

EXECUTIVE SUMMARY

DSH&SC was retained to provide water sampling with *Legionella sp.* analysis at Northshore School District #112 schools. The purpose was to determine whether *Legionella sp.* were present and, if present, was the *Legionella* species known to be the causative bacteria commonly associated with Legionnaire's disease.

A "first draw" sample was collected at one water fountain at each of the school buildings listed below:

- Braeside Elementary School, 150 Pierce Road,
- Elm Place (Edgewood) Middle School, 2031 Sheridan Road,
- Green Bay Early Childhood Center, 1936 Green Bay Road,
- Indian Trail Elementary School, 2075 Saint Johns Avenue,
- Lincoln Elementary School, 711 Lincoln Avenue W,
- Northwood Middle School, 945 North Avenue,
- Oak Terrace Elementary School, 240 Prairie Avenue
- Ravinia Elementary School, 763 Dean Avenue
- Red Oak Elementary School, 530 Red Oak Lane,
- Sherwood Elementary School, 1900 Stratford Road, and
- Wayne Thomas Elementary School, 2939 Summit Avenue.

Based on the results obtained during these visits, the following conclusions are reached:

A total of 11 water samples were collected from water coolers during each visit, one at each location listed below:

- Braeside Elementary School,
- Elm Place (Edgewood) Middle School,
- Green Bay Early Childhood Center,
- Indian Trail Elementary School,
- Lincoln Elementary School,
- Northwood Middle School,
- Oak Terrace Elementary School,
- Ravinia Elementary School,
- Red Oak Elementary School,
- Sherwood Elementary School and
- Wayne Thomas Elementary School.

During the initial (January 5, 2023) visit-

1. Seven of the eleven schools demonstrated the presence of *Legionella sp.* The sources where *Legionella sp.* were detected included:

- Red Oak Elementary, Sherwood Elementary, Ravinia Elementary, Braeside Elementary, Lincoln Elementary, Oak Terrace Elementary and Elm Place (Edgewood) Middle School.

Performed for:

NORTH SHORE SCHOOL DISTRICT #112

1936 Green Bay Road

Highland Park, Illinois 60035

DSH&SC Project #23-02-Legionella

2. The causative agent commonly associated with Legionnaire's disease (*L. pneumophila*) was detected at:
 - Red Oak Elementary, Sherwood Elementary, Lincoln Elementary, Oak Terrace and Elm Place (Edgewood) Middle School.

During the follow-up (February 13, 2023) visit-

1. Six of the eleven schools demonstrated the presence of *Legionella sp.* The sources where *Legionella sp.* were detected included:
 - Red Oak Elementary, Sherwood Elementary, Braeside Elementary, Lincoln Elementary, Oak Terrace Elementary and Elm Place (Edgewood) Middle School.
2. The causative agent commonly associated with Legionnaire's disease (*L. pneumophila*) was detected at:
 - Red Oak Elementary and Sherwood Elementary Schools (only).

It should be noted that Legionnaire's disease is typically caused from inhaling small droplets of water contaminated with this bacteria, not drinking the water. On only rare occasions can it be contracted by aspirating the contaminated water into the lungs while drinking.

Based on these conclusions, the following recommendations are provided:

- Filters on existing water fixtures should be replaced according to manufacturer's specifications. Used filters should be discarded appropriately.
- Consider the chlorine content in each of the involved Schools and ensure that a small level of "free chlorine" is present at each drinking water source.
- Resample anticipated water sources for *Legionella sp.* at Red Oak and Sherwood Schools to ensure the effectiveness of chlorination.
- Consider additional sampling for *Legionella sp.* at the remaining schools where restoring drinking water is considered to ensure the effective of maintenance practices.

INTRODUCTION

DSH&SC was retained to provide water sampling with *Legionella sp.* analysis at Northshore School District #112 schools. The purpose was to determine whether *Legionella sp.* were present and, if present, was the *Legionella* species known to be the causative bacteria commonly associated with Legionnaire's disease.

A "first draw" sample was collected at one water fountain at each of the school buildings listed below:

- Braeside Elementary School, 150 Pierce Road,
- Elm Place (Edgewood) Middle School, 2031 Sheridan Road,
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- Northwood Middle School, 945 North Avenue,
- Oak Terrace Elementary School, 240 Prairie Avenue
- Ravinia Elementary School, 763 Dean Avenue
- Red Oak Elementary School, 530 Red Oak Lane,
- Sherwood Elementary School, 1900 Stratford Road, and
- Wayne Thomas Elementary School, 2939 Summit Avenue.

DSH&SC was represented during the January 5, 2023 visits by David W. Sloman, CIH. DSH&SC was represented during February 13, 2023 visits by Mr. John Kulla and Mr. Victor Salgado.

METHODS

- *Legionella sp. in Water Sampling*



Water samples were collected into laboratory provided 1000cc poly containers. The samples were preserved with sodium thiosulfate added to the bottle as a preservative and halogen (chlorine or bromine)-neutralizing agent by the analytical laboratory. All samples were collected from the cold water faucet. "First draw" samples were collected at each sampled location. A "first draw" sample, collected immediately after the faucet is activated is intended to assess the contaminant level which may be present within the subject fixture.

An independent laboratory (EMSL Analytical Inc., Cinnaminson, NY) was used for Polymerase Chain Reaction (PCR) analysis following ISO Culture method, according to CDC guidelines.

RESULTS

The tables below display a summary of the *Legionella sp.* analysis. The tables show the School Sampled, the Volume of the Water Analyzed, the *Legionella sp.* detected (if any) and the Concentration Detected.

January 5, 2023 Sampling

School Sampled	Volume of Water Analyzed (ml)	Legionella sp. Detected	Concentration Detected (CFU/ml)
Red Oak	2	<i>Legionella pneumophila</i>	80.0
Indian Trail	20	None detected	ND
Sherwood	2	<i>Legionella pneumophila</i>	18.0
Braeside	2	<i>Legionella sp.</i> (not <i>L. pneumophila</i>)	20.5
Ravinia	2	<i>Legionella sp.</i> (not <i>L. pneumophila</i>)	0.50
Green Bay	20	None detected	ND
Lincoln	20	<i>Legionella pneumophila</i>	0.15
Oak Terrace	20	<i>Legionella sp.</i> (not <i>L. pneumophila</i>)	2.30
Wayne Thomas	20	None detected	ND
North Woods	20	None detected	ND
Elm Place	2	<i>Legionella pneumophila</i> and <i>Legionella sp.</i> (not <i>L. pneumophila</i>)	12.5
			9.0

February 13, 2023 Sampling

School Sampled	Volume of Water Analyzed (ml)	Legionella sp. Detected	Concentration Detected (CFU/ml)
Red Oak	18.9	<i>Legionella pneumophila</i>	7.57
Indian Trail	20.24	None detected	ND
Sherwood	1.91	<i>Legionella pneumophila</i>	110.24
Braeside	19.02	<i>Legionella sp.</i> (not <i>L. pneumophila</i>)	5.94
Ravinia	19.12	None detected	ND
Green Bay	19.44	None detected	ND
Lincoln	20	<i>Legionella sp.</i> (not <i>L. pneumophila</i>)	12.99
Oak Terrace	19.98	<i>Legionella sp.</i> (not <i>L. pneumophila</i>)	0.10

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Wayne Thomas	20.56	None detected	ND
North Woods	20.38	None detected	ND
Elm Place	2	<i>Legionella sp.</i> (not <i>L. pneumophila</i>)	0.88

A copy of the laboratory reports for these samples is provided in Appendix 1. Schematic floor plans are highlighted as a means to assist in locating the sources tested in Appendix 2. Appendix 3 contains photos of the water sources sampled.

CONCLUSIONS AND RECOMMENDATIONS

During the initial (January 5, 2023) visit-

1. Seven of the eleven schools demonstrated the presence of *Legionella sp.* The sources where *Legionella sp.* were detected included:
 - Red Oak Elementary, Sherwood Elementary, Ravinia Elementary, Braeside Elementary, Lincoln Elementary, Oak Terrace Elementary and Elm Place (Edgewood) Middle School.
2. The causative agent commonly associated with Legionnaire's disease (*L. pneumophila*) was detected at:
 - Red Oak Elementary, Sherwood Elementary, Lincoln Elementary, Oak Terrace and Elm Place (Edgewood) Middle School.

During the follow-up (February 13, 2023) visit-

1. Six of the eleven schools demonstrated the presence of *Legionella sp.* The sources where *Legionella sp.* were detected included:
 - Red Oak Elementary, Sherwood Elementary, Braeside Elementary, Lincoln Elementary, Oak Terrace Elementary and Elm Place (Edgewood) Middle School.
2. The causative agent commonly associated with Legionnaire's disease (*L. pneumophila*) was detected at:
 - Red Oak Elementary and Sherwood Elementary Schools (only).

It should be noted that Legionnaire's disease is typically caused from inhaling small droplets of water contaminated with this bacteria, not drinking the water. On only rare occasions can it be contracted by aspirating the contaminated water into the lungs while drinking.

Based on these conclusions, the following recommendations are provided:

- Filters on existing water fixtures should be replaced according to manufacturer's specifications. Used filters should be discarded appropriately.
- Consider the chlorine content in each of the involved Schools water systems and ensure that a small level of "free chlorine" is present at each drinking water source.
- Resample anticipated water sources for *Legionella sp.* at each involved school to ensure the effectiveness of chlorination.
- Consider additional periodic sampling for *Legionella sp.* to ensure the effective of maintenance practices.

Below is a link to a Centers of Disease Control and Prevention (CDC) website for additional information regarding Legionnaire's Disease.

[Legionnaires Disease Cause and Spread | CDC](#)

Respectfully submitted,



David W. Sloman, CIH
847.970.0628
DSH&SC
16412 E. Desert Vista Trail
Scottsdale, AZ 85262
indhygienist@hotmail.com

Appendices (3)

1. Laboratory Analysis Reports
2. Schematic Drawing showing Sample Locations
3. Photos

Performed for:
NORTH SHORE SCHOOL DISTRICT #112
1936 Green Bay Road
Highland Park, Illinois 60035
DSH&SC Project #23-02-Legionella

APPENDIX 1

Laboratory Analysis Reports

North Shore School District #112

January 5, 2023 Report



EMSL Analytical, Inc.

490 Rowley Road Depew, NY 14043
 Tel/Fax: (716) 651-0030 / (716) 651-0394
<http://www.EMSL.com/buffalolab@emsl.com>

EMSL Order: 142300077
 Customer ID: DSHS42
 Customer PO:
 Project ID:

Attention: David Sloman
 DSH & SC
 40W745 Stoneridge Ct.
 Elgin, IL 60124

Phone: (847) 970-0628
 Fax:
 Collected Date: 01/05/2023 10:00 AM
 Received Date: 01/06/2023 09:10 AM
 Processed Date: 01/06/2023 05:30 PM
 Analyzed Date: 01/20/2023 12:00 PM

Project: NSSD #112

**Legionella Detection - ID & Enumeration of *L. pneumophila* & *Legionella* species by ISO
 11731:2017 Culture Method (EMSL Test Code M341 & Method MICRO-SOP-105)**

Client Sample ID/Sample Location Lab Sample Number	Sample Type	Volume Submitted (mL)	Volume Filtered (mL)	Method Processed	Identification	Volume Examined (mL)	Limit of Detection (CFU/mL)	Final Results (CFU/mL)
Red Oak - Cooler 142300077-0001	Potable	1000	1000	Concentrated (Acid)	<i>Legionella pneumophila</i> (sero 1-14)	2	0.50	80.00
Indian Trail - Cooler 142300077-0002	Potable	1000	1000	Concentrated	None Detected	20	0.05	ND
Sherwood - Cooler 142300077-0003	Potable	1000	1000	Concentrated (Acid)	<i>Legionella pneumophila</i> (sero 1-14)	2	0.50	18.00
Braeside - Cooler 142300077-0004	Potable	1000	1000	Concentrated (Acid)	<i>Legionella</i> sp. (not <i>L. pneumophila</i>)	2	0.50	20.50
Ravinia - Cooler 142300077-0005	Potable	1000	1000	Concentrated (Acid)	<i>Legionella</i> sp. (not <i>L. pneumophila</i>)	2	0.50	0.50
Green Bay - Cooler 142300077-0006	Potable	1000	1000	Concentrated	None Detected	20	0.05	ND
Lincoln - Cooler 142300077-0007	Potable	1000	1000	Concentrated (Heat)	<i>Legionella pneumophila</i> (sero 1-14)	20	0.05	0.15
Oak Terrace - Cooler 142300077-0008	Potable	1000	1000	Concentrated (Heat)	<i>Legionella</i> sp. (not <i>L. pneumophila</i>)	20	0.05	2.30
Wayne Thomas - Cooler 142300077-0009	Potable	1000	1000	Concentrated	None Detected	20	0.05	ND
North Woods - Cooler 142300077-0010	Potable	1000	1000	Concentrated	None Detected	20	0.05	ND
Elm Place - Cooler 142300077-0011	Potable	1000	1000	Concentrated (Acid)	<i>Legionella pneumophila</i> (sero 1-14) <i>Legionella</i> sp. (not <i>L. pneumophila</i>)	2 2	0.50 0.50	12.50 9.00
Total Legionella:								21.50

Christopher Goulah, Microbiology Manager
 or other Approved Signatory

Legionella identification is carried out using a direct fluorescent antibody (DFA) for *Legionella pneumophila* (serogroups 1-14) and a DFA for 15 other *Legionella* species. *Legionella* spp. have tested negative by DFA but are positive for growth on selective media. ND = None Detected/Below LOD. The limit of detection (LOD) is the lowest reportable CFU/mL count and is dependent on the sample volume processed and the dilutions used during testing. Volume processed may be lower than volume submitted if sample is turbid or contains components that restrict concentration of the sample. Samples are within quality control criteria and met method specifications unless otherwise noted. High bacterial counts (*Legionella* or otherwise) may require dilution of the sample that will lower the Volume Examined and raise the Limit of Detection.

Samples high in non-*Legionella* bacteria may obscure the detection of *Legionella*.

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted.

AIHA LAP, LLC-EMLAP Accredited #288166; NYS ELAP # 11606 - NYS ELAP certification is applicable to the enumeration of *Legionella* spp. (NYS ELAP certification does not apply to *Legionella* species identification); CDC ELITE certified

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Performed for:
NORTH SHORE SCHOOL DISTRICT #112
 1936 Green Bay Road
 Highland Park, Illinois 60035
 DSH&SC Project #23-02-Legionella

February 13, 2023 Report



EMSL Analytical, Inc.

4140 Litt Drive Hillside, IL 60162
 Tel/Fax: (773) 313-0099 / (773) 313-0139
<http://www.EMSL.com/chicagolab@emsl.com>

EMSL Order: 262301329
 Customer ID: DSHS50
 Customer PO:
 Project ID:

Attention: David Sloman
 D.S. Health & Safety Consultants
 16412 E. Desert Vista Trail
 Scottsdale, AZ 85262

Phone: (847) 970-0628
 Fax: (312) 413-3700
 Collected Date: 02/13/2023
 Received Date: 02/13/2023 02:55 PM
 Processed Date: 02/14/2023 01:00 PM
 Analyzed Date: 02/24/2023 12:05 PM

Project: NSSD #112

Legionella Detection - ID & Enumeration of *L. pneumophila* & *Legionella* species by ISO 1731:2017 Culture Method (EMSL Test Code M341 & Method MICRO-SOP-105)

Client Sample ID/Sample Location Lab Sample Number	Sample Type	Volume Submitted (mL)	Volume Filtered (mL)	Method Processed	Identification	Volume Examined (mL)	Limit of Detection (CFU/mL)	Final Results (CFU/mL)
1 - RED OAK - COOLER 262301329-0001	Potable	945	945	Concentrated	<i>Legionella pneumophila</i> (sero 1-14)	18.9	0.05	7.57
2 - INDIAN TRAIL - COOLER 262301329-0002	Potable	1012	1012	Concentrated	None Detected	20.24	0.05	ND
3 - SHERWOOD - COOLER 262301329-0003	Potable	957	957	Concentrated (Acid)	<i>Legionella pneumophila</i> (sero 1-14)	1.91	0.52	110.24
4 - BRAESIDE - COOLER 262301329-0004	Potable	951	951	Concentrated (Heat)	<i>Legionella</i> sp. (not <i>L. pneumophila</i>)	19.02	0.05	5.94
5 - RAVINIA - COOLER 262301329-0005	Potable	956	956	Concentrated	None Detected	19.12	0.05	ND
6 - GREEN BAY - COOLER 262301329-0006	Potable	972	972	Concentrated	None Detected	19.44	0.05	ND
7 - LINCOLN - COOLER 262301329-0007	Potable	997	997	Concentrated (Heat)	<i>Legionella</i> sp. (not <i>L. pneumophila</i>)	19.94	0.05	12.99
8 - OAK TERRACE - COOLER 262301329-0008	Potable	999	999	Concentrated (Heat)	<i>Legionella</i> sp. (not <i>L. pneumophila</i>)	19.98	0.05	0.10
9 - WAYNE THOMAS - COOLER 262301329-0009	Potable	1028	1028	Concentrated	None Detected	20.56	0.05	ND
10 - NORTH WOODS - COOLER 262301329-0010	Potable	1019	1019	Concentrated	None Detected	20.38	0.05	ND
11 - ELM PLACE - COOLER 262301329-0011	Potable	971	971	Concentrated (Heat)	<i>Legionella</i> spp.	19.42	0.05	0.88

Andrei Poluchowicz, Microbiology Technical Manager
 or other Approved Signatory

Legionella identification is carried out using a direct fluorescent antibody (DFA) for *Legionella pneumophila* (serogroups 1-14) and a DFA for 15 other *Legionella* species. *Legionella* spp. have tested negative by DFA but are positive for growth on selective media. ND = None Detected/Below LOD. The limit of detection (LOD) is the lowest reportable CFU/mL count and is dependent on the sample volume processed and the dilutions used during testing. Volume processed may be lower than volume submitted if sample is turbid or contains components that restrict concentration of the sample. Volume examined is the calculated amount of the original sample that is plated for culture analysis. High bacterial counts (*Legionella* or otherwise) may require dilution of the sample that will lower the Volume Examined and raise the Limit of Detection.

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 1936 Green Bay Road
 Highland Park, Illinois 60035
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