



# Saint Louis County

Public Health and Human Services Department • [www.co.st-louis.mo.us](http://www.co.st-louis.mo.us)

**Ann M. Busche**  
Director

February 22, 2006

To all involved parties;

**Re: URINAL COMPARISON TEST**

**Executive Summary:**

At the request of this department, an in-house analysis was performed to compare the Falcon Waterfree Technologies urinals to the standard flush (water) urinals. It was determined to use an air sampling method to collect bio-aerosols containing bacteria. The test results obtained suggest a large difference in Colony Forming Units (CFU's) with average numbers for the waterless urinals at 3-CFU's and the flush urinals at 17-CFU's.

**Location:**

At present the Government Service Center (GSC) has installed waterless urinals on three floors of the building. The comparison tests were done on the third and fourth floors, respectively. These restrooms are all roughly similar in usage patterns.

**Time:**

The tests were performed on Monday 1-30-2006 between 11:00am to 11:40am.

**Test Equipment:**

- An SKC Biostage single-stage impactor with a flow rate of 28.3L/min., timed for five minutes, for a total air volume of about 150 L.
- Blood Agar (5% plate) from Hardy Diagnostics for sampling environmental bacteria.
- Gast vacuum pump, and timer.
- Individual bags, tape, alcohol wipes, and a climate controlled container.

The tests were performed on Monday January 31, 2006 in the GSC on the third and fourth floors. At the time of testing no one was admitted to the rest rooms. The tests were done back to back with less than five minute between tests. The tests were also repeated to provide an average. A control blank was also submitted.

The following test results appear to support previous data stating a greater presence of airborne bacteria most likely caused by the generation of aerosols when flushing.

Public Health  
325 W. 1st St.  
Duluth, MN 55802

An equal opportunity employer

Phone: (218) 725-5200  
Fax: (218) 725-5297  
TTY: (218) 725-5210

Respectfully,

A handwritten signature in cursive script, appearing to read "Kenneth J. Zurian".

Kenneth J. Zurian - St. Louis County REHS

cc. Bob Hart - St. Louis County REHS

Tom Romanstad - St. Louis County Property Management



Friday, February 3, 2006

Robert Hart  
St. Louis County Health & Human Services  
222 E. Superior St.  
Duluth, MN 55802



Re: Project Number 915-601-2851  
Date Sampled: January 30, 2006

Dear Robert Hart:

Aerotech Phoenix is pleased to provide the enclosed report of analyses for samples received January 31, 2006. This cover letter and accompanying pages are an integral part of this report. All analyses are performed in our AIHA EMLAP accredited laboratory under the FDA Good Laboratory Practice Guidelines and the parameters outlined in the most current version of the American Conference of Governmental Industrial Hygienists Bioaerosol Guidelines. The data generated in this report are based on the samples and accompanying information provided and represent concentrations at a point in time under the conditions sampled. Results can vary with site conditions. Aerotech Phoenix employees did not collect samples for this project, and may provide limited interpretation of this data as it relates to the overall investigation.

#### Quality Assurance

Aerotech Laboratories is staffed with over 200 professionals, including PhD's, chemists, and registered microbiologists with over 40 years of experience. The reliability of test results depends on many factors such as the personnel performing the tests, environmental conditions, selection and validation of test methods, equipment functioning, measurement traceability, as well as the sampling, storage and handling of test items, all of which are a reflection of the laboratories overall quality system.

Aerotech Laboratories, Inc. has modeled its quality system after ISO 17025 guidelines, one of the most stringent sets of standards in the industry, to ensure that its customers receive the high standard of accuracy, reliability, and impartiality that they have come to expect from a leader in the environmental industry. Aerotech Laboratories' adherence to the standards set forth in the ISO 17025 guidelines has been validated and formally recognized through accreditations granted by two independent outside agencies, the American Industrial Hygiene Association (AIHA), and the American Association for Laboratory Accreditation (A2LA). As an additional measure to demonstrate its competency to perform the analyses it offers to its clients, Aerotech Laboratories also participates in a variety of different proficiency testing programs, including the Environmental Microbiology Proficiency Analytical Testing Program (EMPAT) sponsored by the American Industrial Hygiene Association.

As part of its continuous commitment to excellence, Aerotech Laboratories is also inspected, licensed and/or accredited by a number of governmental agencies and independent associations in addition to those already mentioned above. The scope document, accreditation certificates, and proficiency results can all be accessed at [www.aerotechlabs.com](http://www.aerotechlabs.com). Below you will find additional information regarding the specific analyses requested for this project.

### Culture Analyses for Fungi and Bacteria

Cultureable microorganisms are those that are viable when media is inoculated, and will grow on the selected media and at the selected temperature. This technique has certain limitations when analyzing for certain types of fungi, specifically *Stachybotrys*. Some reports indicate that the recovery efficiency of *Stachybotrys* spores can be as low as 10% when compared to total spore techniques.

The type of media and incubation temperature can vary depending on the scope of the survey. Isolates are identified to the service level requested. Typical analysis includes identification of most fungi to the genus level. *Aspergillus* and *Penicillium* species are differentiated based on morphology with each variant reported separately. Morphological variants are identified by colony color/shape and may or may not be the same throughout the project. Identification to the species level can be performed if requested in advance. General incubation parameters are summarized below. Incubation times can vary depending on specific growth characteristics. Samples submitted for culture analysis using Cornmeal Agar (CMA) or Cellulose Agar are cultured for 14 days.

Test	Incubation Temperature (° C)	Minimum Incubation Time
Environmental Bacteria	28	48 hours
Total Fungi	20-25	7-10 days
Thermophilic fungi	37	7-10 days
Thermophilic Actinomycetes	50	48 hours

### Common Culture Media

Acronym	Name
BAP	Tryptic Soy Agar with 5% Sheep Blood
PCA	Plate Count Agar
BCYE	Buffered Charcoal Yeast Extract Agar
PDA	Potato Dextrose Agar
MEA	Malt Extract Agar
DG-18	Dichloran Glycerol Agar
SAB	Sabauroud's Dextrose Agar
RBA	Rose Bengal Agar

**Data Qualifiers**

The *Data Qualifiers* identify issues or events that are relevant to your analytical results. A data qualifier includes information about the validity, the source of the data whether calculated, entered or estimated, and the value of an observation. In each case the data qualifiers provide significant information vital to the interpretation of the laboratory data.

This communication is intended only for the individual or entity to which it is directed. It may contain information that is privileged, confidential, or otherwise exempt from disclosure under applicable law. Dissemination, distribution, or copying of this communication by anyone other than the intended recipient, or a duly designated employee or agent of such recipient, is prohibited. If you have received this communication in error, please notify us immediately by telephone at 800.651.4802, and delete this message and all attachments thereto.

For additional information, or if you have any questions regarding this report, please do not hesitate to call.

Sincerely,



Lori Litwiller  
Project Manager  
Aerotech Phoenix  
800-651-4802

**Analytical References**

1. Medically Important Fungi: A Guide to Identification, 3rd ed., ASM, 1995.
2. Standard Methods for the Examination of Water and Wastewater, 19th ed., APHA, 1995.
3. Sampling and Identifying Allergenic Pollens and Molds, Blewstone, 1990.
4. Identifying Filamentous Fungi: A Clinical Laboratory Handbook, Star, 1996.
5. Manual of Clinical Microbiology, 7th ed., ASM, 1999.
6. A Laboratory Guide to Common Aspergillus Species and their Teleomorphs, CSIRO, 1994.
7. Bioaerosols: Assessment and Control, ACGIH, 1999.



An Affiliate of Sevenson Treat Laboratories, Inc.

St. Louis County Health & Human Services  
 222 E. Superior St.  
 Duluth, MN 55802  
 Attn: Robert Hart

Lab Number: 915-601-2851  
 AIHA EMLAP No. 102297  
 Culturable Bacteria at 28°C and Gram Stain Identification-Air  
 Aerotech Method: A005

Project Name: Urinal Study  
 Project Number: #2  
 Date Received: 01/31/2006  
 Date Reported: 02/03/2006

Sample Number	1				2				3				4			
Sample Identification	Blank				Test #1 Water Less				Test #2 Water Less				Test #1 Flust			
Date Analyzed	2/2/2006				2/2/2006				2/2/2006				2/2/2006			
Culture Media	BAP				BAP				BAP				BAP			
Volume(M <sup>3</sup> )	Not Specified				0.1500				0.1500				0.1500			
Bacteria	CFU	CFU/M <sup>3</sup>			CFU	CFU/M <sup>3</sup>			CFU	CFU/M <sup>3</sup>			CFU	CFU/M <sup>3</sup>		
		Result	DL	%		Result	DL	%		Result	DL	%		Result	DL	%
Total	<1			n/a	2	13	7	100	4	27	7	100	22	147	7	100
Actinomycetes																
Bacillus species													2	15	7	10
Gram Negative Bacilli																
Gram Positive Bacilli																
Gram Positive Cocci					2	13	7	100	4	27	7	100	20	132	7	90
Data Qualifier																

MAR. 7. 2006 11:01AM ST LOUIS CITY HEALTH DEPT NO. 6629 P. 7

Laboratory Manager: *Christine Nlym*

Project Manager: *Jon Guibler*



An Affiliate of Severn Trent Laboratories, Inc.

St. Louis County Health & Human Services  
222 E. Superior St.  
Duluth, MN 55802  
Attn: Robert Hart

Lab Number: **915-601-2851**  
AIHA EMLAP No. 102297  
Culturable Bacteria at 28°C and Gram Stain Identification-Air  
Aerotech Method: A005

Project Name: Urinal Study  
Project Number: #2  
Date Received: 01/31/2006  
Date Reported: 02/03/2006

Sample Number	5			
Sample Identification	Test #2 Flush			
Date Analyzed	2/2/2006			
Culture Media	BAP			
Volume(M <sup>3</sup> )	0.1500			
Bacteria	CFU	CFU/M <sup>3</sup>		%
		Result	DL	
Total	12	80	7	100
Actinomycetes				
Bacillus species	1	8	7	10
Gram Negative Bacilli	1	8	7	10
Gram Positive Bacilli				
Gram Positive Cocci	10	64	7	80
Data Qualifier				

MAR. 7. 2006 11:01AM

ST LOUIS CTY HEALTH DEPT

NO. 6629 P. 8

Laboratory Manager:

*Christine Olson*

Project Manager:

*Joe Qualtrous*

A005 AH CLIENT REPORT FORM, P 1 of 2, Revision 03, 9/22/04, LD

A005 Page 2 of 2