid	Post-Flush	W106	-	-	-	ND	/
2 – West	Mens RR 22	Right sink – In-Line filter	DCW	Mid	Pre-Flush	W107	-	-	-	ND	/
2 – West	Mens RR 22	Right sink – In-Line filter	DCW	Mid	Post-Flush	W108	72	0.06	8.6	ND	/
2 – West	Mens RR 22	Hose bib	DCW	Mid	Post-Flush	W109	-	-	-	ND	/
2 – East	Womens RR 24	Right sink – In-Line filter	DHW	Mid	Pre-Flush	W110	-	-	-	ND	/
2 – East	Womens RR 24	Right sink – In-Line filter	DHW	Mid	Post-Flush	W111	99	0.78	8.4	ND	/
2 – East	Janitor Closet J-20	Mop sink	DHW	Mid	Post-Flush	W112	-	-	-	ND	/
2 – East	Womens RR 24	Hose bib	DCW	Mid	Pre-Flush	W113	-	-	-	ND	/
2 – East	Womens RR 24	Hose bib	DCW	Mid	Post-Flush	W114	75	1.88	8.0	ND	/

Floor	Room/ Area	Fixture/ Component	Water Type	System Loc.	Sample Type	Sample #	Temp (F)	Ox. (ppm)	pH	Result (CFU/mL)	Types
1 – West	Mens RR 11-1	Right sink – In-Line filter	DHW	Distal	Pre-Flush	W115	-	-	-	ND	/
1 – West	Mens RR 11-1	Right sink – In-Line filter	DHW	Distal	Post-Flush	W116	92	0.42	8.5	ND	/
1 – West	Mens RR 11-1	Hose bib	DCW	Near	Pre-Flush	W117	-	-	-	ND	/
1 – West	Mens RR 11-1	Hose bib	DCW	Near	Post-Flush	W118	72	0.74	7.9	ND	/
Roof	DHWST	Drain line	DHW	Near	Post-Flush	W119	121	0.24	8.4	ND	/
Roof	DCW Expansion Tank	Inlet drain	DCW	Distal	Post-Flush	W120	85	0.20	8.6	30.0	LA
Roof West	Exterior Hose Bib	Hose bib	DCW	Distal	Post-Flush	W121	-	-	-	ND	/
W of Bldg, Metropolitan Drive		Municipal Backflow Preventer	City Water	Source	Pre-Flush	W122	-	-	-	ND	/
W of Bldg, Metropolitan Drive		Municipal Backflow Preventer	City Water	Source	Post-Flush	W123	70	2.43	8.0	ND	/

Notes:

DCW = domestic cold water

DHW = domestic hot water

DHWH = domestic hot water heater

ND = not detected

LP = *Legionella pneumophila*, not serogroups 1-6LA = *Legionella anisa* (Blue-white *Legionella* sp.)

Appendix D

Laboratory Reports and Chain of Custody Forms



FINAL REPORT

Forensic Analytical

Corporate
 21228 Cabot Blvd
 Hayward, CA 94545
 P: (510) 266-4600

Account #: 5842
SPL Project ID: 2304-01470
Project Name: PJ76066
PO Number: P008889
Sampled By: M. Rebullida
Date Received: 04/18/2023
Date Final: 04/27/2023

Summary

This summary is provided for your convenience. Complete report on the following pages.

General Comments:

Originally on SPL ID 2304-00911. Moved per client request.

Environmental Culture Test-Legionella

Location	Result	Concentration	Species
76066. -417-W01	Not Detected		
76066. -417-W02	Positive	10.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066. -417-W03	Not Detected		
76066. -417-W04	Positive	70.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066. -417-S01	Positive	90.0 CFU/swab	L. pneumophila, not serogroups 1-6
76066. -417-W05	Positive	60.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066. -417-W06	Positive	20.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066. -417-W07	Positive	25.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066. -417-S02	Positive	12.5 CFU/swab	L. pneumophila, not serogroups 1-6
76066. -417-W08	Positive	900.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066. -417-W09	Positive	55.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066. -417-W10	Positive	45.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066. -417-S03	Positive	855.0 CFU/swab	L. pneumophila, not serogroups 1-6
76066. -417-S04	Positive	12.5 CFU/swab	L. pneumophila, not serogroups 1-6
76066. -417-W11	Not Detected		
76066. -417-W12	Not Detected		
76066. -417-W13	Positive	10.0 CFU/mL	L. anisa (Blue-white Legionella sp.)
76066. -417-W14	Positive	5.0 CFU/mL	L. pneumophila, not serogroups 1-6



FINAL REPORT

Forensic Analytical

Corporate
 21228 Cabot Blvd
 Hayward, CA 94545
 P: (510) 266-4600

Account #: 5842
SPL Project ID: 2304-01470
Project Name: PJ76066
PO Number: P008889
Sampled By: M. Rebullida
Date Received: 04/18/2023
Date Final: 04/27/2023

Environmental Culture Test-Legionella

Location	Result	Concentration	Species
76066. -417-W15	Not Detected		
76066. -417-W16	Not Detected		
76066. -417-W17	Not Detected		

Approved By: Brian Verdi

Janet E. Stout, Ph.D.
 Laboratory Director, Special Pathogens Laboratory

FINAL REPORT

Forensic Analytical

Corporate
 21228 Cabot Blvd
 Hayward, CA 94545
 P: (510) 266-4600

Account #: 5842
SPL Project ID: 2304-01470
Project Name: PJ76066
PO Number: P008889
Sampled By: M. Rebullida
Date Received: 04/18/2023
Date Final: 04/27/2023

Location:	76066. -417-W01	Date Collected:	04/17/2023
Sample ID:	2304-01470.001	Sample Type:	Water
		Time Collected:	10:13 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Not Detected		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066. -417-W02	Date Collected:	04/17/2023
Sample ID:	2304-01470.002	Sample Type:	Water
		Time Collected:	10:45 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	10.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066. -417-W03	Date Collected:	04/17/2023
Sample ID:	2304-01470.003	Sample Type:	Water
		Time Collected:	10:47 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Not Detected		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066. -417-W04	Date Collected:	04/17/2023
Sample ID:	2304-01470.004	Sample Type:	Water
		Time Collected:	11:00 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	70.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

FINAL REPORT

Forensic Analytical

Corporate
 21228 Cabot Blvd
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 P: (510) 266-4600

Account #: 5842
SPL Project ID: 2304-01470
Project Name: PJ76066
PO Number: P008889
Sampled By: M. Rebullida
Date Received: 04/18/2023
Date Final: 04/27/2023

Location:	76066. -417-S01	Date Collected:	04/17/2023
Sample ID:	2304-01470.005	Sample Type:	Swab
		Time Collected:	11:02 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	90.0 CFU/swab		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066. -417-W05	Date Collected:	04/17/2023
Sample ID:	2304-01470.006	Sample Type:	Water
		Time Collected:	11:15 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	60.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066. -417-W06	Date Collected:	04/17/2023
Sample ID:	2304-01470.007	Sample Type:	Water
		Time Collected:	11:17 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	20.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066. -417-W07	Date Collected:	04/17/2023
Sample ID:	2304-01470.008	Sample Type:	Water
		Time Collected:	11:19 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	25.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

FINAL REPORT

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 21228 Cabot Blvd
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 P: (510) 266-4600

Account #: 5842
SPL Project ID: 2304-01470
Project Name: PJ76066
PO Number: P008889
Sampled By: M. Rebullida
Date Received: 04/18/2023
Date Final: 04/27/2023

Location:	76066. -417-S02	Date Collected:	04/17/2023
Sample ID:	2304-01470.009	Sample Type:	Swab
		Time Collected:	11:20 am
Sample Comments:	Received 2.5 mL		

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	12.5 CFU/swab		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066. -417-W08	Date Collected:	04/17/2023
Sample ID:	2304-01470.010	Sample Type:	Water
		Time Collected:	11:43 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	900.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066. -417-W09	Date Collected:	04/17/2023
Sample ID:	2304-01470.011	Sample Type:	Water
		Time Collected:	11:44 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	55.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066. -417-W10	Date Collected:	04/17/2023
Sample ID:	2304-01470.012	Sample Type:	Water
		Time Collected:	11:45 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	45.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

FINAL REPORT

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Account #: 5842
SPL Project ID: 2304-01470
Project Name: PJ76066
PO Number: P008889
Sampled By: M. Rebullida
Date Received: 04/18/2023
Date Final: 04/27/2023

Location:	76066. -417-S03	Date Collected:	04/17/2023
Sample ID:	2304-01470.013	Sample Type:	Swab
		Time Collected:	11:43 am
Sample Comments:	Received 3 mL		

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	855.0 CFU/swab		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066. -417-S04	Date Collected:	04/17/2023
Sample ID:	2304-01470.014	Sample Type:	Swab
		Time Collected:	12:20 pm
Sample Comments:	Received 2.5 mL		

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	12.5 CFU/swab		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066. -417-W11	Date Collected:	04/17/2023
Sample ID:	2304-01470.015	Sample Type:	Water
		Time Collected:	12:33 pm

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Not Detected		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066. -417-W12	Date Collected:	04/17/2023
Sample ID:	2304-01470.016	Sample Type:	Water
		Time Collected:	12:50 pm

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Not Detected		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

FINAL REPORT

Forensic Analytical

Corporate
 21228 Cabot Blvd
 Hayward, CA 94545
 P: (510) 266-4600

Account #: 5842
SPL Project ID: 2304-01470
Project Name: PJ76066
PO Number: P008889
Sampled By: M. Rebullida
Date Received: 04/18/2023
Date Final: 04/27/2023

Location:	76066. -417-W13	Date Collected:	04/17/2023
Sample ID:	2304-01470.017	Sample Type:	Water
		Time Collected:	12:52 pm

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	10.0 CFU/mL		
Species:	L. anisa (Blue-white Legionella sp.)		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066. -417-W14	Date Collected:	04/17/2023
Sample ID:	2304-01470.018	Sample Type:	Water
		Time Collected:	12:55 pm

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	5.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066. -417-W15	Date Collected:	04/17/2023
Sample ID:	2304-01470.019	Sample Type:	Water
		Time Collected:	1:30 pm

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Not Detected		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066. -417-W16	Date Collected:	04/17/2023
Sample ID:	2304-01470.020	Sample Type:	Water
		Time Collected:	1:46 pm

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Not Detected		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		



FINAL REPORT

Forensic Analytical
 Corporate
 21228 Cabot Blvd
 Hayward, CA 94545
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Account #: 5842
SPL Project ID: 2304-01470
Project Name: PJ76066
PO Number: P008889
Sampled By: M. Rebullida
Date Received: 04/18/2023
Date Final: 04/27/2023

Location:	76066. -417-W17	Date Collected:	04/17/2023
Sample ID:	2304-01470.021	Sample Type:	Water
		Time Collected:	1:54 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Not Detected		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Approved By: Brian Verdi

Janet E. Stout, Ph.D.
 Laboratory Director, Special Pathogens Laboratory

FINAL REPORT

Forensic Analytical

Corporate
21228 Cabot Blvd
Hayward, CA 94545
P: (510) 266-4600

Account #: 5842
SPL Project ID: 2304-01470
Project Name: PJ76066
PO Number: P008889
Sampled By: M. Rebullida
Date Received: 04/18/2023
Date Final: 04/27/2023

NOTES

Environmental Culture Test-Legionella

- CFU/mL (or swab)=Colony Forming Units per milliliter or swab.
- The limit of detection (LOD)* is approximately - 0.5 - 5 CFU/mL for Potable Water; 5 CFU/mL for Non-Potable Water (Cooling Towers); 0.5 - 5 CFU/mL for Hot Water Tanks; 10 -100 CFU/swab for Swabs.
- * Sensitivity (LOD) may be affected if less than recommended sample volume is submitted for testing and if high concentration of non-Legionella bacteria are present in the sample. LOD values are mathematically derived according to the sample type, volume, and process.
- Results are reported as Not Detected, Positive, or Not Detected*
- Not Detected* The presence of Legionella could not be determined due to overgrowth of non-Legionella bacteria.
- Probable identification. Contact laboratory if further identification by 16S sequencing required.
- Method: ISO 11731:2017 (E). QA/QC performed on the date processed. Turnaround time is 7-10 days.
- Samples should be analyzed within 2 days of collection.
- Accredited by the American Association for Laboratory Accreditation (Cert. No. 2847.01) and CDC ELITE certified.
- Isolates saved upon request. Request must be received 1 week from receipt of report. Extra charges may apply.
- 'Project Name', 'Sampled By', 'Location', 'Date Collected', 'Time Collected' and 'Client Notes' are provided by the customer.

The data and information on this, and other accompanying documents, represent only the sample(s) analyzed. This report is not to be reproduced in whole or in part without the expressed consent of SPL. Results apply to the sample as received.



Chain of Custody: Test Request Form

SPL ID: **2304-00911**

UID:

Client Information				Sampling Contact					
Account Number 5842	P.O. Number P008889	Submitting Company Forensic Analytical		Name Kristy Thornton		Phone Email			
Sample Information									
Project Identifier (Name or Number) PJ76066		Sampled by M. Rebullida		Date Collected 4-17-23		Number of Samples 21			
Samples from New York or Connecticut? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is chlorine the primary biocide? Potable water: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Nonpotable water: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Case investigation? (See back for details) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		QuickCheck™? (See back for details) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Sample No.	Sample Description Specific location, source, or site	Sample Type W=Water I=Ice S=Swab O=Other	Test Codes (1 code per box)			Time Collected (hr:min)	SPL USE ONLY		
			101	103	105		Acceptable?	Temperature	Comments
76066-417-W01		W	101	103	1013 a.m./p.m.	Y	N	18.1	OUT OF Temp for HPC
- W02		↓	↓	↓	1045 a.m./p.m.	Y	N	↓	Temp for HPC
- W03		↓	↓	↓	1047 a.m./p.m.	Y	N	↓	
- W04		↓	↓	↓	1100 a.m./p.m.	Y	N	↓	
- S01		S	↓	↓	1102 a.m./p.m.	Y	N	↓	
- W05		W	↓	↓	1115 a.m./p.m.	Y	N	↓	
- W06		↓	↓	↓	1117 a.m./p.m.	Y	N	↓	
- W07		↓	↓	↓	1119 a.m./p.m.	Y	N	↓	
- S02		S	↓	↓	1120 a.m./p.m.	Y	N	↓	Rec: 2.9ml
- W08		W	↓	↓	1143 a.m./p.m.	Y	N	↓	
- W09		↓	↓	↓	1144 a.m./p.m.	Y	N	↓	
Relinquished by			Date	Time	Received by			Date	Time
M. Rebullida			4/17/23	1400	SP			4/18	



Chain of Custody: Test Request Form

SPL ID: **2304-00911**

APR 18 '23 AM 10:37
 UID:

Client Information				Sampling Contact				
Account Number 5842	P.O. Number PO08889	Submitting Company Forensic Analytical		Name K. Thornton	Phone	Email		
Sample Information								
Project Identifier (Name or Number) PJ76066			Sampled by M. Rebullida		Date Collected 4-17-23	Number of Samples 21		
Samples from New York or Connecticut? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is chlorine the primary biocide? Potable water: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Nonpotable water: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Case investigation? (See back for details) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		QuickCheck™? (See back for details) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Sample No.	Sample Description Specific location, source, or site	Sample Type W=Water I=Ice S=Swab O=Other	Test Codes (1 code per box)		Time Collected (hr:min)	SPL USE ONLY		
						Acceptable?	Temperature	Comments
76066-417-W10		W	101	103	1145 a.m.\p.m.	Y N	18.1	Out of Temp
	- S03	S			1143 a.m.\p.m.	Y N		Rec: 3ml
	- S04	S			1220 a.m.\p.m.	Y N		Rec: 2.5
	- W11	W			1233 a.m.\p.m.	Y N		
	- W12				1250 a.m.\p.m.	Y N		
	- W13				1252 a.m.\p.m.	Y N		
	- W14				1355 a.m.\p.m.	Y N		
	- W15				1330 a.m.\p.m.	Y N		
	- W16				1346 a.m.\p.m.	Y N		
	- W17				1354 a.m.\p.m.	Y N		
Relinquished by		Date	Time	Received by		Date	Time	
M. Rebullida		4/17/23	1400	SB		4/18/23		

FINAL REPORT

Forensic Analytical

Corporate
 21228 Cabot Blvd
 Hayward, CA 94545
 P: (510) 266-4600

Account #: 5842
SPL Project ID: 2304-01470
Project Name: PJ76066
PO Number: P008889
Sampled By: M. Rebullida
Date Received: 04/18/2023
Date Final: 04/27/2023

Summary

This summary is provided for your convenience. Complete report on the following pages.

General Comments:

Originally on SPL ID 2304-00911. Moved per client request.

Environmental Culture Test-Legionella

Location	Result	Concentration	Species
76066. -417-W01	Not Detected		
76066. -417-W02	Positive	10.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066. -417-W03	Not Detected		
76066. -417-W04	Positive	70.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066. -417-S01	Positive	90.0 CFU/swab	L. pneumophila, not serogroups 1-6
76066. -417-W05	Positive	60.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066. -417-W06	Positive	20.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066. -417-W07	Positive	25.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066. -417-S02	Positive	12.5 CFU/swab	L. pneumophila, not serogroups 1-6
76066. -417-W08	Positive	900.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066. -417-W09	Positive	55.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066. -417-W10	Positive	45.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066. -417-S03	Positive	855.0 CFU/swab	L. pneumophila, not serogroups 1-6
76066. -417-S04	Positive	12.5 CFU/swab	L. pneumophila, not serogroups 1-6
76066. -417-W11	Not Detected		
76066. -417-W12	Not Detected		
76066. -417-W13	Positive	10.0 CFU/mL	L. anisa (Blue-white Legionella sp.)
76066. -417-W14	Positive	5.0 CFU/mL	L. pneumophila, not serogroups 1-6



FINAL REPORT

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Project Name: PJ76066
PO Number: P008889
Sampled By: M. Rebullida
Date Received: 04/18/2023
Date Final: 04/27/2023

Environmental Culture Test-Legionella

Location	Result	Concentration	Species
76066. -417-W15	Not Detected		
76066. -417-W16	Not Detected		
76066. -417-W17	Not Detected		

Approved By: Brian Verdi

Janet E. Stout, Ph.D.
 Laboratory Director, Special Pathogens Laboratory

FINAL REPORT

Forensic Analytical

Corporate
 21228 Cabot Blvd
 Hayward, CA 94545
 P: (510) 266-4600

Account #: 5842
SPL Project ID: 2304-01470
Project Name: PJ76066
PO Number: P008889
Sampled By: M. Rebullida
Date Received: 04/18/2023
Date Final: 04/27/2023

Location:	76066. -417-W01	Date Collected:	04/17/2023
Sample ID:	2304-01470.001	Sample Type:	Water
		Time Collected:	10:13 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Not Detected		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066. -417-W02	Date Collected:	04/17/2023
Sample ID:	2304-01470.002	Sample Type:	Water
		Time Collected:	10:45 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	10.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066. -417-W03	Date Collected:	04/17/2023
Sample ID:	2304-01470.003	Sample Type:	Water
		Time Collected:	10:47 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Not Detected		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066. -417-W04	Date Collected:	04/17/2023
Sample ID:	2304-01470.004	Sample Type:	Water
		Time Collected:	11:00 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	70.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

FINAL REPORT

Forensic Analytical

Corporate
 21228 Cabot Blvd
 Hayward, CA 94545
 P: (510) 266-4600

Account #: 5842
SPL Project ID: 2304-01470
Project Name: PJ76066
PO Number: P008889
Sampled By: M. Rebullida
Date Received: 04/18/2023
Date Final: 04/27/2023

Location:	76066. -417-S01	Date Collected:	04/17/2023
Sample ID:	2304-01470.005	Sample Type:	Swab
		Time Collected:	11:02 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	90.0 CFU/swab		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066. -417-W05	Date Collected:	04/17/2023
Sample ID:	2304-01470.006	Sample Type:	Water
		Time Collected:	11:15 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	60.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066. -417-W06	Date Collected:	04/17/2023
Sample ID:	2304-01470.007	Sample Type:	Water
		Time Collected:	11:17 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	20.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066. -417-W07	Date Collected:	04/17/2023
Sample ID:	2304-01470.008	Sample Type:	Water
		Time Collected:	11:19 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	25.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

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Account #: 5842
SPL Project ID: 2304-01470
Project Name: PJ76066
PO Number: P008889
Sampled By: M. Rebullida
Date Received: 04/18/2023
Date Final: 04/27/2023

Location:	76066. -417-S02	Date Collected:	04/17/2023
Sample ID:	2304-01470.009	Sample Type:	Swab
		Time Collected:	11:20 am
Sample Comments:	Received 2.5 mL		

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	12.5 CFU/swab		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066. -417-W08	Date Collected:	04/17/2023
Sample ID:	2304-01470.010	Sample Type:	Water
		Time Collected:	11:43 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	900.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066. -417-W09	Date Collected:	04/17/2023
Sample ID:	2304-01470.011	Sample Type:	Water
		Time Collected:	11:44 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	55.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066. -417-W10	Date Collected:	04/17/2023
Sample ID:	2304-01470.012	Sample Type:	Water
		Time Collected:	11:45 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	45.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

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Account #: 5842
SPL Project ID: 2304-01470
Project Name: PJ76066
PO Number: P008889
Sampled By: M. Rebullida
Date Received: 04/18/2023
Date Final: 04/27/2023

Location:	76066. -417-S03	Date Collected:	04/17/2023
Sample ID:	2304-01470.013	Sample Type:	Swab
		Time Collected:	11:43 am
Sample Comments:	Received 3 mL		

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	855.0 CFU/swab		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066. -417-S04	Date Collected:	04/17/2023
Sample ID:	2304-01470.014	Sample Type:	Swab
		Time Collected:	12:20 pm
Sample Comments:	Received 2.5 mL		

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	12.5 CFU/swab		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066. -417-W11	Date Collected:	04/17/2023
Sample ID:	2304-01470.015	Sample Type:	Water
		Time Collected:	12:33 pm

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Not Detected		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066. -417-W12	Date Collected:	04/17/2023
Sample ID:	2304-01470.016	Sample Type:	Water
		Time Collected:	12:50 pm

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Not Detected		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

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Account #: 5842
SPL Project ID: 2304-01470
Project Name: PJ76066
PO Number: P008889
Sampled By: M. Rebullida
Date Received: 04/18/2023
Date Final: 04/27/2023

Location:	76066. -417-W13	Date Collected:	04/17/2023
Sample ID:	2304-01470.017	Sample Type:	Water
		Time Collected:	12:52 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	10.0 CFU/mL		
Species:	L. anisa (Blue-white Legionella sp.)		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066. -417-W14	Date Collected:	04/17/2023
Sample ID:	2304-01470.018	Sample Type:	Water
		Time Collected:	12:55 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Positive		
Concentration:	5.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066. -417-W15	Date Collected:	04/17/2023
Sample ID:	2304-01470.019	Sample Type:	Water
		Time Collected:	1:30 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Not Detected		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066. -417-W16	Date Collected:	04/17/2023
Sample ID:	2304-01470.020	Sample Type:	Water
		Time Collected:	1:46 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Not Detected		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		



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Account #: 5842
SPL Project ID: 2304-01470
Project Name: PJ76066
PO Number: P008889
Sampled By: M. Rebullida
Date Received: 04/18/2023
Date Final: 04/27/2023

Location:	76066. -417-W17	Date Collected:	04/17/2023
Sample ID:	2304-01470.021	Sample Type:	Water
		Time Collected:	1:54 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 04/27/2023
Result:	Not Detected		
Date Processed:	04/18/2023		
Volume Examined:	0.2 ml of processed sample		

Approved By: Brian Verdi

Janet E. Stout, Ph.D.
 Laboratory Director, Special Pathogens Laboratory

FINAL REPORT

Forensic Analytical

Corporate
21228 Cabot Blvd
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P: (510) 266-4600

Account #: 5842
SPL Project ID: 2304-01470
Project Name: PJ76066
PO Number: P008889
Sampled By: M. Rebullida
Date Received: 04/18/2023
Date Final: 04/27/2023

NOTES

Environmental Culture Test-Legionella

- CFU/mL (or swab)=Colony Forming Units per milliliter or swab.
- The limit of detection (LOD)* is approximately - 0.5 - 5 CFU/mL for Potable Water; 5 CFU/mL for Non-Potable Water (Cooling Towers); 0.5 - 5 CFU/mL for Hot Water Tanks; 10 -100 CFU/swab for Swabs.
- * Sensitivity (LOD) may be affected if less than recommended sample volume is submitted for testing and if high concentration of non-Legionella bacteria are present in the sample. LOD values are mathematically derived according to the sample type, volume, and process.
- Results are reported as Not Detected, Positive, or Not Detected*
- Not Detected* The presence of Legionella could not be determined due to overgrowth of non-Legionella bacteria.
- Probable identification. Contact laboratory if further identification by 16S sequencing required.
- Method: ISO 11731:2017 (E). QA/QC performed on the date processed. Turnaround time is 7-10 days.
- Samples should be analyzed within 2 days of collection.
- Accredited by the American Association for Laboratory Accreditation (Cert. No. 2847.01) and CDC ELITE certified.
- Isolates saved upon request. Request must be received 1 week from receipt of report. Extra charges may apply.
- 'Project Name', 'Sampled By', 'Location', 'Date Collected', 'Time Collected' and 'Client Notes' are provided by the customer.

The data and information on this, and other accompanying documents, represent only the sample(s) analyzed. This report is not to be reproduced in whole or in part without the expressed consent of SPL. Results apply to the sample as received.



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APR 19 '23 09:12

Chain of Custody: Test Request Form

SPL ID: 2304-01642

UID:

Client Information				Sampling Contact				
Account Number 5842-CBS	P.O. Number P008889	Submitting Company FACS, San Diego Office		Name Kristy Thornton	Phone 858-256-7665			
Sample Information				Email kristy.thornton@forensicanalysts.com				
Project Identifier (Name or Number) PJ76066		Sampled by M. Rebullida (510-330-6026)		Date Collected 4/18/2023	Number of Samples			
Samples from NY or Conn.? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is chlorine the primary biocide? Potable water: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Nonpotable water: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Reportable to PADEP? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (Enter sample location 3-digit number in first column below for each sample.)		PWSID: _____		
		Check results for DWELR Reporting: <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliforms		Case investigation? (See back for price.) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		QuickCheck™? (Legionella Culture only. See back for price.) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Sample No./ Location ID	Sample Description Specific location, source, or site	Sample Type W= Water Juice S=Swab O=Other	Test Codes (1 code per box)	Time Collected (hr:min)	SPL USE ONLY			
					MEH	Acceptable?	Temperature	Comments
76066-918-W18		W	101	1530 a.m./p.m.	MEH	Y		
-	- W19			1230 a.m./p.m.		Y		
-	- W20			1232 a.m./p.m.		Y		
-	- W21			1235 a.m./p.m.		Y		
-	- W22			1305 a.m./p.m.		Y		
-	- W23			1308 a.m./p.m.		Y		
-	- W24			1310 a.m./p.m.		Y		
-	- W25			1332 a.m./p.m.		Y		
-	- W26			1334 a.m./p.m.		Y		
-	- W27			1336 a.m./p.m.		Y		
-	- W28			135 a.m./p.m.		Y		
Relinquished by M. Rebullida		Date	Time	Received by MEH		Date 4/19	Time	



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Chain of Custody: Test Request Form

SPL ID: **2304-01042**

APR 19 '23 09:12

UID:

Client Information				Sampling Contact			
Account Number: 5842-CR35		P.O. Number: P008889		Submitting Company: FACS		Name: K. Thornton	
Project Identifier (Name or Number): PJ76066		Sampled by: M. Rebulida		Date Collected: 4/18/23		Number of Samples: 24	
Samples from NY or Conn.? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is chlorine the primary biocide? Potable water: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Nonpotable water: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Reportable to PADEP? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (Enter sample location 3-digit number in first column below for each sample.)		PWSID: _____	
Check results for DWELR Reporting: <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliforms				Case investigation? (See back for price.) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		QuickCheck™? (Legionella Culture only. See back for price.) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Sample No./ Location ID	Sample Description Specific location, source, or site	Sample Type W=Water (ice) S=Swab O=Other	Test Codes (1 code per box)	Time Collected (hr:min)	SPL USE ONLY		
					Acceptable?	Temperature	Comments
76066-418-W29		W	101	1400 a.m./p.m.	Y N		
- W30				1403 a.m./p.m.	Y N		
- W31				1408 a.m./p.m.	Y N		
- W32				1417 a.m./p.m.	Y N		
- W33				1432 a.m./p.m.	Y N		
- W34				1434 a.m./p.m.	Y N		
- W35				1438 a.m./p.m.	Y N		
- W36				1442 a.m./p.m.	Y N		
- W37				1444 a.m./p.m.	Y N		
- W38				1454 a.m./p.m.	Y N		
- W39				1456 a.m./p.m.	Y N		
Relinquished by		Date	Time	Received by		Date	Time
				MEH		4/19	

FINAL REPORT

Forensic Analytical

Corporate
 21228 Cabot Blvd
 Hayward, CA 94545
 P: (510) 266-4600

Account #: 5842
SPL Project ID: 2305-00231
Project Name: PJ76066
PO Number: PO 09001
Sampled By: K. Thornton
Date Received: 05/04/2023
Date Final: 05/16/2023

Summary

This summary is provided for your convenience. Complete report on the following pages.

Environmental Culture Test-Legionella

Location	Result	Concentration	Species
76066-0503-W42	Not Detected		
76066-0503-W43	Not Detected		
76066-0503-W44	Not Detected		
76066-0503-W45	Not Detected		
76066-0503-W46	Not Detected		
76066-0503-W47	Not Detected		
76066-0503-W48	Not Detected		
76066-0503-W49	Positive	5.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066-0503-W50	Positive	1.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066-0503-W51	Not Detected		
76066-0503-W52	Not Detected		
76066-0503-W53	Not Detected		
76066-0503-W54	Not Detected		
76066-0503-W55	Not Detected		
76066-0503-W56	Not Detected		
76066-0503-W57	Not Detected		
76066-0503-W58	Not Detected		
76066-0503-W59	Positive	0.5 CFU/mL	L. pneumophila, not serogroups 1-6
76066-0503-W60	Positive	10.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066-0503-W61	Positive	5.0 CFU/mL	L. pneumophila, not serogroups 1-6



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Account #: 5842
SPL Project ID: 2305-00231
Project Name: PJ76066
PO Number: PO 09001
Sampled By: K. Thornton
Date Received: 05/04/2023
Date Final: 05/16/2023

Environmental Culture Test-Legionella

Location	Result	Concentration	Species
76066-0503-W62	Not Detected		
76066-0503-W63	Not Detected		
76066-0503-W64	Not Detected		
76066-0503-W65	Not Detected		
76066-0503-W66	Not Detected		
76066-0503-W67	Not Detected		
76066-0503-W68	Not Detected		
76066-0503-W69	Not Detected		
76066-0503-W70	Not Detected		
76066-0503-W71	Not Detected		
76066-0503-W72	Not Detected		
76066-0503-W73	Not Detected		
76066-0503-W74	Not Detected		
76066-0503-W75	Not Detected		
76066-0503-W76	Not Detected		
76066-0503-W77	Not Detected		
76066-0503-W78	Not Detected		
76066-0503-W79	Not Detected		
76066-0503-W80	Not Detected		
76066-0503-W81	Not Detected		
76066-0503-W82	Not Detected		
76066-0503-W83	Not Detected		
76066-0503-W84	Not Detected		



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 Corporate
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Account #: 5842
SPL Project ID: 2305-00231
Project Name: PJ76066
PO Number: PO 09001
Sampled By: K. Thornton
Date Received: 05/04/2023
Date Final: 05/16/2023

Environmental Culture Test-Legionella

Location	Result	Concentration	Species
76066-0503-W85	Not Detected		

Approved By: Brian Verdi

Janet E. Stout, Ph.D.
 Laboratory Director, Special Pathogens Laboratory



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Account #: 5842
SPL Project ID: 2305-00231
Project Name: PJ76066
PO Number: PO 09001
Sampled By: K. Thornton
Date Received: 05/04/2023
Date Final: 05/16/2023

Location:	76066-0503-W42	Date Collected:	05/03/2023
Sample ID:	2305-00231.001	Sample Type:	Water
		Time Collected:	8:43 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W43	Date Collected:	05/03/2023
Sample ID:	2305-00231.002	Sample Type:	Water
		Time Collected:	8:34 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W44	Date Collected:	05/03/2023
Sample ID:	2305-00231.003	Sample Type:	Water
		Time Collected:	9:09 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/16/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W45	Date Collected:	05/03/2023
Sample ID:	2305-00231.004	Sample Type:	Water
		Time Collected:	9:18 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/16/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W46	Date Collected:	05/03/2023
Sample ID:	2305-00231.005	Sample Type:	Water
		Time Collected:	9:16 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/16/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		

FINAL REPORT

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Account #: 5842
SPL Project ID: 2305-00231
Project Name: PJ76066
PO Number: PO 09001
Sampled By: K. Thornton
Date Received: 05/04/2023
Date Final: 05/16/2023

Location:	76066-0503-W47	Date Collected:	05/03/2023
Sample ID:	2305-00231.006	Sample Type:	Water
		Time Collected:	9:32 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W48	Date Collected:	05/03/2023
Sample ID:	2305-00231.007	Sample Type:	Water
		Time Collected:	9:34 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W49	Date Collected:	05/03/2023
Sample ID:	2305-00231.008	Sample Type:	Water
		Time Collected:	9:43 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Positive		
Concentration:	5.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W50	Date Collected:	05/03/2023
Sample ID:	2305-00231.009	Sample Type:	Water
		Time Collected:	9:45 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Positive		
Concentration:	1.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		



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Account #: 5842
SPL Project ID: 2305-00231
Project Name: PJ76066
PO Number: PO 09001
Sampled By: K. Thornton
Date Received: 05/04/2023
Date Final: 05/16/2023

Location:	76066-0503-W51	Date Collected:	05/03/2023
Sample ID:	2305-00231.010	Sample Type:	Water
		Time Collected:	10:01 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W52	Date Collected:	05/03/2023
Sample ID:	2305-00231.011	Sample Type:	Water
		Time Collected:	10:04 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W53	Date Collected:	05/03/2023
Sample ID:	2305-00231.012	Sample Type:	Water
		Time Collected:	10:08 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W54	Date Collected:	05/03/2023
Sample ID:	2305-00231.013	Sample Type:	Water
		Time Collected:	10:16 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W55	Date Collected:	05/03/2023
Sample ID:	2305-00231.014	Sample Type:	Water
		Time Collected:	10:18 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		

FINAL REPORT

Forensic Analytical

Corporate
 21228 Cabot Blvd
 Hayward, CA 94545
 P: (510) 266-4600

Account #: 5842
SPL Project ID: 2305-00231
Project Name: PJ76066
PO Number: PO 09001
Sampled By: K. Thornton
Date Received: 05/04/2023
Date Final: 05/16/2023

Location:	76066-0503-W56	Date Collected:	05/03/2023
Sample ID:	2305-00231.015	Sample Type:	Water
		Time Collected:	10:29 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W57	Date Collected:	05/03/2023
Sample ID:	2305-00231.016	Sample Type:	Water
		Time Collected:	10:41 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W58	Date Collected:	05/03/2023
Sample ID:	2305-00231.017	Sample Type:	Water
		Time Collected:	11:01 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W59	Date Collected:	05/03/2023
Sample ID:	2305-00231.018	Sample Type:	Water
		Time Collected:	11:04 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/16/2023
Result:	Positive		
Concentration:	0.5 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		

FINAL REPORT

Forensic Analytical

Corporate
 21228 Cabot Blvd
 Hayward, CA 94545
 P: (510) 266-4600

Account #: 5842
SPL Project ID: 2305-00231
Project Name: PJ76066
PO Number: PO 09001
Sampled By: K. Thornton
Date Received: 05/04/2023
Date Final: 05/16/2023

Location:	76066-0503-W60	Date Collected:	05/03/2023
Sample ID:	2305-00231.019	Sample Type:	Water
		Time Collected:	11:10 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Positive		
Concentration:	10.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066-0503-W61	Date Collected:	05/03/2023
Sample ID:	2305-00231.020	Sample Type:	Water
		Time Collected:	11:12 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Positive		
Concentration:	5.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066-0503-W62	Date Collected:	05/03/2023
Sample ID:	2305-00231.021	Sample Type:	Water
		Time Collected:	11:16 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/16/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066-0503-W63	Date Collected:	05/03/2023
Sample ID:	2305-00231.022	Sample Type:	Water
		Time Collected:	11:19 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/16/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		



FINAL REPORT

Forensic Analytical

Corporate
21228 Cabot Blvd
Hayward, CA 94545
P: (510) 266-4600

Account #: 5842
SPL Project ID: 2305-00231
Project Name: PJ76066
PO Number: PO 09001
Sampled By: K. Thornton
Date Received: 05/04/2023
Date Final: 05/16/2023

Location:	76066-0503-W64	Date Collected:	05/03/2023
Sample ID:	2305-00231.023	Sample Type:	Water
		Time Collected:	11:23 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W65	Date Collected:	05/03/2023
Sample ID:	2305-00231.024	Sample Type:	Water
		Time Collected:	11:27 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W66	Date Collected:	05/03/2023
Sample ID:	2305-00231.025	Sample Type:	Water
		Time Collected:	11:36 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/16/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W67	Date Collected:	05/03/2023
Sample ID:	2305-00231.026	Sample Type:	Water
		Time Collected:	11:38 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W68	Date Collected:	05/03/2023
Sample ID:	2305-00231.027	Sample Type:	Water
		Time Collected:	11:41 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		



FINAL REPORT

Forensic Analytical

Corporate
21228 Cabot Blvd
Hayward, CA 94545
P: (510) 266-4600

Account #: 5842
SPL Project ID: 2305-00231
Project Name: PJ76066
PO Number: PO 09001
Sampled By: K. Thornton
Date Received: 05/04/2023
Date Final: 05/16/2023

Location:	76066-0503-W69	Date Collected:	05/03/2023
Sample ID:	2305-00231.028	Sample Type:	Water
		Time Collected:	12:12 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/16/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W70	Date Collected:	05/03/2023
Sample ID:	2305-00231.029	Sample Type:	Water
		Time Collected:	12:13 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/16/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W71	Date Collected:	05/03/2023
Sample ID:	2305-00231.030	Sample Type:	Water
		Time Collected:	12:17 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/16/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W72	Date Collected:	05/03/2023
Sample ID:	2305-00231.031	Sample Type:	Water
		Time Collected:	12:28 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/16/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W73	Date Collected:	05/03/2023
Sample ID:	2305-00231.032	Sample Type:	Water
		Time Collected:	12:31 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		



FINAL REPORT

Forensic Analytical

Corporate
21228 Cabot Blvd
Hayward, CA 94545
P: (510) 266-4600

Account #: 5842
SPL Project ID: 2305-00231
Project Name: PJ76066
PO Number: PO 09001
Sampled By: K. Thornton
Date Received: 05/04/2023
Date Final: 05/16/2023

Location:	76066-0503-W74	Date Collected:	05/03/2023
Sample ID:	2305-00231.033	Sample Type:	Water
		Time Collected:	12:45 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W75	Date Collected:	05/03/2023
Sample ID:	2305-00231.034	Sample Type:	Water
		Time Collected:	12:49 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W76	Date Collected:	05/03/2023
Sample ID:	2305-00231.035	Sample Type:	Water
		Time Collected:	12:53 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W77	Date Collected:	05/03/2023
Sample ID:	2305-00231.036	Sample Type:	Water
		Time Collected:	12:55 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W78	Date Collected:	05/03/2023
Sample ID:	2305-00231.037	Sample Type:	Water
		Time Collected:	1:01 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/16/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		

FINAL REPORT

Forensic Analytical

Corporate
 21228 Cabot Blvd
 Hayward, CA 94545
 P: (510) 266-4600

Account #: 5842
SPL Project ID: 2305-00231
Project Name: PJ76066
PO Number: PO 09001
Sampled By: K. Thornton
Date Received: 05/04/2023
Date Final: 05/16/2023

Location:	76066-0503-W79	Date Collected:	05/03/2023
Sample ID:	2305-00231.038	Sample Type:	Water
		Time Collected:	1:04 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/16/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W80	Date Collected:	05/03/2023
Sample ID:	2305-00231.039	Sample Type:	Water
		Time Collected:	2:05 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W81	Date Collected:	05/03/2023
Sample ID:	2305-00231.040	Sample Type:	Water
		Time Collected:	2:08 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W82	Date Collected:	05/03/2023
Sample ID:	2305-00231.041	Sample Type:	Water
		Time Collected:	2:12 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0503-W83	Date Collected:	05/03/2023
Sample ID:	2305-00231.042	Sample Type:	Water
		Time Collected:	2:18 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		



FINAL REPORT

Forensic Analytical

Corporate
21228 Cabot Blvd
Hayward, CA 94545
P: (510) 266-4600

Account #: 5842
SPL Project ID: 2305-00231
Project Name: PJ76066
PO Number: PO 09001
Sampled By: K. Thornton
Date Received: 05/04/2023
Date Final: 05/16/2023

Location:	76066-0503-W84	Date Collected:	05/03/2023
Sample ID:	2305-00231.043	Sample Type:	Water
		Time Collected:	2:32 pm

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066-0503-W85	Date Collected:	05/03/2023
Sample ID:	2305-00231.044	Sample Type:	Water
		Time Collected:	2:40 pm

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 05/11/2023
Result:	Not Detected		
Date Processed:	05/04/2023		
Volume Examined:	0.2 ml of processed sample		

Approved By: Brian Verdi

Janet E. Stout, Ph.D.
Laboratory Director, Special Pathogens Laboratory

FINAL REPORT

Forensic Analytical

Corporate
21228 Cabot Blvd
Hayward, CA 94545
P: (510) 266-4600

Account #: 5842
SPL Project ID: 2305-00231
Project Name: PJ76066
PO Number: PO 09001
Sampled By: K. Thornton
Date Received: 05/04/2023
Date Final: 05/16/2023

NOTES

Environmental Culture Test-Legionella

- CFU/mL (or swab)=Colony Forming Units per milliliter or swab.
- The limit of detection (LOD)* is approximately - 0.5 - 5 CFU/mL for Potable Water; 5 CFU/mL for Non-Potable Water (Cooling Towers); 0.5 - 5 CFU/mL for Hot Water Tanks; 10 -100 CFU/swab for Swabs.
- * Sensitivity (LOD) may be affected if less than recommended sample volume is submitted for testing and if high concentration of non-Legionella bacteria are present in the sample. LOD values are mathematically derived according to the sample type, volume, and process.
- Results are reported as Not Detected, Positive, or Not Detected*
- Not Detected* The presence of Legionella could not be determined due to overgrowth of non-Legionella bacteria.
- Probable identification. Contact laboratory if further identification by 16S sequencing required.
- Method: ISO 11731:2017 (E). QA/QC performed on the date processed. Turnaround time is 7-10 days.
- Samples should be analyzed within 2 days of collection.
- Accredited by the American Association for Laboratory Accreditation (Cert. No. 2847.01) and CDC ELITE certified.
- Isolates saved upon request. Request must be received 1 week from receipt of report. Extra charges may apply.
- 'Project Name', 'Sampled By', 'Location', 'Date Collected', 'Time Collected' and 'Client Notes' are provided by the customer.

The data and information on this, and other accompanying documents, represent only the sample(s) analyzed. This report is not to be reproduced in whole or in part without the expressed consent of SPL. Results apply to the sample as received.

Chain of Custody: Test Request Form

SPL ID: 2305-00231

UID:

Client Information				Sampling Contact					
Account Number 5842	P.O. Number PO 09001	Submitting Company Forensic Analytical		Name Kristy Thornton	Phone 6199902426				
				Email Kristy.thornton@forensicanalytical.com					
Sample Information									
Project Identifier (Name or Number) PJ76066		Sampled by K. Thornton		Date Collected 5-3-23	Number of Samples 44				
Samples from New York or Connecticut? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is chlorine the primary biocide? Potable water: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Nonpotable water: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Case investigation? (See back for details) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		QuickCheck™? (See back for details) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Sample No.	Sample Description Specific location, source, or site	Sample Type W= Water Inlet S=Swab O=Other	Water System P = Potable NP = Non-potable HWT = Hot Water Tank	Test Codes (1 code per box)	Time Collected (hr:min)	SPL USE ONLY			
						Acceptable?	Temperature	Comments	
76066-0503-W42		W	LOI		0843 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		SFB	
-W43					0834 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N			
-W44					0909 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N			
-W45					0918 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N			
-W46					0916 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N			
-W47					0932 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N			
-W48					0934 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N			
-W49					0943 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N			
-W50					0945 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N			
-W51					1001 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N			
-W52					1004 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N			
Relinquished by				Date	Time	Received by			Date
[Signature]				5/3/23	1540	SR		5/4	
K. Thornton									

Chain of Custody: Test Request Form

SPL ID: **2305-00231**

UID:

Client Information				Sampling Contact				
Account Number: 5842	P.O. Number: PO 09001	Submitting Company: Forensic Analytical		Name: Kristy Thornbr.	Email:			
Phone: 6199902426								
Sample Information								
Project Identifier (Name or Number): PJ76066		Sampled by: K. Thornbr.		Date Collected: 5-3-23		Number of Samples: 44		
Samples from New York or Connecticut? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is chlorine the primary biocide? Potable water: <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No Nonpotable water: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Case investigation? (See back for details) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		QuickCheck™? (See back for details) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Sample No.	Sample Description Specific location, source, or site	Sample Type W=Water I=Ice S=Swab O=Other	Water System P= Potable NP= Non-potable HWT= Hot Water Tank	Test Codes (1 code per box)	Time Collected (h:mm)	SPL USE ONLY		
						Acceptable?	Temperature	Comments
76066-0503-WS83		W	101		1008 a.m.	<input checked="" type="checkbox"/>		Y N SB
	-WS84				1016 a.m.	<input checked="" type="checkbox"/>		Y N
	-WS85				1018 a.m.	<input checked="" type="checkbox"/>		Y N
	-WS86				1029 a.m.	<input checked="" type="checkbox"/>		Y N
	-WS87				1041 a.m.	<input checked="" type="checkbox"/>		Y N
	-WS88				1101 a.m.	<input checked="" type="checkbox"/>		Y N
	-WS89				1104 a.m.	<input checked="" type="checkbox"/>		Y N
	-WS860				1110 a.m.	<input checked="" type="checkbox"/>		Y N
	-W6061				1112 a.m.	<input checked="" type="checkbox"/>		Y N
	-W6062				1116 a.m.	<input checked="" type="checkbox"/>		Y N
	-W6063				1119 a.m.	<input checked="" type="checkbox"/>		Y N
Relinquished by		Date	Time	Received by		Date	Time	
		5/3/23	1510			SB	5/4	
K. Thornbr.								

Chain of Custody: Test Request Form

SPL ID: 2305-00231

UID:

Client Information				Sampling Contact				
Account Number 5842	P.O. Number PO 09001	Submitting Company Forensic Analytical		Name Kristy Thornton	Email			
				Phone 6199902426				
Sample Information								
Project Identifier (Name or Number) P576066		Sampled by K. Thornton		Date Collected 5/3/23		Number of Samples 44		
Samples from New York or Connecticut? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is chlorine the primary biocide? Potable water: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Nonpotable water: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Case investigation? (See back for details) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		QuickCheck™? (See back for details) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Sample No.	Sample Description Specific location, source, or site	Sample Type W= Water Juice S=Swab O=Other	Water System P = Potable NP = Non-potable HW = Hot Water Tank	Test Codes (1 code per box)	Time Collected (hr:min)	SPL USE ONLY		
						Acceptable?	Temperature	Comments
P576066-0503-W64		W	101		1123	<input type="checkbox"/> Y <input type="checkbox"/> N		SB
-W65					1127	<input type="checkbox"/> Y <input type="checkbox"/> N		
-W66					1136	<input type="checkbox"/> Y <input type="checkbox"/> N		
-W67					1138	<input type="checkbox"/> Y <input type="checkbox"/> N		
-W68					1141	<input type="checkbox"/> Y <input type="checkbox"/> N		
-W69					1212	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		
-W70					1213	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		
-W71					1217	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		
-W72					1228	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		
-W73					1231	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		
-W74					1245	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		
Relinquished by		Date	Time	Received by		Date	Time	
		5/3/23	1540	SB		5/4		
K. Thornton								

Chain of Custody: Test Request Form

SPL ID: 2305-00231

UID:

Client Information				Sampling Contact				
Account Number 5842	P.O. Number PO 09001	Submitting Company Forensic Analytical		Name Kristy Thornton		Email		
				Phone 699902426				
Sample Information								
Project Identifier (Name or Number) PJT6066		Sampled by K. Thornton		Date Collected 5/3/23		Number of Samples 44		
Samples from New York or Connecticut? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is chlorine the primary biocide? Potable water: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Nonpotable water: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Case investigation? (See back for details) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		QuickCheck™? (See back for details) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Sample No.	Sample Description Specific location, source, or site	Sample Type W=Water Inlet S=Swab O=Other	Water System P=Potable NP=Non-potable HWT=Hot Water Tank	Test Codes (1 code per box)	Time Collected (hr:min)	SPL USE ONLY		
						Acceptable?	Temperature	Comments
T6066-0503-W75		W	101		1249 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		SB
-W76					1253 a.m./p.m.	<input type="checkbox"/> Y <input type="checkbox"/> N		
-W77					1255 a.m./p.m.	<input type="checkbox"/> Y <input type="checkbox"/> N		
-W78					1301 a.m./p.m.	<input type="checkbox"/> Y <input type="checkbox"/> N		
-W79					1304 a.m./p.m.	<input type="checkbox"/> Y <input type="checkbox"/> N		
-W80					1405 a.m./p.m.	<input type="checkbox"/> Y <input type="checkbox"/> N		
-W81					1408 a.m./p.m.	<input type="checkbox"/> Y <input type="checkbox"/> N		
-W82					1412 a.m./p.m.	<input type="checkbox"/> Y <input type="checkbox"/> N		
-W83					1418 a.m./p.m.	<input type="checkbox"/> Y <input type="checkbox"/> N		
-W84					1432 a.m./p.m.	<input type="checkbox"/> Y <input type="checkbox"/> N		
-W85					1440 a.m./p.m.	<input type="checkbox"/> Y <input type="checkbox"/> N		
Relinquished by		Date	Time	Received by		Date	Time	
		5/3/23	1540	SB		5/4		
K. Thornton								

FINAL REPORT

Forensic Analytical
 Corporate
 21228 Cabot Blvd
 Hayward, CA 94545
 P: (510) 266-4600

Account #: 5842
SPL Project ID: 2306-00362
Project Name: PJ76066
PO Number: PO 09247
Sampled By: K. Thornton
Date Received: 06/07/2023
Date Final: 06/16/2023

Summary

This summary is provided for your convenience. Complete report on the following pages.

Environmental Culture Test-Legionella

Location	Result	Concentration	Species
76066-0606-W86	Not Detected		
76066-0606-W87	Not Detected		
76066-0606-W88	Not Detected		
76066-0606-W89	Not Detected		
76066-0606-W90	Positive	10.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066-0606-W91	Not Detected		
76066-0606-W92	Not Detected		
76066-0606-W93	Not Detected		
76066-0606-W94	Positive	115.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066-0606-W95	Positive	50.0 CFU/mL	L. pneumophila, not serogroups 1-6
76066-0606-W96	Not Detected		
76066-0606-W97	Not Detected		
76066-0606-W98	Not Detected		
76066-0606-W99	Positive	0.5 CFU/mL	L. pneumophila, not serogroups 1-6
76066-0606-W100	Not Detected		
76066-0606-W101	Not Detected		
76066-0606-W102	Not Detected		
76066-0606-W103	Not Detected		
76066-0606-W104	Not Detected		
76066-0606-W105	Not Detected		



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Account #: 5842
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PO Number: PO 09247
Sampled By: K. Thornton
Date Received: 06/07/2023
Date Final: 06/16/2023

Environmental Culture Test-Legionella

Location	Result	Concentration	Species
76066-0606-W106	Not Detected		
76066-0606-W107	Not Detected		
76066-0606-W108	Not Detected		
76066-0606-W109	Not Detected		
76066-0606-W110	Not Detected		
76066-0606-W111	Not Detected		
76066-0606-W112	Not Detected		
76066-0606-W113	Not Detected		
76066-0606-W114	Not Detected		
76066-0606-W115	Not Detected		
76066-0606-W116	Not Detected		
76066-0606-W117	Not Detected		
76066-0606-W118	Not Detected		
76066-0606-W119	Not Detected		
76066-0606-W120	Positive	30.0 CFU/mL	L. anisa (Blue-white Legionella sp.)
76066-0606-W121	Not Detected		
76066-0606-W122	Not Detected		
76066-0606-W123	Not Detected		

Approved By: Brian Verdi

Janet E. Stout, Ph.D.
 Laboratory Director, Special Pathogens Laboratory



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P: (510) 266-4600

Account #: 5842
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Project Name: PJ76066
PO Number: PO 09247
Sampled By: K. Thornton
Date Received: 06/07/2023
Date Final: 06/16/2023

Location:	76066-0606-W86	Date Collected:	06/06/2023
Sample ID:	2306-00362.001	Sample Type:	Water
		Time Collected:	8:20 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/16/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066-0606-W87	Date Collected:	06/06/2023
Sample ID:	2306-00362.002	Sample Type:	Water
		Time Collected:	8:27 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/16/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066-0606-W88	Date Collected:	06/06/2023
Sample ID:	2306-00362.003	Sample Type:	Water
		Time Collected:	8:32 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/16/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066-0606-W89	Date Collected:	06/06/2023
Sample ID:	2306-00362.004	Sample Type:	Water
		Time Collected:	8:43 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/16/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066-0606-W90	Date Collected:	06/06/2023
Sample ID:	2306-00362.005	Sample Type:	Water
		Time Collected:	9:02 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Positive		
Concentration:	10.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		

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Account #: 5842
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Project Name: PJ76066
PO Number: PO 09247
Sampled By: K. Thornton
Date Received: 06/07/2023
Date Final: 06/16/2023

Location:	76066-0606-W91	Date Collected:	06/06/2023
Sample ID:	2306-00362.006	Sample Type:	Water
		Time Collected:	9:05 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0606-W92	Date Collected:	06/06/2023
Sample ID:	2306-00362.007	Sample Type:	Water
		Time Collected:	9:11 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0606-W93	Date Collected:	06/06/2023
Sample ID:	2306-00362.008	Sample Type:	Water
		Time Collected:	9:19 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0606-W94	Date Collected:	06/06/2023
Sample ID:	2306-00362.009	Sample Type:	Water
		Time Collected:	9:31 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Positive		
Concentration:	115.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		

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Project Name: PJ76066
PO Number: PO 09247
Sampled By: K. Thornton
Date Received: 06/07/2023
Date Final: 06/16/2023

Location:	76066-0606-W95	Date Collected:	06/06/2023
Sample ID:	2306-00362.010	Sample Type:	Water
		Time Collected:	9:35 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Positive		
Concentration:	50.0 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0606-W96	Date Collected:	06/06/2023
Sample ID:	2306-00362.011	Sample Type:	Water
		Time Collected:	9:49 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0606-W97	Date Collected:	06/06/2023
Sample ID:	2306-00362.012	Sample Type:	Water
		Time Collected:	9:54 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0606-W98	Date Collected:	06/06/2023
Sample ID:	2306-00362.013	Sample Type:	Water
		Time Collected:	9:58 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		

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Project Name: PJ76066
PO Number: PO 09247
Sampled By: K. Thornton
Date Received: 06/07/2023
Date Final: 06/16/2023

Location:	76066-0606-W99	Date Collected:	06/06/2023
Sample ID:	2306-00362.014	Sample Type:	Water
		Time Collected:	10:05 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Positive		
Concentration:	0.5 CFU/mL		
Species:	L. pneumophila, not serogroups 1-6		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066-0606-W100	Date Collected:	06/06/2023
Sample ID:	2306-00362.015	Sample Type:	Water
		Time Collected:	10:16 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066-0606-W101	Date Collected:	06/06/2023
Sample ID:	2306-00362.016	Sample Type:	Water
		Time Collected:	10:21 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066-0606-W102	Date Collected:	06/06/2023
Sample ID:	2306-00362.017	Sample Type:	Water
		Time Collected:	10:31 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066-0606-W103	Date Collected:	06/06/2023
Sample ID:	2306-00362.018	Sample Type:	Water
		Time Collected:	10:40 am

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/16/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		



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Project Name: PJ76066
PO Number: PO 09247
Sampled By: K. Thornton
Date Received: 06/07/2023
Date Final: 06/16/2023

Location:	76066-0606-W104	Date Collected:	06/06/2023
Sample ID:	2306-00362.019	Sample Type:	Water
		Time Collected:	10:44 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/16/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0606-W105	Date Collected:	06/06/2023
Sample ID:	2306-00362.020	Sample Type:	Water
		Time Collected:	10:50 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0606-W106	Date Collected:	06/06/2023
Sample ID:	2306-00362.021	Sample Type:	Water
		Time Collected:	10:56 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/16/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0606-W107	Date Collected:	06/06/2023
Sample ID:	2306-00362.022	Sample Type:	Water
		Time Collected:	11:01 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0606-W108	Date Collected:	06/06/2023
Sample ID:	2306-00362.023	Sample Type:	Water
		Time Collected:	11:03 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		



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Project Name: PJ76066
PO Number: PO 09247
Sampled By: K. Thornton
Date Received: 06/07/2023
Date Final: 06/16/2023

Location:	76066-0606-W109	Date Collected:	06/06/2023
Sample ID:	2306-00362.024	Sample Type:	Water
		Time Collected:	11:13 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0606-W110	Date Collected:	06/06/2023
Sample ID:	2306-00362.025	Sample Type:	Water
		Time Collected:	11:19 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0606-W111	Date Collected:	06/06/2023
Sample ID:	2306-00362.026	Sample Type:	Water
		Time Collected:	11:22 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0606-W112	Date Collected:	06/06/2023
Sample ID:	2306-00362.027	Sample Type:	Water
		Time Collected:	11:47 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/16/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0606-W113	Date Collected:	06/06/2023
Sample ID:	2306-00362.028	Sample Type:	Water
		Time Collected:	11:34 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		

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Project Name: PJ76066
PO Number: PO 09247
Sampled By: K. Thornton
Date Received: 06/07/2023
Date Final: 06/16/2023

Location:	76066-0606-W114	Date Collected:	06/06/2023
Sample ID:	2306-00362.029	Sample Type:	Water
		Time Collected:	11:37 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0606-W115	Date Collected:	06/06/2023
Sample ID:	2306-00362.030	Sample Type:	Water
		Time Collected:	11:58 am
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0606-W116	Date Collected:	06/06/2023
Sample ID:	2306-00362.031	Sample Type:	Water
		Time Collected:	12:02 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0606-W117	Date Collected:	06/06/2023
Sample ID:	2306-00362.032	Sample Type:	Water
		Time Collected:	12:11 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/16/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		
Location:	76066-0606-W118	Date Collected:	06/06/2023
Sample ID:	2306-00362.033	Sample Type:	Water
		Time Collected:	12:16 pm
Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		

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Account #: 5842
SPL Project ID: 2306-00362
Project Name: PJ76066
PO Number: PO 09247
Sampled By: K. Thornton
Date Received: 06/07/2023
Date Final: 06/16/2023

Location:	76066-0606-W119	Date Collected:	06/06/2023
Sample ID:	2306-00362.034	Sample Type:	Water
		Time Collected:	12:29 pm

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066-0606-W120	Date Collected:	06/06/2023
Sample ID:	2306-00362.035	Sample Type:	Water
		Time Collected:	12:43 pm

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Positive		
Concentration:	30.0 CFU/mL		
Species:	L. anisa (Blue-white Legionella sp.)		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066-0606-W121	Date Collected:	06/06/2023
Sample ID:	2306-00362.036	Sample Type:	Water
		Time Collected:	12:56 pm

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066-0606-W122	Date Collected:	06/06/2023
Sample ID:	2306-00362.037	Sample Type:	Water
		Time Collected:	1:12 pm

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/16/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		

Location:	76066-0606-W123	Date Collected:	06/06/2023
Sample ID:	2306-00362.038	Sample Type:	Water
		Time Collected:	1:17 pm

Test Requested:	Environmental Culture Test-Legionella	Status:	Complete 06/14/2023
Result:	Not Detected		
Date Processed:	06/07/2023		
Volume Examined:	0.2 ml of processed sample		



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Date Final: 06/16/2023

Approved By: Brian Verdi

A handwritten signature in blue ink, appearing to read 'Janet Stout'.

Janet E. Stout, Ph.D.
Laboratory Director, Special Pathogens Laboratory

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Date Received: 06/07/2023
Date Final: 06/16/2023

NOTES

Environmental Culture Test-Legionella

- CFU/mL (or swab)=Colony Forming Units per milliliter or swab.
- The limit of detection (LOD)* is approximately - 0.5 - 5 CFU/mL for Potable Water; 5 CFU/mL for Non-Potable Water (Cooling Towers); 0.5 - 5 CFU/mL for Hot Water Tanks; 10 -100 CFU/swab for Swabs.
- * Sensitivity (LOD) may be affected if less than recommended sample volume is submitted for testing and if high concentration of non-Legionella bacteria are present in the sample. LOD values are mathematically derived according to the sample type, volume, and process.
- Results are reported as Not Detected, Positive, or Not Detected*
- Not Detected* The presence of Legionella could not be determined due to overgrowth of non-Legionella bacteria.
- Probable identification. Contact laboratory if further identification by 16S sequencing required.
- Method: ISO 11731:2017 (E). QA/QC performed on the date processed. Turnaround time is 7-10 days.
- Samples should be analyzed within 2 days of collection.
- Accredited by the American Association for Laboratory Accreditation (Cert. No. 2847.01) and CDC ELITE certified.
- Isolates saved upon request. Request must be received 1 week from receipt of report. Extra charges may apply.
- 'Project Name', 'Sampled By', 'Location', 'Date Collected', 'Time Collected' and 'Client Notes' are provided by the customer.

The data and information on this, and other accompanying documents, represent only the sample(s) analyzed. This report is not to be reproduced in whole or in part without the expressed consent of SPL. Results apply to the sample as received.

①

JUN 7 '23 09:59

Chain of Custody: Test Request Form

SPL ID: 230600362

UID:

Client Information			Sampling Contact	
Account Number 5842	P.O. Number PO 09247	Submitting Company Forensic Analytical	Name Kristy Thornton	Phone 858 256 7665
			Email Kristy.thornton@forensicanalytical.com	

Sample Information		Project Identifier (Name or Number) PJ76066	Sampled by K. Thornton	Date Collected 6/6/23	Number of Samples 38
Samples from New York or Connecticut? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		If yes, is chlorine the primary biocide? Potable water: <input type="checkbox"/> Yes <input type="checkbox"/> No Nonpotable water: <input type="checkbox"/> Yes <input type="checkbox"/> No		Case investigation? (See back for details) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	QuickCheck™? (See back for details) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Sample No.	Sample Description Specific location, source, or site.	Sample Type W= Water Inlet S=Swab O=Other	Water System P = Potable NP = Non-potable HWT = Hot Water Tank	Test Codes (1 code per box)	Time Collected (hr:min)	-CBS SPL USE ONLY		
						Acceptable?	Temperature	Comments
1 76066-0606-W86		W	HWP	101	0820 a.m./p.m.	Y N		
2 -W87					0821 a.m./p.m.	Y N		
3 -W88					0832 a.m./p.m.	Y N		
4 -W89					0843 a.m./p.m.	Y N		
5 -W90					0902 a.m./p.m.	Y N		
6 -W91					0905 a.m./p.m.	Y N		
7 -W92					0911 a.m./p.m.	Y N		
8 -W93					0919 a.m./p.m.	Y N		
9 -W94					0931 a.m./p.m.	Y N		
10 -W95					0935 a.m./p.m.	Y N		
11 -W96					0949 a.m./p.m.	Y N		

Relinquished by	Date	Time	Received by	Date	Time
Kristy Thornton	06/06/23	14:37		6.7.23	

Chain of Custody: Test Request Form

SPL ID: 2306-00362

UID:

Client Information				Sampling Contact				
Account Number 5842	P.O. Number PO 09247	Submitting Company Forensic Analytical		Name Kristy Thornton	Phone 858 256 7665			Email Kristy.Thornton@forensicanalytical.com
Sample Information								
Project Identifier (Name or Number) P576066		Sampled by K. Thornton		Date Collected 6/6/23		Number of Samples 38		
Samples from New York or Connecticut? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		If yes, is chlorine the primary biocide? Potable water: <input type="checkbox"/> Yes <input type="checkbox"/> No Nonpotable water: <input type="checkbox"/> Yes <input type="checkbox"/> No		Case investigation? (See back for details) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		QuickCheck™? (See back for details) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Sample No.	Sample Description Specific location, source, or site	Sample Type W=Water Juice S=Swab O=Other	Water System P=Potable NP=Non-potable HWT=Hot Water Tank	Test Codes (1 code per box)	Time Collected (hr:min)	SPL USE ONLY		
						Acceptable?	Temperature	Comments
76066-0606-W97		W	P	101	0954 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		
-W98					0958 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		
-W99					1005 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		
-W100					1016 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		
-W101					1021 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		
-W102					1031 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		
-W103					1040 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		
-W104					1044 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		
-W105					1050 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		
-W106					1056 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		
-W107					1101 a.m./p.m.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		
Relinquished by		Date	Time	Received by		Date	Time	
Kristy Thornton		06/06/23	14:37			6.7.23		

JUN 7 '23 4:10:00

Chain of Custody: Test Request Form

SPL ID: 2306-00362

UID:

Client Information			Sampling Contact	
Account Number 5842	P.O. Number PO 09247	Submitting Company Forensic Analytical	Name Kristy Thornton	
			Phone 858 256 7665	Email Kristy.thornton@forensicanalytical.com

Sample Information	
Project Identifier (Name or Number) P576066	Sampled by K. Thornton
Date Collected 6/6/23	Number of Samples 38
Samples from New York or Connecticut? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes, is chlorine the primary biocide? Potable water: <input type="checkbox"/> Yes <input type="checkbox"/> No Nonpotable water: <input type="checkbox"/> Yes <input type="checkbox"/> No
Case investigation? (See back for details) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	QuickCheck™? (See back for details) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Sample No.	Sample Description Specific location, source, or site	Sample Type W=Water I=Ice S=Swab O=Other	Water System P=Potable NP=Non-potable HWT=Hot Water Tank	Test Codes (1 code per box)	Time Collected (hr:min)	SPL USE ONLY		
						Acceptable?	Temperature	Comments
76066-0606-W108		W	P	bi	1103 a.m./p.m.	Y N		
-W109					1113 a.m./p.m.	Y N		
-W110					1119 a.m./p.m.	Y N		
-W111					1122 a.m./p.m.	Y N		
-W112					1147 a.m./p.m.	Y N		
-W113					1134 a.m./p.m.	Y N		
-W114					1137 a.m./p.m.	Y N		
-W115					1158 a.m./p.m.	Y N		
-W116					1202 a.m./p.m.	Y N		
-W117					1211 a.m./p.m.	Y N		
-W118					1216 a.m./p.m.	Y N		

Relinquished by	Date	Time	Received by	Date	Time
Kristy Thornton	06/06/23	14:37		6-7-23	

JUN 7 '23 AM 10:00

Chain of Custody: Test Request Form

SPL ID: 230600362

UID:

Client Information				Sampling Contact				
Account Number 5842	P.O. Number PO 09247	Submitting Company Forensic Analytical		Name Kristy Thornton		Email Kristy.thornton@forensicanalytical.com		
Phone 858 256 7665								
Sample Information								
Project Identifier (Name or Number) P576066		Sampled by K. Thornton		Date Collected 6/6/23		Number of Samples 38		
Samples from New York or Connecticut? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		If yes, is chlorine the primary biocide? Potable water: <input type="checkbox"/> Yes <input type="checkbox"/> No Nonpotable water: <input type="checkbox"/> Yes <input type="checkbox"/> No		Case investigation? (See back for details) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		QuickCheck™? (See back for details) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Sample No.	Sample Description Specific location, source, or site	Sample Type W= Water Inlet S=Swab O=Other	Water System P = Potable NP = Non-potable HWT = Hot Water Tank	Test Codes (1 code per box)	Time Collected (hr:min)	SPL USE ONLY		
						Acceptable?	Temperature	Comments
76066-0606-W119		W	HWT	101	1229	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		HWT
-W120			DCU tank		1243	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		
-W121			P		1256	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		
-W122					1312	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		
-W123					1317	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N		
						<input type="checkbox"/> Y <input type="checkbox"/> N		
						<input type="checkbox"/> Y <input type="checkbox"/> N		
						<input type="checkbox"/> Y <input type="checkbox"/> N		
						<input type="checkbox"/> Y <input type="checkbox"/> N		
						<input type="checkbox"/> Y <input type="checkbox"/> N		
						<input type="checkbox"/> Y <input type="checkbox"/> N		
						<input type="checkbox"/> Y <input type="checkbox"/> N		
						<input type="checkbox"/> Y <input type="checkbox"/> N		
						<input type="checkbox"/> Y <input type="checkbox"/> N		
						<input type="checkbox"/> Y <input type="checkbox"/> N		
						<input type="checkbox"/> Y <input type="checkbox"/> N		
Relinquished by Kristy Thornton		Date 06/06/23	Time 14:37	Received by to		Date 6.7.23	Time	

Appendix E

Centers for Disease Control and Prevention (CDC) and American Industrial Hygiene Association (AIHA) *Legionella* Sample Interpretation Guidance

Centers for Disease Control and Prevention (CDC) Interpretation Guidelines

Figure 1. Routine *Legionella* testing: A multifactorial approach to performance indicator interpretation*^a

Concentration indicates that *Legionella* growth appears:

Uncontrolled	Poorly Controlled	Well Controlled			
≥10 CFU/mL [†] in potable water OR ≥100 CFU/mL in non-potable water	1.0–9.9 CFU/mL in potable water OR 10–99 CFU/mL in non-potable water	Detectable to 0.9 CFU/mL in potable water OR Detectable to 9 CFU/mL in non-potable water	No <i>Legionella</i> detected in a single round of testing	No <i>Legionella</i> detected in multiple rounds of testing	No <i>Legionella</i> detected in multiple rounds of testing with methods that detect viable and non-viable bacteria of any <i>Legionella</i> species

Change in concentration over time indicates that *Legionella* growth appears:

Uncontrolled	Poorly Controlled	Well Controlled			
100-fold or greater increase in concentration (e.g., 0.05 to 5 CFU/mL)	10-fold increase in concentration (e.g., 0.05 to 0.5 CFU/mL)	<i>Legionella</i> concentration steady (e.g., 0.5 CFU/mL for two consecutive sampling rounds)	No <i>Legionella</i> detected in a single round of testing	No <i>Legionella</i> detected in multiple rounds of testing	No <i>Legionella</i> detected in multiple rounds of testing with methods that detect viable and non-viable bacteria of any <i>Legionella</i> species

Extent indicates that *Legionella* growth appears:

Uncontrolled	Poorly Controlled	Well Controlled			
Detection in multiple locations AND a common source location [‡] OR Detection across many locations within a water system	Detection in a common source location that serves multiple areas OR Detection in more than one location within a water system	Detection in a few of many tested locations within a water system	No <i>Legionella</i> detected in a single round of testing	No <i>Legionella</i> detected in multiple rounds of testing	No <i>Legionella</i> detected in multiple rounds of testing with methods that detect viable and non-viable bacteria of any <i>Legionella</i> species

Type^a of *Legionella* (species and serogroup) associated with Legionnaires' disease:

Highly Associated	Less Associated
<i>L. pneumophila</i> serogroup 1; Non-Lp1 <i>L. pneumophila</i> ; Presence of multiple different <i>Legionella</i> species or serogroups	Any non- <i>pneumophila</i> <i>Legionella</i> species including "blue-white" fluorescent <i>Legionella</i>

*This figure is intended for use during routine testing only. Test results are performance indicators and are not a measure of risk of human illness. This figure is not intended for use if a building or device is associated with Legionnaires' disease (LD) cases or an outbreak.

[†]See "Routine testing for *Legionella*" for guidance regarding suggested response activities. Comparable results may lead to different suggested response activities when other factors are considered (e.g., if there is evidence of poorly controlled growth at a healthcare facility).

[‡]Considering the type of *Legionella* identified along with other *Legionella* testing performance indicators provides a clearer picture of water system control than the results of any single indicator. For example, facility owners and operators may consider implementing immediate interventions for a healthcare facility with: A. detectable but <10

colony-forming units per milliliter (CFU/mL), B. non-Lp1 *Legionella pneumophila*, C. observed at steady concentrations, but D. detected at multiple distal locations including a central water heater.

[†]Concentrations expressed as CFU/mL are for test results generated by traditional spread plate culture methods. If other test methods are used, consult testing lab or manufacturer instructions for appropriate interpretation.

[‡]Common source location examples include water heaters, hot water returns, storage tanks, and cooling tower basins.

[¶]If a facility has a history of associated LD cases, then sequencing isolates obtained during routine testing may provide performance indicators regarding outbreak strain persistence (if that strain is detected).



U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

American Industrial Hygiene Association (AIHA) Interpretation Guidelines

Table 3.2: Recommended Actions

Action	Recommended Actions
Humidifiers & Misters, Decorative Fountains & Water Features, Hot Tubs, Whirlpools & Spas	
No Action Required	<ul style="list-style-type: none"> • Continue routine monitoring for <i>Legionella</i> levels, as scheduled per the site-specific plan, based on risk assessment results. • Continue maintaining system and source. • Consider reassessment if conditions change to favor <i>Legionella</i> colonization or amplification.
1 <1 CFU/mL	<p>MONITOR –</p> <ol style="list-style-type: none"> 1. Measure disinfectant levels, where appropriate, to determine if adequate to control <i>Legionella</i> growth; increase to effective control levels, if necessary. 2. Measure temperature, where appropriate, to determine if it is within a range that is permissive for <i>Legionella</i> growth and adjust accordingly. 3. Inspect system components for accumulated sediment, debris, scale, and biofilm. 4. Ensure maintenance and operation procedures are appropriate and are being followed. 5. Reassess treatment practices and consider cleaning and/or disinfection protocols if judged to be necessary. 6. Collect retest samples if any changes to the operation of the system or cleaning or disinfection actions were taken; if re-testing, wait for at least 48 hours, and no more than 7 days, after treatment.
2 1 to <10 CFU/mL	<p>INVESTIGATE & MITIGATE RISKS OF GROWTH –</p> <p>Take the water system component out of service as soon as possible.</p> <ol style="list-style-type: none"> 1. Implement Items 1–4 listed in Action 1 above. 2. Conduct remedial cleaning and/or disinfection protocols. 3. Reestablish normal biocide and pH levels. 4. Collect a retest sample. (Wait at least 48 hours, and no more than 7 days, after treatment to re-test.) 5. Based on professional judgment and the history of the water source, consider increasing the frequency and/or intensity of sampling efforts in order to identify any contributing amplification sources(s). 6. Wait until post-treatment sample results are reported and reviewed by a Competent Professional before returning system to operation. <p>If one or more cases of legionellosis (either LD or PF) are suspected, take the following additional steps:</p> <ul style="list-style-type: none"> • Notify appropriate management and public health authorities (if required) of test results and coordinate further efforts. • Coordinate and implement cleaning and/or disinfection protocols with any proposed testing by public health officials, when applicable.
3 >10 CFU/mL	<p>INVESTIGATE, MITIGATE RISKS OF GROWTH & REMEDIATE GROWTH –</p> <p>IMMEDIATELY take the water system component out of service.</p> <ul style="list-style-type: none"> • Implement Items 1–5 listed in Action 2 above. • Wait until post-treatment sample results are reported and reviewed by a Competent Professional before returning the system to operation. <p>If one or more cases of legionellosis (either LD or PF) are suspected, take the following additional steps:</p> <ul style="list-style-type: none"> • Notify appropriate management and public health authorities (if required) of test results and coordinate further efforts. • Coordinate and implement cleaning and/or disinfection protocols with any proposed testing by public health officials, when applicable.

Table 3.2: Recommended Actions (continued)

Action	Recommended Actions
Incoming Municipal Water	
No Action Required	<ul style="list-style-type: none"> • Continue routine monitoring for <i>Legionella</i> levels, as scheduled per the site-specific plan, based on risk assessment results. • Continue maintaining system and source. • Consider reassessment if conditions change to favor <i>Legionella</i> colonization or amplification.
4 < 1 CFU/mL	<p>MONITOR –</p> <ol style="list-style-type: none"> 1. Measure and document incoming water disinfectant levels and pH at least three times a week (for 1–2 weeks).
5 1 to <10 CFU/mL	<p>INVESTIGATE & MITIGATE RISKS OF GROWTH –</p> <ol style="list-style-type: none"> 1. Measure and document incoming water temperature, disinfectant levels, and pH every other day (for 1–2 weeks). 2. Investigate possible causes of water supply disruption or disturbance, such as water main or service line breaks, and/or nearby construction that may be dislodging deposited sediment, debris, or corrosion. 3. Notify municipal water supplier of findings and request investigation of contributing factors. If low disinfectant levels are determined to be an issue, implement measures to increase them. 4. Based on professional judgment and the history of the water source, consider increasing the frequency and/or scope of sampling efforts IN THE PREMISE PLUMBING in order to identify high-risk sites of amplification source, such as water heaters or low use areas. 5. If disinfectant levels are increased, re-test the incoming water for culturable <i>Legionella</i> after 1–2 months.
6 >10 CFU/mL	<p>INVESTIGATE, MITIGATE RISKS OF GROWTH & ENHANCE CONTROL MEASURES –</p> <ol style="list-style-type: none"> 1. Measure and document incoming water disinfectant levels and pH every other day (for 1–2 weeks). 2. Notify the municipal water supplier of these findings and request investigation of contributing factors. If low disinfectant levels are determined to be an issue, consider adding supplemental disinfectant. 3. IMMEDIATELY examine secondary parameters (pH, residual disinfectant levels, water temperature, etc.) IN THE PREMISE PLUMBING to identify potential effects of elevated <i>Legionella</i> levels in municipal water supply. 4. Carry out a complete <i>Legionella</i> source assessment for at-risk premise plumbing and other building water systems that receive water from this service. Take appropriate actions based on the findings of the building water system assessment. 5. Based on professional judgment and the history of the water source, consider increasing the frequency and/or scope of sampling efforts IN THE PREMISE PLUMBING in order to identify high-risk sites of amplification source, such as water heaters or low use areas. 6. Re-test the incoming water for culturable <i>Legionella</i> after 1 month.

Table 3.2: Recommended Actions (continued)

Action	Recommended Actions
Premise Plumbing Potable Water	
No Action Required	<ul style="list-style-type: none"> • Continue routine monitoring for <i>Legionella</i> levels, as scheduled per the site-specific plan, based on risk assessment results. • Continue maintaining system and source. • Consider reassessment if conditions change to favor <i>Legionella</i> colonization or amplification.
7 1 to <10 CFU/mL	<p>MONITOR –</p> <ol style="list-style-type: none"> 1. Measure disinfectant levels (and pH if necessary) to determine if adequate to control <i>Legionella</i> growth. 2. Measure water temperatures to determine if they are within a range that is permissive for <i>Legionella</i> growth and adjust accordingly. 3. Reassess maintenance, usage patterns, and flushing programs; if existing procedures need improvement or if none exist, implement actions (such as periodic flushing) to improve disinfectant levels and/or alter temperatures to inhibit <i>Legionella</i> growth.
8 10 to <100 CFU/mL	<p>INVESTIGATE & MITIGATE RISKS OF GROWTH –</p> <ol style="list-style-type: none"> 1. Implement Items 1–3 listed in Action 7 above. 2. If multiple sample sites for a water system (hot or cold) are positive for <i>Legionella</i> in this range, implement remedial cleaning or disinfection protocols, considering the following: <ul style="list-style-type: none"> • If disinfectants are low, perform flushing and/or consider adding supplemental disinfectant. • If needed (and possible), adjust temperatures to levels that can better control <i>Legionella</i> growth. • Based on professional judgment, history of the water source, and the sampling data: <ul style="list-style-type: none"> – If the sample results from other locations in the water system indicate systemic growth, implement systemwide remedial cleaning or disinfection protocols, or – If the sample results indicate localized or distal growth, implement localized remedial cleaning, disinfection protocols, or fixture replacement. 3. Re-test the entire water system for culturable <i>Legionella</i> at least 48 hours, and no more than 7 days, after disinfection to assess the effectiveness of corrective actions. 4. Consider increasing the frequency and/or intensity of sampling efforts in order to identify any contributing amplification source(s) or implement preventive cleaning or biocide treatment. 5. Implement follow-up monitoring using a Routine Evaluation strategy. <p>If one or more cases of legionellosis (either LD or PF) are suspected, take the following additional steps:</p> <ol style="list-style-type: none"> 6. Notify appropriate management and public health authorities (if required) of test results and coordinate further efforts. 7. Take immediate steps to prevent further aerosol exposure to occupants, workers, and the public. Interim measures to restrict water use, filter the organism from the water, or prevent aerosolization can effectively prevent exposure until terminal measures are implemented. 8. Coordinate and implement remedial cleaning and/or disinfection protocols with any proposed testing by public health officials. 9. Continue water use restrictions and/or interim measures until post-treatment sample results are received from the laboratory and reviewed by a Competent Professional. <p>All amplification sites identified in the course of further investigation should be remediated and actions taken to monitor for and prevent its recurrence. Perform post-remediation testing to verify and document the effectiveness of remediation protocols.</p>

Table 3.2: Recommended Actions (continued)

Action	Recommended Actions
Premise Plumbing Potable Water	
9 >100 CFU/mL	<p>INVESTIGATE, MITIGATE RISKS OF GROWTH & REMEDIATE GROWTH –</p> <p>IMMEDIATELY take steps to prevent further exposure to occupants, workers, and the public.</p> <ul style="list-style-type: none"> • Interim mitigation measures to restrict water use, filter the organism from the water, or prevent aerosolization can effectively prevent exposure until terminal measures are implemented. <ol style="list-style-type: none"> 1. Implement Items 1–3 listed in Action 8 above. 2. Conduct remedial cleaning and/or disinfection protocols. <ul style="list-style-type: none"> • Based on professional judgment, history of the water source, and the sampling data: <ul style="list-style-type: none"> – If the sample results from other locations in the water system indicate systemic growth, implement systemwide remedial cleaning or disinfection protocols, or – If the sample results indicate localized or distal growth, implement localized remedial cleaning, disinfection protocols, or fixture replacement. 3. Re-test the entire water system for culturable <i>Legionella</i> at least 48 hours, and no more than 7 days, after disinfection to assess the effectiveness of corrective actions. 4. Continue water use restrictions and/or interim measures until post-treatment sample results are received from the laboratory and reviewed by a Competent Professional. At least two (2) consecutive sampling events, separated by at least seven (7) days, should be reviewed to determine whether <i>Legionella</i> growth has been remediated. 5. Consider increasing the frequency and/or intensity of sampling efforts in order to identify any contributing amplification source(s) or implement preventive cleaning or biocide treatment. 6. Implement follow-up monitoring using a Routine Evaluation strategy. <p>All amplification sites identified in the course of further investigation should be remediated and actions taken to monitor for and prevent its reoccurrence. Perform post-remediation testing to verify and document the effectiveness of remediation protocols.</p> <p>If one or more cases of legionellosis (either LD or PF) are suspected, take the following additional steps:</p> <ul style="list-style-type: none"> • Notify appropriate management and public health authorities (if required) of test results and coordinate further efforts. Coordinate and implement remedial cleaning and/or disinfection protocols with any proposed testing by public health officials.
Cooling Towers and Evaporative Condensers	
No Action Required <10 CFU/mL	<p>MONITOR –</p> <ul style="list-style-type: none"> • Verify water treatment procedures and, if necessary, increase biocide treatment levels. Review physical cleaning, biocide, corrosion, and scale control program to determine if it should be enhanced. Continue maintaining system. • Continue routine monitoring for <i>Legionella</i> levels, as scheduled per the site-specific plan, based on risk assessment results. • Consider any state or local statutes requiring specific sampling intervals.
10 10 to <100 CFU/mL	<p>ON-LINE DISINFECTION –</p> <ol style="list-style-type: none"> 1. Perform On-line Disinfection within 24 hours, per recommendations described in the Cooling Technology Institute <i>Legionellosis Guideline: Practices to Reduce the Risk of Legionellosis from Evaporative Heat Rejection Equipment Systems</i> [GDL 159] (2021). <p>Perform post-remediation testing to verify and document the effectiveness of remediation protocols and implement follow-up monitoring using a Routine Evaluation strategy as follows:</p> <ol style="list-style-type: none"> 2. After 3–7 days, re-test cooling tower for culturable <i>Legionella</i> levels. 3. Re-treat and test until <i>Legionella</i> levels are consistently below 10 CFU/mL. 4. If on-line disinfection is considered ineffective by a Competent Professional, shut down and clean the cooling tower within 7 days. 5. Review physical cleaning, biocide, corrosion, and scale control program to determine if it should be enhanced moving forward. 6. Implement follow-up monitoring. <p>Some state and local statutes may require specific sampling intervals, remedial actions, and reporting requirements.</p>

Table 3.2: Recommended Actions (continued)

Action	Recommended Actions
Cooling Towers and Evaporative Condensers	
<p>11</p> <p>100 to <1000 CFU/mL</p>	<p>EMERGENCY DISINFECTION –</p> <ol style="list-style-type: none"> 1. Perform <i>Emergency Disinfection</i> within 24 hours, per recommendations described in the Cooling Technology Institute <i>Legionellosis Guideline: Practices to Reduce the Risk of Legionellosis from Evaporative Heat Rejection Equipment Systems</i> [GDL 159] (2021). <p>Perform post-remediation testing to verify and document the effectiveness of remediation protocols and implement follow-up monitoring using a Routine Evaluation strategy as follows:</p> <ol style="list-style-type: none"> 2. After 3–7 days, re-test cooling tower for culturable <i>Legionella</i> levels. 3. Re-treat and test until <i>Legionella</i> levels are consistently below 10 CFU/mL. 4. If on-line disinfection is considered ineffective by a Competent Professional, shut down and clean the cooling tower within 7 days. 5. Review physical cleaning, biocide, corrosion, and scale control program to determine if it should be enhanced moving forward. 6. Implement follow-up monitoring. <p>Some state and local statutes may require specific sampling intervals, remedial actions, and reporting requirements.</p> <p>If one or more cases of legionellosis (either LD or PF) are suspected, take the following additional steps:</p> <ul style="list-style-type: none"> • Notify appropriate management and public health authorities (if required) of test results and coordinate further efforts. Coordinate and implement remedial cleaning and/or disinfection protocols with any proposed testing by public health officials.
<p>12</p> <p>>1000 CFU/mL</p>	<p>EMERGENCY DISINFECTION & CLEANING –</p> <ul style="list-style-type: none"> • Perform <i>Emergency Disinfection</i> within 24 hours, per recommendations described in the Cooling Technology Institute <i>Legionellosis Guideline: Practices to Reduce the Risk of Legionellosis from Evaporative Heat Rejection Equipment Systems</i> [GDL 159] (2021). • Follow up with a shut down and cleaning of the cooling tower within 2 days. <p>Perform post-remediation testing to verify and document the effectiveness of remediation protocols and implement follow-up monitoring using a Routine Evaluation strategy as follows:</p> <ol style="list-style-type: none"> 1. After 3–7 days, re-test cooling tower for culturable <i>Legionella</i> levels. 2. Re-treat and test until <i>Legionella</i> levels are consistently below 10 CFU/mL. 3. If on-line disinfection is considered ineffective by a Competent Professional, shut down and clean the cooling tower within 7 days. 4. Review physical cleaning, biocide, corrosion, and scale control program to determine if it should be enhanced moving forward. 5. Implement follow-up monitoring. <p>Some state and local statutes may require specific sampling intervals, remedial actions, and reporting requirements.</p> <p>If one or more cases of legionellosis (either LD or PF) are suspected, take the additional following steps:</p> <ul style="list-style-type: none"> • Notify appropriate management and public health authorities (if required) of test results and coordinate further efforts. Coordinate and implement remedial cleaning and/or disinfection protocols with any proposed testing by public health officials.

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