



236 South 3<sup>rd</sup> Street, #340  
Montrose, Colorado 81401  
970-252-1363 \* 970-728-5737

September 28, 2012

Delta County Health Department  
Mr. Ken Nordstrom, Director of Environmental Health  
255 West 6<sup>th</sup> Street  
Delta, Colorado 81416

Subject: Inspection and Air Testing, Hostetler Poultry Farm, Amendment

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OTHER PARTIES WITHOUT PERMISSION

Dear Mr. Nordstrom,

This is an amendment to the report originally produced regarding the subject testing. The initial report was completed on August 27<sup>th</sup>, 2012. The purpose of this amendment is to discuss the results of speciation tests conducted on the samples.

The original testing consisted of 6 each of viable airborne bacteria samples, viable airborne fungal samples, and 6 non-viable (total count) fungal and particle samples. The samples were sent to a qualified laboratory for analysis, which was thoroughly discussed in the original report. The analysis and reporting of the samples was conducted following industry standard procedures. These procedures are described in good detail in the publication "Field Guide for the Determination of Biological Contaminants in Environmental Samples", published by the American Industrial Hygiene Association. Analysis of viable testing includes reporting of genus or classification of bacteria and fungi. Occasionally, certain cultures can be identified more precisely and even to the species level. More detailed analysis is occasionally desired and advanced tools such as polymerase chain reaction (PCR) or sub-culturing are available, though not typical of standard analytical procedures. In this case, the analysis reported genera of fungi and a class of bacteria that were of further interest as they are not commonly isolated in the outdoor air to such levels. As a courtesy, Plateau Inc. requested a more detailed analysis of these organisms.

The laboratory was able to determine three mold species from the genera of interest. An attempt was made to identify the gram-negative bacteria found in samples 3B, 4B and 5B. However, during sub-culturing, this bacteria was overgrown by other bacterial species and the opportunity for identification was lost. Following is a brief discussion of each fungus.

**Penicillium glandicola**- Information regarding this species is limited and it is generally regarded as not common. This soil borne fungi has been identified a possible contaminant of grains and feed products. It is also of interest in remediation of contamination and for its ability to degrade cork.

*Penicillium griseofulvum*- Another soil borne fungi of scientific interest for drug derivatives, soil remediation and as a possible contaminant of feed products. It is frequently isolated from settled dust in homes.

*Scopulariopsis brevicaulis*- This is a very common species found in soil, decaying wood, and various plant and animal products. It is known as an agent for infection of skin and especially nails. It has been isolated from chicken farms and is likely associated with the degradation of feather and other detritus.

It does not appear that these or any of the predominant fungal isolates from this study are unusual. These fungal particles are likely generated from decay organism associated with deposited feed, feces, and detritus. The action of the forced air upon the adjoining soil may also liberate some of these spores from the soil as well. It is likely that any animal feeding operation would have a mix of fungal and bacterial species generated from similar circumstances.

In the consideration of these findings and those from the original report, persons may naturally wish to make interpretations of the suspected hazards associated with exposure to these bioaerosols. We would caution that such interpretations should not be made carelessly. The presence of bioaerosols in the natural environment is common; most especially so in rural environments where farming activities are considerable sources of bioaerosols, chemicals, and particulates from virtually any of the activities common in this environment. These exposures are consequent to common farming activities such as, tilling/plowing, hay and grass storage, feeding, harvesting, fertilizing, cleaning pens and other animal husbandry activities. Currently there are no standards that we are aware of regarding acceptable exposures to bacterial and fungal propagules. The data from this testing does show that the facility is a generator of a variety of bio-aerosols, organic and non-organic dust, and small amounts of ammonia gas. However, there is not sufficient information at this time to suggest that these conditions are contextually abnormal, nor that they are sufficient to induce health problems in normal healthy individuals. However, other studies may provide context.

A Polish study of air quality in a seven horse stable reveals bacterial levels of 10,000 cfu to 100,000 cfu. Similarly high levels of fungal spores were also found. *Microbial Contamination of Air Inside and Around Stables at Different Seasons of the Year. Witkowska et al.*

A study from Ohio reveals 10,000 to 1,000,000 cfu of bacteria in cattle housing barns. *A New Look at Ventilating Calf Barns in Winter. Ken Nordlund, DVM*

A study of pathogens in cow manure shows it as a reservoir of E-coli, Listeria, Salmonella, Mycobacterium paratuberculosis, cryptosporidia, giardia and viruses. *Pathogens in Manure, John H. Kirk DVM*

There are over 50 pesticides listed for use on alfalfa crops. [www.pesticideinfo.org](http://www.pesticideinfo.org).

Exposures to fungi are common during gardening and handling of composts. Rarely, fatal infections have been reported from these activities. The human pathogen, *Aspergillus Fumigatus* is commonly present in domestic composts.

In one of our own studies of air quality at a rural residence in the upper Gunnison River valley, elevated fungal spore levels (over 5000 spores per cubic meter) were found associated with wintertime cattle feeding operations several miles upwind. Only one family member was affected due to pre-existing asthma.

In another of our studies in a semi-rural area of Grand Junction, we determined that the occupant of a home suffered from allergies related to a large grassy field adjacent to her home. The installation of HEPA and charcoal filtration resolved the problem.

Normal atmospheric fungal spore levels range from a few hundred to several thousand spores per cubic meter (based upon hundreds of outdoor tests Plateau Inc. has conducted in Western Colorado).

The foregoing is intended to illustrate the complexities associated with various types of exposures in a rural environment. Due to the proliferation of such activities in a rural environment an analysis of the health effects should be approached with caution and with the input of a qualified medical practitioner. Any further evaluation of alleged health affects should at least consider confounding factors, individual medical history (including atopy), lifestyle, etc. It would be unfortunate to make any unqualified determination based upon the findings of this investigation or unsubstantiated allegations of health effects. We encourage the use of this data in a scientific manner.

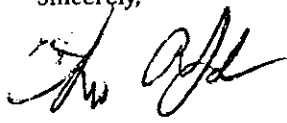
We are also aware of concern regarding visible dust generation at this facility. From the particle identification of the non-viable samples, it would appear that a vast majority of the particulates generated from this facility are mineral particles from soil and starch from the feed. From the information available to us it appears that generation of a visible cloud from this facility is an occasional occurrence; not typical of normal operations. However, it may also be indicative of conditions suitable to preclude biological amplification within the facility, unlike that found in more humid environments and as such may be an indicator of favorable operational conditions. Moist conditions may reduce visible discharges; however, moisture may increase the growth and viability of mold and bacteria.

*This report has been prepared to assist the owner in evaluating the impact the air quality and at the subject facility. Plateau, Inc. provided these services consistent with the level and skill ordinarily exercised by members of the profession currently practicing under similar conditions. This statement is in lieu of other statements expressed or implied. This report is intended for the sole use of the client. This report is not intended to serve neither as a bidding document nor as a project specification document. Actual site conditions and quantities should be field verified. A reasonable attempt has been made to identify all suspect problems in the identified areas. Currently, there are no standards for allowable exposure to mold, or mold byproducts. The response to mold exposure is highly dependant upon the individual, with some persons experiencing no reported symptoms, and others reporting physical responses including respiratory irritation, headaches, and exacerbation of asthma. Other more serious ailments have been alleged or documented.*

*Due to changing environmental conditions, the characteristics at this site may change from the time of inspection to the present. This report does not warrant against future operations or conditions that could affect the recommendations made. The results, finding, conclusions, and recommendations expressed in this report are based only on conditions that were observed on the date of Plateau Inc.'s inspection of the site.*

Thank you for this the opportunity to be of service. Please contact Plateau Inc. 252-1363 should you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Chris Lakin". The signature is fluid and cursive, with a large initial "C" and "L".

Christopher A. Lakin, P.E.  
Industrial Hygienist  
Plateau, Inc.



# INVOICE

Environmental Science & Engineering  
236 South 3rd Street, #340  
Montrose, Colorado 81401  
970-252-1363

|           |           |
|-----------|-----------|
| Date      | Invoice # |
| 9/19/2012 | 825       |

Bill To

Ken Nordstrom, Dir. of Enviro. Health  
Delta County Health Department  
255 West 6th Street  
Delta, Colorado 81416

|                |
|----------------|
| Terms          |
| Due on receipt |

| Qty/Days/Each                | Description  | Rate         | Amount            |
|------------------------------|--|--------------|-------------------|
| 1                            | Consulting Services, Air Quality Investigation, Reference email dated July 18, 2012<br><br>Pending laboratory analysis will not affect quoted price. | 4,875.00     | 4,875.00          |
| Thank you for your business. |  | <b>Total</b> | <b>\$4,875.00</b> |