

# STC

Environmental Services Inc.  
Environmental Scientists and Engineers

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4754 RESEARCH DRIVE

SAN ANTONIO, TEXAS 78240

Office (210) 696-6286 / FAX (210) 696-8761

July 30, 2007

Ms. Rachel Peña  
SAHA  
818 S. Flores Street  
San Antonio, Texas 78204

RE: Report of Indoor Air Quality Investigation of 1511 Villa Flores, San Antonio, Texas  
STC Project 27449

Ms. Peña:

In accordance with your written request of July 18, 2007, we have conducted a mold indoor air quality investigation at the above reference location. This air sampling consisted of bioaerosols air sampling of selected areas. The sampling was completed on July 20, 2007.

## PROJECT INFORMATION

STC was asked to assess the air quality present in this residence as part of a resale transaction. The indoor air quality assessment was completed by Mr. David O. Scheiding P.E. of STC Environmental Services on July 20, 2007. Mr. Scheiding is a Texas Licensed Mold Consultant (MAC0174). The following comments document the results of the mold assessment completed on July 20, 2007.

This residence is a two (2) story wooden frame structure constructed on a slab on grade foundation (See Photo 1). The indoor air quality investigation consisted of a visual inspection of the HVAC system and ducts and a visual inspection of the areas where water pipes are located. Samples were collected based on the visual inspection. The results of this assessment depict the indoor air quality conditions on the day of the assessment. Previous mold level conditions or future conditions may vary from the conditions identified on July 20, 2007 as a result of water leaks or other conditions that could result in water intrusion.

In addition, the assessment requested may be for a second opinion on the current conditions. STC understands that previous assessments may have been completed by others and their findings may differ from the results obtained by STC on this day. STC understands that some cleaning or corrective efforts may have been completed on some of the residences prior to STC's assessment. These types of activities can cause variances between assessments, since each assessment measures conditions on the day of the assessment only. Since this residence is being prepared for resale, it is assumed that corrective actions, if previously recommended, have been completed.

## RESULTS OF THE INDOOR AIR QUALITY INVESTIGATION

### Visual Inspection and Interviews

Upon arrival, STC inspected the HVAC system and ducts. At the time of this investigation the HVAC system was functioning. The HVAC outlet vents and return air vent were clean (See Photos 2, 3, 4 and 5). The area by the HVAC unit was clean (See Photo 6). However there was water present in the condensate pan under the water heater (See Photo 7). Window sills were clean (See Photo 8). The area under the kitchen sink was dry but dusty (See Photo 9). The residence was generally clean (See Photo 10).

Based on the above inspection, the following air samples were collected.

- A-1 Breathing environment from the HVAC outlet, 2<sup>nd</sup> Floor
- A-2 Breathing environment the HVAC return
- A-3 Breathing environment in the front Bedroom
- A-4 Breathing environment in the Living room/Kitchen
- A-5 Outside

In addition to the above sampling, relative humidity, temperature and dew point information was also collected from inside and outside the facility. The following table depicts the information collected on July 20, 2007.

LOCATION	TEMP	RELATIVE HUMIDITY RANGE (HI/LOW)	DEW POINT
2 <sup>nd</sup> Floor	68.1°F	32.0% 29.7% to 33.1%	37.3°F
1 <sup>st</sup> Floor	65.7°F	31.4% 31.1% to 33.8%	34.4°F
Outside	72.9°F	97.2% 75.7% to 98.5%	72.6°F

The steady state indoor relative humidity varied from 31.4% to 32.0%. These levels are well within the desired indoor comfort zone for relative humidity.

The five (5) air samples collected on July 20, 2007 were submitted to EMSL Analytical, Inc. in Houston, Texas for analysis for mold and fungi levels and identification. EMSL is a Texas licensed mold laboratory (LAB0105).

### Air Sample Results

Five (5) air samples were collected for this investigation. The following tables depict the results of the air sampling.

**TABLE I**  
**AIR SAMPLING RESULTS FOR**  
**MOLD AND POLLEN SPORES**

Sample ID and Location	Particle ID	Concentration Particles/Cubic Meter	Adjusted for Outside
A-1 – Breathing environment from HVAC outlet	Agrocybe/Coprinus	ND	N/A
	Alternaria	ND	N/A
	Ascospores	ND	N/A
	Aspergillus/Penicillium	ND	N/A
	Basidiospores	ND	N/A
	Bipolaris	ND	N/A
	Chaetomium	ND	N/A
	Cladosporium	ND	N/A
	Curvularia	84	Less than outside
	Epicoccum	ND	N/A
	Fusarium	ND	N/A
	Ganoderma	ND	N/A
	Myxomycete	42	Less than outside
	Nigrospora	42	Equal to outside
	Paecilomyces	ND	N/A
	Rust	ND	N/A
	Scopulariopsis	ND	N/A
	Stachybotrys	ND	N/A
	Torula	ND	N/A
	Ulocladium	ND	N/A
	Unidentifiable spores	84	Less than outside
	Zygomycetes	ND	N/A
	Cercospora	ND	N/A
<b>Total Mold</b>	<b>252</b>	<b>Less than outside</b>	
<b>Total Pollen</b>	<b>ND</b>	<b>N/A</b>	
Fibrous Particulate	252	Greater than outside	
Hyphal Fragment	42	Greater than outside	
Insect Fragments	ND	N/A	

Sample ID and Location	Particle ID	Concentration Particles/Cubic Meter	Adjusted for Outside
A-2 – Breathing environment by HVAC Return	Agrocybe/Coprinus	ND	N/A
	Alternaria	84	Greater than outside
	Ascospores	168	Less than outside
	Aspergillus/Penicillium	126	Less than outside
	Basidiospores	ND	N/A
	Bipolaris	ND	N/A
	Chaetomium	ND	N/A
	Cladosporium	ND	N/A
	Curvularia	84	Less than outside
	Epicoccum	ND	N/A
	Fusarium	ND	N/A
	Ganoderma	ND	N/A
	Myxomycete	ND	N/A
	Nigrospora	42	N/A
	Paecilomyces	ND	N/A
	Rust	ND	N/A
	Stachybotrys	ND	N/A
	Torula	ND	N/A
	Ulocladium	ND	N/A
	Unidentifiable spores	42	Greater than outside
<b>Total Mold</b>	<b>546</b>	<b>Less than outside</b>	
<b>Total Pollen</b>	<b>ND</b>	<b>N/A</b>	
Fibrous Particulate	336	Greater than outside	
Hyphal Fragment	82	Greater than outside	
Insect Fragments	42	Greater than outside	
A-3 – Breathing environment in Front Bedroom	Agrocybe/Coprinus	ND	N/A
	Alternaria	ND	N/A
	Ascospores	ND	N/A
	Aspergillus/Penicillium	ND	N/A
	Basidiospores	ND	N/A
	Bipolaris	42	Greater than outside
	Chaetomium	ND	N/A
	Cladosporium	42	Less than outside
	Curvularia	42	Less than outside
	Epicoccum	ND	N/A
	Fusarium	ND	N/A
	Ganoderma	ND	N/A
	Myxomycete	42	Less than outside
	Paecilomyces	ND	N/A
	Rust	ND	N/A
	Scopulariopsis	ND	N/A
	Stachybotrys	ND	N/A
	Torula	ND	N/A
	Ulocladium	ND	N/A
	Unidentifiable spores	84	Less than outside
<b>Total Mold</b>	<b>252</b>	<b>Less than outside</b>	
<b>Total Pollen</b>	<b>ND</b>	<b>N/A</b>	
Fibrous Particulate	252	Greater than outside	
Hyphal Fragment	ND	N/A	
Insect Fragments	ND	N/A	

Sample ID and Location	Particle ID	Concentration Particles/Cubic Meter	Adjusted for Outside
A-4 – Breathing environment in Living room/Kitchen	Agrocybe/Coprinus	ND	N/A
	Alternaria	126	Greater than outside
	Ascospores	ND	N/A
	Aspergillus/Penicillium	882	Greater than outside
	Basidiospores	ND	N/A
	Bipolaris	ND	N/A
	Chaetomium	ND	N/A
	Cladosporium	ND	N/A
	Curvularia	126	Less than outside
	Epicoccum	ND	N/A
	Fusarium	ND	N/A
	Ganoderma	ND	N/A
	Myxomycete	ND	N/A
	Paecilomyces	ND	N/A
	Rust	ND	N/A
	Scopulariopsis	ND	N/A
	Stachybotrys	ND	N/A
	Torula	ND	N/A
	Ulocladium	ND	N/A
	Unidentifiable spores	126	Less than outside
<b>Total Mold</b>	<b>1260</b>	<b>Less than outside</b>	
<b>Total Pollen</b>	<b>ND</b>	<b>N/A</b>	
Fibrous Particulate	ND	N/A	
Hyphal Fragment	84	Greater than outside	
Insect Fragments	ND	N/A	
A-5 – Outside	Agrocybe/Coprinus	ND	N/A
	Alternaria	ND	N/A
	Ascospores	6540	N/A
	Aspergillus/Penicillium	420	N/A
	Basidiospores	ND	N/A
	Bipolaris	ND	N/A
	Cercospora	84	N/A
	Chaetomium	4070	N/A
	Cladosporium	ND	N/A
	Curvularia	210	N/A
	Epicoccum	ND	N/A
	Fusarium	ND	N/A
	Ganoderma	ND	N/A
	Myxomycete	126	N/A
	Nigrospora	42	N/A
	Paecilomyces	ND	N/A
	Rust	ND	N/A
	Scopulariopsis	ND	N/A
	Stachybotrys	ND	N/A
	Unidentifiable spores	1130	N/A
<b>Total Mold</b>	<b>12600</b>	<b>N/A</b>	
<b>Total Pollen</b>	<b>ND</b>	<b>N/A</b>	
Fibrous Particulate	ND	N/A	
Hyphal Fragment	ND	N/A	
Insect Fragments	ND	N/A	

### Air Sample Discussion (General)

The results of air sampling should always include a comparison to outside levels at the time of indoor sampling. This is required since make-up air for the HVAC unit comes from outside as well as outside air entering with normal door opening during entry and departure events. It also should be noted that there are **NO** specified levels of mold/fungi that are considered harmful to humans. Each individual has a different tolerance level for molds/fungi species. In addition, different geographical locations also have a wide variance of air quality levels. Therefore what is considered normal outside in one (1) geographical area may never occur in other geographical areas.

It is generally accepted that “normal” outside levels are 1,200 or 12,000 counts/m<sup>3</sup> depending on Laboratory Protocol, with the majority of the particles made up of the common species of Aspergillus/Penicillium and Cladosporium. Based on this outside “normal” level, the inside level that is accepted as “normal” is 300 or 3,000 counts/m<sup>3</sup>. Essentially acceptable indoor air quality is normally considered to be 50% of the outside level when the HVAC unit is running. It may be as high as 80% if the HVAC unit is not running. This is why a comparison is always required to establish acceptable indoor levels. With the HVAC system running then the indoor air quality should be less than 2,000 or 20,000 counts/m<sup>3</sup>. The HVAC system was operating at the time of this investigation. Currently the house is vacant.

### Air Sample Results Discussion (Specific)

The air sample collected outside (A-5) produced a level of 12,600 counts/m<sup>3</sup>. The species identified included Ascospores, Aspergillus/Penicillium, Cladosporium, Curvularia, Nigrospora, Cercospora, and Unidentifiable spores. This level is significantly above the level normally accepted as “normal” for outside.

The four (4) air samples collected from the breathing environment inside the residence produced levels that ranged from 252 counts/m<sup>3</sup> detected to 1260 counts/m<sup>3</sup>. The species identified were Alternaria, Ascospores, Aspergillus/Penicillium, Curvularia, Myxomycete, Nigrospora and Unidentifiable spores. These levels are below the outside sample and range from 2.0% to 10.0% of the outside level. The above species are found normally in both the outdoor and indoor environments. There currently are **NO** established levels that these species are considered harmful to humans. Each individual respond to mold spores based on their individual immune systems.

It should be noted that **NO** Stachybotrys was identified in the breathing environment. Based on the levels and type of species, the breathing environment is considered acceptable for mold.

A copy of the analytical laboratory report is attached.

## **CONCLUSIONS**

Based on the above investigation, the following conclusions are supported:

- The indoor relative humidity was considered to be well within the indoor desired range.

- The breathing environment in the residence is considered acceptable for mold.
- However, it would be advisable to inspect the condensate drains to ensure the primary drain is not plugged.
- There is no evidence to suggest that a mold condition exists in this residence on the day of the investigation.

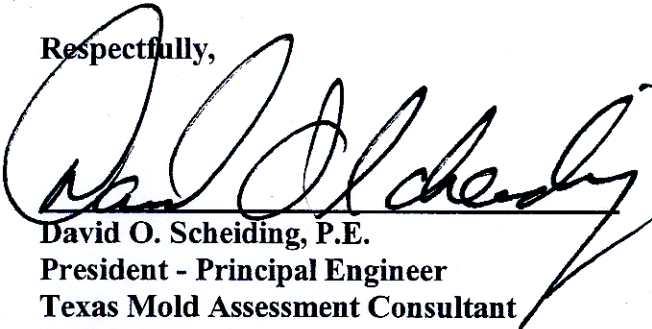
## RECOMMENDATIONS

Based on the above results, the following recommendations are provided.

- No further environmental investigative efforts are recommended nor considered warranted at the current time.

If you have any questions concerning the above information, please do not hesitate to contact our office at (210) 696-6286.

Respectfully,



David O. Scheiding, P.E.  
President - Principal Engineer  
Texas Mold Assessment Consultant  
MAC0174

**Attachments: Laboratory Report  
Photographs**



# EMSL Analytical, Inc.

2501 Central Parkway, Suite C-17 Houston, TX 77092

Phone: (713) 686-3635

Fax: (713) 686-3645

Email: [houstonlab@emsl.com](mailto:houstonlab@emsl.com)

Attn: Dave Scheiding  
STC Environmental Services, Inc.  
4754 Research Drive  
San Antonio, TX 78240

EMSL Order: 150704171  
Customer ID: STCE50  
Received: 7/23/07  
Analyzed: 7/23/07  
Report Date: 7/23/07

Proj: 27449 1511 Villa Flores

## Air-O-Cell(™) Cassette Analysis of Fungal Spores & Other Airborne Particulates by Optical Microscopy (EMSL Method M001)

Lab Sample Number:	150704171-0001	150704171-0002	150704171-0003	150704171-0004	150704171-0005
Client Sample ID:	A-1	A-2	A-3	A-4	A-5
Volume (L):	75	75	75	75	75
Sample Location:	HVAC Outlet	HVAC Return	Front Bedroom	Kitchen/ LR	Outside
Spore Types	Count/m <sup>3</sup>	Count/m <sup>3</sup>	Count/m <sup>3</sup>	Count/m <sup>3</sup>	Count/m <sup>3</sup>
Agrocybe/Coprinus	-	-	-	-	-
Alternaria	-	84	-	126	-
Ascospores	-	168	-	-	6510
Aspergillus/Penicillium	-	126	-	882	420
Basidiospores	-	-	-	-	-
Bipolaris	-	-	42	-	-
Chaetomium	-	-	-	-	-
Cladosporium	-	-	42	-	4070
Curvularia	84	84	42	126	210
Epicoccum	-	-	-	-	-
Fusarium	-	-	-	-	-
Ganoderma	-	-	-	-	-
Myxomycete	42	-	42	-	126
Paecilomyces	-	-	-	-	-
Rust	-	-	-	-	-
Scopulariopsis	-	-	-	-	-
Stachybotrys	-	-	-	-	-
Torula	-	-	-	-	-
Ulocladium	-	-	-	-	-
Unidentifiable Spores	84	42	84	126	1130
Zygomycetes	-	-	-	-	-
Cercospora	-	-	-	-	84
Nigrospora	42	42	-	-	42
<b>Total Fungi</b>	<b>252</b>	<b>546</b>	<b>252</b>	<b>1260</b>	<b>12600</b>
Fibrous Particulate	252	336	252	-	-
Hyphal Fragment	42	84	-	84	-
Insect Fragment	-	42	-	-	-
Pollen	-	-	-	-	-
Analytical Sensitivity	42	42	42	42	42
Skin Fragments (1-4)	1	1	1	1	1
Background (1-5)	2	2	2	2	2

No discernable field blank was submitted with this group of samples.

AIHA EMLAP Accreditation #102575

Samples received in good condition unless otherwise noted. High Levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. Present= Spores found during additional scan at lower mag. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. Results have not been adjusted for field or laboratory blank unless otherwise noted.

Mary Sacilowski, Laboratory Manager  
or Other Approved Signatory

150704171



MICROBIOLOGY - CHAIN OF CUSTODY

Date Collected: 7/20/07 Date Sent: 7/20/07

Contact: SCHEIDING Bill To: STC ENVIRONMENTAL  
 Company:

STC ENVIRONMENTAL SERVICES  
 4754 RESEARCH DRIVE

Phone: (210) 696-6286 Fax: (210) 696-8761  
 SAN ANTONIO, TEXAS 78240

Project Name: 27449 1511 VILLA FLORES

Air Samples	Wipe & Bulk Samples
<input checked="" type="checkbox"/> Mold & Fungi by Air-O-Cell Cassette (Select turn around time)	<input type="checkbox"/> Mold & Fungi - Direct Examination (Select turn-around time) Submit cellophane tape sample or bulk
<input type="checkbox"/> Mold & Fungi by Agar Plate (Count & identification)	<input type="checkbox"/> Mold & Fungi - Direct Examination - Follow up examination by culture if necessary
<input type="checkbox"/> Mold & Fungi by Agar Plate (Count Only)	<input type="checkbox"/> Mold & Fungi - Culture (ID & Count)
<input type="checkbox"/> Bacterial Count & Gram Stain	<input type="checkbox"/> Mold & Fungi - Culture (Count Only)
<input type="checkbox"/> Bacterial Count & Identification (Three most prominent types)	<input type="checkbox"/> Bacterial Count & Gram Stain
	<input type="checkbox"/> Bacterial Count & Identification (Three most prominent types)

STC PO 528-07  
 [Signature]

TURN AROUND TIME:  
 Same Day  1 Day  2 Day  3 Day  4 Day  5 Day  6-10 Day

SAMPLE ID	LOCATION	VOLUME	COMMENTS
A-1	HVAC OUTLET	75 L	MOLD/FUNGAL
A-2	HVAC RETURN	75 L	
A-3	FROM BEDROOM	75 L	
A-4	KITCHEN/LR	75 L	
A-5	OUTSIDE	75 L	

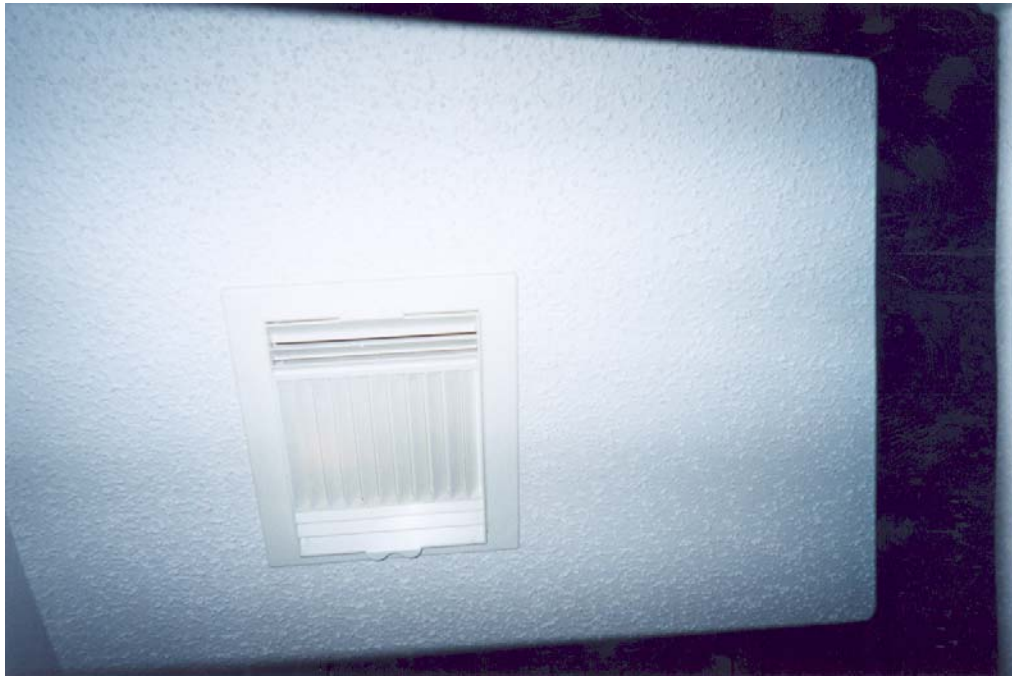
Recd. Y. Mandiath 7/23/07 9:00am



**PHOTO 1:** View of the front of the subject residence.



**PHOTO 2:** View of a clean HVAC outlet.



**PHOTO 3:** Additional view of a typical HVAC outlet.



**PHOTO 4:** Another view of a clean HVAC outlet.



**PHOTO 5:** View of the clean HVAC return vent.



**PHOTO 6:** View of a clean HVAC closet.



**PHOTO 7:** View of water in the condensate pan beneath the water heater.



**PHOTO 8:** View of typical clean window sills.



**PHOTO 9:** View of dry but dusty area under the sink.



**PHOTO 10:** View depicting the residence being generally clean.