

# INDOOR AIR QUALITY ASSESSMENT TESTING REPORT

CLIENT:	NJIT University Heights 333 Martin Luther King Boulevard Newark, NJ 07102-1982
SITE INVESTIGATED:	Tiernan Hall, Lecture Hall 161 Warren Street Newark, NJ 07102-1982
CONTACT:	Todd Miller
SITE EVALUATION CONDUCTED:	6/28/2018
DATE OF REPORT:	7/13/2018

**REPORT REVIEWED BY:** 

Veronica Kero, CIH, P.E.

Munica Kan

{Omega Project #: 18-1088C}

### TABLE OF CONTENTS

EXEC	KECUTIVE SUMMARY:			
1	PROJECT OVERVIEW	4		
1.1	Project Overview/Scope of Work			
2	MOLD	5		
2.1 2.2 2.3 2.4	Mold Sampling Methodology Applicable Guidelines Laboratory Sampling Data Data Interpretation			
3	VOLATILE ORGANIC COMPOUNDS - VAPOR	6		
3.1 3.2 3.3 3.4	Sampling Methodology Applicable Guidelines Laboratory Sampling Data Data Interpretation			
4	CONCLUSIONS AND RECOMMENDATIONS	8		
4.1 4.2 4.3	Data Summary Conclusion Recommendations			
Appen	dices:			

Appendix A: Laboratory analysis reports

#### **Executive Summary:**

On 6/28/2018, Omega Environmental Services performed an environmental investigation at NJIT Tiernan Hall 4<sup>th</sup> Floor in response to reported occupant concerns. Indoor air quality (IAQ), and soil were evaluated.

Issue	Location(s)	Findings/Field Notes	Recommendations			
Indoor Air Quality Investigation						
Mold/Fungi		• Indoor mold counts were below outdoor background control levels at representative sample locations.	• None at this time			
VOCs-Soil Vapor	• 4 <sup>th</sup> Floor	• Trace detectable levels of VOC compounds reported inside the building were below NJDEP Vapor Intrusion Guidance Levels, OSHA standards, and NIOSH guidelines.	• None at this time			

Omega's findings indicate that the indoor spaces of the building are, in general, acceptable for occupancy. Continue maintaining HVAC systems according the manufacturer's recommendations and maintain air quality parameters with the ASHRAE Comfort Guideline Ranges.

#### **1 PROJECT OVERVIEW:**

#### 1.1 Project Overview/Scope of Work:

In response to an OSHA complaint, Omega Environmental Services was retained to perform an Indoor Air Quality investigation at Tiernan Hall 4<sup>th</sup> Floor on 6/28/2018. Mold and indoor airborne VOCs were evaluated.

#### 2 MOLD:

#### 2.1 <u>Sampling Methodology:</u>

Representative culturable mold air samples are collected on culture plates using the Anderson N-2 bio-aerosol sampler.

#### 2.2 <u>Applicable Guidelines:</u>

While there are no specific promulgated standards for microbiological contamination, the presence of greater than 100-1000  $cfu/m^3$  total airborne mold/fungi above background is normally considered elevated. Since microbiological growth is naturally present in the ambient environment, the outside air concentration levels of various species must be subtracted (i.e. outside and/or inside control sample) as a background level. In addition, individual species such as *Aspergillus* (pathogenic) and *Penicillium* (may be allergenic) must be considered on a qualitative basis.

#### 2.3 Culturable Mold Air Sample Data (6/28/2018):

Sample ID	Sampling Location	Туре	Total Counts (CFU/m <sup>3</sup> )	Predominant Species	Indoor–Outdoor Relative Difference (Indoor-Outdoor)
01	4 <sup>th</sup> Floor near Room 484	Air	7	Penicillium sp	- 173
02	4 <sup>th</sup> Floor near Room 470	Air	13	Basidiomycetes	- 167
03	Outside Control	Air	180	Basidiomycetes	N/A

#### 2.4 Data Interpretation:

• Indoor mold counts were below outdoor background control levels in the representative sample locations.

#### 3. AIRBORNE VOLATILE ORGANIC COMPOUNDS (INDOOR VAPOR):

#### 3.1 <u>Sampling Methodology:</u>

In order to quantitatively evaluate the presence/absence of VOC vapors, representative air testing was performed via evacuated SUMA canisters, which were used to collect a six liter volume of air for analysis of VOC levels at two indoor and one outdoor locations. The sampling was performed utilizing a 8-hour regulator.

The sample was analyzed according to EPA Method TO-15 for 74 common VOC compounds. Upon completion of the sampling, the samples were submitted to EMSL, Inc. an independent AIHA and NELAC certified laboratory for EPA TO-15 Method analysis using Gas Chromatography/Mass Spectrometry (GC/MS).

#### 3.2 <u>Laboratory Data:</u>

The following compounds were detected above the method detection limits (MDLs):

Parameter	Room 463		NJDEP Indoor Air Screening Levels (1)		OSHA PEL	NIOSH REL
Room 463	ppbv	ug/m <sup>3</sup>	Residential ug/m <sup>3</sup>	Nonresidential ug/m <sup>3</sup>	TWA (ppbv)	TWA (ppbv)
Chloromethane	0.76	1.6	94	390		
n-Butane	0.75	1.8	NA	NA		800,000
Ethanol	16	31	NA	NA	1,000,000	1,000,000
Isopropyl alcohol(2-Propanol)	2.1	5.3	NA	NA	400,000	400,000
Freon 113(1,1,2- Trichlorotrifluoroethane	7.2	17	NA	NA	1,000,000	1,000,000
n-Hexane	3.4	12	730	3,100	500,000	50,000
Ethyl Acetate	1.8	6.5	NA	NA	400,000	400,000
Cyclohexane	1.6	5.5	6,300	26,000	300,000	300,000
Toluene	0.55	2.1	5,200	22,000	200,000	100,000

Parameter	Room 463		NJDEP Indoor A	ir Screening Levels	OSHA PEL	NIOSH REL
3 <sup>rd</sup> FloorEnt. Tiernan	ppbv	ug/m <sup>3</sup>	Residential ug/m <sup>3</sup>	Nonresidential ug/m <sup>3</sup>	TWA (ppbv)	TWA (ppbv)
Chloromethane	0.79	1.6	94	390		
n-Butane	2.4	5.7	NA	NA		800,000
Ethanol	28	54	NA	NA	1,000,000	1,000,000
Freon 11(Trichlorofluoromethane)	0.69	3.9	NA	NA		
Isopropyl alcohol(2-Propanol)	19	47	NA	NA	400,000	400,000
Acetone	10	24	32,000	140,000	1,000,000	250,000
Methylene chloride	1.2	4.2	96	1,200		
n-Hexane	3.3	12	730	3,100	500,000	50,000
Ethyl Acetate	3.8	14	NA	NA	400,000	400,000
Cyclohexane	1.2	4.2	6,300	26,000	300,000	300,000

Parameter	Room 463		NJDEP Indoor A	ir Screening Levels	OSHA PEL	NIOSH REL
4 <sup>th</sup> Floor Ent. Tiernan	ppbv	ug/m <sup>3</sup>	Residential (ug/m <sup>3</sup> )	Nonresidential (ug/m <sup>3</sup> )	TWA (ppbv)	TWA (ppbv)
Chloromethane	0.75	1.5	94	390		
n-Butane	0.83	2.0	NA	NA		800,000
Ethanol	12	23	NA	NA	1,000,000	1,000,000
Isopropyl alcohol(2-Propanol)	4.7	12	NA	NA	400,000	400,000
Acetone	15	37	32,000	140,000	1,000,000	250,000
Methylene chloride	0.57	2.0	96	1,200		
n-Hexane	2.5	8.9	730	3,100	500,000	50,000
2-Butanone(MEK)	0.60	1.8	5,200	22,000	200,000	200,000
Ethyl Acetate	0.97	3.5	NA	NA	400,000	400,000
Cyclohexane	1.2	4.0	6,300	26,000	300,000	300,000
Toluene	1.6	6.1	5,200	22,000	200,000	100,000

#### <sup>(1)</sup> NJDEP GENERIC VAPOR INTRUSION SCREENING LEVELS, Table 1

#### 3.3 Data Interpretation:

Detectable VOC compounds were alcohols (hand sanitizer) and common floor stripper and cleaning product compounds at trace ppb levels.

There's outside possibility that an extremely chemical sensitive occupant could notice trace alcohol/cleaning product levels, but not likely related to construction or abatement.

To be pro-active, moving forward, should make sure that ETS and/or other Sub-Contractors do not use encapsulants/sealants that produce odors near the building interface during the day. Asbestos abatement lockdown sealant, for example, can produce a short-term odor that dissipates.

Roofing products that contain MDI/TDI and/or other products that contain epoxy are also known to cause occupant issues. These need to be carefully controlled if they are used on-site.

Trace detectable levels of VOC compounds reported inside the building were below applicable standards and guideline criteria limits.

Due to the high sensitivity of the analysis method, it common for trace concentrations of Isopropyl alcohol and Acetone to be detectable, because they are common chemicals in laboratories. However, the detectable concentration of Toluene is likely due to off-gassing in conjunction with the use of products in new construction or cleaning products.

<b>Identified Compounds</b>	CAS#	Uses
n-Butane	106-97-8	Common ingredient for vehicle fuels (gasoline and LPG), refrigerants for household and vehicle A/C units, and small lighter or plumber's torch.
Ethanol	64-17-5	Commonly used in hand sanitizers, disinfectant wipes, and laboratory
		reagents.
Isopropyl alcohol a.k.a. 2-Propanol	67-63-0	Commonly used surface disinfectant and is an ingredient in some solvents.
Acetone	67-64-1	Commonly used as a solvent.
Tolyona	108-88-3	Common solvent, e.g. for paints, paint thinners, silicone sealants, and as an
Toluelle		octane booster.

#### 4 CONCLUSION AND RECOMMENDATIONS:

#### 4.1 Data Summary:

- Indoor mold counts were below outdoor background control levels in the representative sample locations.
- Trace detectable levels of VOC compounds reported inside the building were below applicable standards and guideline criteria limits for occupational exposure.
- Trace detectable levels were likely related to use of cleaning products.

#### 4.2 <u>Conclusions:</u>

Omega's findings indicate that the indoor spaces of the building are, in general, acceptable for occupancy. Continue maintaining HVAC systems according the manufacturer's recommendations and maintain air quality parameters with the ASHRAE Comfort Guideline Ranges.

#### 4.3 <u>Recommendations:</u>

• Continue maintaining HVAC systems according the manufacturer's recommendations.

If you have any questions regarding this report, please do not hesitate to contact our office at (201)-489-8700.

## Appendix A Laboratory Analysis Reports