

Limited Indoor Air Quality Assessment

TRAUTMANN ELEMENTARY SCHOOL

810 Lindenwood Drive

Laredo, Texas

January 11, 2011

Terracon Project No. 90107327

Prepared for:

United Independent School District

3501 East Saunders

Laredo, Texas

Prepared by:

Terracon Consultants, Inc.

Laredo, Texas

Offices Nationwide
Employee-Owned

Established in 1965
terracon.com

Terracon

Geotechnical ■ Environmental ■ Construction Materials ■ Facilities



January 11, 2011

United Independent School District
3501 East Saunders
Laredo, Texas 78041

Attention: Mr. Cesar Trevino

Telephone: (956) 473-7984
E-mail: ctrevino@uisd.net


Re: **Limited Indoor Air Quality Assessment**
Trautmann Elementary School
810 Lindenwood Drive
Laredo, Webb County, Texas
Terracon Project No. 90107327

Dear Mr. Trevino:


Terracon Consultants, Inc. (Terracon) is pleased to submit the enclosed Limited Indoor Air Quality Assessment report for the above-referenced site. This assessment was performed in accordance with Terracon Proposal No. P90100976 dated December 7, 2010. It was a pleasure being of service to United ISD on this project. Please do not hesitate to call us if you have any questions or if we may be of further assistance.

Respectfully submitted,


Terracon Consultants, Inc.



Lene L. Griego
Mold Assessment Consultant
TDSHS License No. MAC1174



for: Cindy A. Baldwin CIH, LIH
Senior Industrial Hygienist



Joe A. Lambert
Mold Assessment Consultant
TDSHS License No. MAC1179

Terracon Consultants, Inc. 6911 Blanco Road, San Antonio, Texas 78216
P [210] 641 2112 F [210] 641 2124 Texas Professional Engineers No. F-3272 terracon.com

TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
1.1	Scope of Services	1
1.2	Standard of Care	1
1.3	General Conditions and Limitations	1
1.4	Reliance	2
2.0	SITE DESCRIPTION.....	2
2.1	Building Description.....	2
2.2	Interviews with Facility Representatives.....	3
3.0	EVALUATION CRITERIA.....	3
3.1	Visual Observations	3
3.2	Temperature and Relative Humidity	3
3.3	Bioaerosol Exposure Limits (Air Samples)	4
	3.3.1 Outdoor Assemblage of Molds.....	5
	3.3.2 Indoor Assemblage of Molds.....	5
3.4	TVOCs and TMVOCs	6
3.4	Potential Skin Irritants	6
3.5	Common Indoor Allergens.....	7
4.0	FIELD ACTIVITIES	8
4.1	Parameters.....	8
4.2	Visual Assessment	8
4.3	Temperature and Relative Humidity	8
4.4	Air Samples	8
4.5	TVOCs and TMVOCs	9
4.6	Potential Skin Irritants	9
4.7	Common Indoor Allergens.....	9
5.0	RESULTS	10
5.1	Visual Assessment	10
5.2	Temperature and Relative Humidity	10
5.3	Airborne Spore and Particulate Analysis Results	11
5.4	TVOCs and TMVOCs	13
5.5	Potential Skin Irritants	14
5.6	Common Indoor Allergens.....	15
6.0	CONCLUSIONS AND RECOMMENDATIONS.....	15

APPENDIX A – Laboratory Results

APPENDIX B – Terracon Personnel and Laboratory Licenses

LIMITED INDOOR AIR QUALITY ASSESSMENT
TRAUTMANN ELEMENTARY SCHOOL
810 Lindenwood Drive, Laredo, Texas
Terracon Project No. 90107327

1.0 INTRODUCTION

1.1 Scope of Services

Terracon Consultants, Inc. (Terracon) conducted a Limited Indoor Air Quality (IAQ) Assessment on December 14, 2010 for specific locations at Trautmann Elementary School located at 810 Lindenwood Drive in Laredo, Texas. The objective of this assessment was to gather data and render an opinion regarding the absence or presence of potential microbial growth concerns in several sub-grade classrooms. Samples were collected from two areas and analyzed for sewer gas indicators, total volatile organic compounds (TVOCs), and total microbial volatile organic compounds (TMVOCs). In addition, samples of particulate matter in air were collected from two locations and analyzed for obvious indicators of potential skin irritants. Bulk dust samples were also collected from the same areas and analyzed for common allergens. Access to the areas assessed was provided by United Independent School District (UISD) personnel.

1.2 Standard of Care

Terracon conducted this assessment in general accordance with acceptable industry standards, our proposal, and the *Texas Mold Assessment and Remediation Rules* established by the Texas Department of State Health Services (TDSHS). Guidelines established by the American Industrial Hygiene Association *Report of Microbial Growth Task Force*, 2001 and the United States Environmental Protection Agency (USEPA), *Mold Contamination in Public Buildings: A Guide to Recognition and Management*, 2001 also served as references for this assessment.

1.3 General Conditions and Limitations

The field activities for this limited indoor air quality assessment were conducted on December 14, 2010, in general conformance with the authorized scope of work included in Terracon's proposal number P90100976. Certain aspects of this project, such as the number and specific locations where samples were collected, were modified in the field based on conditions encountered at Trautmann Elementary School, and were made in conjunction with the UISD Environmental Officer. The level of effort and associated tasks completed for this assessment were limited to the parameters and defined limitations included in our proposal. Terracon did not attempt to identify every potential exposure or hazard present in the subject building. Molds are ubiquitous to the environment, and have somewhat specific requirements for survival and growth. Elevated mold concentrations in indoor environments occur when both moisture and an available food source are present.

Indoor food sources for mold growth can include organic materials such as those resulting from a flood or sewer back up, or building materials high in cellulose such as, but not limited to, carpet backing, drywall paper or ceiling panels. Moisture sources in buildings can occur as a result of leaks from water or sewer lines, moisture intrusion through walls and foundations, or as condensation on windows or in the HVAC (heating, ventilating, and air conditioning) systems.

In some areas of the United States, relative humidity during certain times of the year is high enough to serve as a moisture source. In order to reduce the potential occurrence or recurrence of mold growth in indoor environments, sources of indoor moisture must be eliminated or controlled.

The results, findings, conclusions, and recommendations expressed in this report are based on conditions observed during our limited assessment. Many factors such as weather conditions, building occupancy, ventilation patterns, and seasonal variations in mold levels can affect the conditions observed. The information contained in this report should not be relied upon to represent conditions that existed previously or at a later date. Terracon does not warrant the services of regulatory agencies, laboratories, or other third parties supplying information, which may have been used in the preparation of this report. No warranty, express or implied is made.

1.4 Reliance

This report is for the exclusive use of the client for the project being discussed. No other individual or entity may rely on this report without the written permission of Terracon and United Independent School District. Reliance on this report by any additional authorized party will be subject to the key understandings and limitations stated in the proposal, this report, and the Services Agreement form (Exhibit B) executed by United Independent School District.

2.0 SITE DESCRIPTION

2.1 Building Description

The portion of the school evaluated consists of an approximately 30,000-square foot portion of sub-grade classrooms located at Trautmann Elementary School in Laredo, Texas. It is our understanding that there have been water intrusion issues in Room #29, as well as sulfur/sewer odors and general IAQ concerns in a number of areas. A wastewater lift station that was located in the sub-grade level was recently removed. Reportedly, a below-ground water main leak has been detected on the exterior of the building.

Interior wall systems observed in the majority of the sub-grade building areas accessed consist of masonry block and plaster finishes with very limited use of drywall construction. Ceiling materials consist of suspended acoustic ceiling tiles in the majority of the classroom and common areas. Flooring materials consist of vinyl tiles in the majority of the interior spaces. The building heating and cooling is accomplished by a numerous air handler units. Roofing materials were not inspected as part of this assessment.

2.2 Interviews with Facility Representatives

Based on information provided by UISD personnel, it is Terracon's understanding that indoor air quality (IAQ) concerns have been raised by members of the faculty pertaining to an approximately 30,000-square foot portion of sub-grade classrooms located at Trautmann Elementary School in Laredo, Texas. The IAQ issues have involved respiratory concerns, allergies, and skin irritations. A wastewater lift station located on the sub-grade level of the building was recently removed, and sulfur or sewer smells have been reported in a number of areas. Similar odors have also been reported in the school kitchen in the ground level. The school building has experienced water intrusions through wall plugs and floor penetrations in Room #29, a problem that was traced to a leaking water main that has reportedly been repaired.

The majority of the areas of concern in the building are currently being used, but assessment activities were conducted after school was dismissed. The UISD Environmental Officer who accompanied Terracon during the site visit indicated that, other than the seepage into Room #29, there had not been major water intrusion into the building. Other UISD facility representatives stated that leaks from a kitchen drainpipe that runs in the plenum above some of the below-grade classrooms have also been reported in the past. The below-grade area at the school uses the hallways as the return air conduit resulting in a positive pressure that may reduce air circulation in some portions of the building.

Terracon was requested to collect non-culturable spore trap air samples in a number of classrooms where IAQ concerns have been reported to evaluate ambient concentrations of airborne mold spores, as well as perform a visual assessment to investigate for potential water intrusions and fungal amplification. Additional testing was conducted to assess specific areas for TVOCs (including sewer gas indicators), TMVOCs, common allergens, and potential skin irritants. Terracon conducted a visual assessment of building conditions and collected ambient air and bulk dust samples on December 14, 2010.

3.0 EVALUATION CRITERIA

3.1 Visual Observations

Since many building materials can provide a source of food for mold, water is the limiting factor in minimizing the potential for its growth. Therefore, visible mold, excessive dirt, and water-damaged building materials are undesirable conditions for indoor environment. When these conditions are observed, it indicates a need to conduct additional remediation to minimize the potential for mold-related issues.

3.2 Temperature and Relative Humidity

Indoor air temperature and relative humidity are physical conditions important to the perception of comfort. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) has published recommendations regarding thermal comfort. ASHRAE Standard 55-2004, Thermal Environmental Conditions for Human Occupancy, identifies six primary factors

that affect comfort: metabolic rate (affected by the activity being performed), clothing insulation, air temperature, radiant temperature, air speed, and humidity. Although the relationships are complex, a temperature range between 73 and 79 degrees Fahrenheit (°F) with relative humidity between roughly 20 and 60 percent (%) is recommended for persons doing “office” work and wearing light summer clothing. Higher temperatures require lower humidity for comfort. For persons in winter clothing, temperatures can range between 68 and 75°F, with relative humidity between 30 and 60%. In order to avoid conditions sufficiently moist to promote the growth of molds or other biogrowth, relative humidity should not exceed 60%.

3.3 Bioaerosol Exposure Limits (Air Samples)

Microorganisms are ubiquitous in the environment, and have specific requirements for survival and growth. In the indoor environment, microorganisms often exist as bioaerosols. Bioaerosols are airborne particles that are living or were released from a living organism. At present, no mandatory regulations or standards have been established for the maximum allowable concentration of bioaerosols such as mold spores. Although bioaerosols have not been conclusively associated with adverse health effects commonly noted in building-related complaints (e.g., mucous membrane irritation, headache, and fatigue) some studies and case histories have shown correlations between these symptoms and microbial contamination of humidification and cooling systems.

When moisture intrusions become chronic or involve sewage contamination, potentially toxigenic (toxin producing) molds, such as the genus *Stachybotrys*, may become pervasive. *Stachybotrys* has received significant media attention in recent years due to its ability to produce toxins. Although there is currently inadequate evidence to support the conclusion that exposure to these mold-produced toxins (mycotoxins) in the indoor environment are causally related to symptoms or illnesses, remediation of surfaces contaminated with mold is warranted to reduce the likelihood of potential health effects related to mold exposure.

Over the past several years, industrial hygienists and researchers from a number of governmental and non-governmental agencies have collectively gathered a significant body of data from air, dust, and surface samples during both investigative studies and mold abatement projects. The recommended criteria for evaluating airborne mold concentrations which have emerged from peer-reviewed publications include the following:

1. The mold concentration in indoor air should be quantitatively lower than, but qualitatively similar to, that of outdoor air.
2. The presence of one or more mold species at significant levels indoors but not outdoors is evidence of indoor amplification (i.e., biological growth occurring in the indoor environment).
3. Pathogenic (disease causing) and toxigenic (toxin-producing) molds should not be amplified.

Moisture sources in buildings occur most commonly as water and/or sewer leaks, moisture intrusion through walls and foundations, or as condensation in HVAC systems. In some areas of the United States, the relative humidity during certain times of the year is high enough to act as a significant moisture source alone.

Indoor food sources for mold can be any organic material provided by a flood or sewer backup, or cellulosic materials present in the building such as carpet backing, linoleum backing, drywall paper, ceiling panels, or the buildup of plant and/or animal debris on inorganic surfaces. Skin cell fragments are a significant food and colonizing source in office buildings and private homes where a high occupancy exists or where adequate housekeeping is not performed.

Molds colonize most readily when air disturbance is minimal. For this reason, mold colonization occurs most frequently in closed or concealed spaces such as closets, storerooms, basements, refrigeration units, or on the back or underside surface of furniture.

3.3.1 Outdoor Assemblage of Molds

Over 90% of outdoor assemblages of mold spores are commonly populated with the following species (listed in order of descending abundance):

- *Cladosporium*
- Mushroom-like fungi (ascospores and basidiospores)
- *Alternaria*
- Rusts and smuts (colonizing primarily flower and leaf parts)
- *Aspergillus* and *Penicillium* (soil and moist cellulosic surfaces)

These common spores colonize in decaying vegetation and/or soil. The remaining molds listed in this report normally occur with a frequency of less than 10% of the total spore count.

3.3.2 Indoor Assemblage of Molds

The following mold species are most commonly susceptible to indoor amplification and typically comprise over 90% of indoor mold growth. In approximate order of descending abundance, these species include:

- *Penicillium* species
- *Aspergillus* species
- *Cladosporium*
- *Stachybotrys*
- *Alternaria*, *Ulocladium*, *Chaetomium*
- Zygomycetes (*Mucor* and *Rhizopus*)

As a general rule, total indoor airborne spore concentrations in a “typical” clean HVAC-supplied building are comparable to outside concentrations but occur at levels 50% to 25% below the levels measured in the outside sample.

3.4 TVOCs and TMVOCs

TVOCs are a broad category of chemical compounds that include components of many common office supplies and products such as paints, mothballs, some janitorial supplies, photocopiers, insecticides, carbonless office forms, building materials such as construction adhesives, and sewer gas components. Examples of VOCs found in some of these products are benzene, toluene, trichloroethylene, methyl ethyl ketone, and acetone. Sewer gas indicators found in VOCs include a variety of sulfide compounds.

VOCs may also be released by microorganisms such as molds. These microbial VOCs (MVOCs) represent a variety of chemical classes, including alcohols, amines, aldehydes, ketones, sulfides, and basic hydrocarbons. Numerous MVOCs are released from mold and actual MVOC patterns depend on both the type of mold and the material on which it is growing. Identification and quantification of MVOCs may assist in identifying and locating mold growth and differentiating mold growth odors from other VOC odors.

Although the OSHA has established PELs for many of these chemicals, concentrations in non-industrial indoor air seldom exceed the OSHA limits. However, as with all chemical contaminants, different people are affected differently by exposure to even low concentrations of TVOCs/TMVOCs. Common symptoms of exposure include nausea; dizziness; eye, mucous membrane and respiratory tract irritation; headache and fatigue.

No federal or state agency has published a specific limit for TVOCs or TMVOCs in indoor air; however the European Union and the U.S. Green Building Council (USGBC) have recommended a limit of 500 nanograms per liter (ng/L) for TVOCs. Based on information provided with the analytical report from Prism Analytical Technologies, Inc. (PATI), TVOC concentrations between 500 and 700 ng/L are considered marginal in office environments.¹ TMVOC concentrations less than 8 ng/L are considered minimal and indicate that actively growing molds may be present, but are at or below levels found in most homes and working environments.² Values between 8 - 30 ng/L indicate a low level of mold that may affect sensitive individuals; levels of 30 - 150 ng/L indicate the presence of actively growing mold and occupants will probably be affected.²

3.4 Potential Skin Irritants³

Skin irritation may be caused by the following:

- Chemical agents are the main cause of occupational skin diseases and disorders. These agents are divided into two types: primary irritants and sensitizers. Primary or direct irritants act directly on the skin though chemical

¹ Technical Bulletin 531 rev 3 attached to the analytical report in Appendix B.

² PATI analytical report in Appendix B.

³ NIOSH Safety and Health Topic - Skin Exposures & Effects. Posted at <http://www.cdc.gov/niosh/topics/skin/>. Accessed 1/6/2011.

reactions. Sensitizers may not cause immediate skin reactions, but repeated exposure can result in allergic reactions. Skin may be exposed to hazardous chemicals through:

- direct contact with contaminated surfaces,
 - deposition of aerosols,
 - immersion, or
 - splashes.
-
- Physical agents such as extreme temperatures (hot or cold) and radiation (UV/solar radiation).
 - Mechanical trauma includes friction, pressure, abrasions, lacerations and contusions (scrapes, cuts and bruises).
 - Biological agents include parasites, microorganisms, plants and other animal materials.

Contact dermatitis is defined as an inflammation of the skin resulting from exposure to a hazardous agent. Common symptoms of dermatitis include:

- Itching,
- Pain,
- Redness,
- Swelling,
- The formation of small blisters or wheals (itchy, red circles with a white centre) on the skin,
- Dry, flaking, scaly skin that may develop cracks.

Occupational contact dermatitis (OCD) may be irritant or allergic. Irritant OCD is inflammation that results from a non-immunologic reaction and is caused by damage to skin following exposure to a hazardous agent. The reaction is typically localized to the area of contact. Allergic contact dermatitis is an immunologic reaction triggered by contact with a skin allergen in a person who is already sensitized to the allergen.

3.5 Common Indoor Allergens

Although many fungi are known allergens, not all fungi have been shown to be allergenic. Presently, it is not known what airborne concentration of mold spores/hyphal fragments is required to induce an allergic reaction. Furthermore, it is quite possible that this quantity will never be known, since individuals respond to different levels of spores (or allergens) and different molds have different sizes and varying amounts of antigens. Chronic exposure to large airborne concentrations of fungal material can induce allergy or hypersensitivity in certain individuals. In

some cases, chronic exposure to fungal spores can result in a flu-like debilitating disease known as hypersensitivity pneumonitis (HP).

Allergies and HP can also be caused by other proteinaceous airborne materials (i.e., cockroach antigens, dust mite feces, etc.). Sensitized people subsequently respond to very low levels of environmental antigens. To date, there is no data that supports a threshold limit or dose-response relationship for exposure to fungal aeroallergens. The Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH), and other occupational health related associations, have not established permissible exposure limits (PELs), recommended exposure limits (RELs), or other limit values for aeroallergens. Most environments (air, water, and solid surfaces) contain a wide variety of fungi. However, no research indicating acceptable levels for indoor bioaerosols has been widely accepted by industrial hygiene professionals.

4.0 FIELD ACTIVITIES

4.1 Parameters

This limited indoor air quality assessment involved a visual inspection of the areas of concern and sample collection for specific parameters on the sub-grade level of the school as well as the kitchen on the ground floor. In addition to visual observations, measurements were made for temperature and humidity, and samples were collected in select areas for non-culturable mold, TVOCs, and TMVOCs. Samples of particulate matter in air were also tested for obvious indicators of potential skin irritants, and bulk dust samples were tested for common allergens. Access to the areas assessed was provided by USD personnel.

4.2 Visual Assessment

The visual assessment included observation of accessible surfaces and did not include observations of hidden conditions such as unexposed areas, interior of wall cavities, secured HVAC systems, or behind wall paneling or vinyl wall coverings that had not become detached.

4.3 Temperature and Relative Humidity

Terracon measured temperature and relative humidity (RH) using an AMPROBE TH-2A Digital Thermo Hygrometer, a handheld electronic monitoring instrument. The instrument provides direct-reading measurements of temperature and relative humidity.

4.4 Air Samples

During this limited assessment, Terracon collected 12 non-culturable air samples for total bioaerosols using a calibrated sampling pump and Allergenco-D/Air-O-Cell™ cassettes. This sampling method uses an impaction technique to collect total airborne particulates, including mold

spores. Samples were taken from the indoor and outdoor air to evaluate the condition of the air in the sub-grade level of the subject building. The classrooms and other areas that were sampled included Rm #1, Rm #2, Rm #3, Rm #7, Rm #7, Rm #12, Rm #17, Rm #25, Rm #27, Rm #28, and Rm #29, as well as a sample of the outdoor ambient air. All sample collection events ran for five minutes at 15 liters per minute. Samples were submitted under chain of custody (COC) to Steve Moody Micro Services, LLC (SMMS) in Farmers Branch, Texas for microscopic analysis. SMMS is a Texas Department of State Health Services (TDSHS) licensed mold laboratory, which participates in the AIHA Laboratory Accreditation Programs, LLC Environmental Microbiology Proficiency in Analytical Testing (EMPAT) program.

4.5 TVOCs and TMVOCs

Terracon used multi-matrix sorption tubes attached to calibrated air sampling pumps to monitor TVOC and TMVOC concentrations in Rm #7 in the sub-grade level and in the kitchen area on the ground floor of the building. The two areas have experienced intermittent sulfur or sewer odors, although the condition was not evident at the time of the field activities. The air samples were submitted under COC to Prism Analytical Technologies, Inc. (PATI), Mount Pleasant, Michigan. PATI is accredited by the AIHA Laboratory Accreditation Programs, LLC under the Industrial Hygiene Laboratory Accreditation Program (IHLAP).

4.6 Potential Skin Irritants

Two samples of airborne particulate matter were collected at the school from Rm #1 and Rm #12. The samples were collected using calibrated air sampling pumps and 37-millimeter (mm) open-faced cassettes with 0.45-micrometer (μm) mixed cellulose ester (MCE) filters. The cassettes were positioned facing upwards as instructed by the laboratory. Upon completion of the sampling event, the filter cassettes were closed and sent with a COC to EMSL Analytical, Inc. (EMSL), in Cinnaminson, New Jersey laboratory for microscopic analysis. EMSL's Cinnaminson laboratory is accredited by the AIHA Laboratory Accreditation Programs, LLC under IHLAP.

4.7 Common Indoor Allergens

Two bulk dust samples were collected for testing of common indoor allergens from the top of shelves located behind the teacher's desks in Rm #1 and Rm #12. The samples were collected using 25-mm dust sampling cassettes with 0.45- μm MCE filters. Upon completion of the sampling event, the filter cassettes were sent with a COC to EMSL Analytical, Inc. (EMSL), Cinnaminson, New Jersey laboratory for analysis.

5.0 RESULTS

5.1 Visual Assessment

- The overall building hygiene observed appeared acceptable. It was noted that air handling equipment was operational in all areas accessed at the time of the assessment and indoor temperatures were observed to be consistent and within ASHRAE guidelines for persons doing office work.
- Water-stained ceiling tiles were observed in several rooms and hallways as noted in Table 1 in Section 5.2. Although not verified, it appears the water intrusions are related to a kitchen drain line, roof leaks and/or condensation on air conditioning lines. There had not been a major rainfall event in Laredo for some time, and it could not be determined if there are currently active leaks at Trautmann Elementary School. However, based on discussions with the UISD Environmental Officer, it is our understanding that there have not been recent repairs made to the roof.
- No visible growth was observed on the water-stained ceiling tiles. Table 1 summarizes observations related to potential air quality conditions made during the visual assessment of the site.

5.2 Temperature and Relative Humidity

The measured temperature levels in the building ranged from 70.3°F to 71.8°F. The measured RH levels in the building ranged from 41.2% to 52.3%.

Room Number	Visual Assessment	Temperature (°F)	Relative Humidity (%)
29	Staining on ceiling tiles not observed	70.4	52.3
28	Staining on ceiling tiles not observed	70.5	43.7
27	Staining on ceiling tiles not observed	70.3	47.5
25	Staining on ceiling tiles not observed	70.3	42.3
9	Upon returning to make visual observations, door was locked	70.6	44.4
7	Ceiling tile containing water stain near center of room	71.8	43.7
3	Ceiling tile containing water stain near AC vent	70.8	44.7
2	Staining on ceiling tiles not observed	71.0	41.2

Room Number	Visual Assessment	Temperature (°F)	Relative Humidity (%)
1	Staining on ceiling tiles not observed	71.7	43.7
12	Staining on ceiling tiles not observed	70.8	44.1
17	Upon returning to make visual observations, door was locked	70.6	43.3
Outside	N/A	70.8	42.2

All readings were within the levels (73°F to 79°F for temperature and 30% to 60% for RH), recommended by ASHRAE.

5.3 Airborne Spore and Particulate Analysis Results

Total airborne mold spore concentrations in the tested area ranged from 26 to 247 particles per cubic meter of air (particles/m³). The total airborne mold spore concentration for the outdoor sample was 702 particles/m³. The types of outdoor mold spores identified were considered by the analytical laboratory as typical for the outdoor environment. The types of outdoor and indoor spores were similar and no *Stachybotrys* was identified in any air sample collected during the assessment.

Airborne particulates include hyphae, fibers, and epithelial (skin) cells. The hyphae ranged from 39 to 195 particles/m³, the fibers ranged from 195 to 1,144 particles/m³, and the epithelial cells ranged from 624 to 3,263 particles/m³.

Room/ Area	Sample Location	Mold Spores (particles/m ³)	Predominant Genera Identified ⁴	Other Airborne Particulates (particles/m ³)
Rm #1	Center front of class / 2 ft up	130	<i>Cladosporium</i> spp. <i>Drechslera</i> spp. <i>Curvularia</i> spp. <i>Nigrospora</i> spp.	Hyphae = 130 Fibers = 806 Epithelial cells = 1,833
Rm #2	Center front of class / 2 ft up	182	<i>Cladosporium</i> spp. <i>Alternaria</i> spp. <i>Pithomyces</i> spp. <i>Curvularia</i> spp. <i>Nigrospora</i> spp.	Hyphae = 65 Fibers = 325 Epithelial cells = 1,651 Pollen = 26

⁴ See analytical laboratory report in Appendix B for all genera observed in the air samples.

Table 2 Airborne Spores and Particulates				
Room/ Area	Sample Location	Mold Spores (particles/m ³)	Predominant Genera Identified ⁴	Other Airborne Particulates (particles/m ³)
Rm #3	Center front of class / 2 ft up	91	<i>Cladosporium</i> spp. <i>Alternaria</i> spp. <i>Nigrospora</i> spp.	Hyphae = 104 Fibers = 767 Epithelial cells = 2,301 Pollen = 13
Rm #7	Center front of class / 2 ft up	247	<i>Cladosporium</i> spp. <i>Alternaria</i> spp. <i>Drechslera</i> spp. <i>Curvularia</i> spp. <i>Nigrospora</i> spp.	Hyphae = 195 Fibers = 897 Epithelial cells = 3,263
Rm #9	Center front of class / 2 ft up	221	<i>Cladosporium</i> spp. <i>Drechslera</i> spp. <i>Curvularia</i> spp. <i>Nigrospora</i> spp.	Hyphae = 156 Fibers = 1144 Epithelial cells = 2,509
Rm #12	Center front of class / 2 ft up	39	<i>Aspergillus/Penicillium</i> – like <i>Cladosporium</i> spp.	Hyphae = 39 Fibers = 208 Epithelial cells = 273
Rm #17	Center front of class / 2 ft up	26	<i>Cladosporium</i> spp. <i>Nigrospora</i> spp.	Hyphae = 26 Fibers = 195 Epithelial cells = 624
Rm #25	Center front of class / 2 ft up	104	<i>Cladosporium</i> spp. <i>Drechslera</i> spp. <i>Curvularia</i> spp. <i>Nigrospora</i> spp. <i>Pithomyces</i> spp.	Hyphae = 156 Fibers = 936 Epithelial cells = 2,262
Rm #27	Center front of class / 2 ft up	65	<i>Cladosporium</i> spp. <i>Nigrospora</i> spp.	Hyphae = 104 Fibers = 624 Epithelial cells = 1,209
Rm #28	Center front of class / 2 ft up	130	<i>Cladosporium</i> spp. <i>Alternaria</i> spp. <i>Drechslera</i> spp. <i>Nigrospora</i> spp. <i>Pithomyces</i> spp.	Hyphae = 195 Fibers = 338 Epithelial cells = 1,508
Rm #29	Center front of class / 2 ft up	52	<i>Cladosporium</i> spp. <i>Alternaria</i> spp.	Hyphae = 65 Fibers = 572 Epithelial cells = 962

Room/ Area	Sample Location	Mold Spores (particles/m ³)	Predominant Genera Identified ⁴	Other Airborne Particulates (particles/m ³)
Outside	Outside cafeteria	702	<i>Aspergillus/Penicillium</i> – like <i>Cladosporium</i> spp. <i>Alternaria</i> spp. <i>Drechslera</i> spp. <i>Curvularia</i> spp. <i>Nigrospora</i> spp. <i>Pithomyces</i> spp.	Hyphae = 208 Fibers = 169 Pollen = 52

The mold spore concentrations in tested areas of the building were below those observed in the ambient, exterior environment and are approximately equivalent to those found in a non-complaint area of the building. Because the types of mold spores identified in indoor air are similar to those found in outside air and indoor concentrations are less than outdoor concentrations, the source of the indoor airborne mold spores is likely filtered, outdoor air rather than spores released from indoor mold growth.

Other particulates identified include hyphal fragments (hyphae are the principal element of the growing or vegetative form of a mold); epithelial (skin) cells (shed by building occupants); fibers (natural or manmade textile fibers (not including asbestos) from clothing, carpet, upholstery, etc.); and pollen. These are all common airborne particulates in buildings.

5.4 TVOCs and TMVOCs

TVOC and TMVOC results are provided in Table 3.

Sample ID	TVOC (ng/L)	Paint Range VOCs (ng/L)	TMVOC (ng/L)
Rm #7	1,900	24% (~456)	7
Kitchen	3,600	8% (~288)	4

The TVOC result of 1,900 ng/L in Room #7 exceeds the concentration that is considered marginal in office environments. A review of the analytical report shows that approximately 24% of the TVOCs are hydrocarbon substances contained in paint. Sewer gas indicator compounds were not detected in this sample. The main VOC components identified in the sample from Room #7 consist of acetaldehyde (50 ng/L), ethanol (1,000 ng/L), isopropanol (54 ng/L), limonene (130 ng/L), acetone (31 ng/L), and 4-methyl-2-pentanone (31 ng/L).⁵ Ethanol and

⁵ These are semi-quantitative results and represent approximate concentrations of the substances listed.

isopropanol are common components of hand sanitizers and other personal care products. Acetaldehyde and limonene are fragrance, flavoring and cleanser ingredients. Acetone is commonly found in nail care products and paints, while 4-methyl-2-pentanone is a component of glues and adhesives. The analysis also identified a variety of low-range petroleum hydrocarbon compounds.

The TMVOC value detected in the sample from Rm # was 7 ng/L, a level considered minimal.

The TVOC result of 3,600 ng/L in the kitchen exceeds the concentration that is considered acceptable in offices as well as production/manufacturing. A review of the analytical report shows that approximately 8% of the TVOCs are hydrocarbon substances contained in paint. Sewer gas indicator compounds were not detected in this sample. The main VOC components identified in the sample from the kitchen consist of acetaldehyde (70 ng/L), ethanol (630 ng/L), isopropanol (35 ng/L), myrcene (57 ng/L), limonene (2,400 ng/L), and a-pinene (32 ng/L).⁶ Myrcene, limonene, and a-pinene are ingredients of fragrances and cleansers. The most likely source of these materials is detergents and other cleaning products used in the kitchen.

The TMVOC value detected in the sample collected from the kitchen was 4 ng/L, a level considered minimal.

5.5 Potential Skin Irritants

The results of the air sampling for potential airborne skin irritants are provided in Table 4. The results are reported in structures per cubic meter of air (str/m³).

Category	Analyte	Rm #1		Rm #12	
		str/m ³	Est. %	str/m ³	Est. %
Manmade vitreous fibers (MMVFs)	Fibrous glass	<LOQ ⁷	0.0	<LOQ	0.0
	Mineral wool	<LOQ	0.0	<LOQ	0.0
Cellulose	Processed	737.57	23.3	2451.27	54.5
	Natural	<LOQ	0.0	<LOQ	0.0
	Paper pulp	576.23	18.2	619.55	13.8
	Starch	<LOQ	0.0	<LOQ	0.0
Synthetics	Total fibers	<LOQ	0.0	<LOQ	0.0
Hair	Human	<LOQ	0.0	<LOQ	0.0
	Animal	<LOQ	0.0	<LOQ	0.0
Biological	Skin fragments	414.89	13.1	242.43	5.4
	Insect fragments	<LOQ	0.0	<LOQ	0.0
	Mold	<LOQ	0.0	<LOQ	0.0
	Pollen	<LOQ	0.0	<LOQ	0.0
Minerals	Quartz	530.13	16.7	457.93	10.2

⁶ Semi-quantitative results

⁷ <LOQ means below the limit of quantitation

Category	Analyte	Rm #1		Rm #12	
		str/m ³	Est. %	str/m ³	Est. %
	Calcite	276.59	8.7	53.87	1.2
Estimated % unidentified materials			20		15

No potential airborne particulate skin irritants were identified.

5.6 Common Indoor Allergens

The results of the analysis of dust samples for allergens are provided in Tables 5 and 6. The results are reported in micrograms of allergen per gram of dust (µg/g).

Parameter	Antigens	Concentration	Allergen Risk Levels
Dust mite allergen	Der f1	ND	ND
Dust mite allergen	Der p1	ND	ND
Cat allergen	Fel d1	ND	ND
Dog allergen	Can f1	0.76 µg/g	Low
Cockroach allergen	Bla g1	ND	ND

Parameter	Antigens	Concentration	Allergen Risk Levels
Dust mite allergen	Der f1	2.49 µg/g	Moderate
Dust mite allergen	Der p1	ND	ND
Cat allergen	Fel d1	0.45 µg/g	Low
Dog allergen	Can f1	0.44 µg/g	Low
Cockroach allergen	Bla g1	ND	ND

Based on the laboratory results, the allergen risk levels were found to be below the method detection limits or low in Rm #1 and not considered an indoor air quality concern. The results from Rm #12 were below the method detection limits or low for all parameters with the exception of dust mite allergens, which had a moderate risk level, an indication that sensitive individuals may be affected.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Terracon's observations and sampling identified the following:

- Water-stained ceiling tiles were observed in several rooms and hallways.
- Temperature and relative humidity levels were within normal ranges.
- Airborne fungal spore concentrations throughout the portion of the subject building that was tested were lower than outdoors and overall displayed similar spore types. Consequently, the source of indoor mold spores is most likely outdoor air.
- TVOC concentrations were elevated above generally acceptable concentrations in the two rooms tested, but did not contain sewer gas indicators. Analysis of the TVOC concentrations indicated that compounds in the highest concentrations were components of personal care products, cleaning products, and glues and adhesives. TMVOC concentrations were low and did not indicate the presence of mold growth.
- No potential airborne skin irritants were identified in the rooms tested.
- Common indoor allergens were generally not detected or found in low concentrations, with the exception of a dust mite allergen concentration found at moderate risk levels in Rm #12.

Terracon is not able to make conclusions about the potential causes of medical conditions reported by school occupants, as that is a responsibility reserved by physicians.

Terracon recommends the following:

- Have a qualified individual inspect the building for failures that would allow water intrusion. Repair any identified plumbing, roof, and/or building envelope leaks as soon as practical.
- Remove and replace water-stained ceiling tiles from the building.
- Review the materials used in classrooms and the kitchen for potential VOC sources. Material safety data sheets (MSDS) are a good resource; however, fragrance components are often not reported on MSDSs because they are present in low concentrations. Substitute or eliminate materials with high VOC concentrations or highly fragranced materials.
- Have a qualified individual inspect/adjust the HVAC system for steps that can be implemented to improve air circulation and/or increasing the amount of fresh air intake in order to reduce the accumulation of VOCs.
- Clean Rm #12 to reduce levels of dust mite allergens.
- If the occurrences of sewer odors persist, have a plumber or other qualified individual inspect the wastewater system for the source(s) of the problem and take appropriate corrective actions.

If indoor air quality complaints persist, Terracon recommends that detailed logs be kept to document the occurrences. At a minimum, the logs should include the time, date, and pertinent observations (e.g., detailed description of symptoms, how long the symptoms lasted, what they were doing when symptoms began, what was happening in adjacent areas when the symptoms

began, weather, temperature, humidity, etc.) which may be helpful in identifying a source. Such logs may provide useful information in the event that additional investigation(s) are warranted.

APPENDIX A

LABORATORY RESULTS



EMSL Analytical, Inc.

**200 Route 130 North
Cinnaminson, NJ 08077**



**Tel: (856) 858-4800
Fax: (856) 786-0262**

Indoor Allergen Analysis by ELISA

Prepared Exclusively For

**Joe Lambert
Terracon Consultants, Inc.
6911 Blanco Road
San Antonio, TX 78216**

Date Received:	12/16/2010
Date Reported:	12/23/2010
Project:	Trautmann Elementary School
EMSL Order:	371015672
Client ID	DRASH50

If you have any questions, please do not hesitate to contact us at (856)858-4800.

All samples were collected by and all sampling data was provided by the client. The results are valid only for those samples analyzed, and only for those samples collected in accordance with the appropriate methodology as determined by the client. The results herein do not denote or represent a medical or clinical diagnosis or conclusion. In the event that sample(s) were submitted in opened, used, non-sterile or otherwise adulterated condition, EMSL shall not be responsible or liable.

EMSL Analytical (Cinnaminson, NJ) is accredited by the American Industrial Hygiene Association (AIHA) in the EMLAP accreditation program for specified Field(s) of Testing as documented on the scope of accreditation.

Please visit our website at <http://www.emsl.com> for more information about our certifications and accreditations.



EMSL Analytical, Inc.

200 Route 130 North | Cinnaminson, NJ 08077
Phone: 856.858.4800 Fax: 856.786.0262

Email: westmontmicro@emsl.com

Joe Lambert
Terracon Consultants, Inc.
6911 Blanco Road
San Antonio, TX 78216

EMSL Reference: 371015672
Date Collected: 12/14/2010
Date Received: 12/16/2010
Date Reported: 12/23/2010

Indoor Allergen Report

Lab Sample ID	371015672-1
Client Sample ID	Rm 12 D
Sample Location	Room 12

<i>Test Parameter</i>	<i>Antigens</i>	<i>Detection Limits</i>	<i>Concentrations</i>		<i>Allergen Risk Levels</i>
Dust Mites Allergen	Der f1	0.40	2.49	µg/g	Moderate
Dust Mites Allergen	Der p1	0.40	ND	µg/g	ND
Cat Allergen	Fel d1	0.12	0.45	µg/g	Low
Dog Allergen	Can f1	0.40	0.44	µg/g	Low
Cockroach Allergen	Bla g1	0.60	ND	U/g	ND

Jason Dobranic, Ph.D., Lab Manager
Or Other Approved Signatory

Low: Not Sufficient to cause symptoms. Moderate: Risk for sensitization and bronchial hyperactivity. High: Risk for acute allergic asthma attack. µg/g: Micrograms per gram, U/g: Units per gram, ng/g: Nanogram per gram. N/A: Not Applicable. ND (None Detected): Indicates that the amount of allergen in the sample is below the detection limits.

†: Sufficient evidence is not available for risk levels

This report and guidelines furnish information only. Whether an individual suffers allergic symptoms or not depends on his/her medical history and previous exposure.

This report has been prepared by EMSL Analytical, Inc. at the request of and for the exclusive use of the client named in this report.

Completely read the important terms, conditions, and limitations that apply to this report.

© 2008, EMSL Analytical, Inc., All rights reserved. No part of this report may be reproduced or otherwise distributed or used without the express written consent of EMSL.



EMSL Analytical, Inc.

200 Route 130 North | Cinnaminson, NJ 08077
Phone: 856.858.4800 Fax: 856.786.0262

Email: westmontmicro@emsl.com

Joe Lambert
Terracon Consultants, Inc.
6911 Blanco Road
San Antonio, TX 78216

EMSL Reference: 371015672
Date Collected: 12/14/2010
Date Received: 12/16/2010
Date Reported: 12/23/2010

Indoor Allergen Report

Lab Sample ID	371015672-2
Client Sample ID	Rm 1 D
Sample Location	Room 1

<i>Test Parameter</i>	<i>Antigens</i>	<i>Detection Limits</i>	<i>Concentrations</i>		<i>Allergen Risk Levels</i>
Dust Mites Allergen	Der f1	0.40	ND	µg/g	ND
Dust Mites Allergen	Der p1	0.40	ND	µg/g	ND
Cat Allergen	Fel d1	0.12	ND	µg/g	ND
Dog Allergen	Can f1	0.40	0.76	µg/g	Low
Cockroach Allergen	Bla g1	0.60	ND	U/g	ND

Jason Dobranic, Ph.D., Lab Manager
Or Other Approved Signatory

Low: Not Sufficient to cause symptoms. Moderate: Risk for sensitization and bronchial hyperactivity. High: Risk for acute allergic asthma attack. µg/g: Micrograms per gram, U/g: Units per gram, ng/g: Nanogram per gram. N/A: Not Applicable. ND (None Detected): Indicates that the amount of allergen in the sample is below the detection limits.

†: Sufficient evidence is not available for risk levels

This report and guidelines furnish information only. Whether an individual suffers allergic symptoms or not depends on his/her medical history and previous exposure.

This report has been prepared by EMSL Analytical, Inc. at the request of and for the exclusive use of the client named in this report.

Completely read the important terms, conditions, and limitations that apply to this report.

© 2008, EMSL Analytical, Inc., All rights reserved. No part of this report may be reproduced or otherwise distributed or used without the express written consent of EMSL.



EMSL Analytical, Inc.

200 Route 130 North | Cinnaminson, NJ 08077

Phone: 856-858-4800 | Fax: 856-786-0262

www.EMSL.com

EMSL Order: 371015672

Guidelines to Interpretation

Allergens	$\mu\text{g/g}$												
		<1	1	2	3	4	5	6	7	8	9	>10	
	Fel d1	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	High	High	High
	Can f1	Low	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	High
	Der p1	Low	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	High
	Der f1	Low	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	High
	Mus m1	No sufficient information is available											
	$\mu\text{g/m}^3$												
	Rat n1	<0.7 $\mu\text{g/m}^3$ = Not associated with increased risk of asthma											
	Hev b5	<0.6 ng/m ³ = Not associated with increased risk of asthma											
	Hev b6.02	<0.6 ng/m ³ = Not associated with increased risk of asthma											
	U/g												
Bla g1 †	Low	Mod	Mod	Mod	High	High	High	High	High	High	High	High	
Bla g2 †	Low	Mod	Mod	Mod	High	High	High	High	High	High	High	High	

† Suggested levels. Not officially established.

Note: This report and guidelines furnish information only.

Whether an individual suffers allergic symptoms or not depends on his/her medical history and previous exposure.

References

- Journal of Allergy and Clinical Immunology* 1989; 83:416-427
- Journal of Allergy and Clinical Immunology* 1995; 96:449-456
- The American review of respiratory disease* 1990; 141:361-367
- The American review of respiratory disease* 1993; 147:573-578
- Environmental Health Perspectives* 2002; 110:419-425
- Clinical and Experimental Allergy* 1998; 28(5):537-44

Terminology

Allergen	A substance which reacts with the body's immune system to produce an allergic reaction.
Antigen	A substance, foreign to the body, which stimulates the production of antibodies by the immune system.
Bla g1	<i>Blattella germanica</i> (Cockroach) allergen 1
Bla g2	<i>Blattella germanica</i> (Cockroach) allergen 2
Can f1	<i>Canis familiaris</i> (Dog) allergen 1
Der f1	<i>Dermatophagoides farinae</i> (Dust Mites) allergen 1
Der p1	<i>Dermatophagoides pteronyssinus</i> (Dust Mites) allergen 1
Detection Limits	The smallest amount of a substance, in this case antigens, which can be measured.
Fel d1	<i>Felis domesticus</i> (Cat) allergen 1
Hev b5	<i>Hevea brasiliensis</i> (Latex) allergen 5
Hev b6.02	<i>Hevea brasiliensis</i> (Latex) allergen 6.02
Mus m1	<i>Mus musculus</i> (Mouse) allergen 1
Rat n1	<i>Rattus norvegicus</i> (Rat) allergen 1

This report has been prepared by EMSL Analytical, Inc. at the request of and for the exclusive use of the client named in this report.

Completely read the important terms, conditions, and limitations that apply to this report.

© 2008, EMSL Analytical, Inc., All rights reserved. No part of this report may be reproduced or otherwise distributed or used without the express written consent of EMSL.



EMSL Analytical, Inc.

200 Route 130 North | Cinnaminson, NJ 08077

Phone: 856-858-4800 | Fax: 856-786-0262

www.EMSL.com

EMSL Order: 371015672

Important Terms, Conditions, and Limitations

A. Sample Retention

Samples analyzed by EMSL will be retained for 60 days after analysis date. Storage beyond this period is available for a fee with written request prior to the initial 30 day period. Samples containing hazardous/toxic substances which require special handling will be returned to the client immediately. EMSL reserves the right to charge a sample disposal fee or return samples to the client.

B. Change Orders and Cancellation

All changes in the scope of work or turnaround time requested by the client after sample acceptance must be made in writing and confirmed in writing by EMSL. If requested changes result in a change in cost the client must accept payment responsibility. In the event work is cancelled by a client, EMSL will complete work in progress and invoice for work completed to the point of cancellation notice. EMSL is not responsible for holding times that are exceeded due to such changes.

C. Warranty

EMSL warrants to its clients that all services provided hereunder shall be performed in accordance with established and recognized analytical testing procedures and with reasonable care in accordance with applicable federal, state and local laws. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied. EMSL disclaims any other warranties, express or implied, including a warranty of fitness for particular purpose and warranty of merchantability.

D. Limits of Liability

In no event shall EMSL be liable for indirect, special, consequential, or incidental damages, including, but not limited to, damages for loss of profit or goodwill regardless of the negligence (either sole or concurrent) of EMSL and whether EMSL has been informed of the possibility of such damages, arising out of or in connection with EMSL's services thereunder or the delivery, use, reliance upon or interpretation of test results by client or any third party. We accept no legal responsibility for the purposes for which the client uses the test results. EMSL will not be held responsible for the improper selection of sampling devices even if we supply the device to the user. The user of the sampling device has the sole responsibility to select the proper sampler and sampling conditions to insure that a valid sample is taken for analysis. Any resampling performed will be at the sole discretion of EMSL, the cost of which shall be limited to the reasonable value of the original sample delivery group (SDG) samples. In no event shall EMSL be liable to a client or any third party, whether based upon theories of tort, contract or any other legal or equitable theory, in excess of the amount paid to EMSL by client thereunder.

This report has been prepared by EMSL Analytical, Inc. at the request of and for the exclusive use of the client named in this report. Completely read the important terms, conditions, and limitations that apply to this report.

© 2008, EMSL Analytical, Inc., All rights reserved. No part of this report may be reproduced or otherwise distributed or used without the express written consent of EMSL.



EMSL Analytical, Inc.

200 Route 130 North | Cinnaminson, NJ 08077

Phone: 856-858-4800 | Fax: 856-786-0262

www.EMSL.com

EMSL Order: 371015672

E. Indemnification

Client shall indemnify EMSL and its officers, directors and employees and hold each of them harmless for any liability, expense or cost, including reasonable attorney's fees, incurred by reason of any third party claim in connection with EMSL's services, the test result data or its use by client.

THIS IS THE LAST PAGE OF THE REPORT

This report has been prepared by EMSL Analytical, Inc. at the request of and for the exclusive use of the client named in this report.

Completely read the important terms, conditions, and limitations that apply to this report.

© 2008, EMSL Analytical, Inc., All rights reserved. No part of this report may be reproduced or otherwise distributed or used without the express written consent of EMSL.



Materials Science Division

Attn.: Joe A. Lambert
Terracon Consultants, Inc.
6911 Blanco Road
San Antonio, TX 78216

Phone: 210-641-2124 Fax: 210-641-2112

EMSL Case No.: 361005868
Sample(s) Received: 12/17/10
Date of Analysis: 12/23/10
Date Printed: 12/23/10
Reported By: S.Vaddi

- Laboratory Report -

Common Particle Identification™

Project: Trautmann Elementary School / 90107327

Analyzed by:

Satya Vaddi
Materials Scientist

December 23, 2010

Date

QA/QC :

Matthew Maki
Approved Signatory

Eugenia Mirica, Ph.D.
Laboratory Manager

December 23, 2010

Date



EMSL Analytical, Inc.

200 US 130 N, Cinnaminson, NJ 08077
Phone: (856) 858-4800

Attn.: *Joe A. Lambert*
Terracon Consultants, Inc.
6911 Blanco Road
San Antonio, TX 78216

Phone: 210-641-2124 Fax: 210-641-2112

EMSL Case No.: 361005868
Sample(s) Received: 12/17/10
Date of Analysis: 12/23/10
Date Printed: 12/23/10
Reported By: S.Vaddi

Procurement of Samples and Analytical Overview:

The material for analysis arrived at EMSL Analytical's corporate laboratory in Cinnaminson, NJ on December 17, 2010. The package arrived in satisfactory condition with no evidence of damage to the contents. The purpose of the analysis is to determine the identification of the individual components. The data reported herein has been obtained using the following equipment and methodologies.

Methods & Equipment: Polarized Light Microscopy (PLM)



Attn.: Joe A. Lambert
Terracon Consultants, Inc.
 6911 Blanco Road
 San Antonio, TX 78216

EMSL Case No.: 361005868
 Sample(s) Received: 12/17/10
 Date of Analysis: 12/23/10
 Date Printed: 12/23/10
 Reported By: S.Vaddi

Phone: 210-641-2124 Fax: 210-641-2112

Results and Discussion:

<i>Sample ID</i>	<i>Description</i>	<i>Analyte</i>	<i>Concentration</i> <i>n</i> (str/m3)	<i>Est.</i> (%)	<i>Notes</i>
Rm - 1(A)	Room #1 (Air Sample)	MMVF's:	Fibrous Glass	<LOQ	0.0
			Mineral Wool	<LOQ	0.0
Volume (L)= 1358		Cellulose:	Processed	737.5744	23.3
			Natural	<LOQ	0.0
			Paper Pulp	576.2300	18.2
			Starch	<LOQ	0.0
		Synthetics:	Total Fibers	<LOQ	0.0
		Hair:	Human	<LOQ	0.0
			Animal	<LOQ	0.0
		Biological:	Skin Fragments	414.8856	13.1
			Insect Fragments	<LOQ	0.0
			Mold	<LOQ	0.0
Pollen	<LOQ		0.0		
Minerals:	Quartz	530.1316	16.7		
	Calcite	276.5904	8.7		
Estimated Percent		Unidentified Material	20	(%)	
Sample Loading:		(0 to 5 Rating)	1		
		(0 = No Particles; 5 = Overloaded)			



Attn.: Joe A. Lambert
Terracon Consultants, Inc.
6911 Blanco Road
San Antonio, TX 78216

EMSL Case No.: 361005868
Sample(s) Received: 12/17/10
Date of Analysis: 12/23/10
Date Printed: 12/23/10
Reported By: S.Vaddi

Phone: 210-641-2124 Fax: 210-641-2112

<i>Sample ID</i>	<i>Description</i>	<i>Analyte</i>	<i>Concentration</i> <i>n</i> (str/m ³)	<i>Est.</i> (%)	<i>Notes</i>	
Rm - 12 (A)	Room #12 (Air Sample)	MMVF's:	Fibrous Glass Mineral Wool	<LOQ <LOQ	0.0 0.0	
Volume (L)=	1162	Cellulose:	Processed Natural Paper Pulp Starch	2451.2685 <LOQ 619.5514 <LOQ	54.5 0.0 13.8 0.0	
		Synthetics:	Total Fibers	<LOQ	0.0	
		Hair:	Human Animal	<LOQ <LOQ	0.0 0.0	
		Biological:	Skin Fragments Insect Fragments Mold Pollen	242.4331 <LOQ <LOQ <LOQ	5.4 0.0 0.0 0.0	
		Minerals:	Quartz Calcite	457.9293 53.8740	10.2 1.2	
		Estimated Percent	Unidentified Material	15	(%)	
		Sample Loading:	(0 to 5 Rating)	2		
		(0 = No Particles; 5 = Overloaded)				



Attn.: *Joe A. Lambert*
Terracon Consultants, Inc.
6911 Blanco Road
San Antonio, TX 78216

EMSL Case No.: 361005868
Sample(s) Received: 12/17/10
Date of Analysis: 12/23/10
Date Printed: 12/23/10
Reported By: S.Vaddi

Phone: 210-641-2124 Fax: 210-641-2112

Descriptions & Definitions:

None Detected (ND) denotes the absence of an analyte in the sub-sample analyzed. Trace levels of the analyte may be present in the sample below the limit of detection (LOD).

Trace (TR) denotes the presence of a material in a concentration significantly below the limit of detection (LOD) for the method.

Limit of Detection (LOD): The minimum concentration that can be theoretically achieved for a given analytical procedure in the absence of matrix or sample processing effects. Particle analysis is limited to a single occurrence of an analyte particle in the sub-sample analyzed.

Limit of Quantitation (LOQ): The minimum concentration of an analyte that can be measured within specified limits of precision and accuracy during routine laboratory operating conditions

Concentrations for bulk samples are derived from Visual Area Estimation (VAE) unless otherwise noted. Air sample concentrations are calculated to particles per unit volume.

VAE technique estimates the relative projected area of a certain type of particulate from a mixture of particulate by comparison to data derived from analysis of calibration materials having similar texture and particulate content. Due to bi-dimensional nature of the measurements, in some cases the particle thickness could affect the results.

Optical Particle Identification is only intended to identify larger micro- to macroscopic particle observed in indoor environments such as hair, clothing fibers, skin fragments, insect fragments, mold and pollen. In most cases a significant portion of the material is not identifiable by this technique alone and a more comprehensive analysis may be required.



Attn.: *Joe A. Lambert*
Terracon Consultants, Inc.
6911 Blanco Road
San Antonio, TX 78216

Phone: 210-641-2124 Fax: 210-641-2112

EMSL Case No.: 361005868
Sample(s) Received: 12/17/10
Date of Analysis: 12/23/10
Date Printed: 12/23/10
Reported By: S.Vaddi

Important Terms, Conditions, and Limitations

1. Sample Retention: Samples analyzed by EMSL will be retained for 60 days after analysis date. Storage beyond this period is available for a fee with written request prior to the initial 30 day period. Samples containing hazardous/toxic substances which require special handling may be returned to the client immediately. EMSL reserves the right to charge a sample disposal fee or return samples to the client.
2. Change Orders and Cancellation: All changes in the scope of work or turnaround time requested by the client after sample acceptance must be made in writing and confirmed in writing by EMSL. If requested changes result in a change in cost the client must accept payment responsibility. In the event work is cancelled by a client, EMSL will complete work in progress and invoice for work completed to the point of cancellation notice. EMSL is not responsible for holding times that are exceeded due to such changes.
3. Warranty: EMSL warrants to its clients that all services provided hereunder shall be performed in accordance with established and recognized analytical testing procedures and with reasonable care in accordance with applicable federal, state and local laws. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied. EMSL disclaims any other warranties, express or implied, including a warranty of fitness for particular purpose and warranty of merchantability.
4. Limits of Liability: In no event shall EMSL be liable for indirect, special, consequential, or incidental damages, including, but not limited to, damages for loss of profit or goodwill regardless of the negligence (either sole or concurrent) of EMSL and whether EMSL has been informed of the possibility of such damages, arising out of or in connection with EMSL's services thereunder or the delivery, use, reliance upon or interpretation of test results by client or any third party. We accept no legal responsibility for the purposes for which the client uses the test results. EMSL will not be held responsible for the improper selection of sampling devices even if we supply the device to the user. The user of the sampling device has the sole responsibility to select the proper sampler and sampling conditions to insure that a valid sample is taken for analysis. Any resampling performed will be at the sole discretion of EMSL, the cost of which shall be limited to the reasonable value of the original sample delivery group (SDG) samples. In no event shall EMSL be liable to a client or any third party, whether based upon theories of tort, contract or any other legal or equitable theory, in excess of the amount paid to EMSL by client thereunder.



EMSL ANALYTICAL, INC.
LABORATORY PRODUCTS TRAINING

EMSL Order Number (Lab Use Only):

361005868

EMSL ANALYTICAL, INC.
200 ROUTE 130
N. CINNAMINSON, NJ 08077

PHONE (856) 858-4800
FAX (856) 786-5974

Company: Terracon Consultants, INC
 Street: 6911 Blanco Rd.
 City: SAN ANTONIO State/Province: TX Zip/Postal Code: 78216 Country:
 Report To (Name): Joe Lambert Fax #:
 Telephone #: (210) 641-2112 E-mail Address: j.lambert@terracon.com
 Project Name/ Number: Trautmann Elementary School / 90107327
 Please Provide Results: Fax E-mail PO# 90107327 State Samples Taken: TX

EMSL-Bill to: Same Different
 If Bill to is Different please note in Comments**
 Third Party Billing requires written authorization from third party
 Turnaround Time (TAT) Options* - Please Check
 3 Hour 6 Hour 24 Hour 48 Hour 72 Hour 96 Hour 1 Week 2 Week
 *Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide. TATs are subject to methodology requirements

Non Culturable Air Samples (Spore Traps)

- M001 Air-O-Cell
- M049 BioSIS
- M030 Micro 5
- M173 Allegro M2
- M003 Burkard
- M174 MoldSnap
- M004 Allergenco
- M043 Cyclcx
- M176 Relle Smart
- M032 Allergenco-D
- M002 Cyclcx-d
- M130 Via-Cell
- M172 Versa Trap

Other Microbiology Test Codes

- M041 Fungal Direct Examination
- M005 Viable Fungi ID and Count
- M006 Viable Fungi ID and Count (Speciation)
- M007 Culturable Fungi
- M008 Culturable Fungi (Speciation)
- M009 Gram Stain Culturable Bacteria
- M010 Bacterial Count and ID - 3 Most Prominent
- M011 Bacterial Count and ID - 5 Most Prominent
- M013 Sewage Contamination in Buildings
- M014 Endotoxin Analysis
- M015 Heterotrophic Plate Count
- M180 Real Time Q-PCR-ERMI 36 Panel
- M018 Total Coliform (Membrane Filtration)
- M020 Fecal Streptococcus (Membrane Filtration)
- M210-215 Legionella Detection
- M026 Recreational Water Screen
- M027 Mycotoxin Analysis
- M029 Enterococci
- M019 Fecal Coliform
- M133 MRSA Analysis
- M028 Cryptococcus neoformans Detection
- M120 Histoplasma capsulatum Detection
- M033-39 Allergen Testing
- M044 Group Allergen (Cat, Dog, Cockroach, Dustmites)
- Other See Analytical Price Guide

Preservation Method (Water):

Name of Sampler: Signature of Sampler:

Sample #	Sample Location	Sample Type	Test Code	Volume/Area	Date/Time Collected
RM-1(A)	Room #1 (Air Sample)	MCE-Filter	CPID	1,358 L	12/14/10 @ 6:00 PM
RM-12(A)	Room #12 (Air Sample)	MCE-Filter	CPID	1,162 L	12/14/10 @ 5:36 PM
RM-12(D)	Room #12 (Bulk Dust)	MCE-Filter	*	36 in ²	12/14/10 @ 5:45 PM
RM-1(D)	Room #1 (Bulk Dust)	MCE Filter	*	144 in ²	12/14/10 @ 5:57 PM

EMSL ANALYTICAL, INC.
 FOR ANALYSIS BY
 SAMPLES ACCEPTED

12/14

DEC 16 AM 11:18
 C:\Data\121410

Client Sample # (s): Total # of Samples: 4

Relinquished (Client): Joe Lambert Date: 12/15/2010 Time: 16:20 hrs

Received (Client): DMB-EX-1030A Date: 12-16-10 Time:

Comments: * Analyze bulk dust samples for M033-39 and CPID.
 Note: Air samples collected using "open face" cassette as instructed

★ 2c for Mat Jie

Mycotech Biological, Inc.

650 Rocky Creek Road, Dripping Springs, Texas 78620
 Tel: 800-272-3716, 512-264-9076 Fax: 512-264-0218
Field Data Sheet and Chain of Custody Sheet (PLEASE PRINT CLEARLY)

Company Name: TERRACON - SAN ANTONIO Contact Name: Lene Griego/ Joe Lambert
 Address: 6911 Blanco Rd. San Antonio, TX 78216 Phone: 210-641-2112 Email: lgriego@terracon.com
 Project Name: Trautmann Elementary School/90107377 Sample Type: Pre Post Retest Clearance
 Turn around time Same Day Next Day Third Day

PLEASE COMPLETE THIS CHAIN OF CUSTODY AND INCLUDE WITH SAMPLES 10-0789

Sample #	Sample Description or Location	Date	Method	Sample Time	Flow Rate	Sample Volume	Analytical Request	Comments (Media)
RM 1-T	center front of class/aft	12/14		5 min	15 L/min	75 L	MBI-86	
RM 2-T								
RM 3-T								
RM 7-T								
RM 9-T								
RM 12-T								
RM 17-T								
RM 25-T								
RM 27-T								
RM 28-T								
RM 29-T								
outside-T	outside Cafeteria/Jan Desk							

METHOD OF PAYMENT: Visa/MC/American Express Card# _____ Exp. Date: _____
 Authorized Signature: _____ PO# (if applicable): _____
 Released by: Lene Griego Date: 12/15/10 Received by: [Signature] Date: 12/16/10

Mycotech Biological, Inc. is not responsible for damaged samples received and/or samples with an incomplete chain of custody form.
 Standard turn-around is 7-10 business days, and **does not** include weekends and/or holidays.
 ALL SAMPLES RECEIVED AFTER 3:00 PM WILL BE PROCESSED AND MARKED AS RECEIVED THE NEXT BUSINESS DAY.
 Questions or complaints should be directed to: Indoor Air Quality Program, Toxic Substances Control Division,
 Texas Department of Health, 1100 West 49th Street, Austin, Texas 78756 512-834-4509 or 800-293-0752



Mycotech Biological, Inc.

Project : Trautmann Elementary School
90107327

AIHA EMPAT NO: 103006
TDSHS LIC. NO: LAB0163

Analysis Type : Air-O-Cell

Report No: 10-0789
Received date: 12/16/2010
Report date: 12/20/2010

Terracon - San Antonio
6911 Blanco Rd.
San Antonio , **TX** **78216**
TERRACONS691

Media : Hex-Sil

Sample No: (10) Description: Rm. 28-T Center front of Class / 2 ft. up				Sample No: (11) Description: Rm. 29-T Center front of Class / 2 ft. up				Sample No: (12) Description: Outside-T Center front of Class / 2 ft. up			
Sample Type:	Pre	Sample Type:	Pre	Sample Type:	Pre	Sample Type:	Pre	Sample Type:	Pre	Sample Type:	Pre
Sample Date:	12/14/2010	Sample Date:	12/14/2010	Sample Date:	12/14/2010	Sample Date:	12/14/2010	Sample Date:	12/14/2010	Sample Date:	12/14/2010
Matrix:	Air	Matrix:	Air	Matrix:	Air	Matrix:	Air	Matrix:	Air	Matrix:	Air
Date Analyzed:	12/20/2010	Date Analyzed:	12/20/2010	Date Analyzed:	12/20/2010	Date Analyzed:	12/20/2010	Date Analyzed:	12/20/2010	Date Analyzed:	12/20/2010
% Analyzed:	100% of Trace at 400X Magnification	% Analyzed:	100% of Trace at 400X Magnification	% Analyzed:	100% of Trace at 400X Magnification	% Analyzed:	100% of Trace at 400X Magnification	% Analyzed:	100% of Trace at 400X Magnification	% Analyzed:	100% of Trace at 400X Magnification
Reporting Limit:	13	Reporting Limit:	13	Reporting Limit:	13	Reporting Limit:	13	Reporting Limit:	13	Reporting Limit:	13
Particles / M ³				Particles / M ³				Particles / M ³			
Observed	Raw Count	Results	Comments:	Observed	Raw Count	Results	Comments:	Observed	Raw Count	Results	Comments:
Cladosporium spp.	4	52	1	Cladosporium spp.	2	26	1	Asper./Pen. - like	6	78	105
Alternaria spp.	1	13	1, 2	Alternaria spp.	2	26	1, 2	Cladosporium spp.	38	494	1
Drechslera spp.	1	13	1, 2	hyphae	5	65	7	Alternaria spp.	3	39	1, 2
hyphae	15	195	7	fibers	44	572	112	Drechslera spp.	2	26	1, 2
Nigrospora spp.	3	39	1	epithelial cells	74	962	-	Curvularia spp.	1	13	1, 2
Pithomyces spp.	1	13	1					hyphae	16	208	7
fibers	26	338	112					Nigrospora spp.	3	39	1
epithelial cells	116	1,508	-					Pithomyces spp.	1	13	1
								fibers	13	169	112
								Pollen	4	52	1
2,171 Particles / M ³				1,651 Particles / M ³				1,131 Particles / M ³			

General Comment Reference Page

ONLY COMMENT NUMBERS INDICATED ON REPORT ARE RELEVANT.

Mycotech Biological is not responsible for any errors resulting from improper or incorrect sampling procedures, atmospheric conditions at the time of sampling or during shipment, or from shipping conditions or methods.

Results relate only to samples analyzed.

1. This is a known and documented aeroallergen. It may cause an allergic reaction to hypersensitive individuals at normal airborne concentrations. Chronic exposure, at above normal airborne concentrations, may also result in the sensitization and development of allergic disease in previously unaffected individuals.
2. This fungus is an opportunistic pathogen. Many factors affect host contraction; however, this fungus will typically infect only those who are immuno-compromised. Immuno-compromization may be a function of age, sex, race, state of health, or nutrition. Individuals exposed to immunotherapy, chemotherapy, radiotherapy, immunosuppressant drugs, or who have contracted an immunological disorder, are at greater risk of infection. As with other diseases, opportunistic infections may be contracted by a variety of potential routes including injection, ingestion, skin contact and/or respiration.
7. The hyphae observed represented desiccated/unorganized hyphal fragments that are not representative of established fungal growth. The presence of this is common to typical dust and debris.
105. Due to the absence of supporting data, a definitive Genus could not be assigned.
112. Natural or man-made textile fibers (not including asbestos); typically from clothing, floor coverings (carpet), or upholstery.

Chris Wardlaw, B.S.
Laboratory Manager
Mycotech Biological, Inc.

PATI Indoor Air Quality Check

Client: Terracon Consultants Inc.	Sample Number: 14903 - 1
Project: Trautmann 90107327	Date Sampled: 12/14/2010
Location: Laredo, TX	Order Date: 12/16/2010
Sampled By: JA Lambert/L Griego	Date Analyzed: 12/16
Submitter ID: RM# 7	Date Reported: 01/03/2011

Results for this Submission

Total VOCs (TVOC), ng/L: 1,900

Mold VOCs (TMVOC), ng/L: 7

Sample Volume (L): 40

Notes: -

Understanding the Results

TVOC (Total Volatile Organic Compounds)

No federal or state agency has specified a specific limit for TVOCs in indoor air; however, the European Union and the U. S. Green Building Council (USGBC) have recommended 500 ng/L as the limit. TVOC levels below 500 ng/L indicate that the IAQ is acceptable. TVOC levels between 500 and 1,500 ng/L indicate that the IAQ is marginal and some effect on the occupants is possible. Levels above 1,500 ng/L indicate that the IAQ should be improved. Based on what the individual compounds are that make up the TVOC, it is possible to suggest actions which will lower the level into an acceptable range. To do this, contact the testing service that took the sample and request that a full breakdown of the VOCs be performed. There is an extra charge for this service. Once this analysis is completed, the tester may be able to use the information to suggest ways to improve the IAQ. It is possible, however, that the full analysis will not yield a simple solution in which case, an IAQ specialist should be contacted.

TMVOC (Total Mold Volatile Organic Compounds)

This is an assessment of the quantity of actively growing mold in the building. Like TVOC, no federal or state agency has specified specific limits for TMVOC. Typically, if there is no plumbing leak or water intrusion into the building, there will not be a mold problem. If mold is indicated, the first step in fixing the problem is to find and repair the water leak. Typical places to check are roof leaks, plumbing leaks, and leaks under the windows. Levels below 8 ng/L indicate that there is a minimal amount of actively growing mold present; 8-30 ng/L indicates a low level of mold but people sensitive to mold will be affected; 30-150 ng/L indicates that actively growing mold is present at a moderate level and building occupants will probably be affected. Levels above 150 ng/L indicate that a high level of mold is present and most building occupants will be affected.

The results contained in this report were dependent upon a number of factors, which may include, but are not limited to, the sampling techniques utilized, the size or source of the sample, the compounds which make up the TVOC and/or the type of mold(s) present. Therefore, neither Prism, nor its agents, officers, directors, employees, or successors (1) expresses any opinion about action which may or should be taken based upon the results provided and (2) shall be liable for any claims, actions, causes of action, costs, loss of service, expenses and compensation whatsoever which may now or hereafter occur or accrue based upon the information contained herein.

Client: Terracon Consultants Inc.
Project: Trautmann 90107327
Location: Laredo, TX
Sampled By: JA Lambert/L Griego

C.O.C. No.: 14903
Order Date: 12/16/2010
Report Date: 01/03/2011

AS002-HS-MS TDT Air Scan Analysis All results are reported in ng/L

A scan was made for all compounds contained in the attached Air Survey Analysis List (TB503, Rev. 14, Quantitative A and Semiquantitative). All compounds detected are listed below:

Page 1 of 4

Client Sample ID: RM# 7
Laboratory ID: 14903 - 1
Date Sampled: 12/14/2010
Date Analyzed: 12/16 Volume: 40. L

Detection Limits	
Quantitative List A:	0.3 ng/L
Semiquantitative List:	2 ng/L

Compound	Calculated Result	Actual Result	Comments
Total VOCs		1,900	Total volatile organic compounds calculated based on internal standard ratio; does not include C1, C2, or methanol
Paint-Range VOCs		24%	This is an estimate of the fraction of Total VOCs represented by the sum of compounds typically associated with latex paints, lacquers, enamals, varnishes, sealers, thinners, and polyurethane finishes.
Trichlorofluoromethane		2.2	Freon 11 ppb 0.4 MW 136 CAS 75-69-4
Methylene Chloride		0.3	Dichloromethane ppb 0.08 MW 85 CAS 75-09-2
Benzene		0.9	Cyclohexatriene ppb 0.3 MW 78 CAS 71-43-2
1,2-Dichloroethane		0.5	1,2-DCA ppb 0.1 MW 98 CAS 107-06-2
Toluene		3.4	Methyl benzene ppb 0.9 MW 92 CAS 108-88-3
Tetrachloroethene		0.3	PCE; Perchloroethylene ppb 0.04 MW 166 CAS 127-18-4
Ethylbenzene		0.5	ppb 0.1 MW 106 CAS 100-41-4
m,p-Xylene		1.4	m,p-Dimethylbenzene ppb 0.3 MW 106 CAS 106-42-3
o-Xylene		0.5	o-Dimethylbenzene ppb 0.1 MW 106 CAS 95-47-6
Styrene		0.3	Vinylbenzene ppb 0.07 MW 104 CAS 100-42-5

Client Sample ID: RM# 7
 Laboratory ID: 14903 - 1
 Date Sampled: 12/14/2010
 Date Analyzed: 12/16

Volume: 40. L

Detection Limits	
Quantitative List A:	0.3 ng/L
Semiquantitative List:	2 ng/L

Compound	Calculated Result	Actual Result	Comments
1,3,5-Trimethylbenzene		0.4	Mesitylene; 1,3,5-TMB ppb 0.08 MW 120 CAS 108-67-8
1,2,4-Trimethylbenzene		1.5	1,2,4-TMB ppb 0.3 MW 120 CAS 95-36-3
p-Isopropyltoluene		1.2	4-Methyl isopropyl benzene ppb 0.2 MW 134 CAS 99-87-6
1,4-Dichlorobenzene		2.0	p-Dichlorobenzene ppb 0.3 MW 146 CAS 106-46-7
1,2,3-Trimethylbenzene		0.3	1,2,3-TMB ppb 0.06 MW 120 CAS 526-73-8
Naphthalene		0.6	ppb 0.1 MW 128 CAS 91-20-3
Propylene + propane + formaldehyde	2	1-4	Sum of all three compounds; exact identification is not possible; alternative testing may be required
C 4	3	1-6	Butane ppb 1.1 MW 58 CAS 106-97-8
1-Chloro-1,1-difluoroethane	3	1-6	Freon 142b ppb 0.8 MW 100 CAS 75-68-3
Isobutane	3	1-6	2-Methyl propane ppb 1.1 MW 58 CAS 75-28-5
Acetaldehyde	50	25-100	ppb 28 MW 44 CAS 75-07-0
C 5	2	1-4	Pentane ppb 0.7 MW 72 CAS 109-66-0
Ethanol	1,000	500-2,000	Ethyl alcohol ppb 520 MW 46 CAS 64-17-5
Acetone	31	15-62	2-Propanone ppb 13 MW 58 CAS 67-64-1
Isopropanol	54	27-110	Isopropyl alcohol; 2-propanol ppb 22 MW 60 CAS 67-63-0
Ethylacetate	4	2-8	Ethyl ester of acetic acid ppb 1.2 MW 88 CAS 141-78-6
1-Butanol	4	2-8	n-Butyl alcohol ppb 1.3 MW 74 CAS 71-36-3
Methylcyclohexane	2	1-4	ppb 0.5 MW 98 CAS 108-87-2
1-Propanol	3	1-6	n-Propyl alcohol ppb 1.3 MW 60 CAS 71-23-8
Pentanal	2	1-4	Valeraldehyde ppb 0.7 MW 86 CAS 110-62-3
4-Methyl-2-pentanone	31	15-62	MIBK; methyl isobutyl ketone ppb 7.4 MW 100 CAS 108-10-1

Client Sample ID: RM# 7
 Laboratory ID: 14903 - 1
 Date Sampled: 12/14/2010
 Date Analyzed: 12/16

Volume: 40. L

Detection Limits	
Quantitative List A:	0.3 ng/L
Semiquantitative List:	2 ng/L

Compound	Calculated Result	Actual Result	Comments
n-Butylacetate	14	7-28	ppb 2.9 MW 116 CAS 123-86-4
Hexanal	12	6-24	Hexaldehyde; caproic aldehyde ppb 2.9 MW 100 CAS 66-25-1
C6-C8 Hydrocarbon	6	3-12	23.8 min; contains oxygen
C 9	4	2-8	Nonane ppb 0.8 MW 128 CAS 111-84-2
Heptanal	3	1-6	Heptaldehyde ppb 0.7 MW 114 CAS 111-71-7
a-Pinene	3	1-6	2-Pinene ppb 0.6 MW 136 CAS 80-56-8
2-Butoxyethanol	29	14-58	Butylcellosolve ppb 6.0 MW 118 CAS 111-76-2
C9-C11 Hydrocarbon	7	3-14	26.2 min
C8-C10 Hydrocarbon	5	2-10	26.3 min; contains oxygen; possibly an alcohol
C10	6	3-12	Decane ppb 1.0 MW 142 CAS 124-18-5
m,p-Ethylmethylbenzene	3	1-6	3- and 4-Ethyl toluene; CAS No. is for the para isomer ppb 0.5 MW 120 CAS 622-96-8
Myrcene	5	2-10	7-Methyl-3-methylene-1,6-octadiene; tangerine ppb 0.9 MW 136 CAS 123-35-3
C9-C11 Hydrocarbon	28	14-56	27.2 min
C9-C11 Hydrocarbon	10	5-20	27.4 min
C9-C11 Hydrocarbon	9	4-18	27.6 min
C9-C11 Hydrocarbon	34	17-68	27.7 min
Benzaldehyde	3	1-6	ppb 0.7 MW 106 CAS 100-52-7
Octanal	10	5-20	Caprylic aldehyde ppb 2.0 MW 128 CAS 124-13-0
Limonene	130	65-260	Air Scan does not differentiate between Limonene (CAS 138-86-3) and d-Limonene (CAS 5989-27-5) ppb 24 MW 136
C10-C12 Hydrocarbon	46	23-92	28.2 min

Client Sample ID: RM# 7
 Laboratory ID: 14903 - 1
 Date Sampled: 12/14/2010
 Date Analyzed: 12/16

Volume: 40. L

Detection Limits	
Quantitative List A:	0.3 ng/L
Semiquantitative List:	2 ng/L

Compound	Calculated Result	Actual Result	Comments
C10-C12 Hydrocarbon	7	3-14	28.3 min
Eucalyptol	11	5-22	ppb 1.8 MW 154 CAS 470-82-6
C9-C11 Hydrocarbon	23	11-46	28.6 min; contains oxygen
C11	10	5-20	Undecane ppb 1.5 MW 156 CAS 1120-21-4
C10-C12 Hydrocarbon	5	2-10	28.9 min
C10-C12 Hydrocarbon	7	3-14	29.0 min; sum of at least two overlapping hydrocarbons
2-Methyl decahydronaphthalene	8	4-16	ppb 1.2 MW 152 CAS 2958-76-1
Nonanal	8	4-16	ppb 1.3 MW 142 CAS 124-19-6
C12	4	2-8	Dodecane ppb 0.6 MW 170 CAS 112-40-3

These results have been reviewed and approved
 by the Laboratory Director.



Randall S. Fike, Ph.D.

Prism Analytical Technologies, Inc. 1200 N. Fancher Mt. Pleasant, MI 48858 989-772-5088
--

PATI Indoor Air Quality Check

Client: Terracon Consultants Inc.	Sample Number: 14903 - 2
Project: Trautmann 90107327	Date Sampled: 12/14/2010
Location: Laredo, TX	Order Date: 12/16/2010
Sampled By: JA Lambert/L Griego	Date Analyzed: 12/16
Submitter ID: Kitchen	Date Reported: 01/03/2011

Results for this Submission

Total VOCs (TVOC), ng/L: 3,600

Mold VOCs (TMVOC), ng/L: 4

Sample Volume (L): 40

Notes: -

Understanding the Results

TVOC (Total Volatile Organic Compounds)

No federal or state agency has specified a specific limit for TVOCs in indoor air; however, the European Union and the U. S. Green Building Council (USGBC) have recommended 500 ng/L as the limit. TVOC levels below 500 ng/L indicate that the IAQ is acceptable. TVOC levels between 500 and 1,500 ng/L indicate that the IAQ is marginal and some effect on the occupants is possible. Levels above 1,500 ng/L indicate that the IAQ should be improved. Based on what the individual compounds are that make up the TVOC, it is possible to suggest actions which will lower the level into an acceptable range. To do this, contact the testing service that took the sample and request that a full breakdown of the VOCs be performed. There is an extra charge for this service. Once this analysis is completed, the tester may be able to use the information to suggest ways to improve the IAQ. It is possible, however, that the full analysis will not yield a simple solution in which case, an IAQ specialist should be contacted.

TMVOC (Total Mold Volatile Organic Compounds)

This is an assessment of the quantity of actively growing mold in the building. Like TVOC, no federal or state agency has specified specific limits for TMVOC. Typically, if there is no plumbing leak or water intrusion into the building, there will not be a mold problem. If mold is indicated, the first step in fixing the problem is to find and repair the water leak. Typical places to check are roof leaks, plumbing leaks, and leaks under the windows. Levels below 8 ng/L indicate that there is a minimal amount of actively growing mold present; 8-30 ng/L indicates a low level of mold but people sensitive to mold will be affected; 30-150 ng/L indicates that actively growing mold is present at a moderate level and building occupants will probably be affected. Levels above 150 ng/L indicate that a high level of mold is present and most building occupants will be affected.

The results contained in this report were dependent upon a number of factors, which may include, but are not limited to, the sampling techniques utilized, the size or source of the sample, the compounds which make up the TVOC and/or the type of mold(s) present. Therefore, neither Prism, nor its agents, officers, directors, employees, or successors (1) expresses any opinion about action which may or should be taken based upon the results provided and (2) shall be liable for any claims, actions, causes of action, costs, loss of service, expenses and compensation whatsoever which may now or hereafter occur or accrue based upon the information contained herein.

Client: Terracon Consultants Inc.
Project: Trautmann 90107327
Location: Laredo, TX
Sampled By: JA Lambert/L Griego

C.O.C. No.: 14903
Order Date: 12/16/2010
Report Date: 01/03/2011

AS002-HS-MS TDT Air Scan Analysis All results are reported in ng/L

A scan was made for all compounds contained in the attached Air Survey Analysis List (TB503, Rev. 14, Quantitative A and Semiquantitative). All compounds detected are listed below:

Page 1 of 4

Client Sample ID: Kitchen
Laboratory ID: 14903 - 2
Date Sampled: 12/14/2010
Date Analyzed: 12/16 Volume: 40. L

Detection Limits	
Quantitative List A:	0.3 ng/L
Semiquantitative List:	2 ng/L

Compound	Calculated Result	Actual Result	Comments
Total VOCs		3,600	Total volatile organic compounds calculated based on internal standard ratio; does not include C1, C2, or methanol
Paint-Range VOCs		8%	This is an estimate of the fraction of Total VOCs represented by the sum of compounds typically associated with latex paints, lacquers, enamals, varnishes, sealers, thinners, and polyurethane finishes. Does not include Limonene.
Trichlorofluoromethane		3.2	Freon 11 ppb 0.6 MW 136 CAS 75-69-4
Methylene Chloride		0.3	Dichloromethane ppb 0.08 MW 85 CAS 75-09-2
Benzene		1.0	Cyclohexatriene ppb 0.3 MW 78 CAS 71-43-2
Toluene		2.2	Methyl benzene ppb 0.6 MW 92 CAS 108-88-3
Ethylbenzene		0.7	ppb 0.2 MW 106 CAS 100-41-4
m,p-Xylene		1.1	m,p-Dimethylbenzene ppb 0.2 MW 106 CAS 106-42-3
o-Xylene		0.4	o-Dimethylbenzene ppb 0.09 MW 106 CAS 95-47-6
Styrene		0.5	Vinylbenzene ppb 0.1 MW 104 CAS 100-42-5
tert-Butylbenzene		0.3	ppb 0.05 MW 134 CAS 98-06-6
1,2,4-Trimethylbenzene		1.0	1,2,4-TMB ppb 0.2 MW 120 CAS 95-36-3

Client Sample ID: Kitchen
 Laboratory ID: 14903 - 2
 Date Sampled: 12/14/2010
 Date Analyzed: 12/16

Volume: 40. L

Detection Limits	
Quantitative List A:	0.3 ng/L
Semiquantitative List:	2 ng/L

Compound	Calculated Result	Actual Result	Comments
p-Isopropyltoluene		2.4	4-Methyl isopropyl benzene ppb 0.4 MW 134 CAS 99-87-6
1,4-Dichlorobenzene		1.1	p-Dichlorobenzene ppb 0.2 MW 146 CAS 106-46-7
1,2,3-Trimethylbenzene		0.3	1,2,3-TMB ppb 0.06 MW 120 CAS 526-73-8
Naphthalene		0.5	ppb 0.09 MW 128 CAS 91-20-3
C 4	4	2-8	Butane ppb 1.6 MW 58 CAS 106-97-8
1-Chloro-1,1-difluoroethane	4	2-8	Freon 142b ppb 0.9 MW 100 CAS 75-68-3
Isobutane	3	1-6	2-Methyl propane ppb 1.3 MW 58 CAS 75-28-5
Acetaldehyde	70	35-140	ppb 38 MW 44 CAS 75-07-0
2-Methylbutane	11	5-22	Isopentane ppb 3.5 MW 72 CAS 78-78-4
C 5	4	2-8	Pentane ppb 1.3 MW 72 CAS 109-66-0
Ethanol	630	310-1,300	Ethyl alcohol ppb 330 MW 46 CAS 64-17-5
Acetone	27	13-54	2-Propanone ppb 11 MW 58 CAS 67-64-1
Isopropanol	35	17-70	Isopropyl alcohol; 2-propanol ppb 14 MW 60 CAS 67-63-0
1-Propanol	2	1-4	n-Propyl alcohol ppb 0.9 MW 60 CAS 71-23-8
Ethylacetate	4	2-8	Ethyl ester of acetic acid ppb 1.1 MW 88 CAS 141-78-6
Methylcyclohexane	2	1-4	ppb 0.5 MW 98 CAS 108-87-2
4-Methyl-2-pentanone	5	2-10	MIBK; methyl isobutyl ketone ppb 1.1 MW 100 CAS 108-10-1
Hexanal	9	4-18	Hexaldehyde; caproic aldehyde ppb 2.2 MW 100 CAS 66-25-1
C6-C8 Hydrocarbon	3	1-6	23.8 min; contains oxygen
C 9	2	1-4	Nonane ppb 0.5 MW 128 CAS 111-84-2
Heptanal	3	1-6	Heptaldehyde ppb 0.5 MW 114 CAS 111-71-7
a-Pinene	32	16-64	2-Pinene ppb 5.6 MW 136 CAS 80-56-8

Client Sample ID: Kitchen
 Laboratory ID: 14903 - 2
 Date Sampled: 12/14/2010
 Date Analyzed: 12/16

Volume: 40. L

Detection Limits	
Quantitative List A:	0.3 ng/L
Semiquantitative List:	2 ng/L

Compound	Calculated Result	Actual Result	Comments
2-Butoxyethanol	6	3-12	Butylcellosolve ppb 1.2 MW 118 CAS 111-76-2
C9-C11 Hydrocarbon	8	4-16	25.8 min
C9-C11 Hydrocarbon	4	2-8	26.2 min
C10	4	2-8	Decane ppb 0.7 MW 142 CAS 124-18-5
m,p-Ethylmethylbenzene	2	1-4	3- and 4-Ethyl toluene; CAS No. is for the para isomer ppb 0.4 MW 120 CAS 622-96-8
Myrcene	57	28-120	7-Methyl-3-methylene-1,6-octadiene; tangerine ppb 10 MW 136 CAS 123-35-3
C9-C11 Hydrocarbon	18	9-36	27.2 min
C9-C11 Hydrocarbon	4	2-8	27.4 min
6-Methyl-5-hepten-2-one	4	2-8	ppb 0.7 MW 126 CAS 110-93-0
C9-C11 Hydrocarbon	27	13-54	27.7 min
Benzaldehyde	2	1-4	ppb 0.5 MW 106 CAS 100-52-7
Octanal	3	1-6	Caprylic aldehyde ppb 0.5 MW 128 CAS 124-13-0
Limonene	2,400	1,200-4,800	Air Scan does not differentiate between Limonene (CAS 138-86-3) and d-Limonene (CAS 5989-27-5) ppb 420 MW 136
C10-C12 Hydrocarbon	37	18-74	28.2 min
Eucalyptol	5	2-10	ppb 0.8 MW 154 CAS 470-82-6
C9-C11 Hydrocarbon	14	7-28	28.6 min; contains oxygen
C11	6	3-12	Undecane ppb 0.9 MW 156 CAS 1120-21-4
C10-C12 Hydrocarbon	3	1-6	28.9 min
2-Methyl decahydronaphthalene	6	3-12	ppb 0.9 MW 152 CAS 2958-76-1
Nonanal	6	3-12	ppb 1.0 MW 142 CAS 124-19-6

Client Sample ID: Kitchen
 Laboratory ID: 14903 - 2
 Date Sampled: 12/14/2010
 Date Analyzed: 12/16

Volume: 40. L

Detection Limits	
Quantitative List A:	0.3 ng/L
Semiquantitative List:	2 ng/L

Compound	Calculated Result	Actual Result	Comments
C12	2	1-4	Dodecane ppb 0.3 MW 170 CAS 112-40-3

These results have been reviewed and approved
 by the Laboratory Director.



 Randall S. Fike, Ph.D.

Prism Analytical Technologies, Inc. 1200 N. Fancher Mt. Pleasant, MI 48858 989-772-5088
--

APPENDIX B

TERRACON PERSONNEL AND LABORATORY LICENSES

JOE LAMBERT

PRINCIPAL / ENVIRONMENTAL MANAGER

PROFESSIONAL EXPERIENCE

Joe Lambert has over 20 years of professional environmental and analytical chemistry experience with specialized knowledge in environmental testing and chemical analysis.

As Environmental Department Manager in Terracon's San Antonio office, Mr. Lambert has overseen hundreds of projects involving a wide range of assessment, monitoring and remediation services. These projects have included underground storage tank removals, subsurface plume delineations, worksite perimeter monitoring, oilfield cleanup, storm water runoff and erosion control, landfill gas monitoring, product recovery and groundwater remediation. Joe has provided technical expertise and oversight for Indoor Air Quality projects, Spill Prevention, Control and Countermeasures (SPCC) Plans, Phase I and Phase II Environmental Site Assessments, hazardous materials handling and disposal, spill containment and cleanup, as well as contaminated soil excavation and remediation. This work has required regulatory compliance in accordance with Texas Commission on Environmental Quality and Environmental Protection Agency protocols and has included the Innocent Owner/Operator Program (IOP), the Voluntary Cleanup Program (VCP) and the US EPA Brownfields Program.

PROJECT EXPERIENCE

- **San Antonio Water System Aquifer Storage & Recovery (ASR) Program – Bexar County, Texas**
Performed a Phase II subsurface assessment at four specific locations along the proposed ASR pipeline route that were identified as areas of potential environmental concern. The assessment involved drilling borings and collecting subsurface samples of soil and groundwater at various intervals for laboratory analyses.
- **Cedar Creek Property – San Antonio, Texas**
Conducted a Phase I Environmental Site Assessment for part of the Parklands Acquisition over the Recharge and Contributing Zones of the Edwards Aquifer. Assessed historical structures, wetlands, endangered species, sole-source aquifer, and environmental concerns for properties totaling over 800 acres in size.
- **Thrift Property – San Antonio, Texas**
Conducted a Phase I Environmental Site Assessment for the Proposition 3 Land Acquisition over the Recharge and Contributing Zones of the Edwards Aquifer. Assessed an approximate 641-acre tract of land for environmental concerns.
- **11.9-Acre New Proposed School – Somerset, Texas**
Performed Phase I Environmental Site Assessment for 11.9-acre tract of land containing numerous oil fields.
- **340-Acres – Laredo, Texas**
Conducted a Phase I Environmental Site Assessment for approximately 340-acres of raw/industrial land for consideration as a housing development. Also evaluated the property for signs of state and federally listed species and their habitat. Conducted a limited archaeological survey for indication of significant historical artifacts and remains.

EDUCATION

Bachelor of Science, Natural Science, 1977, Miami University, Oxford Ohio.

University of Texas at El Paso, Graduate Studies program, Environmental Science and Geology, 1986-1988, completed 23 credit hours.

CERTIFICATIONS

40 Hour OSHA Certificate and Refresher, current.

Certificate for conducting IAQ Investigations (American IAQ Council), 2000.

AFFILIATIONS

*Air and Waste Management Association
American Indoor Air Quality Council
Member*

WORK HISTORY

Terracon, Environmental Manager, 2004-current.

Drash Consulting Engineers, Inc., Environmental Manager, 1998-2004.

Chemron Incorporated, Assistant Laboratory Manager/Quality Assurance Director, 1991-1998

Caleb Brett Incorporated, Regional Manager, 1981-1991.

- **Skygen Project – Corpus Christi, Texas**

Performed air monitoring for health and safety at several refineries in Corpus Christi, Texas. The air monitoring was prompted by subsurface excavation for a proposed transmission line along the North Oak Park Substation to Lon Hill Switchyard 138 in Corpus Christi, Texas.

- **Dallas Terminal – Dallas, Texas**

Principal in charge of overseeing remediation activities for a leaking petroleum storage tank trucking facility. Also conducted numerous water sampling events and prepared regulatory compliance reports.

- **San Antonio International Airport Remain Overnight Apron - San Antonio, Texas**

Performed subsurface assessments (drilling, sample collection, and analysis) and a Hazardous Materials Inventory for contamination at the San Antonio International Airport.

- **SPCC Site Evaluation – La Villa, Texas**

Evaluated SPCC plans for 30 sites.

- **Laredo Community College Voluntary Cleanup Program – Laredo, Texas**

Conducted a Full Affected Property Assessment Report (APAR) for the Laredo Community College. Excavated over 2,000 cubic yards of contaminated soil. Project received closure.

ADDITIONAL COURSES

Contractor Safety Council of the Coastal Bend Refinery Training, 2001.



TEXAS DEPARTMENT OF STATE HEALTH SERVICES

BE IT KNOWN THAT

JOSEPH A LAMBERT

is hereby licensed and authorized to perform as a

Mold Assessment Consultant

in the State of Texas and is hereby governed by the rights, privileges, and responsibilities set forth in Title 25, Texas Administrative Code, Chapter 295, relating to Texas Mold Assessment and Remediation Rules, as long as this license is not suspended or revoked.

A handwritten signature in black ink, appearing to read "David Lakey MD".

David L Lakey, M.D
Commissioner of Health

License Number: MAC1179

Control Number: 7234

Expiration Date: 11/16/2012

(Void After Expiration Date)

VOID IF ALTERED NON-TRANSFERABLE

LENÉ L. GRIEGO

STAFF BIOLOGIST

PROFESSIONAL EXPERIENCE

Mrs. Griego is a Staff Biologist in Terracon's San Antonio, Texas, office. She is proficient in Environmental Site Assessments (ESAs), Wetlands/Waters of the US, Threatened and Endangered Species, and Environmental Assessments (EAs). Mrs. Griego has acquired an understanding of facility operating systems, state and federal regulations, and the fate and transport of chemicals through air, soil, surface water, and groundwater.

AQUATIC TAXONOMIC IDENTIFICATION: Prior to working at Terracon, Mrs. Griego investigated Salado Creek in San Antonio, for the San Antonio River Authority. Her work included analyzing the recycled water used to maintain flow in the creek, identify the 15 different species of fish and the 75 different species of invertebrate taxa, and use this analysis to assess the aquatic habitat. This information was used in a report for the Clean Rivers Project.

PROJECT EXPERIENCE

Environmental Site Assessments (ESAs)

Performed ESAs on several properties throughout Texas.

Project Manager- These assessments included reviewing available sources such as historical photographs, topographic maps, city directories, and endangered species reports, determination of wetlands, FCC regulations, and listed tribal and regulatory databases. The ESAs also included extensive knowledge and identification of distinctive features such as caves, cavities, dry river beds and distressed vegetation that may or may not be associated with environmental conditions..

U.S. Knipling-Bushland Livestock Insects Research Laboratory- Kerrville, Texas

Project Manager -Conducted a Phase I Environmental Site Assessment for a USDA insect research facility. Activities at the facility included pesticide and genetic insect research. The ESA investigation included: possible chemical and radioactive impacts in leach fields pertaining to various on-site septic systems, pesticides associated with the former dipping vat, spray barn, and spray room, PCBs from previously removed transformers, heavy metals and other potential impacts around the vat, spray barn, and spray room, PCBs from previously removed transformers, heavy metals and other potential impacts around the current and former (if known) maintenance and welding shops areas, petroleum hydrocarbon impacts from the former on-site ASTs, Asbestos and lead impacts in the vicinity of buildings that have been demolished on the site, and environmental conditions related to the sediment and sludge from the animal waste lagoons

Bulverde-Nacogdoches Development – San Antonio, Texas

Project Manager - Conducted a Phase I Environmental Site Assessment for a multi-parcel site that included the Cady (ROWCO) facility. ROWCO is an aerial applicator (crop dusting) business where helicopter repair, stripping and painting took place and pesticides were stored. Chemicals

Education

Master of Science in Aquatic Biology, 2005, Texas State University

Bachelor of Science, Geography, 2001, Southwest Texas State University

Certifications

TDSHS Licensed Individual Asbestos Inspector, # 602949

TDSHS Licensed Mold Assessment Consultant, #MAC1174

Affiliations

Commercial Real Estate Women

North American Benthological Society

Air and Waste Management Association

Work History

*Terracon Consultants, Inc.
Staff Environmental Scientist
2007-Present*

*San Antonio Parks Foundation,
Aquatic Biologist*

Clean Environments, Inc. San Antonio, TX, Environmental Scientist

identified on site included, paint remover that contained methylene chloride and epoxy stripper that contained chlorinated solvents. Additionally, an aboveground storage tank (AST) was observed on the Cady area of the site.

Lockhill Selma at DeZavala – San Antonio, Texas

Project Manager - Conducted a Phase I Environmental Site Assessment for the Stream Realty Acquisition over the Recharge and Contributing Zones of the Edwards Aquifer.

Fort Sam Houston Lighthouse – San Antonio, Texas

Project Manager - Conducted a Phase I Environmental Site Assessment for a 3-acre site on Fort Sam Houston. The tract of land has a long history that included WWII era buildings, pesticide usage, underground storage tanks, and a large number of environmental concerns on adjacent property and in the vicinity. A Phase II study was recommended to assess subsurface impacts.

Environmental Assessments (EAs)

Performed EAs on several properties throughout Texas.

These assessments included determining the effect of additions and new structures on the environment utilizing information from available sources such as, endangered species reports, wetlands determination, FCC regulations, and listed tribal and regulatory databases, State and Federal regulatory agencies.

Veterans Hospital EAs – San Antonio/Harlingen, Texas

Performed the threatened and endangered species portions of Environmental Assessments for the veterans hospitals in San Antonio and Harlingen. Contacted federal, state and local agencies concerning the effects of new facilities on the habitats of threatened and endangered species. Researched threatened and endangered species habitats and assessed the site location for potential habitat.

Additional Courses

40 Hour Hazardous Waste Operations and Emergency Response Course October 24, 2007

Hazardous Waste Operations and Emergency Response Refresher November 2008

40 USCOE Hour Wetland Delineation Certification Course October 26, 2007

Initial Asbestos Inspector Course, December 14, 2007

Asbestos Inspector Refresher, December 2009

Asbestos Inspector Refresher, December 2010

Initial Mold Consultant Course, June-July 2010

Storm Water Construction Inspector Workshop, January 19, 2007

Presentations

"The Japanese Tea Garden, Past, Present and a Plan for the Future"

Presented to various Optimist Clubs, Lions Clubs and other neighborhood organizations from July 2005 to March 2006.

"Effects of Recycled Wastewater Effluent as Augmented Baseflow on Benthic Macroinvertebrates in Salado Creek, Bexar County, TX" Presented to the Texas State University thesis committee, and, by invitation, to several Magnet Schools in the San Antonio School District in the Distinguished Lecture Series, May 2005-May 2007.

"Selective Predation and Optimal Foraging by Largemouth Bass, *Micropterus salmoides*" co-authored with Casey Williams, Brad Littrell and presented to the Texas Academy of Science Annual Meeting, 2003.

"Trans-Texas Water Project, Superhighways for Exotic Species" presented at the American Association of Geographers Annual Meeting 2001 and the Texas Academy of Science Annual Meeting 2001.



TEXAS DEPARTMENT OF STATE HEALTH SERVICES

BE IT KNOWN THAT

LENE L GRIEGO

is hereby licensed and authorized to perform as a

Mold Assessment Consultant

in the State of Texas and is hereby governed by the rights, privileges, and responsibilities set forth in Title 25, Texas Administrative Code, Chapter 295, relating to Texas Mold Assessment and Remediation Rules, as long as this license is not suspended or revoked.

A handwritten signature in cursive script, reading "David L. Lakey, M.D.".

David L. Lakey, M.D.
Commissioner of Health

License Number: MAC1174

Control Number: 7196

Expiration Date: 9/16/2012

(Void After Expiration Date)

VOID IF ALTERED NON-TRANSFERABLE

CINDY A. BALDWIN, CIH

SENIOR INDUSTRIAL HYGIENIST

PROFESSIONAL EXPERIENCE

Ms. Baldwin is an industrial hygienist in Terracon's Cedar Rapids, Iowa, office. She has 27 years of experience in the comprehensive practice of industrial hygiene, asbestos-related issues, occupational safety, and related services. She has held positions in both the regulated community and as the environmental consultant serving industry. She has provided clients with professional, practical solutions in her field nationwide and in Canada.

Her work experience also includes environmental areas of SARA Title III, hazardous and solid waste management, National Pollutant Discharge Elimination System (NPDES), air emissions, and Phase I Environmental Site Assessments. Other experience involved two years of experience with transportation of regulated hazardous materials.

She has experience in identifying environmental, health and safety issues in the public and plant environments and thereafter developing and implementing appropriate corrective actions. These include air and employee exposure monitoring for a wide variety of contaminants. Other industrial services involve noise monitoring, evaluation of ergonomics or evaluation of other worker environments. Her services include development and implementation of programs to meet regulatory requirements and for client loss prevention. She has developed and delivered environmental health and safety training programs to clients ranging from small businesses to large Fortune 500 firms. Her training audiences have included diverse client labor work forces, including organized labor, all levels of management, and environmental, health and safety professionals. She has trained and worked closely with public officials.

Technical experience includes management of projects, performance of environmental assessments, and identification of health and safety hazards through audits in public and private sector establishments. Her knowledge of OSHA, NFPA, DOT and EPA regulations is excellent and she has had experience with OSHA and EPA/DNR inspections.

PROJECT EXPERIENCE

AIR MONITORING

Personal exposure monitoring to evaluate employee exposures to various air contaminants, including:

- Calcium oxide, particulates, respirable silica, asbestos—Miami-Dade Water & Sewer Department, Miami, Florida
- Hexavalent chromium—Ivy Steel & Wire, Hazleton, Pennsylvania; Meadow Burke, Converse, Texas; Kraft Foods, Davenport, Iowa; Kinze Manufacturing, Williamsburg, Iowa
- Welding fume—Sears Manufacturing, Davenport, Iowa, Iowa; Kinze Manufacturing, Inc., Williamsburg, Iowa
- Respirable silica—Cargill Corn Milling, Cedar Rapids; Crawford Quarry, Cedar Rapids, Iowa,
- Propylene oxide, sulfur dioxide, particulates, respirable silica—Cargill, Wet Corn Milling, Cedar Rapids, Iowa
- Acetic acid, furfural—Danisco Sweeteners, Thomson, Illinois

EDUCATION

Master of Science, Environmental Health, Colorado State University

Bachelor of Science, Biology, Metropolitan State College

CERTIFICATIONS/ LICENSES

Certified Industrial Hygienist, Comprehensive Practice #3857

Licensed Industrial Hygienist, State of Illinois #232

Licensed Asbestos Inspector/Management Planner/Project Designer, Illinois ID #100-7020

Licensed Asbestos Inspector/Management Planner, Missouri license #7112103108MOIR12948; 7112103108MOMR12948

Asbestos Abatement Project Designer, Iowa license 08-5500PD

Asbestos Inspector/Management Planner, Iowa license 08-55021, 08-5501MP

AFFILIATIONS

American Industrial Hygiene Association (AIHA), Diplomate Member

American Society of Safety Engineers (ASSE)

WORK HISTORY

Terracon Consultants, Inc., Senior Industrial Hygienist, 2002-Present

Pointer Environmental, Inc., Senior Industrial Hygienist, 1997-2002

Beling Consultants, Project Manager, 1995-1997

Amana Refrigeration, Inc., Manager, Environmental Health and Safety, 1993-1995; Director, Occupational Health, 1984-1993

PROJECT EXPERIENCE (continued)

2008 FLOOD RECOVERY

Iowa flood recovery services, including asbestos inspections; entry procedures and personal protective equipment; and visual clearance inspections and mold testing following cleanup efforts; formaldehyde testing in mobile housing units:

- Cargill Corn Milling, Cedar Rapids, Iowa
- City of Cedar Rapids, Cedar Rapids, Iowa
- University of Iowa, Iowa City, Iowa
- PAMI Ryan Town Centre
- Cedar Falls Utilities, Cedar Falls, Iowa
- TrueNorth Companies, Cedar Rapids, Iowa
- Plaza 425, Cedar Rapids, Iowa
- GreatAmerica, Cedar Rapids, Iowa
- Parkview Church, Iowa City, Iowa

NOISE MONITORING

Personal exposure monitoring to evaluate employee exposures to noise, including:

- Miami-Dade Water & Sewer Department, Miami, Florida
- Cargill Corn Milling, Cedar Rapids, Iowa
- Illini Hospital, Silvis, Illinois
- Paper Cal Steel Co., St. Paul, Minnesota; Houston, Texas
- IPSCO Ontario Inc., Toronto, Ontario; Blytheville Works, Blytheville, Arkansas; IPSCO Tubulars, Inc., Geneva, Nebraska and Camanche, Iowa

Community noise surveys to evaluate environmental noise levels.

- Community Noise Survey, Nichols Aluminum, Davenport, Iowa
- Noise Assessment, HouTex Inn, Houston, Texas

INDOOR AIR QUALITY INVESTIGATIONS

Investigations of indoor air quality (IAQ) complaints, including evaluation of basic IAQ characteristics (carbon dioxide, carbon monoxide, temperature, humidity) and mold.

- Basic IAQ Indicators – Quad City Airport, Moline, Illinois; State Farm, Milwaukee, Wisconsin; Geneseo Telephone Company, Geneseo, Illinois; Genesis Medical Center, Bettendorf, Iowa; Intermec Technologies, Cedar Rapids, Iowa; Curves, Davenport, Iowa; Vera French Community Mental Health Center, Davenport, Iowa; Scott County, Davenport, Iowa
- Mold – Norwood Souvenir, Cedar Rapids, Iowa; Jorgensen Facilities Services, Cedar Rapids, Iowa; Yellow Book USA, Cedar Rapids, Iowa; RF Micro Devices, Cedar Rapids, Iowa; Albany Area Hospital, Albany, Minnesota; University of Dubuque, Dubuque, Iowa; Blackhawk College, Moline, Illinois; Intermec Technologies, Cedar Rapids, Iowa; GE Commercial Finance, Cedar Rapids, Iowa; Planned Parenthood of Greater Iowa, Des Moines, Iowa; Straka Johnson Architects, Dubuque, Iowa; Iowa State Patrol Post, Osceola.

TRAINING

Develop and deliver customized training programs including:

- Health Hazards in Construction – Master Builders of Iowa, Ames, Iowa
- Hearing Conservation – Cargill Corn Milling, Cedar Rapids, Iowa
- Risk Management Plan/Process Safety Management – Hellers Carbonic, Galva, Iowa
- Hazardous Waste, Hazard Communication, Container Handling – Recycle Aerosols, Laurens, Iowa
- Confined Space Entry and Confined Space Entry Refresher – Alcoa Davenport Works, Bettendorf, Iowa
- Spill Response, First Responder Operations Level and annual refreshers – Augustana College, Rock Island, Illinois

ENVIRONMENTAL SITE ASSESSMENTS/BROWNFIELDS

- Phase I Environmental Site Assessments for a variety of industrial and commercial clients.
- Participated in Brownfields projects for City of Cedar Rapids, Iowa and East Moline, Illinois
- Construction Monitoring/Site Specific Health Plans – Peters Construction Corp., Waterloo, Iowa; Rathje Construction, Cedar Rapids, Iowa; Dave Schmitt Construction, Cedar Rapids, Iowa.

ENVIRONMENTAL, HEALTH, AND SAFETY PROGRAMS

Develop site specific programs to meet regulatory requirements, including:

- Confined Space Entry Program – Croell Redi-Mix, Sumner, Iowa
- Spill Prevention, Control, and Countermeasures (SPCC) – Kirkwood Community College, Cedar Rapids, Iowa; City of Cedar Rapids, Cedar Rapids, Iowa
- Respiratory Protection Programs – Creative Edge Corporation, Fairfield, Iowa; Midland Davis Corporation, Moline, Illinois; Warkins Export Pre-Delivery, Moline, Illinois; and Davenport Machine, Davenport, Iowa

REMEDIATION PROJECTS

- Mold Remediation Guidelines – Blackhawk College, Moline, Illinois; Carroll County Housing Authority, Savanna, Illinois; City of Tipton, Tipton, Iowa; Iowa Illinois Taylor Insulation, Federal Building, Cedar Rapids, Iowa; Cincinnati Insurance Companies, Michael Residence, Muscatine, Iowa; Cincinnati Insurance Companies, Lundell Residence, Burlington, Iowa
- Lead-Based Paint Abatement Specification – City of Springfield, Springfield, Missouri
- Lead Work Plan (Firing Range) – Hardesty Federal Complex, Kansas City, Kansas

ASBESTOS

- Project Designer for asbestos abatement projects – Proposed Wal-Mart, Silvis, Illinois; Goldthorp Science Hall, University of Dubuque; Iowa State Records Building, Des Moines, Iowa; Denison Job Corp. Center, Denison, Iowa; Federal Building, Iowa City, Iowa.
- Project Manager for asbestos inspection projects – Management Company, Cedar Rapids, Iowa; AEGON USA Realty Advisers, Cedar Rapids, Iowa; Wal-Mart, Fairfield, Iowa; Iowa Department of Administrative Services, Tama, Coralville, Toledo, Fort Madison, and Mount Pleasant, Iowa
- Project Manager for asbestos abatement projects – Macerich Management Company, Cedar Rapids, Iowa; University of Iowa, Iowa City, Iowa; Iowa Department of General Services, Des Moines, Fort Madison, and Mount Pleasant, Iowa

PUBLICATIONS/PRESENTATIONS

Baldwin, C.A. and Ganson, G.A.: *Sampling Indoor Air Quality*, Environmental Protection, June 16, 2009, posted at <http://www.eponline.com/articles/72431/>.

Baldwin, C.A.: *Asbestos in Your Building*, Utah Buildings, Summer 2009:23-24.

Baldwin, C.A.: *Indoor Air Concerns*, Occupational Health and Safety, 75(7):26-32 (2006).

Baldwin, C.A., Beaulieu, H.J., Buchan, R.M., and Johnson, H.H.: *Asbestos in Colorado Schools*, Public Health Reports, 97(4):325-331 (1982).

Baldwin, C.A., Beaulieu, H.J., and Buchan, R.M.: *Application of the K² Asbestos Screening Test in Colorado Schools*, American Industrial Hygiene Association, J. 43(8):602-604 (1982).

Baldwin, C.A., *Noise Analysis and Control*, Occupational Hearing Conservationist Certification Course, Allen College, Waterloo, Iowa (2004, 2005, 2006, 2007).

Baldwin, C.A., *Noise Analysis and Control*, Occupational Hearing Conservationist Certification Course, St. Luke's Hospital, Cedar Rapids, Iowa (2006, 2008).

Baldwin, C.A., *Introduction to Industrial Hygiene*, Industrial Safety Class, University of Northern Iowa, Cedar Falls, Iowa (2004, 2005, 2006)

Baldwin, C.A., *Respiratory Protection*. American Society of Safety Engineers, Cedar Falls, Iowa (2007).

Baldwin, C.A., *Health Hazards in Construction*, Master Builders of Iowa, Des Moines, Amana, Dubuque, Iowa (2005, 2006, 2007, 2008).

Baldwin, C.A., *Two Hour Asbestos Awareness for Construction and Lead and Silica Awareness*, Master Builders of Iowa, Amana, Iowa (2006).

Baldwin, C.A., *Silica Awareness*, Master Builders of Iowa, 2007 Annual Convention / Iowa Construction Exposition, Des Moines, Iowa (2007, 2008).

Baldwin, C.A., *Indoor Air Quality and Mold*, Master Builders of Iowa, 2007 Annual Convention / Iowa Construction Exposition, Des Moines, Iowa (2007).

Baldwin, C.A., *Indoor Air Quality*, Design Engineers, Cedar Rapids, Iowa (2007).

Baldwin, C.A., *2008 Flood Recovery*, Rotary Club, ASSE, and ASCE, Cedar Rapids, Iowa (2008).

Baldwin, C.A., *Identify Hazardous Building Materials Before Your Next Renovation Project*, 2009 Annual Convention / Iowa Construction Exposition, Des Moines, Iowa (2009).



TEXAS DEPARTMENT OF STATE HEALTH SERVICES

Be it known that

TERRACON CONSULTANTS INC

is licensed to perform as a

Mold Assessment Company

in the State of Texas and is hereby governed by the rights, privileges, and responsibilities set forth in Title 25, Texas Administrative Code, Chapter 295, relating to Texas Mold Assessment and Remediation Rules, as long as this license is not suspended or revoked.

A handwritten signature in black ink, appearing to read "David Lakey MD".

David Lakey, M.D.
Commissioner of Health

License Number: ACO0117

Expiration Date: 12/14/2011

Control Number: 6483

(Void After Expiration Date)

VOID IF ALTERED NON-TRANSFERABLE