# TAB 8

**BioMax Environmental**
*Environmental Consulting and Industrial Hygiene Services*

December 16th, 2008

Mr. Doug Button
Deputy Director
Real Estate Services Division
707 Third Street - 8th Floor
West Sacramento, CA 95605

**Post Mitigation Assessment Report**
**Department of General Services**
**Board of Equalization Building, 450 N. Street**
**Break Room 2014**
**Sacramento, California**

Mr. Button,

BioMax Environmental, LLC (BioMax) is pleased to provide The Department of General Services (DGS) with this letter summary report detailing BioMax's findings and recommendations pertaining to our post mitigation microbial inspection and sampling assessment services provided within the noted break room within the Board of Equalization (BOE) building located at 450 N Street, Sacramento, California. BioMax understands that these post mitigation microbial inspection and sampling assessment services were contracted with BioMax, at your request, in an effort to review and verify the successful completion of microbial mitigative efforts performed by your restoration contractor, JLS Environmental, Inc., (JLS) within the previously identified area located within the subject building.

Therefore, these post mitigation clearance assessment services are intended to assess the current site conditions wherein mitigative activities were performed by JLS to investigate and address (as needed) the prior moisture and mold related damages and impacts. Procedural recommendations pertaining to BioMax's review of historical and analytical data associated with the subject break room and adjacent interior areas have been summarized within our previously developed procedural assessment reports including those entitled:

- Mitigation Procedures for Moisture Impacted – Break Room Area, dated March 19th, 2008.
- Mitigative and Clean Up Procedures for Interior Electrical/Data Rooms, Janitorial Rooms, Supply Rooms, Copy Rooms, Storage Rooms, and Rest Room Areas, dated May 7th, 2008.
- Microbial Assessment of Break Room Areas ("Building Wide"), dated July 11th, 2008

Additional historical reports and assessment data may also be obtained for further background and technical reference, as necessary.

Hence, these post mitigation microbial clearance assessment services, thereby, are intended to provide a professional evaluation verifying the physical conditions wherein the successful completion of microbial removal and decontamination within each of the affected areas has been achieved. Following the completion of the prescribed mitigative activities performed by your mitigation contractor, Mr. Michael A. Polkabla, CIH, REA of BioMax performed a detailed post mitigation site inspection and sampling assessment within each of the affected interior areas (and adjacent impacted areas as necessary) as noted in this report. BioMax's findings and conclusions pertaining to these post mitigation sampling assessment activities are, therefore, summarized herein.

## SITE OBSERVATIONS

Site inspection and post mitigation assessment sampling activities were performed within the noted Break Room 2014 on December 8th, 2008. Site access into the noted contained area was facilitated by site contractor and DGS personnel. On this date, Mr. Michael A. Polkabla, CIH, REA of BioMax performed a detailed visual site inspection within the noted containment system barriers associated with the noted break room area. Following the performance of a detailed visual assessment within this area (indicating acceptable visual post mitigation conditions), BioMax collected a series of airborne SporeTrap confirmation samples within and surrounding the noted area as noted below.

On-site inspection and clearance sampling assessment activities were performed by Mr. Michael A. Polkabla, CIH, REA, of BioMax in accordance with currently recognized microbial assessment and sampling guideline procedures. Mr. Polkabla has been certified in the Comprehensive Practice of Industrial Hygiene by the American Board of Industrial Hygiene and holds the right to the designation "Certified Industrial Hygienist" (CIH) under certification number CP 7104. Mr. Polkabla is also certified by the California Environmental Protection Agency (Cal/EPA) as a Class I Registered Environmental Assessor (REA) under Cal/EPA certification number 05011. Previously established clearance criteria developed for these activities has been formalized in BioMax's Post Mitigation Clearance Assessment Protocols dated February 15th, 2008. Such protocols have been reviewed and approved by BOE's environmental consultant, Hygientech International, Inc. (HTI) prior to implementation. A summary of significant notations and observations gathered during BioMax's site inspection and post mitigation clearance assessment activities within the subject containment areas are compiled as follows:

1. At the time of our site inspection and clearance sampling assessment performed on December 8th, 2008 ambient outdoor conditions both prior to and following our interior assessment activities consisted of clear and cold conditions with an outdoor temperatures range between 43 and 48 degrees F and relative humidity of 37-39 %, respectively. Predominant winds were noted at approximately 0-5 knots from the southwesterly direction at the time of our

assessment. Interior environmental conditions within the sampled containment area consisted of a temperature range between 67 and 68 degrees F with relative humidity of 28-29 percent.

2. At the time of this assessment, the interior containment barrier system, whereby microbial mitigative and inspection activities were performed, were observed to be established and maintained within the impacted areas as per BioMax's protocols. Specific detail as noted on the "as built" construction site floor diagram documents (maintained by the site contractor, JLS) may be reviewed for further reference as necessary. During mitigative activities, BioMax routinely performed regular and periodic inspections and review of records/conditions within and surrounding each of the noted containment areas. A review of such information has indicated a preponderance of evidence verifying that the current barrier systems have provided appropriate protective controls for the duration and performance of the noted mitigative activities.

3. During the post mitigation inspection within the noted containment area, BioMax noted the absence of visible evidence of elevated residual moisture and/or microbial indicators (such as staining, delamination, etc.) within the remaining exposed interior walls, flooring, wall framing, and wall cavities following the performance of the prescribed mitigative measures. Utilization of a TraMex hand-held inductive moisture meter indicated normal moisture content within all remaining walls and building materials inspected within the sampled containment area at the time of our assessment.

4. As noted within the previously referenced assessment reports and summary documents, the primary affected areas of visible moisture damage previously identified within the noted break room primarily included moisture staining and mold damaged cabinetry, adjacent flooring, and wallboard materials. According to BioMax's review of current evidence and available historical data, it is BioMax's opinion that such material damage has likely followed a history of plumbing related water/moisture releases, tenant-specific activities, and resultant maintenance actions over an extended period of time. At the time of this post mitigation assessment, BioMax noted that all floor mounted cabinets, all tile flooring, and affected wallboard materials had been removed from the app. 10 x 15 ft break room area as per the established protocols.

5. The establishment of containment system barriers encompassing the doorway entrance to the noted break room were observed and verified under appropriate posting and negative pressure differential at the time of this post mitigation assessment. Worker and equipment entry and exit chambers comprised of a series of zippered plastic access doorways were also observed attached to the noted containment barriers consistent with BioMax's previously noted mitigation protocols.

6. As verified during these assessment activities, all identified affected interior wallboard building materials had been removed from each of the noted interior areas of concern exposing interior wall cavity framing (metal) and underlayment wallboard siding materials present within each of the impacted materials and areas. Upon post mitigation inspection, all

remaining exposed building materials located within the break room exhibited no significant staining and/or elevated mold growth following the completion of prescribed physical material removal and chemical decontamination procedures performed by JLS.

7. Digital images and schematic records have been developed and maintained by JLS for the duration the performance of these mitigative removal activities indicating the extent and areas where visible staining and/or mold like indicators have been identified within the exposed wall cavities and wall cavity underlayment materials and subsequently removed within each containment area. Such records have been reviewed by BioMax as part of this clearance assessment and may be provided by JLS for additional review upon request. BioMax has estimated that a total of 25 square feet of sheetrock had been removed from Break Room 2014 as part of the mitigative effort. Mold and/or moisture related staining present on these (removed) sheetrock materials consisted of an estimated total of less than 2 percent by relative area.

8. Following the completion of visual inspections within each of these containment areas, BioMax collected series airborne samples within and outside the containment systems noted below for subsequent comparative analysis. Such samples collected within and surrounding each the interior containment system were performed in an effort to identify and quantify the presence of potential airborne mold spores present within (and surrounding) the containment systems following the completion of the prescribed mitigative effort. Findings associated with these verification sampling activities are noted below.

9. BioMax also collected a series of digital images during these post mitigative inspection and sampling assessment activities to document the conditions and significant site observations gathered at this time. Such images are provided as an attachment to this summary report for further reference, as necessary.

## SAMPLING PROCEDURES

On-site inspection and sampling assessment activities were conducted by Mr. Michael A. Polkabla, CIH, REA, of BioMax Environmental within the noted break room and adjacent areas on December 8th, 2008. All sampling equipment, supplies, calibration materials, and collection media were provided and maintained by BioMax as part of the performance of this scope of work. Sample collection procedures and methods were performed using standard industrial hygiene sampling methods following techniques prescribed by the contracted analytical laboratory.

### Spore Trap Airborne Microbial and Particulate Sampling:

The collection of airborne Spore Trap microbial samples was achieved using Zefon Air-O-Cell sampling cassette collection devices placed in each of the areas identified in the tables below. Airborne Spore Trap samples were collected within and outside each of the containment area locations at a height of approximately four feet above ground level using a tripod mounted Quick

Take 15 air sampling pump manufactured by SKC. Samples were collected at a calibrated flow rate of 15 liters per minute for a total of five minutes per sample. Resultant total sample volumes, therefore, corresponded to 75 liters collected for each collected sample. Field calibration of the SKC air sampling pump was conducted using a field rotometer devise calibrated with a Bios Drycal primary standard flow meter. All spore trap air sampling and analytical procedures were performed in accordance with prescribed manufacturer guidelines as well as applicable professional certified industrial hygiene indoor air quality microbial investigation procedures and certified industrial hygiene practices.

Additional exterior ambient samples were also similarly collected and analyzed before and after the interior sample collection in an effort to identify and quantify representative background microbial taxa (types), rank order, and corresponding airborne spore levels present within the ambient environment at the time of this assessment for comparative purposes. Sampling collection activities performed during this study included the collection of identifiable airborne microbial contaminants within the representative area locations noted in Table 1:

**Table 1. Airborne Spore Trap Sampling Locations of Break Room 2014:**

| Air Sample Number | Spore Trap Air Sampling Location |
|---|---|
| 14354946 | Ambient Pre-interior Sample at Garage 3rd Level Area |
| 14525158 | 20th Floor Hallway outside Break Room 2014 (outside containment) |
| 14525182 | Break Room 2014 (inside containment) |
| 142525190 | Ambient Post Sample at Ground Level Main Entrance |

At the conclusion of sampling activities, preparation and shipping of the collected samples were accomplished in accordance with standard industrial hygiene chain of custody (COC) documentation procedures and quality assurance/quality control practices. Once collected, labeled, and recorded, all samples were double sealed within airtight plastic Ziploc shipping containers and transported via Federal Express Priority Mail to Environmental Microbial Laboratories (EMLabs) in San Bruno, California. EMLabs holds current applicable analytical accreditation and specializes in microbial analytical procedures. Sampling and chain of custody records are provided as an attachment to this letter report for further reference.

## ANALYTICAL FINDINGS AND CONCLUSIONS

### Airborne Spore Trap Findings Break Room 2014:

Laboratory analytical methods for the identification and enumeration of microbial (mold) taxa and particulate contaminants were conducted in accordance with prescribed analytical procedures and quality control/assurance measures. Original laboratory results including the enumeration of recognizable microbial spore and particulate types are also attached to this letter report for further

reference and detail. A summary of airborne Spore Trap microbial (mold) and particulate findings pertaining to each of the subject areas are presented in Table 2 below:

**Table 2. Airborne Microbial and Particulate Findings – Break Room 707 and 706 Supply Room.**

| Location Desc. | Total Mold Spores (Cts/m3) | Background Debris (scale of 1-4) | Skin Cell Fragments (scale of 1-4) | Hyphal Fragments (units/m3) |
|---|---|---|---|---|
| Ambient Pre-interior Sample at Garage 3rd Level Area | 3,300 | 2+ | <1+ | <13 |
| 20th Floor Hallway outside Break Room 2014 (outside containment) | 110 | 2+ | 1+ | <13 |
| Break Room 2014 (inside containment) | 410 | 3+ | 2+ | <13 |
| Ambient Post Sample at Ground Level Main Entrance | 2,400 | 2+ | 1+ | <13 |

The analytical findings presented in Table 2 above clearly indicate the presence of significantly lower concentrations of total microbial (mold) spores measured within the interior samples collected both within and surrounding the subject break room containment area when compared to the levels currently measured within the samples collected from the corresponding ambient outside environment. Analytical findings also indicate similar fungal taxa distribution (mold types) and rank order (predominant taxa) of molds identified within the mitigated areas as well as the adjacent hallway area sampled (area noted as "Hallway" outside containment). Analysis of fungal hyphal fragments (vegetative fungal growth structures) also indicated the absence of fungal growth structures within the interior containment area s as similarly noted and compared to the corresponding levels found within the collected ambient outside environmental samples. Particularly worthy of note, was the verified absence of elevated levels of hydrophilic (moisture loving) airborne mold spore taxa following the performance of mitigative activities within the noted containment areas.

Although there are currently no regulatory standards or limits pertaining to allowable airborne fungal concentrations (for any mold taxa) present in indoor environments, there is a general consensus among indoor air quality experts that airborne microbial contamination found within "typical healthy" living and working spaces are generally similar in kind and present at levels which are below those found in the corresponding native outside environment. BioMax believes that the absence of visible staining resultant from moisture and/or residual mold, the absence of elevated residual moisture, absence of elevated airborne hyphal (mold growth) structures, and relatively fewer total airborne mold levels with typical taxa and rank order distribution following mitigative clean-up activities are consistent with these generally acceptable interior space

conditions. BioMax, therefore, believes that these findings provide reasonable evidence indicating that current microbial removal and clean-up measures have successfully mitigated mold contamination within the above noted areas and materials to normal representative levels.

Based on these findings, BioMax believes that the current physical site conditions present within the mitigated areas may be considered acceptable in meeting both the visual and analytical clearance criteria established for these activities. As such, BioMax's review and interpretation of the collected analytical data associated with the noted containment areas has been shown to meet the previously referenced clearance criteria established for these activities. Such clearance criteria has been presented in BioMax's Post Mitigation Clearance Assessment Protocols dated February 15th, 2008, and has been reviewed and approved by BOE's environmental consultant, HTI. Therefore, BioMax believes that the verified achievement of such criteria supports BioMax's determination that the noted break room's mitigated area may be considered acceptable for reconstruction at this time.

**Airborne Particulate Findings:**

Analytical particulate findings also sampled and analyzed as part of this assessment identified, what BioMax believes to be, "unremarkable" levels present within the collected air samples. Such findings within and surrounding the noted containment area also provide reasonable evidence indicating that current particulate clean-up and mitigative control measures have successfully controlled and contained particulate debris within the identified containment areas.

## RECOMMENDATIONS

Based on BioMax's post mitigation assessment findings and conclusions presented in this report, BioMax believes that the current airborne microbial levels sampled and analyzed from within break room 2014 provides no significant evidence of elevated residual microbial contamination or airborne contamination/migration following the completion of the prescribed microbial mitigative measures. BioMax understands that parallel airborne assessment sampling performed within these containment areas by BOE's consultant, HTI, has indicated acceptable airborne microbial levels following the completion of the mitigative effort. However, one of the two HTI surface tape samples collected from an exposed metal frame stud within Break Room 2014 had indicated the presence of a single spore of Chaetomium as referenced in HTI's data table 20812001-3, dated December 8, 2008. In an email transmittal dated 12/09/08, Mr. Kenny Hsi of HTI indicated ...

> "HygieneTech does not consider the containment "cleared". HygieneTech recommends that additional detail cleaning be performed on the flooring surface and the lower two feet of all walls or metal studs within the open wall cavities. Once such cleaning has been performed, HygieneTech would collect additional random sample(s) within the containment."

It is BioMax's professional opinion that the presence of a single loose spore (and absence of hyphal growth and/or sporulating structures) as indicated by HTI's data within a single surface sample does not and should not constitute the failure of the area in meeting an acceptable

clearance criteria level. BioMax's stated position on this matter is consistent with general microbial industry standards and criteria referenced by the American Industrial Hygiene Association (AIHA) as indicated in the AIHA's current reference guide publication entitled Recognition, Evaluation and Control of Indoor Mold published in 2008. However, current direction has been provided by DGS to BioMax and JLS that the additional detail cleaning be performed in accordance with the referenced HTI December 9th recommendation. As of the time of this report, BioMax understands that such additional cleaning has been accomplished by the site mitigation contractor as directed by DGS.

Hence, based on current site observations, field measurements, and review of all available findings at this time, BioMax believes that the mitigated areas within the noted break room containment may be considered acceptable for general reconstruction following prudent reconstruction practices. Therefore, based on our professional review and interpretation of these current referenced findings, BioMax provides the following recommendations for consideration as discussed below:

1. BioMax believes that current airborne microbial (mold) levels and mold taxa (types) identified within Break Room 2014 are currently consistent with generally acceptable conditions and industry standard parameters following the performance of the mitigative activities noted. Hence, BioMax recommends that no further airborne and/or surface microbial sampling activities are warranted within this specific noted containment area and that the containment systems may be deactivated at this time.

2. During the performance of interior reconstruction activities, BioMax recommends that a qualified and experienced building inspector/contractor be utilized to verify the current compliance and functional integrity of all applicable building related plumbing, flashing, sealing, and drainage systems in accordance with current building codes and construction practices. Any identified deficiencies should be appropriately documented, corrected, and functionally verified (tested) prior to subsequent reconstruction. Certainly, the establishment and/or installation of any additional corrective measures or engineering controls (as identified through additional professional engineering consultation) should also be performed and implemented in accordance with applicable standards, building codes, and ordinances, as appropriate.

3. BioMax recommends that reconstruction of interior structural building materials within these areas should only be undertaken utilizing high quality, visibly clean (hand selected) construction grade building materials obtained from reputable commercial sources and which are verified through visual assessment to be free from elevated microbial contamination and/or elevated moisture content. Building materials, which are notably moist and/or visibly stained, should not be used during the reconstruction undertaken within the subject building.

4. BioMax also recommends that current plastic barriers (as established during this mitigative activity) should remain during any reconstruction activity so as to minimize the potential transmission of associated nuisance construction dust and debris as desired.

5. Reasonable additional assessment and investigative measures may also be required upon the identification of new or previously undiscovered materials and/or information related to moisture/microbial impacts within the noted structures and/or areas, as necessary. Any occurrence and/or re-occurrence of moisture intrusion following reconstruction within these areas should also be reviewed and addressed through additional professional consultation, as necessary. BioMax is certainly prepared to provide such professional consultation pertaining to these and any follow-up investigative measures upon request.

BioMax believes that the conclusions and recommendations provided above are consistent with standard industry microbial mitigative practices and prudent industrial hygiene hazard control and assessment methods. Please do not hesitate to contact me directly at (510) 724-3100 if you have any questions, comments, and/or require further assistance regarding this subject matter.

Sincerely,

Michael A. Polkabla, CIH, REA
Vice President, Principal

## LIMITATIONS

Please note that the professional opinions presented in this review are intended for the sole use of the California State Department of General Services (DGS) and their designated beneficiaries. No other party should rely on the information contained herein without the prior written consent of BioMax Environmental and DGS. The professional opinions provided herein are based on BioMax's review and understanding of current site information and observed site conditions present within the areas inspected at the time these services were performed. Professional recommendations provided as part of this limited scope of work are intended for client consideration only and are not intended as a professional or regulatory mandate. Implementation of any of the above measures or recommendations does not, in any way, warrant the day-to-day health and/or safety of building occupants, residents, site workers, nor regulatory or building code compliance status during normal and changing environmental conditions. As microbial contamination, by nature, may change over time due to additional moisture intrusion, favorable growth conditions, and changing environments, the findings of this report are subject to change in the event that such conditions and/or environments arise. Also, the professional opinions expressed here are subject to revision in the event that new or previously undiscovered information is obtained or uncovered.

The information contained in this and any other applicable communication is for consideration purposes only. It is not intended, nor should it be construed as providing legal advice or warranting any level of safety or regulatory compliance. The sole purpose of such information is to assist with the anticipation, identification, evaluation and control of elevated and/or unnecessary health of physical hazards. Any action taken based on this information, including but not limited to opinions, suggestions and recommendations, whether implied or expressed, is the sole responsibility of the individual taking the action. The management of acceptable health and safety is criteria dependent and situation specific in nature, therefore requiring extensive knowledge and prudent value assessments so as to be properly determined and maintained.

These services were performed by BioMax in accordance with generally accepted professional industrial hygiene principals, practices, and standards of care. Under the existing Industrial Hygiene Definition and Registration Act, all reports, opinions or official documents prepared by a Certified Industrial Hygienist (CIH) constitutes an expression of professional opinion regarding those facts or findings which are subject of a certification and does not constitute a warranty or guarantee, either expressed or implied.

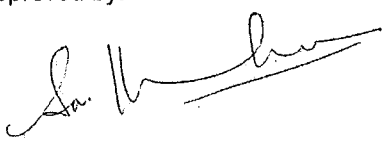
**EMLab P&K**

Report for:

**Mr. Michael Polkabla**
**Biomax Environmental**
775 San Pablo Ave.
Pinole, CA 94564

Regarding: Project: 120808-01; DGS, BOE Bld, Rm 2014 Assessment
EML ID: 495532

Approved by:



Lab Manager
Dr. Kamashwaran Ramanathan

Dates of Analysis:
Spore trap analysis: 12-10-2008

Project SOPs: Spore trap analysis (I100000)

This coversheet is included with your report in order to comply with AIHA and ISO accreditation requirements.

For clarity, we report the number of significant digits as calculated; but, due to the nature of this type of biological data, the number of significant digits that is used for interpretation should generally be one or two. All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. Due to the nature of the analyses performed, field blank corrections of results is not a standard practice. The results relate only to the items tested.

EMLab P&K ("the Company") shall have no liability to the client or the client's customer with respect to decisions or recommendations made, actions taken or courses of conduct implemented by either the client or the client's customer as a result of or based upon the Test Results. In no event shall the Company be liable to the client with respect to the Test Results except for the Company's own willful misconduct or gross negligence nor shall the Company be liable for incidental or consequential damages or lost profits or revenues to the fullest extent such liability may be disclaimed by law, even if the Company has been advised of the possibility of such damages, lost profits or lost revenues. In no event shall the Company's liability with respect to the Test Results exceed the amount paid to the Company by the client therefor.

**EMLab P&K**
1150 Bayhill Drive, Suite 100, San Bruno, CA 94066
(650) 829-5800 Fax (650) 829-5852 www.emlab.com

Client: Biomax Environmental
C/O: Mr. Michael Polkabla
Re: 120808-01; DGS, BOE Bld, Rm 2014 Assessment

Date of Receipt: 12-09-2008
Date of Report: 12-10-2008

## SPORE TRAP REPORT: NON-VIABLE METHODOLOGY

| Location: | 14354946: Ambient garage, 3rd level | | 14525158: 2014 area, outside containment | | 14525182: Break room 2014, in cont | | 14525190: Ambient front main entry | |
|---|---|---|---|---|---|---|---|---|
| Comments (see below) | None | | None | | None | | None | |
| Lab ID-Version‡: | 2189084-1 | | 2189085-1 | | 2189086-1 | | 2189087-1 | |
| | raw ct. | spores/m3 | raw ct. | spores/m3 | raw ct. | spores/m3 | raw ct. | spores/m3 |
| Alternaria | | | | | | | | |
| Arthrinium | | | | | | | | |
| Ascospores* | 11 | 590 | | | 1 | 53 | 6 | 320 |
| Aureobasidium | | | | | | | | |
| Basidiospores* | 41 | 2,200 | 1 | 53 | | | 26 | 1,400 |
| Bipolaris/Drechslera group | | | | | | | | |
| Botrytis | | | | | | | | |
| Chaetomium | | | | | | | | |
| Cladosporium | 7 | 370 | | | 4 | 210 | 10 | 530 |
| Curvularia | | | | | | | | |
| Epicoccum | | | | | | | | |
| Fusarium | | | | | | | | |
| Myrothecium | | | | | | | | |
| Nigrospora | | | | | | | | |
| Other brown | | | | | 1 | 13 | | |
| Penicillium/Aspergillus types† | 3 | 160 | 1 | 53 | 2 | 110 | 3 | 160 |
| Pithomyces | | | | | | | | |
| Rusts* | | | | | | | | |
| Smuts*, Periconia, Myxomycetes* | | | | | 2 | 27 | | |
| Stachybotrys | | | | | | | | |
| Stemphylium | | | | | | | | |
| Torula | | | | | | | | |
| Ulocladium | | | | | | | | |
| Zygomycetes | | | | | | | | |
| Background debris (1-4+)†† | 2+ | | 2+ | | 3+ | | 2+ | |
| Hyphal fragments/m3 | < 13 | | < 13 | | < 13 | | < 13 | |
| Pollen/m3 | < 13 | | < 13 | | < 13 | | < 13 | |
| Skin cells (1-4+) | < 1+ | | 1+ | | 2+ | | 1+ | |
| Sample volume (liters) | 75 | | 75 | | 75 | | 75 | |
| § TOTAL SPORE/m3 | | 3,300 | | 110 | | 410 | | 2,400 |

**Comments:**

* Most of these spore types are not seen with culturable methods (Andersen sampling), although some may appear as non-sporulating fungi. Most of the basidiospores are "mushroom" spores while the rusts and smuts are plant pathogens.
† The spores of *Aspergillus* and *Penicillium* (and others such as *Acremonium, Paecilomyces*) are small and round with very few distinguishing characteristics. They cannot be differentiated by non-viable sampling methods. Also, some species with very small spores are easily missed, and may be undercounted.
††Background debris indicates the amount of non-biological particulate matter present on the trace (dust in the air) and the resulting visibility for the analyst. It is rated from 1+ (low) to 4+ (high). Counts from areas with 4+ background debris should be regarded as minimal counts and may be higher then reported. It is important to account for samples volumes when evaluating dust levels.
The Limit of Detection is the product of a raw count of 1 and 100 divided by the percent read. The analytical sensitivity (counts/m3) is the product of the Limit of Detection and 1000 divided by the sample volume.
‡ A "Version" greater than 1 indicates amended data.
§ Total Spores/m3 has been rounded to two significant figures to reflect analytical precision.

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Client: Biomax Environmental
C/O: Mr. Michael Polkabla
Re: 120808-01; DGS, BOE Bld, Rm 2014
Assessment

Date of Receipt: 12-09-2008
Date of Report: 12-10-2008

## MoldRANGE™: Extended Outdoor Comparison

## Outdoor Location: 14354946, Ambient garage, 3rd level

| Fungi Identified | Outdoor data | Typical Outdoor Data by Date† Month: December | | | | Typical Outdoor Data by Location‡ State: CA | | | |
|---|---|---|---|---|---|---|---|---|---|
| | spores/m3 | low | med | high | freq % | low | med | high | freq % |
| **Generally able to grow indoors*** | | | | | | | | | |
| Alternaria | - | 7 | 20 | 200 | 38 | 7 | 27 | 210 | 58 |
| Bipolaris/Drechslera group | - | 7 | 13 | 200 | 14 | 7 | 13 | 120 | 13 |
| Chaetomium | - | 7 | 13 | 150 | 10 | 7 | 13 | 120 | 19 |
| Cladosporium | 370 | 27 | 370 | 6,200 | 91 | 53 | 630 | 6,500 | 98 |
| Curvularia | - | 7 | 27 | 590 | 14 | 7 | 13 | 230 | 7 |
| Nigrospora | - | 7 | 13 | 180 | 13 | 7 | 13 | 160 | 8 |
| Penicillium/Aspergillus types | 160 | 27 | 210 | 2,400 | 84 | 38 | 210 | 2,400 | 87 |
| Stachybotrys | - | 7 | 13 | 340 | 3 | 7 | 13 | 300 | 5 |
| Torula | - | 7 | 13 | 150 | 6 | 7 | 13 | 150 | 12 |
| **Seldom found growing indoors**** | | | | | | | | | |
| Ascospores | 590 | 13 | 110 | 2,900 | 65 | 13 | 110 | 1,800 | 72 |
| Basidiospores | 2,200 | 13 | 260 | 11,000 | 88 | 13 | 210 | 6,800 | 94 |
| Rusts | - | 7 | 13 | 210 | 14 | 7 | 13 | 250 | 28 |
| Smuts, Periconia, Myxomycetes | - | 7 | 27 | 370 | 61 | 8 | 40 | 480 | 70 |
| **TOTAL SPORES/M3** | 3,320 | | | | | | | | |

† The Typical Outdoor Data by Date represents the typical outdoor spore levels across North America for the month indicated. The last column represents the frequency of occurrence. The low, medium, and high values represent the 2.5, 50, and 97.5 percentile values of the spore type when it is detected. For example, if the frequency of occurrence is 63% and the low value is 53, it would mean that the given spore type is detected 63% of the time and, when detected, 2.5% of the time it is present in levels above the detection limit and below 53 spores/m3. These values are updated periodically, and if enough data is not available to make a statistically meaningful assessment, it is indicated with a dash.

‡ The Typical Outdoor Data by Location represents the typical outdoor spore levels for the region indicated for the entire year. As with the Typical Outdoor Data by Date, the four columns represent the frequency of occurrence and the typical low, medium, and high concentration values for the spore type indicated. These values are updated periodically, and if enough data is not available to make a statistically meaningful assessment, it is indicated with a dash.

*The spores in this category are generally capable of growing on wet building materials in addition to growing outdoors. Building related growth is dependent upon the fungal type, moisture level, type of material, and other factors. *Cladosporium* is one of the predominant spore types worldwide and is frequently present in high numbers. *Penicillium/Aspergillus* species colonize both outdoor and indoor wet surfaces rapidly and are very easily dispersed. Other genera are usually present in lesser numbers.

**These fungi are generally not found growing on wet building materials. For example, the rusts and smuts are obligate plant pathogens. However, in each group there are notable exceptions. For example, agents of wood decay are members of the basidiomycetes and high counts of a single morphological type of basidiospore on an inside sample should be considered significant.

Interpretation of the data contained in this report is left to the client or the persons who conducted the field work. This report is provided for informational and comparative purposes only and should not be relied upon for any other purpose. "Typical outdoor data" are based on the results of the analysis of samples delivered to and analyzed by EMLab P&K and assumptions regarding the origins of those samples. Sampling techniques, contaminants infecting samples, unrepresentative samples and other similar or dissimilar factors may affect these results. In addition, EMLab P&K may not have received and tested a representative number of samples for every region or time period. EMLab P&K hereby disclaims any liability for any and all direct, indirect, punitive, incidental, special or consequential damages arising out of the use or interpretation of the data contained in, or any actions taken or omitted in reliance upon, this report.

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Client: Biomax Environmental
C/O: Mr. Michael Polkabla
Re: 120808-01; DGS, BOE Bld, Rm 2014 Assessment

Date of Receipt: 12-09-2008
Date of Report: 12-10-2008

## MoldRANGE™: Extended Outdoor Comparison

## Outdoor Location: 14525190, Ambient front main entry

| Fungi Identified | Outdoor data | Typical Outdoor Data by Date† Month: December | | | | Typical Outdoor Data by Location‡ State: CA | | | |
|---|---|---|---|---|---|---|---|---|---|
| | spores/m3 | low | med | high | freq % | low | med | high | freq % |
| **Generally able to grow indoors*** | | | | | | | | | |
| Alternaria | - | 7 | 20 | 200 | 38 | 7 | 27 | 210 | 58 |
| Bipolaris/Drechslera group | - | 7 | 13 | 200 | 14 | 7 | 13 | 120 | 13 |
| Chaetomium | - | 7 | 13 | 150 | 10 | 7 | 13 | 120 | 19 |
| Cladosporium | 530 | 27 | 370 | 6,200 | 91 | 53 | 630 | 6,500 | 98 |
| Curvularia | - | 7 | 27 | 590 | 14 | 7 | 13 | 230 | 7 |
| Nigrospora | - | 7 | 13 | 180 | 13 | 7 | 13 | 160 | 8 |
| Penicillium/Aspergillus types | 160 | 27 | 210 | 2,400 | 84 | 38 | 210 | 2,400 | 87 |
| Stachybotrys | - | 7 | 13 | 340 | 3 | 7 | 13 | 300 | 5 |
| Torula | - | 7 | 13 | 150 | 6 | 7 | 13 | 150 | 12 |
| **Seldom found growing indoors**** | | | | | | | | | |
| Ascospores | 320 | 13 | 110 | 2,900 | 65 | 13 | 110 | 1,800 | 72 |
| Basidiospores | 1,400 | 13 | 260 | 11,000 | 88 | 13 | 210 | 6,800 | 94 |
| Rusts | - | 7 | 13 | 210 | 14 | 7 | 13 | 250 | 28 |
| Smuts, Periconia, Myxomycetes | - | 7 | 27 | 370 | 61 | 8 | 40 | 480 | 70 |
| **TOTAL SPORES/M3** | 2,410 | | | | | | | | |

† The Typical Outdoor Data by Date represents the typical outdoor spore levels across North America for the month indicated. The last column represents the frequency of occurrence. The low, medium, and high values represent the 2.5, 50, and 97.5 percentile values of the spore type when it is detected. For example, if the frequency of occurrence is 63% and the low value is 53, it would mean that the given spore type is detected 63% of the time and, when detected, 2.5% of the time it is present in levels above the detection limit and below 53 spores/m3. These values are updated periodically, and if enough data is not available to make a statistically meaningful assessment, it is indicated with a dash.

‡ The Typical Outdoor Data by Location represents the typical outdoor spore levels for the region indicated for the entire year. As with the Typical Outdoor Data by Date, the four columns represent the frequency of occurrence and the typical low, medium, and high concentration values for the spore type indicated. These values are updated periodically, and if enough data is not available to make a statistically meaningful assessment, it is indicated with a dash.

*The spores in this category are generally capable of growing on wet building materials in addition to growing outdoors. Building related growth is dependent upon the fungal type, moisture level, type of material, and other factors. *Cladosporium* is one of the predominant spore types worldwide and is frequently present in high numbers. *Penicillium/Aspergillus* species colonize both outdoor and indoor wet surfaces rapidly and are very easily dispersed. Other genera are usually present in lesser numbers.

**These fungi are generally not found growing on wet building materials. For example, the rusts and smuts are obligate plant pathogens. However, in each group there are notable exceptions. For example, agents of wood decay are members of the basidiomycetes and high counts of a single morphological type of basidiospore on an inside sample should be considered significant.

Interpretation of the data contained in this report is left to the client or the persons who conducted the field work. This report is provided for informational and comparative purposes only and should not be relied upon for any other purpose. "Typical outdoor data" are based on the results of the analysis of samples delivered to and analyzed by EMLab P&K and assumptions regarding the origins of those samples. Sampling techniques, contaminants infecting samples, unrepresentative samples and other similar or dissimilar factors may affect these results. In addition, EMLab P&K may not have received and tested a representative number of samples for every region or time period. EMLab P&K hereby disclaims any liability for any and all direct, indirect, punitive, incidental, special or consequential damages arising out of the use or interpretation of the data contained in, or any actions taken or omitted in reliance upon, this report.

12-10-2008: 120808-01

**EMLab P&K**
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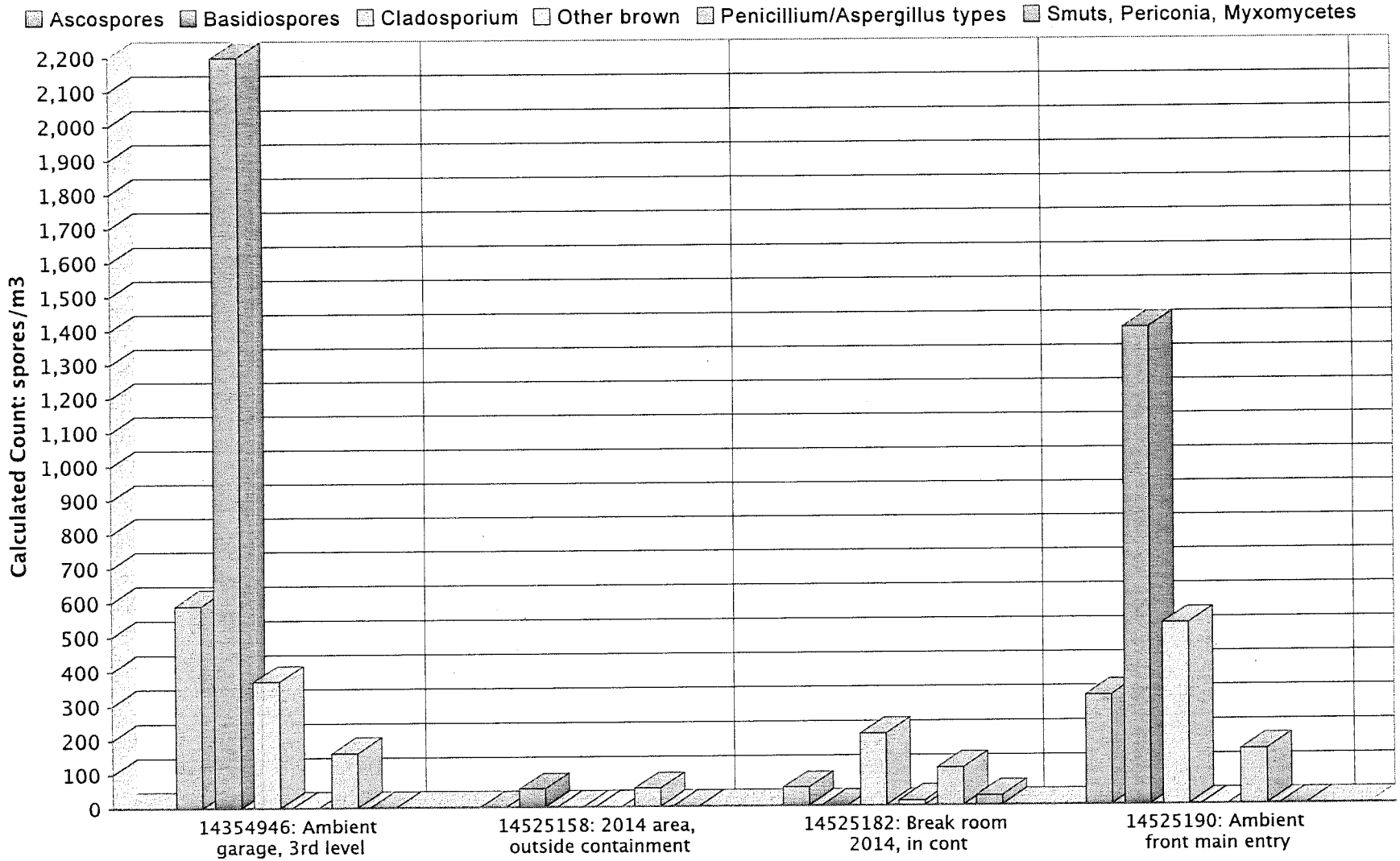
(650) 829-5800 Fax (650) 829-5852 www.emlab.com

# SPORE TRAP REPORT: NON-VIABLE METHODOLOGY




**Comments:**

Note: Graphical output may understate the importance of certain "marker" genera.
TestAmerica Environmental Microbiology Laboratory, Inc.

# MICROBIAL SPORE TRAI
# AIR SAMPLING RECORD

000495532

Page 1 of 1

**BioMax Environmental**
**775 San Pablo Ave.**
**Pinole, CA 94564**

www.biomaxenvironmental.com

Phone: (510) 724-3100
Fax: (510) 724-3145
biomaxenv@aol.com

| | |
|---|---|
| **Location:** BOE Bld Rm 2014 Assessment | **Client:** DCoS<br>**Project #:** 120808-01 |
| **Date:** 12/8/08 | **Laboratory:** EM Labs |
| **Collected by:** M A Polkablo | **Req. Turn Around:** 24 HR |
| ***Signature:*** [signature] | **Analysis (circle):** ~~Fungal~~ / ***Particulate*** ~~ID / Quantification.~~ |

| Sample Number | Time | Location/Desc. | Temp / RH |
|---|---|---|---|
| 14354946 | 1050 | Ambient Garage 3rd Level | 48°/39% |
| 14525158 | 1105 | 2014 Area (Outside Containment) | 67°/29% |
| 14525182 | 1114 | Break Room 2014 (in cont.) | 68/28% |
| 14525190 | 1215 | Ambient Front Main Entry | 43°/37% |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| Total Sample Time (min): | Flow Rate (l/min): | Total Sample Volume (liters): | Ambient Conditions: | Comments: |
|---|---|---|---|---|
| 5 min | 15 l/m | 75 l | Clear / Cold | |

**Please sign this form below acknowledging sample receipt and return executed form with laboratory reports. Fax, send, e-mail results to BioMax Environmental at (510) 724-3145 biomaxenv@aol.com**

**Other Instructions:** 24 Hour Turn Around Requested

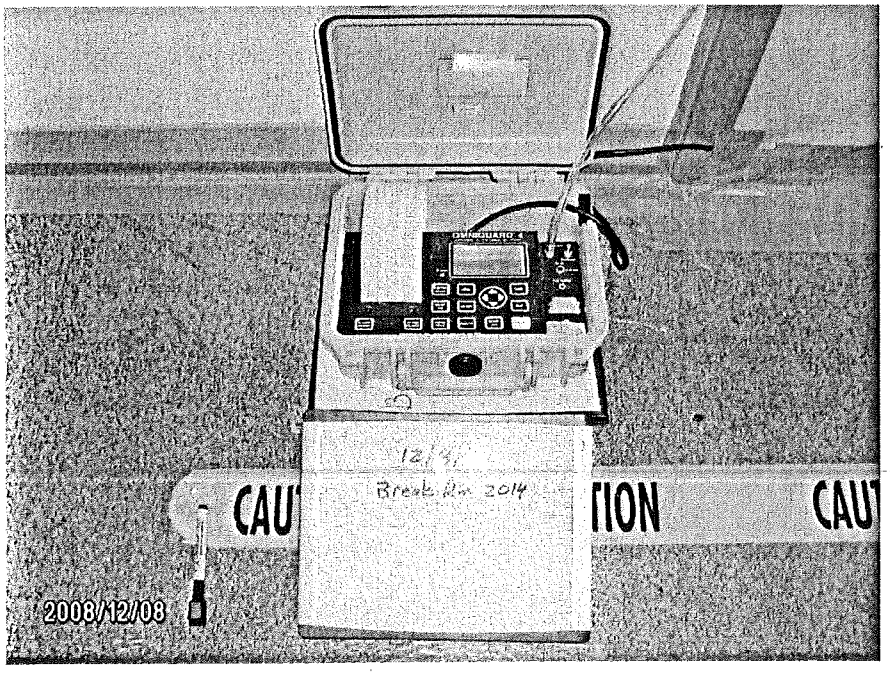
| | |
|---|---|
| *Relinquished by:* [signature] | *Received By:* Am Morrissey |
| *Method of Transportation:* FedEx | |
| *Time/Date Sent:* 4:30 12/8/08 | *Time/Date Received:* 12-9-08 9:15 |

**Attachment A: Digital Images**
December 8th, 2008
BOE Building Break Room 2014
450 N. Street, Sacramento, CA

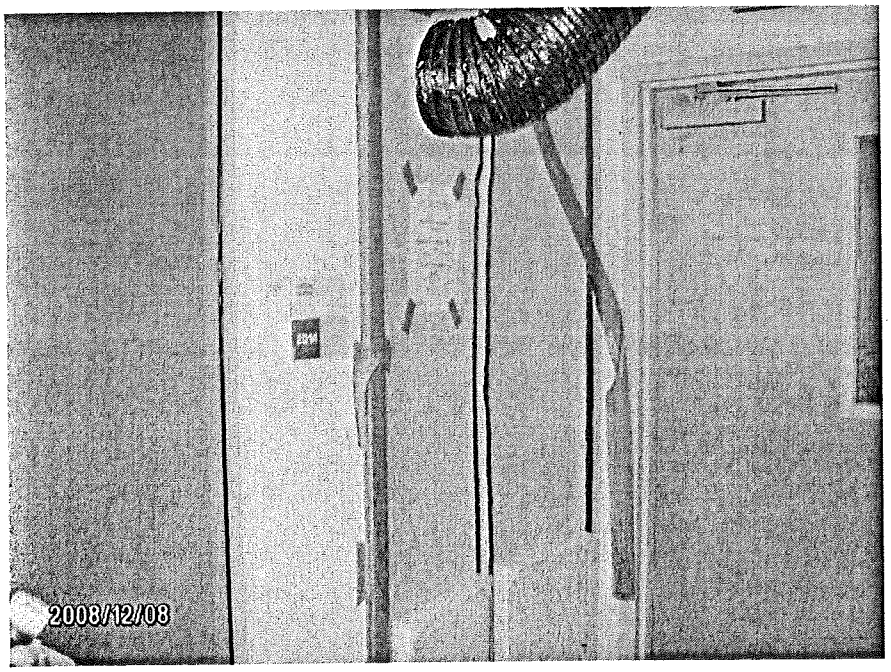


Click here for color photos

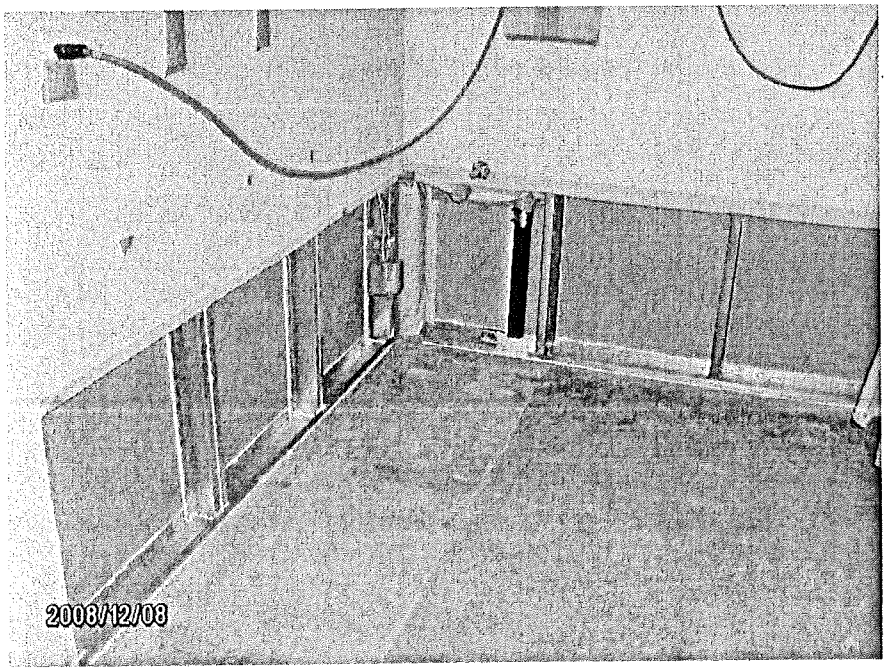
1) Image within tenant occupied hallway working space of 20th floor adjacent to 2014 Break Room Area at time of assessment.



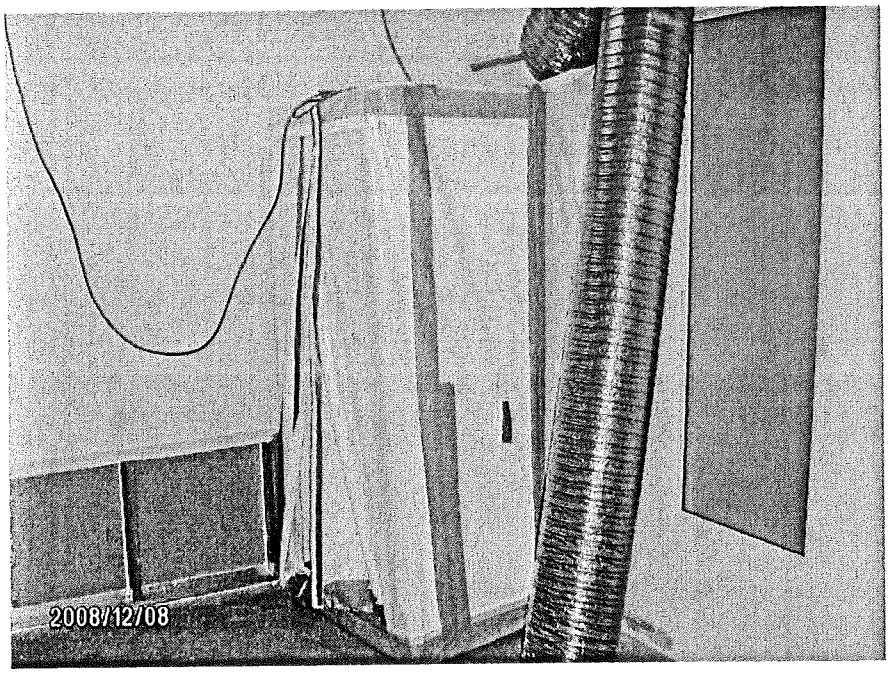

2) Image of Break Room 2014 pressure data logging equipment as viewed from occupied hallway at time of clearance assessment.



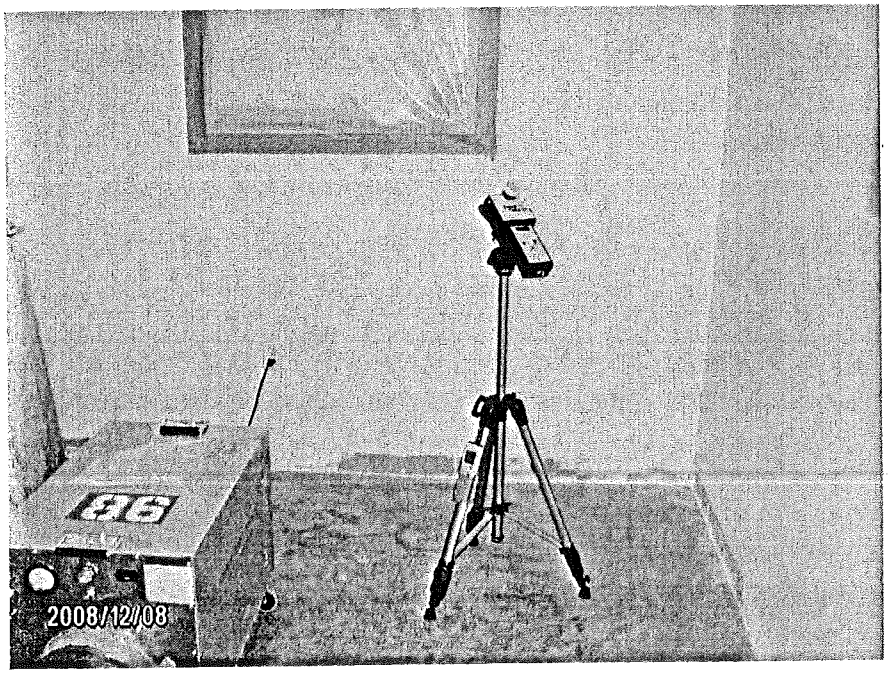

3) Image of exterior containment structures and postings at entrance to Break Room 707 area at time of assessment.



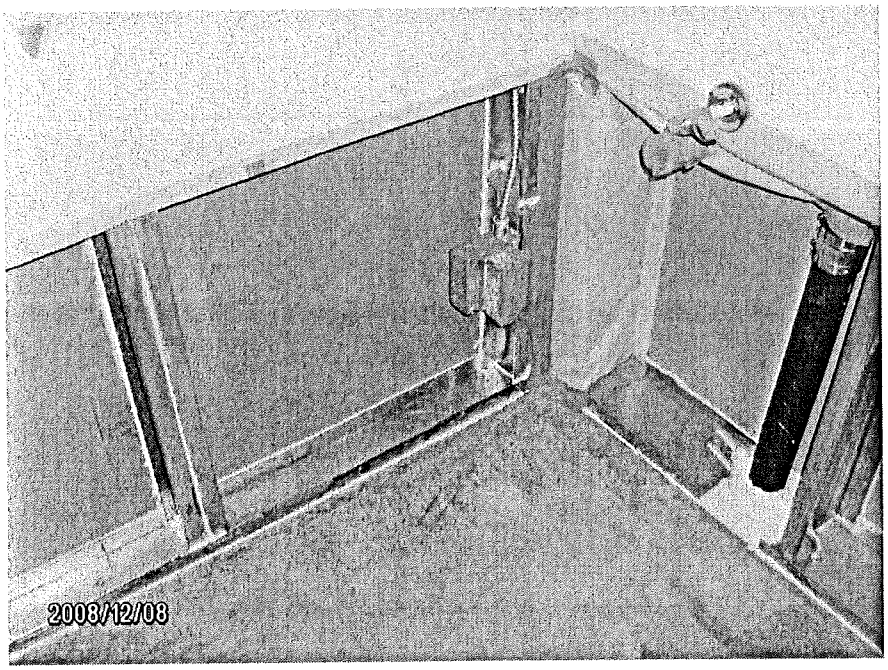

4) Image of exposed wall cavity, exposed plumbing, removed floor tile, and delineation of wallboard removal within Break Room 2014 at time of assessment.




5) Image of interior containment entry chamber and flex exhaust HEPA ducting within Break Room 2014 at time of assessment.

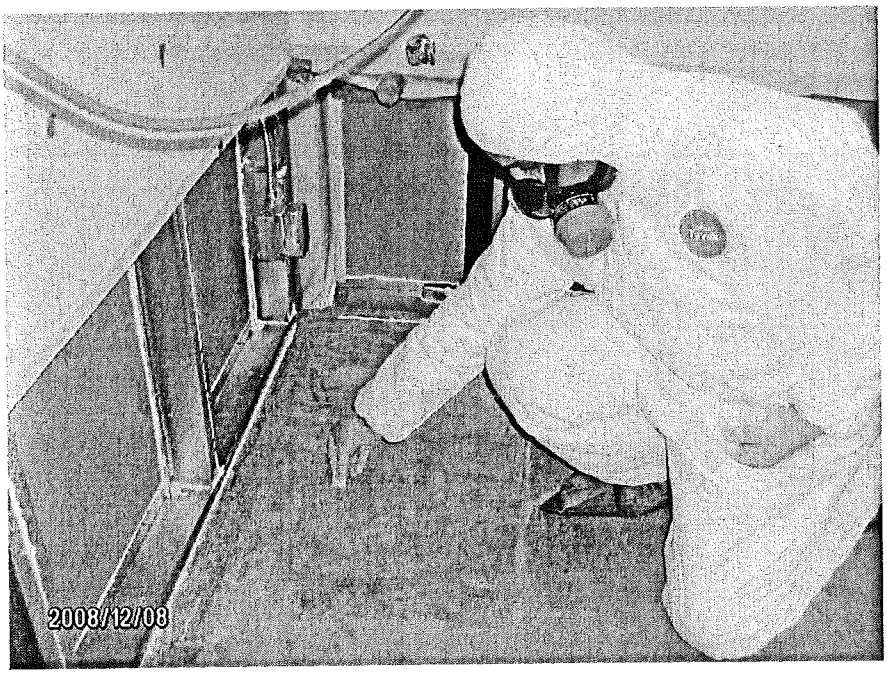



6) Image of air sampling equipment and critical barrier over existing tenant postings within break room 2014 area at time of assessment.

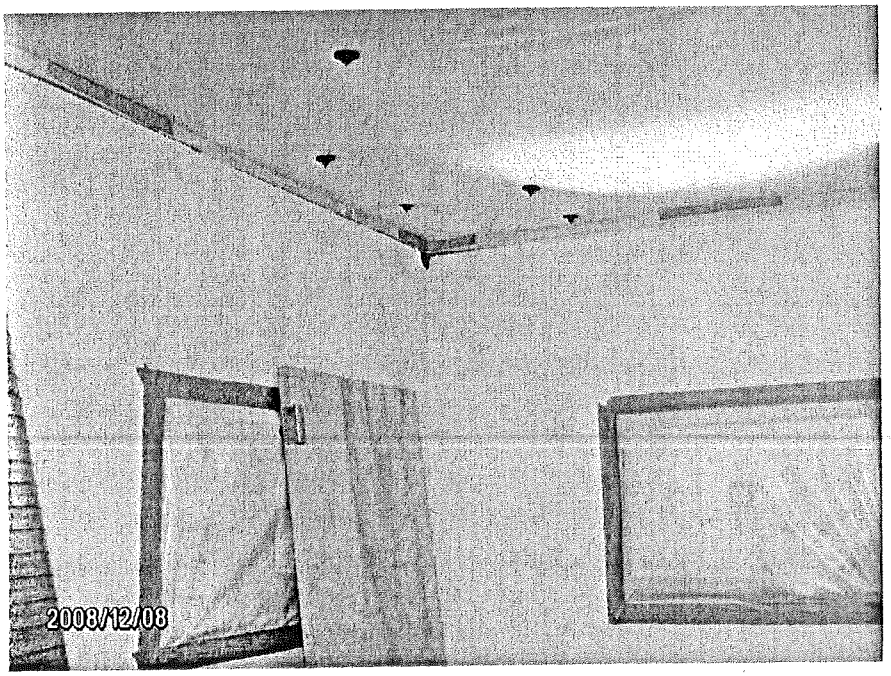



7) Close up image of exposed plumbing and metal floor sill framing following mitigative cleaning as viewed within Break Room 2014 at time of assessment.

8) Image of exposed metal wall framing where HTI technician (Larry) collects surface tape lift sample at time of assessment.




9) Close-up image of HTI technician collecting surface sample on exposed concrete surface within break room 2014 at time of assessment.




10) Image within break room 2014 containment viewing ceiling and wall posting barrier plastic maintained by JLS for duration of mitigative effort.