SUMMARY OF TESTIMONY
CB21-2018
James D. Walsh
April 16, 2018

I am opposed to "industrial mulching", but as is often the case, the devil is in the details. One resident's "industrial mulching" could be another resident's "regular agricultural use". My opinion is that regularly trucking in, processing, and trucking out, wood and compost material is indicative of a non-agricultural industrial operation as opposed to an agricultural use.

I have heard many people who want to ban mulching and composting outright in agricultural areas. However, I have heard no mention of the unintended consequence that residents could face if the County tried to shut down existing mulching and composting operations completely. Right now, we have a gray area of law as to whether or not mulching and composting is "agricultural". As the members of Council know, an important exception to zoning law is the concept of "pre-existing use". Basically, if a use was legally allowed under the zoning code when the use began, but a subsequent zoning change prohibits that use on the property, that owner (and his successors) are grandfathered in under the old rules and may continue the now otherwise-prohibited use indefinitely. Moreover, because the owner must continue the use to keep their pre-existing use exception, the owner is actually encouraged to engage in practices that many people might find objectionable. Anyone seeking to ban industrial mulching and composting in agricultural areas should pause for moment to consider whether they are willing to roll the dice on whether or not some court may find that, yes, mulching and composting as now practiced are agricultural uses.

Adding reasonable regulations, however, protects the public interest without the same risk of inadvertently grandfathering unsafe and unsound practices. One of the most important aspects about CB 21 is the usefulness of applying a set of objective standards and regulations designed to protect the public health and safety.

Composting produces soil enhancements that help produce crops with naturally rich organic matter, reducing the need for petroleum-based supplements. Mulch is another by product of yard wastes and biodegradable materials, which many home owners use on their property to help prevent weed growth and to preserve soil moisture. Mulching and composting, properly done, are sound ecological practices that keep biodegradable waste from clogging up our limited waste facilities.

HCCA **Howard County Citizens Association**

Since 1961...

The Voice Of The People of Howard County

Date: 16 April 2018

Subject: HCCA Testimony Regarding CB21-2018 – Mulching, Composting and Natural Wood Waste

My name is Stu Kohn and I am the President of the Howard County Citizens Association, HCCA. My address is 8709 Yellow Bird Court, Laurel, MD. 20723.

Let it be known that the concerned citizens continue to not in any way be against farming. Our theme from the very beginning regarding mulching, composting, and natural wood waste is simply -- for the farm, by the farm and on the farm. It is a shame we are back here for a repeat performance. Does anyone really think anything will change? Will this just unfortunately be a repeat performance? Does anyone really care about the potential Health and Safety concerns regarding the impact that this proposed Bill might cause with perhaps the exception of Councilpersons Terrasa and Ball based on their last vote. Why is it that in both the Planning Board and in your previous Work Session there was no dialog regarding this major concern raised by your constituents? Why wasn't there at least one Medical Expert to be questioned in the Council's Work Session? How about performing this request at your next Work Session? Let your constituents have the opportunity to hear your questions and the answers so all can clearly draw conclusions whereby CB21 is warranted or not!

Your job is to ensure that the public is in no way at risk when it comes to our health and safety. On page 11 of the Technical Staff Report it states, "Policy 4.5 of the General Plan regarding RC and RR zoning regulations is to provide greater flexibility for the agricultural community as well as appropriate protections for rural residents." We ask is this the case regarding the proposed Bill? Simply tell the residents of Howard County they should have no worry regarding their Health and Safety and why? We want to at a bare minimum for you to have a discussion at your Work Session on this major concern. We are looking at Councilman Weinstein to be the individual who might turn this around if the facts from the medical experts are heard at your next Work Session with overwhelming compelling evidence. Two weeks ago, I learned at a public meeting regarding the storage facility located on Old Guilford Road in the M1 zoning district that there is no citizen input or notification required. All should take note of this especially Councilman Weinstein as Mulching facilities are permitted in both M1 and M2 districts. Certainly you would think that citizens should have a voice. This should be a concern for the betterment of transparency.

In conclusion, HCCA as you know has always been an advocate for Quality of Life issues. All we ask is to please get all the facts on the table at your Work Session as the Health and Safety of our County is in your hands. We don't want to be dealt a bad hand whereby it will be too late to recover. We can not afford the consequences.

Thank You,

Stu Kohn
HCCA, President

Wood Dust

CAS No.: none assigned

Known to be a human carcinogen

First listed in the *Tenth Report on Carcinogens* (2002)

Carcinogenicity

Wood dust is *known to be a human carcinogen* based on sufficient evidence of carcinogenicity from studies in humans.

Cancer Studies in Humans

Many case reports and epidemiological studies (including cohort studies and case-control studies that specifically addressed nasal cancer) have found a strong association between exposure to wood dust and cancer of the nasal cavity. Strong and consistent associations with cancer of the nasal cavity and paranasal sinuses were observed both in studies of people whose occupations were associated with wood-dust exposure and in studies that directly estimated wood-dust exposure. Cancer risks were highest for adenocarcinoma, particularly among European populations. Studies of U.S. populations showed similar significant positive associations between wood-dust exposure and adenocarcinoma of the nasal cavity. A pooled analysis of 12 case-control studies found a very high estimated relative risk of adenocarcinoma (45.5) among men with the greatest exposure, and the risk increased with increasing duration of exposure (Demers *et al.* 1995). The association between wood-dust exposure and elevated risk of nasal cancer (adenocarcinoma) in a large number of independent studies and in many different occupations in many countries strongly supports the conclusion that the increased risk is due to wood-dust exposure, rather than to simultaneous exposure to other substances, such as formaldehyde or wood preservatives (IARC 1995, NTP 2000).

Other types of nasal cancer (squamous-cell carcinoma of the nasal cavity) and cancer at other tissue sites, including cancer of the nasopharynx and larynx and Hodgkin disease, have been associated with exposure to wood dust in several epidemiological studies. However, these associations were not found in all studies, and the overall epidemiological evidence is not strong enough or consistent enough to allow firm conclusions to be drawn about the role of wood-dust exposure in the development of cancer at tissue sites other than the nasal cavity (IARC 1995, NTP 2000).

Studies on Mechanisms of Carcinogenesis

Polar organic solvent extracts of some hardwood dusts were weakly mutagenic in *Salmonella typhimurium,* and two chemicals found in wood, delta-3-carene and quercetin, also were mutagenic in *S. typhimurium*. *In vivo* exposure of mammals and *in vitro* exposure of mammalian cells to organic solvent extracts of some wood dusts (beech and oak) caused DNA damage, micronucleus formation, and chromosomal aberrations (primarily chromatid breaks). Elevated rates of DNA damage (primarily single-strand breaks and DNA repair) and micronucleus formation were observed in peripheral-blood lymphocytes from people occupationally exposed to wood dust (IARC 1995, NTP 2000).

The roles of specific chemicals found in wood dust (either naturally in the wood or added to it in processing) in causing cancer are not clear. The particulate nature of wood dust also may contribute to wood-dust-associated carcinogenesis, because a high proportion of dust particles generated by woodworking typically are deposited in the nasal cavity. Some studies of people with long-term exposure to wood dust have found decreased mucociliary clearance and enhanced inflammatory reactions in the nasal cavity. Also, cellular changes (metaplasia and dysplasia) observed in the nasal mucosa of woodworkers and of laboratory animals may be precancerous (IARC 1995, NTP 2000).

Cancer Studies in Experimental Animals

The evidence from studies in experimental animals is inadequate to evaluate the carcinogenicity of wood dust. No tumors attributable to beech wood-dust exposure were found in rats exposed by inhalation or intraperitoneal injection. Inhalation exposure to wood dust also did not significantly affect the incidence of tumors caused by simultaneous exposure to other compounds (known to be carcinogenic in humans or experimental animals), including formaldehyde or sidestream cigarette smoke in rats and *N*-nitrosodiethylamine in hamsters. However, each of these studies was limited by such factors as small numbers of animals or exposure groups, short study duration, or inadequate data reporting. In female mice, dermal exposure to a methanol extract of beech wood dust resulted in significant dose-related increases in the incidence of skin tumors (squamous-cell papilloma and carcinoma) and mammary-gland tumors (adenocarcinoma, adenoacanthoma, and mixed tumors) (IARC 1995).

Properties

Wood is an important worldwide renewable natural resource. Forests cover about one third of the earth's total land mass (about 3.4 million square kilometers). An estimated 12,000 species of trees each produce a characteristic type of wood, and the species of trees harvested vary considerably among different countries and even among different regions of a country. However, even in countries with high domestic production of wood, some wood may be imported for specific uses, such as furniture production (IARC 1995).

Most of the 12,000 tree species are broad-leaved deciduous trees, or hardwoods, principally angiosperms. Only about 800 species are pines, firs, and other coniferous trees, or softwoods, principally gymnosperms. The terms "hardwood" and "softwood" refer to the species, and not necessarily the hardness of the wood. Although hardwoods generally are denser than softwoods, the density varies greatly within each group, and the hardness of the two groups overlaps somewhat. The composition of softwood tissue is simpler than that of hardwood, consisting of mainly one type of cells, tracheids. Hardwoods show more detailed differentiation among stabilizing, conducting, and storage tissue. Although most trees harvested worldwide are hardwoods (58% of volume), much of the hardwood is used for fuel. Softwood is the major wood used for industrial purposes (69%); however, the percentage varies from region to region (IARC 1995).

Wood dust is a complex mixture generated when timber is processed, such as when it is chipped, sawed, turned, drilled, or sanded. Its chemical composition depends on the species of tree and consists mainly of cellulose, polyoses, and lignin, plus a large and variable number of substances with lower relative molecular mass. Cellulose is the major component of both softwood and hardwood. Polyoses (hemicelluloses), which consist of five neutral sugar units, are present in larger amounts in hardwood than in softwood. The lignin content of softwood is higher than that of hardwood. The lower-molecular-mass substances significantly affect the properties of wood; these include substances extracted with nonpolar organic solvents (fatty acids, resin acids, waxes, alcohols, terpenes, sterols, steryl esters, and glycerols), substances extracted with polar organic solvents (tannins, flavonoids, quinones, and lignans), and water-soluble substances (carbohydrates, alkaloids, proteins, and inorganic material). Wood dust is also characterized by its moisture content: "dry" wood has a moisture content of less than approximately 15%, and "moist" wood has a higher moisture content. Woodworking operations us-

ing dry wood generate more total dust and a larger quantity of inhalable dust particles than do those using moist wood (IARC 1995).

Use

Wood dust is produced in woodworking industries as a by-product of the manufacture of wood products; it is not usually produced for specific uses. One commercial use for wood dust is in wood composts (Weber *et al.* 1993). "Industrial roundwood" refers to categories of wood not used for fuel, which include sawn wood (54%), pulpwood (21%), poles and pit props (14%), and wood used for other purposes, such as particle board and fiberboard (11%) (IARC 1995).

Production

Wood dust is created when machines or tools are used to cut or shape wood materials. Industries in which large amounts of wood dust are produced include sawmills, dimension mills, furniture industries, cabinetmaking, and carpentry (IARC 1995). In 1990, total estimated production of wood used in U.S. industry was 311.9 million cubic meters of softwood and 115 million cubic meters of hardwood (Demers *et al.* 1997).

Exposure

Exposure to wood dust occurs when individuals use machinery or tools to cut or shape wood. When the dust is inhaled, it is deposited in the nose, throat, and other airways. The amount of dust deposited within the airways depends on the size, shape, and density of the dust particles and the strength (turbulence and velocity) of the airflow. Particles with a diameter larger than 5 μm (inspirable particles) are deposited almost completely in the nose, whereas particles 0.5 to 5 μm in diameter (respirable particles) are deposited in the lower airways (IARC 1981, 1995).

Wood dust usually is measured as the concentration of airborne dust, by particle size distribution, by type of wood, and by other characteristics of wood. Total airborne dust concentration is reported as mass per unit volume (usually milligrams of dust per cubic meter of air). Wood dust generally is collected by a standard gravimetric method, whereby a sampling pump is used to collect a known volume of air through a special membrane filter contained in a plastic cassette. Some sampling studies reported that the particle size distribution varied according to the woodworking operation, with sanding producing smaller particles than sawing, but others found no consistent differences (IARC 1995). The majority of the wood-dust mass was reported to be contributed by particles larger than 10 μm in aerodynamic diameter; however, between 61% and 65% of the particles by count measured between 1 and 5 μm in diameter (IARC 1995).

Exposure to wood dust also occurs through handling of compost containing wood dust. One study measured dust concentrations resulting from handling of compost material consisting of successive layers of chopped leaves, bark, and wood; visible clouds of fine particles were easily generated when the compost material was agitated. The reported background concentration of respirable dust sampled upwind of the compost pile was 0.32 mg/m^3. During loading and unloading of compost, samplers in the breathing zone detected inspirable dust at 0.74 mg/m^3 and respirable dust at 0.42 mg/m^3. Samples collected directly from the visible clouds of particles generated by compost agitation contained inspirable dust at 149 mg/m^3 and respirable dust at 83 mg/m^3 (Weber *et al.* 1993).

The National Occupational Exposure Survey (conducted from 1981 to 1983) estimated that nearly 600,000 workers were exposed to woods (NIOSH 1990). Teschke *et al.* (1999) analyzed 1,632 measurements of personal time-weighted-average airborne wood-dust concentrations in 609 establishments on 634 inspection visits that were reported to the Occupational Safety and Health Administration Integrated Management Information System between 1979 and 1997. Exposures ranged from less than 0.03 to 604 mg/m^3, with an arithmetic mean of 7.93 mg/m^3 and a geometric mean of 1.86 mg/m^3. Exposure levels decreased significantly over time; the unadjusted geometric mean was 4.59 mg/m^3 in 1979 and 0.14 mg/m^3 in 1997. Occupations with high exposure to wood dust included sander in the transportation equipment industry (unadjusted geometric mean = 17.5 mg/m^3), press operator in the wood products industry (12.3 mg/m^3), lathe operator in the furniture industry (7.46 mg/m^3), and sander in the wood cabinet industry (5.83 mg/m^3). High exposures occurred in the chemical, petroleum, rubber, and plastics products industries, in sanding, pattern making, and mill and saw operations. The lowest exposures occurred in industrial pattern-making facilities, paper and paperboard mills, schools and institutional training facilities, and veneer and plywood mills.

Use of hand-held electric sanders has been identified as a particularly dusty process that leads to dust exposure. Wood-dust concentrations vary with type of dust extraction, amount of wood removed, and type of sander (Thorpe and Brown 1994). For electric belt sanders used to sand dowels, total dust concentrations ranged from 0.22 mg/m^3 with external dust extraction to 3.74 mg/m^3 without extraction, and concentrations of respirable dust ranged from 0.003 mg/m^3 with extraction to 0.936 mg/m^3 without extraction. Rotary sanders tested with flat wood samples produced total dust concentrations ranging from 0.002 mg/m^3 with extraction to 0.699 mg/m^3 without extraction; concentrations of respirable dust ranged from 0.001 mg/m^3 with extraction to 0.088 mg/m^3 without extraction. Comparable decreases in dust concentration were observed when dust extraction was used with electrical orbital sanders.

Regulations

Occupational Safety and Health Administration (OSHA)

This legally enforceable PEL was adopted from the 1969 United States Department of Labor regulation *Safety and Health Standards for Federal Supply Contracts* shortly after OSHA was established. The PEL may not reflect the most recent scientific evidence and may not adequately protect worker health.

Permissible exposure limit (PEL) = 15 mg/m^3 total fibers; = 5 mg/m^3 respirable fibers (based on the standard for "particles not otherwise regulated").

Guidelines

American Conference of Governmental Industrial Hygienists (ACGIH)

Threshold limit value – time-weighted average (TLV-TWA) = 0.5 mg/m^3 for western red cedar; = 1 mg/m^3 for all other species.

National Institute for Occupational Safety and Health (NIOSH)

Recommended exposure limit (REL) = 1 mg/m^3.
Listed as a potential occupational carcinogen.

References

Demers PA, Boffetta P, Kogevinas M, Blair A, Miller BA, Robinson CF, *et al.* 1995. Pooled reanalysis of cancer mortality among five cohorts of workers in wood-related industries. *Scand J Work Environ Health* 21(3): 179-190.

Demers PA, Teschke K, Kennedy SM. 1997. What to do about softwood? A review of respiratory effects and recommendations regarding exposure limits. *Am J Ind Med* 31(4): 385-398.

IARC. 1981. Wood. In *Wood, Leather and Some Associated Industries.* IARC Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Humans, vol. 25. Lyon, France: International Agency for Research on Cancer. pp. 49-197.

IARC. 1995. Wood dust. In *Wood Dust and Formaldehyde.* IARC Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Humans, vol. 62. Lyon, France: International Agency for Research on Cancer. pp. 35-215.

NIOSH. 1990. *National Occupational Exposure Survey (1981-83).* National Institute for Occupational Safety and Health. Last updated 7/1/90. http://www.cdc.gov/noes/noes1/94220sic.html.

NTP. 2000. *Report on Carcinogens Background Document for Wood Dust.* National Toxicology Program. http://ntp.niehs.nih.gov/ntp/newhomeroc/roc10/WD.pdf.

Health Hazards of Industrial Wood Waste and Composting

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Johns Hopkins University

Submitted to Howard County Task Force, December 14, 2014

Slide 1

Health Hazards

Industrial mulch processing and composting results in increased health risks

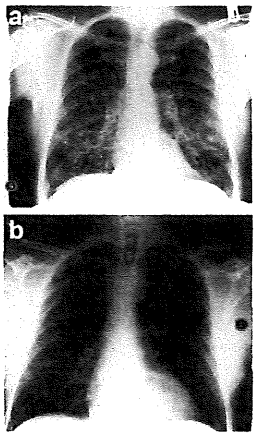
- Mulch infectious agents – fungi and bacteria
- Wood dust – allergic and mucosal effects
- Wood dust – cancer
- Composting – volatile compounds, organic dust, infectious agents
- Exposure and risk

Slide 2

Infectious agents example: acute fungal pneumonia

At presentation

2 months later



A 69 year old retired man with no significant medical history. Developed acute pneumonia after spreading tree bark mulch.

Hospitalized, developed kidney injury and failure. Remained dialysis dependent and housebound.

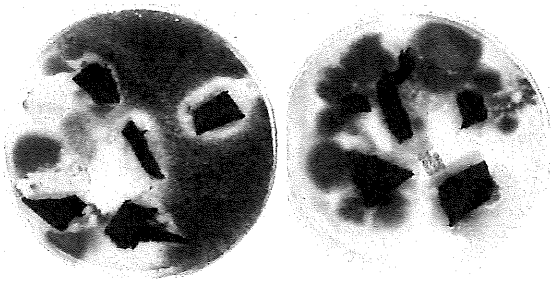
Died of sepsis 10 months later.

Inhalation of fungal spores from mulch was determined be the likely route of infection.

Medical MycologyCaseReports2(2013)125–127

Slide 3

Infectious agents example: acute fungal pneumonia



Mulch culture showing growth of microogranisms (Aspergillus fumigatus, Rhizopus spp., Sporobolomyces spp. and bacteria)

Medical MycologyCaseReports2(2013)125–127

Slide 4

Studies of mulch related infections in medical literature

1: Ameratunga R, Woon ST, Vyas J, Roberts S. Fulminant mulch pneumonitis in undiagnosed chronic granulomatous disease: a medical emergency. Clin Pediatr (Phila). 2010 Dec;49(12):1143-6. doi: 10.1177/0009922810370057. Epub 2010 Aug 19.

2: Siddiqui S, Anderson VL, Hilligoss DM, Abinun M, Kuijpers TW, Masur H, Witebsky FG, Shea YR, Gallin JI, Malech HL, Holland SM. Fulminant mulch pneumonitis: an emergency presentation of chronic granulomatous disease. Clin Infect Dis. 2007 Sep 15;45(6):673-81. Epub 2007 Aug 8.

3: Veillette M, Cormier Y, Israël-Assayag E, Meriaux A, Duchaine C. Hypersensitivity pneumonitis in a hardwood processing plant related to heavy mold exposure. J Occup Environ Hyg. 2006 Jun;3(6):301-7.

4: Nagai K, Sukoh N, Yamamoto H, Suzuki A, Inoue M, Watanabe N, Kuroda R, Yamaguchi E. [Pulmonary disease after massive inhalation of Aspergillus niger]. Nihon Kokyuki Gakkai Zasshi. 1998 Jun;36(6):551-5. Japanese.

5: Weber S, Kullman G, Petsonk E, Jones WG, Olenchock S, Sorenson W, Parker, Marcelo-Baciu R, Frazer D, Castranova V. Organic dust exposures from compost handling: case presentation and respiratory exposure assessment. Am J Ind Med. 1993 Oct;24(4):365-74.

6: Johnson CL, Bernstein IL, Gallagher JS, Bonventre PF, Brooks SM. Familial hypersensitivity pneumonitis induced by Bacillus subtilis. Am Rev Respir Dis. 1980 Aug;122(2):339-48. PubMed PMID: 6774642.

Dozens of examples of scientific articles from throughout the world related to infectious agents in mulch.

Particularly important and dangerous for immune compromised individuals.

Recent study found that of patients with fulminant mulch pneumonitis, half of those died of due to infection and underlying kidney disease.

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Health Hazards

Industrial mulch processing and composting results in increased health risks

- Mulch infectious agents – fungi and bacteria
- Wood dust – allergic and mucosal effects
- Wood dust – cancer
- Composting – volatile compounds, organic dust, infectious agents
- Exposure and risk

Slide 6

Health Effects of Wood Dust

From Centers for Disease Control and Prevention:

"Exposure to wood dust has long been associated with a variety of adverse health effects, including dermatitis, allergic respiratory effects, mucosal and nonallergic respiratory effects, and cancer. The toxicity data in animals are limited, particularly with regard to exposure to wood dust alone; there are, however, a large number of studies in humans."

1988 CDC OSHA PEL Documentation

Slide 7

Health Effects of Wood Dust

From *Ann Agric Environ Med* 2010, 17, 29–44.

- **Abstract:** This paper reviews the literature on associations between dry wood dust exposure and non-malignant respiratory diseases ... The results support an association between dry wood dust exposure and asthma, asthma symptoms, coughing, bronchitis, and acute and chronic impairment of lung function. In addition, an association between wood dust exposure and rhino-conjunctivitis is seen across the studies."

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Dermatitis

- "Dermatitis. There are a large number of case reports, epidemiological studies, and other data on the health effects of wood dust exposure in humans. Dermatitis caused by exposure to wood dusts is common, and can be caused either by chemical irritation, sensitization (allergic reaction), or both of these together. As many as 300 species of trees have been implicated in wood-caused dermatitis."

1988 CDC OSHA PEL Documentation

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Asthma

- "Allergic respiratory effects. Allergic respiratory responses are mediated by the immune system, as is also the case with allergic dermatitis. Many authors have reported cases of allergic reactions in workers exposed to wood dust ... Asthma is the most common response to wood dust exposure"

1988 CDC OSHA PEL Documentation

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Other Lung Effects

- "Mucosal and nonallergic respiratory effects (changes in the structure and function of the nasal mucosa and respiratory tract that are caused by exposure to wood dust). These changes include nasal dryness, irritation, bleeding, and obstruction; coughing, wheezing, and sneezing; sinusitis; and prolonged colds."

1988 CDC OSHA PEL Documentation

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Health Hazards

Industrial mulch processing and composting results in increased health risks

- Mulch infectious agents – fungi and bacteria
- Wood dust – allergic and mucosal effects
- Wood dust – cancer
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- Exposure and risk

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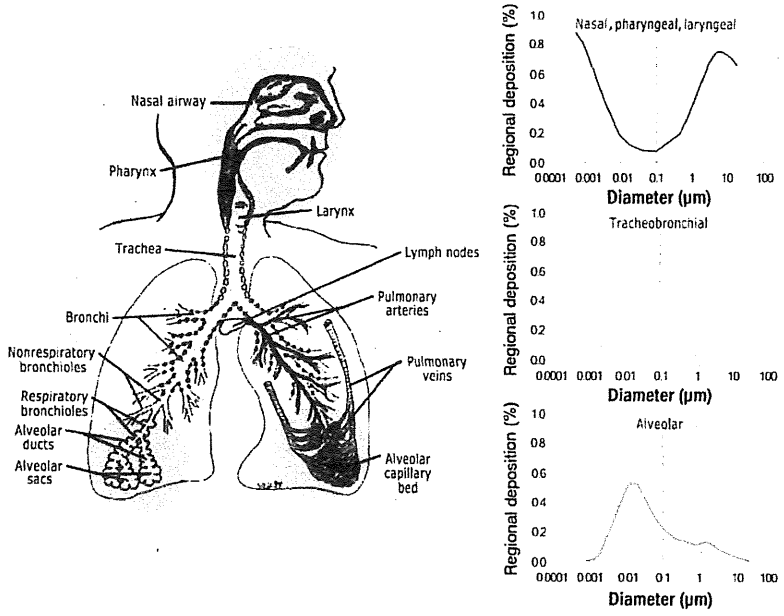
Cancer

- "The association between occupational exposure to wood dust and various forms of cancer has been explored in many studies and in many countries." (CDC)
- "There is *sufficient evidence* in humans for the carcinogenicity of wood dust. Wood dust causes cancer of the nasal cavity and paranasal sinuses and of the nasopharynx. **Wood dust is *carcinogenic to humans (Group 1)*.**" (WHO, IARC)

Slide 13

Fig. 4.1 Deposition of inhaled particles in the human respiratory tract during nasal breathing



From ..... Drawing courtesy of J Harkema. Reproduced with permission from Environmental Health Perspectives

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Nasal Cancer

- "Summary of evidence for nasal and sinus cavity cancers. The literature clearly demonstrates an association between wood dust exposure and nasal cancer. "
- English studies first identified this link by showing a 10- to 100 times-greater incidence of nasal adenocarcinoma among those exposed to wood dust than in the general population.
- "In the United States, three studies have reported a fourfold risk of nasal cancer or adenocarcinoma ... and wood dust exposure."

1988 CDC OSHA PEL Documentation

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Lung Cancer

- "Pulmonary cancer. A number of studies investigating the association between wood dust exposure and the development of lung cancer have been conducted."
- Milham (1974/Ex. 1-943) found a significant excess of malignant tumors of the bronchus and lung in workers who exposed to wood dust.

1988 CDC OSHA PEL Documentation

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Hodgkin Lymphoma

- "Hodgkin's disease. Milham and Hesser concluded, on the basis of a case-cohort study of 1,549 white males dying of this disease ... that there was an association between Hodgkin's disease and exposure to wood dust."
- Other studies concluded that men working in the wood industries in the eastern United States as well as Washington state were at special risk for Hodgkin's disease.

1988 CDC OSHA PEL Documentation

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Other Cancers

- "Other cancers. NIOSH (1987a/Ex. 1-1005) concluded that the data on the relationship between occupational exposure to wood dust and the development of cancers other than nasal, Hodgkin's disease, or lung cancers are insufficient and inconclusive."
- Emerging evidence that risks of oral cancer increase with exposure to wood dust.

1988 CDC OSHA PEL Documentation

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Health Hazards

Industrial mulch processing and composting results in increased health risks

- Mulch infectious agents – fungi and bacteria
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- Wood dust – cancer
- Composting – volatile compounds, organic dust, infectious agents
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Composting

A commonly used method of waste management involving aerobic, biological process of degradation of biodegradable organic matter

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Composting Health Effects – VOC's

- Composting generates volatile organic compounds (VOCs)
- VOCs can comprise hundreds of compounds including benzene, toluene, m,p-xylene, o-xylene, styrene, formaldehyde, chloroform, ethylbenzene among others.
- High levels of VOC's observed in many studies at variety of composting sites

Environ. Sci. Techno/. 1995, 29, 896-902
J.L. Domingo, M. Nadal / Environment International 35 (2009) 382–389

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Composting Health Effects – VOC's

VOC's comprise substances that are

- Carcinogenic: examples include benzene, a risk factor for leukemia, and formaldehyde, associated with nasal carcinoma
- Toxic: includes many VOC's that may lead to renal, hematological, neurological and hepatic damage as well as mucosal irritation.

J.L. Domingo, M. Nadal / Environment International 35 (2009) 382–389

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Composting Health Effects – Biologic Agents

Composting sites due to their contents comprise infectious, allergenic, toxic, and carcinogenic agents including

- Fungi such as Aspergillus fumigatus (A. fumigatus), gram negative bacteria, and parasitic protozoa, all involved in a variety of infectious conditions
- Endotoxins produced by bacteria and fungi, including aflatoxins which are known to be associated with liver cancer

J.L. Domingo, M. Nadal / Environment International 35 (2009) 382–389

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Composting Health Effects – Biologic Agents

Composting sites due to their contents comprise infectious, allergenic, toxic, and carcinogenic agents including

- Organic dusts that can lead to pulmonary inflammation (acute inflammation, hypersensitive pneumonitis), occupational asthma, chronic bronchitis, gastrointestinal disturbances, fevers, and irritation of eyes, ear and skin.

J.L. Domingo, M. Nadal / Environment International 35 (2009) 382–389

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Composting Health Effects – Animal Mortality and Leachate

- Composting process can lead to increases in solubility of hazardous metals and organic substances in contaminated water (leachate)
- Burial of animal carcasses can lead to significant contamination of soil and groundwater with antimicrobials, steroid hormones, other veterinary pharmaceuticals

Q. Yuan et al. / Science of the Total Environment 456–457 (2013) 246–253

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Composting Health Effects – Food Wastes and Pathogens

- "There have been numerous studies on pathogen content in the composting process."
- "In San Jose, California literally hundreds of people were affected by a nearby composting yard. This case illustrates the importance of carefully siting compost facilities with adequate setbacks from residential areas. One study, presented at a BioCycle conference recommended two miles isolation distance from residential and high travel areas."

Cronin, C. Pathogens and Public Health Concerns with Composting
Vermont Department of Environmental Conservation

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Local Example – MDE and Recycled Green Industries

- "A Woodbine company that had been processing food scraps into composted materials with commercial applications ... has ceased those operations after hearing concerns about pollution from the Maryland Department of the Environment... Food scraps present different environmental concerns than yard waste, the spokesman said. Namely, food contains "nutrients and potential pathogens" not found in yard waste, and are harmful to the environment when washed into surface and ground water, said Jay Apperson, the spokesman, in an email... The letter said water samples taken by the department on or near the company's property "confirm that the operation is generating polluted leachate and storm water and is discharging pollutants without a permit in violation of state law."

Rector, K. Baltimore Sun, Feb 6, 2012

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Real World Example of Composting Health Effects on Nearby Residents

- Health effects to a residential area from environmental outdoor pollution hundreds of meters from a composting site (Occup Environ Med 2003;60:336–342)

Reported health complaints§	SS¶	Bioaerosol pollution in residential air‡ up to >10^3 CFU m^{-3} air OR**	95% CI††	Duration of present residency >5 years OR	95% CI
Respiratory tract					
Frequency of colds >5×/year	209	1.94	0.65 to 6.78	4.72	1.19 to 31.83
Bronchitis	210	3.02	1.35 to 7.06	2.91	1.29 to 7.03
Waking up due to coughing	202	2.70	1.23 to 6.10	2.51	1.19 to 5.53
Wheezing	207	1.96	0.84 to 4.82	2.95	1.22 to 7.99
Shortness of breath at rest	203	3.99	1.31 to 15.19	1.50	0.56 to 4.49
Coughing on rising or during the day‡‡	210	2.67	1.17 to 6.10	1.51	0.69 to 3.29
Shortness of breath after exertion	205	4.23	1.74 to 11.34	2.03	0.90 to 4.91
Eyes and general health					
Itching eyes >10×/year	206	1.35	0.61 to 3.05	2.85	1.31 to 6.50
Smarting eyes >10×/year	205	2.44	1.02 to 6.22	2.42	1.06 to 5.86
Nausea or vomiting >5×/year	204	2.65	0.87 to 9.97	4.10	1.28 to 18.44
Excessive tiredness >5×/year	200	2.80	1.22 to 6.72	1.83	0.84 to 4.11
Shivering	210	4.63	1.44 to 20.85	3.67	1.32 to 12.20
Joint trouble >10×/year	207	1.27	0.54 to 3.07	1.52	0.65 to 3.71
Muscular complaints >10×/year	201	1.17	0.47 to 2.99	1.39	0.55 to 3.86

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Health Hazards

Industrial mulch processing and composting results in increased health risks

- Mulch infectious agents – fungi and bacteria
- Wood dust – allergic and mucosal effects
- Wood dust – cancer
- Composting – volatile compounds, organic dust, infectious agents
- Exposure and risk

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Significant Medical Literature of Effects of Emissions from Waste Facilities

- Chalvatzaki E, Aleksandropoulou V, Glytsos T, Lazaridis M. The effect of dust emissions from open storage piles to particle ambient concentration and human exposure. Waste Manag. 2012 Dec;32(12):2456-68
- Nadal M, Inza I, Schuhmacher M, Figueras MJ, Domingo JL. Health risks of the occupational exposure to microbiological and chemical pollutants in a municipal waste organic fraction treatment plant. Int J Hyg Environ Health. 2009 Nov;212(6): 661-9.
- Domingo JL, Nadal M. Domestic waste composting facilities: a review of human health risks. Environ Int. 2009 Feb;35(2):382-9.
- Herr CE, Nieden Az Az, Stilianakis NI, Eikmann TF. Health effects associated with exposure to residential organic dust. Am J Ind Med. 2004 Oct;46(4):381-5.
- Herr CE, zur Nieden A, Stilianakis NI, Gieler U, Eikmann TF. Health effects associated with indoor storage of organic waste. Int Arch Occup Environ Health.
- Herr CE, Zur Nieden A, Jankofsky M, Stilianakis NI, Boedeker RH, Eikmann TF. Effects of bioaerosol polluted outdoor air on airways of residents: a cross sectional study. Occup Environ Med. 2003 May;60(5):336-42.

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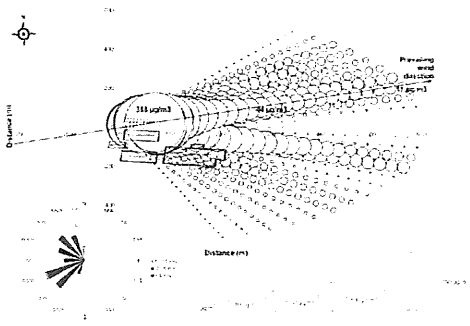
Dust Emissions and Distance

- Dust emissions from open piles of mulch / organic waste can be measured at distances >500 m (>1500 feet) (Waste Management 32 (2012) 2456–2468)



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Microorganisms and VOC's - Dispersion Distance

- High levels of molds, fungi, thermophilic fungi, bacteria and other microorganisms (concentrations of >10^4 colony forming units) could be measured >300 m (>1000 feet) in residential air neighboring outdoor organic waste (Am. J. Ind. Med. 46:381–385, 2004)
- Volatile organic compounds can detected at distances of up to 800 meters (Environment International 35 (2009) 382–389) and others

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Dispersion of infectious agents – worst case scenario

- Infectious agents have been shown to be dispersed at larger distances. Prominent example includes outbreak of Legionnaires disease in a radius of 6km through release from an elevated water tower
- Dispersion led to 86 infected cases of which 18 (21%) were fatal

J Infect Dis. 2006 Jan 1;193(1):102-11

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Summary

- Mulch and composting sites can pose risks for human health due to increased exposure of infectious agents, toxic substances, and VOC's. These include
  - infections due to fungal spores and bacteria
  - Increased risk of dermatitis, allergic respiratory effects, and mucosal and nonallergic respiratory effects
  - Increased risk of cancer, including nasal, lung, and Hodgkin lymphoma
- Exposure risks can occur at significant distances from waste processing area
- Numerous examples of exposure risks have been document in affected populations world-wide

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ORIGINAL ARTICLE

Effects of bioaerosol polluted outdoor air on airways of residents: a cross sectional study

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Occup Environ Med 2003;**60**:336–342

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Background: Bioaerosol pollution of workplace and home environments mainly affects airways and mucous membranes. The effect of environmental outdoor residential bioaerosol pollution, for example, livestock holdings, farming, and waste disposal plants, is unclear.
Aims: To investigate the perceived health of residents living in areas with measurable outdoor bioaerosol pollution (for example, spores of *Aspergillus fumigatus* and actinomycetes), and effects of accompanying odours.
Methods: In a cross sectional study, double blinded to ongoing microbial measurements, doctors collected 356 questionnaires from residents near a large scale composting site, and from unexposed controls in 1997. Self reported prevalence of health complaints during the past year, doctors' diagnoses, as well as residential odour annoyance were assessed. Microbiological pollution was measured simultaneously in residential outdoor air.
Results: Concentrations of $>10^5$ colony forming units of thermophilic actinomycetes, moulds, and total bacteria/m^3 air were measured 200 m from the site, dropping to near background concentrations within 300 m. Positive adjusted associations were observed for residency within 150–200 m from the site versus unexposed controls for self reported health complaints: "waking up due to coughing", odds ratio (OR) 6.59 (95% confidence interval (CI) 2.57 to 17.73); "coughing on rising or during the day", OR 3.18 (95% CI 1.24 to 8.36); "bronchitis", OR 3.59 (95% CI 1.40 to 9.4); and "excessive tiredness", OR 4.27 (95% CI 1.56 to 12.15). Reports of irritative airway complaints were associated with residency in the highest bioaerosol exposure, 150–200 m (versus residency >400–500 m) from the site, and period of residency more than five years, but not residential odour annoyance. Lifetime prevalence of self reported diseases did not differ with exposure.
Conclusions: Bioaerosol pollution of residential outdoor air can occur in concentrations found in occupational environments. For the first time residents exposed to bioaerosol pollution were shown to report irritative respiratory complaints similar to mucous membrane irritation independently of perceived odours.

Bioaerosols occur ubiquitously as inhalable mixtures of air and microorganisms, parts of microorganisms, or organic substances of microbial and plant origin.[1] In the outdoor air, exposure bioaerosols (for example, containing *Aspergillus fumigatus*) can occur from natural or anthropogenic sources.[2–4]

When evaluating health effects of bioaerosols (organic dusts), their composition, concentration, and measurement methods applied must be considered.[5] Individual susceptibility, for example, atopy, allergic sensitisation, or immunodeficiency, also plays an important role in the risk assessment. Health based threshold levels for microorganisms for outdoor, indoor, or workplace air have not been established.[4] It is, however, known that infectious, allergic, or toxic disturbances triggered by bioaerosols originate mostly in moulds, thermophilic actinomycetes, Gram negative bacteria, and viruses.[3 6–10]

Besides livestock breeding and farming, the increasing number of large scale composting facilities for sewage sludge, and yard and solid waste being established within the scope of modern disposal concepts can release bioaerosols. Health relevant moulds (*Aspergillus fumigatus*) and actinomycetes accumulated in compost material become airborne as vegetative cells or spores through movement of the material.[3 4] Workers on composting sites have higher rates of airway related mucous membrane complaints and diseases. In these workers, specific antibodies against actinomycetes, as well as airway inflammation (or mucous membrane irritation (MMI)) have been reported.[2 11 12] Severe cases of general disease, for example, hypersensitivity pneumonia or severe toxic reactions (toxic pneumonitis or organic dust toxic syndrome (ODTS)) were reported in workers and one private person following direct contact with compost.[3 13–15]

Worldwide several thousand of these often malodorous sites are operating. However, their health effects on nearby residents have not been investigated sufficiently. A study in residents living within 500 m of a site showed no clear evidence of health changes.[16] In a case report, an asthmatic, living 80 m from a composting site (52% of the year in the wind direction), was found to have an allergic bronchopulmonary aspergillosis (ABPA).[17]

There is an urgent need to evaluate pollution due to bioaerosols (organic dusts), which can also occur in indoor air,[18–22] as far as the general public health is concerned. This is particularly important as an increasing fraction of the general population in industrialised countries must be classified as a risk group (for example, atopics) in the context of bioaerosol pollution.[23]

This cross sectional study aimed to relate self reported health to measurable bioaerosol pollution in the residential outdoor air. Prevalence of perceived complaints and self

Abbreviations: ABPA, allergic bronchopulmonary aspergillosis; CFU, colony forming units; CI, confidence interval; ISAAC, International Study on Allergy and Asthma in Childhood; MMI, mucous membrane irritation; N, north; ND, not detected; NW, northwest; ODTS, organic dust toxic syndrome; OR, odds ratio; WHO, World Health Organisation; SS, sample size; SE, southeast; WNW, west-northwest

reported doctors' diagnoses of residents living very close (150–200 m) to a composting site were compared to those in the same neighbourhood living further away (>400–500 m), and to a corresponding unexposed control group without a residential source of bioaerosols. Measurements of viable airborne microorganisms in residential air were performed during the ongoing epidemiological study and were known neither to interviewers nor to the study subjects at that time. Reports of annoying residential odours were also assessed, as they are known to be of relevance to reported health.[24–26]

METHODS

Assessment of exposure to cultivable microorganisms in the outdoor air of the residential area

The aim of the measurements was to assess location specific "worst case" conditions with regard to released bioaerosols into the neighbourhood. This concerned periods of intense microorganism releasing work activity, previously defined meteorological conditions at the time of measurement, as well as topographical aspects. Because of the ubiquity of the microorganisms under research, especially the thermophilic organisms, comparative quantitative measurements of background concentrations were taken upwind of the site.

The concentrations of three fractions of culturable microorganisms were determined in three repeated measurements. These were collected with filter based samplers (MD 8 Sartorius, Goettingen, Germany, flow rate 8 m^{-3} h^{-1}, collection time 10 min) 1.5 m above ground level, with subsequent indirect plating method after filtration and precipitation on gelatine filters[27 28]:

- Total bacteria (R2A agar (oxoid), 25°C)
- Moulds (dichrorane-glycerine-(DG18)–(oxoid), 25°C)
- Thermophilic and thermotolerant actinomycetes (glycerine-arginine-agar, 50°C).[29]

As results of single microbial measurements are known to vary considerably, results of the three consecutive measurements are given as maximum and minimum concentrations in table 2 and not mean values.

Epidemiological investigation

Study population

A team of doctors, process engineers, microbiologists, and meteorologists selected a composting site which had been in operation for five years and had lead to distress in the neighbouring residents due to odour annoyance and fear of allergies and infection. Considering topographical and meteorological (for example, wind direction) as well as technical aspects (site not completely closed off, processing of yard trimmings and organic waste, a turnover of approximately 12 500 Mg per year), discharge of bioaerosols from the site into the neighbouring residential area was presumed prior to the study. Other sources of bioaerosol exposure (sewage plants, etc) did not exist in the proximity of the residential area. Together with the local health authority, an unexposed control area was selected in the same governmental district. Criteria for the selection were: similarity of population pattern, residential area (size of households, road traffic, petrol stations, and industrial sites) and the lack of sources of microorganisms in the residential outdoor air.

The residential area next to the composting plant was located at a distance from 150 to 500 m downwind. All persons living there (n = 310) and 411 unexposed inhabitants in the control area were invited to participate in the study. Addresses were collected from the municipal registration of address office.

Questionnaires concerning perceived health and odour annoyance

An environmental health questionnaire was used for the assessment of self reported health: complaints and symptoms as well as lifetime prevalence of doctors' diagnoses. The questionnaire was developed with items validated and applied in several national and international studies, for example,

Table 1 Characteristics of 356 participants of the cross sectional study: unexposed controls and residents of a neighbourhood with bioaerosol pollution in outdoor air classified according to the distance between home and emitting composting site

	Study population		Unexposed controls		Residents of a neighbourhood with bioaerosol pollution of outdoor air							
					Total		Classified					
Distance from the emitting site	–		–		150–500 m		150–200 m		>200–400 m		>400–500 m	
Bioaerosol pollution in residential air	–		Not measured		Up to >10^5 CFU* m^{-3}		Up to >10^5 CFU m^{-3}		Up to <10^5 CFU m^{-3}		Near background	
Participants	n=356		n=142		n=214		n=82		n=76		n=56	
	SS†	Yes [%]	SS	Yes [%]	SS	Yes [%]	SS	Yes [%]	SS	Yes [%]	SS	Yes [%]
Female	356	56.7	142	52.8	214	59.3	82	59.8	76	60.5	56	57.1
Age >50 years	356	43.0	142	36.6	214	47.2	82	46.3	76	50.0	56	44.6
Duration of present residency >5 years	350	71.7	137	70.8	213	72.3	82	73.2	75	76.0	56	66.1
Odour annoyance in the residential area	344	59.3	132	25.8	212	80.2	82	95.1	74	75.7	56	64.3
Type of odour annoyance, disgusting	199	7.5	37	0.0	162	9.3	74	5.4	52	17.3	36	5.6
Separate collection of organic household waste	348	55.5	136	75.0	212	42.9	82	32.9	75	45.3	55	54.5
Composting in own garden	350	67.4	137	65.7	213	68.5	82	76.8	75	61.3	56	66.1
Occupation at a composting site	337	0.6	136	0.0	201	1.0	76	1.3	71	1.4	54	0.0
Smoking status (smoker and non-smoker <5 years)	324	26.5	132	25.0	192	27.6	73	17.8	69	39.1	50	26.0
Environmental tobacco smoke (at home/in the workplace)	283	39.6	111	39.6	172	39.5	65	41.5	63	38.1	44	38.6
Use of inhalers at home	343	9.9	140	7.1	203	11.8	78	10.3	73	6.8	52	21.2
Bedroom equipment‡	355	97.5	142	99.3	213	96.2	81	90.1	76	100	56	100
Exposure in the workplace§	349	22.3	136	28.7	213	18.3	82	23.2	75	16.0	56	14.3
Home <50 m from busy street	356	30.6	142	17.6	214	39.3	82	39.0	76	35.5	56	44.6

*CFU, colony forming units.
†SS, sample size.
‡Bedroom furnishings include one of the following: carpet, furs, eiderdown, horsehair or innerspring mattress, furniture made of chipboard.
§Vapours, gases, dusts, heat, cold, dampness.

Table 2 Concentrations of culturable microorganisms [minimum/maximum]* in residential air neighbouring a bioaerosol releasing composting site

Sample points (by distance and direction to composting site†)	Total bacteria [CFU‡ m^{-3} air]		Moulds [CFU m^{-3} air]		Thermophilic actinomycetes [CFU m^{-3} air]	
	Min	Max	Min	Max	Min	Max
Upwind						
500 m SE§	8.4×10^2	1.8×10^3	1.9×10^3	3.6×10^3	[ND]¶	[ND]
Downwind						
200 m NW**	2.2×10^4	5.1×10^5	7.7×10^3	1.3×10^5	2.3×10^4	5.5×10^5
250 m WNW††	3.9×10^4	1.7×10^5	1.3×10^4	4.6×10^4	1.9×10^4	1.1×10^5
300 m N‡‡	4.4×10^3	8.3×10^4	4.3×10^3	1.7×10^4	2.8×10^3	6.0×10^4
320 m NW	6.8×10^3	5.9×10^4	3.9×10^3	1.9×10^4	1.3×10^3	5.0×10^4
550 m N	8.3×10^2	4.3×10^3	2.3×10^3	4.1×10^3	<5	9.9×10^2
Sampling conditions						
Samplers	Filter based MD 8 Sartorius, (Goettingen, Germany), flow rate 8 $m^{-3}h^{-1}$					
Collection time	10 min at 1.5 m above ground level with subsequent indirect plating method after filtration and precipitation on gelatine filters					
Detection limit	40 CFU					
Date and time	07.08.1997; 00:00–02:15§§					

*Minimum (Min) and maximum (Max) values of three repeated measurements. †"Kompostwerk Langes Feld", Kassel, Germany. ‡CFU, colony forming units. §SE, southeast. ¶ND, not detected. **NW, northwest. ††WNW, west-northwest. ‡‡N, north. §§Although there was a cold air flow from the composting site towards the studied neighbouring residential area "worst case" conditions.

ISAAC.[23] It was designed in particular to record health impairments and diseases of the respiratory tract from air pollution.

Prevalence of respiratory (12 items), eye related (two items), and general (eight items) health complaints, as well as current intake of medicine during the past 12 months were recorded (table 1). Subjects were also asked to state lifetime prevalence of diseases found by their own doctors in 18 categories. Interviewing doctors checked allergic conditions and current medicine intake by inspecting documents stating allergies and medicine supply during the study related house call.

Lifestyle factors and individual exposure to microorganisms from household sources (contact with compost, organic waste collection in the home,[30] inhalers, soft furnishings) were determined (see table 1). Further questions concerned the occurrence and quality of annoying odours in the residential area.

Epidemiological survey

The survey was carried out after consultation with the state data protection officer. It took place on all seven days of one week in July 1997, not during school holidays. A press conference, information by mail, and public event had previously taken place. The selected sample was mailed the questionnaire accompanied by additional information stating, for example, that their participation was voluntary. They were then phoned up to three times in order to arrange appointments for the doctor supported medical history interviews. These interviews took place in their homes and lasted for about an hour per person.

Statistical analysis

Using the LOGISTIC procedure of the SAS/STAT software, version 8.0, a logistic regression modelling approach was employed to analyse the health data of the 356 respondents studied. The model associated odds ratios (OR) and the corresponding 95% confidence intervals (CI) were determined. A p value of 0.05 or less was judged relevant. First a core model in which residents living at different distances (150–200 m, >200–400 m, >400–500 m) from the site were compared to unexposed controls living in the residential area without an adjoining compost site. The model included age, odour annoyance, and period of residence in the current home >5 years as fixed covariables. Additional confounders were gender, composting in own garden, collection of organic waste in the home, distance of home from a busy street <50 m, smoking, and exposure to passive smoke.

In a second stage the model was calculated for those 214 residents living near the composting site only. Those living in the two distance groups nearest to the site (150–200 m, >200–400 m) were compared to those living at >400–500 m. Fixed covariables were age, odour annoyance, and period of residence in the current home >5 years.

RESULTS

Exposure to culturable microorganisms in the outdoor air of the residential area

In the outdoor air of the residential area 200 m from the plant, concentrations of up to $>10^5$ CFU m^{-3} air were recorded for total bacteria, moulds, and thermophilic actinomycetes. Even 320 m from the site differences in concentrations of total bacteria and moulds which were 100 times background levels (10^3–10^4 CFU m^{-3} air) were detected. Furthermore, the site characteristic thermophilic actinomycetes which were not found in upwind—background measurements—were still detectable 550 m downwind from the site at a concentration of $<10^3$ CFU m^{-3} air.[27]

These high concentrations of culturable microorganisms close to the plant came down quickly to near background concentrations within 550 m from the plant (table 2). Based on this observation, the exposed population was divided into three groups, dependent on the linear distance of the respective home from the site (150–200 m, >200–400 m, >400–500 m).

Epidemiological investigation

Study population

A total of 356 people took part in the study (see table 1). The response rate in the residential area with bioaerosol pollution was 69%. Selection bias due to low participation rate (35%) in the unexposed group would be characterised by stronger weighing of health concerned subjects perceiving health impairment.

More females and subjects >50 years took part in the exposed group. As stated above an adjustment was made for both parameters in the core model.

In the neighbourhood of the site, residential odour annoyance was reported by 80%, increasing to 95% in residents living 150–200 m from the site. When asked to characterise this odour annoyance, 10% described it as "disgusting". None of the unexposed controls reporting odours from other possible environmental sources stated this kind of odour annoyance. This underlines the specific odour annoyance of the exposed group.

Table 3 Prevalence of reported health complaints in residents in the neighbourhood of a composting site stratified according to the distance between home and composting site respectively, increasing concentration of bioaerosol exposure in residential air and unexposed controls

	Study population	Unexposed controls	Residents in the neighbourhood of a composting site with bioaerosol pollution of outdoor air							
			Total		Classified					
Distance of home from composting site	–	–	150–500 m		150–200 m		>200–400 m		>400–500 m	
Bioaerosol pollution in residential air	–	Not measured	Up to $>10^5$ CFU* m^{-3}		Up to $>10^5$ CFU m^{-3}		Up to $<10^5$ CFU m^{-3}		Near	
Participants	n=356	n=142	n=214		n=82		n=76		n=56	
Reported health complaints†	SS‡	SS	Yes [%]	SS	Yes [%]	SS	Yes [%]	SS	Yes [%]	SS	Yes [%]
Respiratory tract											
Frequency of colds >5×/year	352	142	6.3	210	11.4	81	21.0	73	2.7	56	8.9
Hay fever	355	142	16.2	213	19.7	81	18.5	76	19.7	56	21.4
Sinusitis	354	141	14.2	213	17.4	82	26.8	75	10.7	56	12.5
Bronchitis	355	142	26.8	213	33.3	81	54.3	76	17.1	56	25.0
Pneumonia	348	139	1.4	209	3.3	80	6.3	75	1.3	54	1.9
Shortness of breath at rest	343	137	5.1	206	18.4	82	24.4	68	20.6	56	7.1
Shortness of breath following exertion	344	136	16.2	208	31.3	82	43.9	70	30.0	56	14.3
Waking up with chest tightness	338	135	11.9	203	22.2	79	26.6	69	26.1	55	10.9
Waking up due to shortness of breath	341	136	3.7	205	9.3	82	7.3	67	13.4	56	7.1
Waking up due to coughing	343	138	25.4	205	41.5	82	57.3	67	31.3	56	30.4
Wheezing	349	139	15.8	210	28.1	79	38.0	76	23.7	55	20.0
Cough on rising/during the day§	355	142	19.0	213	35.2	82	47.6	75	28.0	56	26.8
Eyes and general health											
Itching eyes >10×/year	340	131	20.6	209	40.2	80	47.5	74	40.5	55	29.1
Smarting eyes >10×/year	344	136	15.4	208	35.6	80	43.8	74	40.5	54	16.7
Loss of appetite	347	140	5.0	207	10.1	76	10.5	76	10.5	55	9.1
Nausea or vomiting >5×/year	343	136	5.9	207	16.9	81	23.5	73	16.4	53	7.5
Diarrhoea >5× year	349	138	3.6	211	9.5	81	21.0	76	2.6	54	1.9
Excessive tiredness >5×/year	341	138	13.0	203	40.4	76	53.9	76	36.8	51	25.5
Shivering	353	140	13.6	213	19.7	82	29.3	75	20.0	56	5.4
Fever >5×/year	356	142	1.4	214	2.3	82	2.4	76	3.9	56	0.0
Joint trouble >10×/year	346	136	19.1	210	37.1	80	41.3	75	36.0	55	32.7
Muscular complaints >10×/year	339	135	11.1	204	25.0	77	26.0	72	26.4	55	21.8
Current intake of medicine/vitamins	355	142	41.5	213	56.8	82	54.9	76	59.2	55	56.4

*CFU, colony forming units.
†Frequency or occurrence in the past 12 months. If not otherwise stated, rates are for a single occurrence.
‡SS, sample size.
§Criteria of the World Health Organisation for chronic bronchitis.

Regarding exposure to airborne microorganisms from domestic sources, residents near the composting site reported less separate collection of organic household waste. This rate was lowest in those living closest to the site. From this observation, as well as from reports on composting in own gardens, there was no indication of a higher exposure of the residents in the neighbourhood of the site to bioaerosols from domestic waste sources.

Smoking status and exposure to environmental tobacco smoke, occupational exposure, personal use of inhalers, as well bedroom equipment, also gave no indication of a higher burden on the airways of the exposed group. The same applied to the statements on mould or dampness in homes (9% in unexposed controls, 3% in exposed).

Differences were observed for the proximity of the home to a busy street (<50 m), which indicated a higher exposure to car traffic related pollutants close to the site. For this reason an adjustment was made in the logistic regression.

Health effects in a residential area with bioaerosol pollution

Residents living in the neighbourhood of the composting site reported health complaints, medicine intake, and 11 of the 18 self reported illnesses ever diagnosed by a doctor more frequently than unexposed controls without a neighbouring composting site. Stratification showed the highest prevalence of complaints in those living closest to the site who were respectively exposed to the highest concentration of bioaerosols measured. Nevertheless, the exposed group living furthest away from the site at a distance of >400–500 m still reported higher rates of health complaints (but not self perceived diseases) compared to unexposed controls (table 3).

In the core model the unexposed residents without an adjacent composting site were compared with exposed residents in the neighbourhood of the site. For this the exposed group was stratified according to distance between home and composting site, and nine confounders were taken into consideration. Adjusted associations were found between close residency to the site (150–200 m)—highest concentration of airborne microorganisms (up to $>10^5$ CFU m^{-3} residential air)—and three of 12 airway related complaints, as well as excessive tiredness and intake of medicine (table 4). For those living further away from the site (>200–400 m), these associations were not observed.

In this core model, duration of present residency (>5 years), respectively duration of exposure was positively associated with "waking up due to coughing" (OR 2.29; 95% CI 1.13 to 4.79) and "bronchitis" (OR 2.37; 95% CI 1.65 to 5.06) during the past 12 months.

In a second step only those living in the neighbourhood of the composting site were studied. This allowed the effects of the bioaerosols (measured concentrations and duration of exposure) and the possible bias due to the specific, in part disgusting, residential odour annoyance near the composting site to be analysed more precisely. This comparison of the most highly exposed (up to $>10^5$ CFU m^{-3} residential air) with the least exposed (near background concentrations of airborne

Table 4 Health effects* of bioaerosol pollution in residential outdoor air highly exposed (>10^5 CFU† m^{-3} air) in the neighbourhood of a composting site compared to unexposed controls without a neighbouring composting site

	Residents with bioaerosol pollution of up to >10^5 CFU m^{-3} residential air living 150–200 m from the composting site		
Reported health complaints‡	SS§	OR¶	95%CI**
Bronchitis	262	3.59	1.40 to 9.47
Waking up due to coughing	255	6.59	2.57 to 17.73
Coughing on rising or during the day††	263	3.18	1.24 to 8.36
Excessive tiredness	251	4.27	1.56 to 12.15
Current medication intake	263	2.64	1.08 to 6.60

*Only the significant positive associations from table 3 are listed.
†CFU, colony forming units.
‡Frequency of occurrence in the past 12 months; if not otherwise stated, rates are for a single occurrence.
§SS, sample size.
¶OR, adjusted odds ratio comparing the group nearest to the composting site (150–220 m) with the control group in a residential area without a neighbouring composting site adjusted for residential odour annoyance, duration present residency >5 years, composting in own garden, separate collection of organic household waste, distance of home to busy road <50 m, age, gender, smoking, and passive smoke exposure.
**CI, confidence interval.
††Criteria of the World Health Organisation for chronic bronchitis.

Table 5 Health effects* of highest (>10^5 CFU† m^{-3} air) versus near background concentrations of outdoor bioaerosol, pollution, duration of present residency, and odour annoyance in a residential area with a neighbouring composting site

		Bioaerosol pollution in residential air‡ up to >10^5 CFU m^{-3} air		Duration of present residency >5 years		Odour annoyance in the residential area	
Reported health complaints§	SS¶	OR**	95% CI††	OR	95% CI	OR	95% CI
Respiratory tract							
Frequency of colds >5×/year	209	1.94	0.65 to 6.78	**4.72**	**1.19 to 31.83**	3.09	0.50 to 60.14
Bronchitis	210	**3.02**	**1.35 to 7.06**	**2.91**	**1.29 to 7.03**	1.86	0.71 to 5.54
Waking up due to coughing	202	**2.70**	**1.23 to 6.10**	**2.51**	**1.19 to 5.53**	1.95	0.81 to 5.08
Wheezing	207	1.96	0.84 to 4.82	**2.95**	**1.22 to 7.99**	1.97	0.72 to 6.35
Shortness of breath at rest	203	**3.99**	**1.31 to 15.19**	1.50	0.56 to 4.49	1.97	0.59 to 9.02
Coughing on rising or during the day‡‡	210	**2.67**	**1.17 to 6.10**	1.51	0.69 to 3.29	1.51	0.61 to 3.75
Shortness of breath after exertion	205	**4.23**	**1.74 to 11.34**	2.03	0.90 to 4.91	2.15	0.79 to 6.90
Eyes and general health							
Itching eyes >10×/year	206	1.35	0.61 to 3.05	**2.85**	**1.31 to 6.50**	**4.97**	**1.89 to 15.67**
Smarting eyes >10×/year	205	**2.44**	**1.02 to 6.22**	**2.42**	**1.06 to 5.86**	**10.40**	**2.87 to 66.96**
Nausea or vomiting >5×/year	204	2.65	0.87 to 9.97	**4.10**	**1.28 to 18.44**	§§	§§
Excessive tiredness >5×/year	200	**2.80**	**1.22 to 6.72**	1.83	0.84 to 4.11	§§	§§
Shivering	210	**4.63**	**1.44 to 20.85**	**3.67**	**1.32 to 12.20**	§§	§§
Joint trouble >10×/year	207	1.27	0.54 to 3.07	1.52	0.65 to 3.71	**4.30**	**1.55 to 14.17**
Muscular complaints >10×/year	201	1.17	0.47 to 2.99	1.39	0.55 to 3.86	**2.99**	**1.02 to 11.03**

*Only the significantly increased complaints from table 3 are listed and printed in bold type.
†CFU, colony forming units.
‡Distance of home to the emitting site 150–200 m.
§Frequency or occurrence in the past 12 months. If not otherwise stated, rates are for a single occurrence.
¶SS, sample size.
**OR, odds ratio of those living the stated distance from site compared to those living >400 m from the site adjusted for odour annoyance in the residential area, period of residence in the present home >5 years, and age.
††CI, confidence interval.
‡‡Criteria of the World Health Organisation for chronic bronchitis.
§§Due to the small number of subjects of this complaint reliable odds ratio could not be determined.

microorganisms) population of the same neighbourhood was positively associated with eight items of reported health (table 5).

"Shortness of breath" ("following exertion" and "while at rest") was most strongly associated with residential exposure to highest concentrations (>10^5 CFU m^{-3}) bioaerosols. Frequency of perceived bronchitis in the past 12 months and two symptoms associated with cough all had positive adjusted OR above 2.5. Sore eyes as well as diarrhoea, excessive tiredness, and shivering were also positively associated with the close proximity of home to the composting site (table 5).

Duration of present residency (>5 years), defining those individuals exposed to residential bioaerosol since the commencement of operations at the site, was positively associated with an increased frequency of one third of the airway complaints, eye complaints, as well as nausea or vomiting and shivering. Specific odour annoyance did not confound any of the airway related complaints in the neighbourhood of the composting site (table 5).

In this analysis, distance of the home from the site, and duration of residency, as well as residential odour annoyance were not associated with increased reporting of lifetime prevalence of 18 self reported doctor diagnosed illnesses.

DISCUSSION

Concentrations of culturable airborne microorganisms, including moulds, measured in the residential air during the study (table 2) at 150 to 320 m from the composting site were 100–1000 times higher than those concentrations generally reported as natural background concentrations. Background concentrations for total bacteria and moulds are given as <10^3

CFU m^{-3} air and $<10^2$ CFU m^{-3} air for actinomycetes.[2] As a result of this, and particularly because of the detection of site typical actinomycetes, a distance dependent influence of the composting site on the residential air could be demonstrated up to 550 m (table 2). In a study conducted in Islip, New York,[16] the bioaerosol related influence of a large scale composting site on a residential area 500 m away could not be excluded. However, this study has methodological shortcomings as far as exposure measurements and health effects are concerned. In other studies, the bioaerosol pollution due to sites could only be demonstrated up to a distance of 200 m.[4]

The highest concentrations of total bacteria and actinomycetes ($>10^7$ CFU m^{-3} air) measured, were within the range of those reported in occupational studies of composting sites.[2 11] For total bacteria, the measured concentrations of 10^4 or 5×10^3 CFU m^{-3} air also exceeded occupational threshold levels recommended in Denmark and Sweden.[31] Health effects have been observed in the studies on workplace or indoor environment in association with concentration levels recorded here for total bacteria and moulds (*Aspergillus fumigatus*).[11 22]

These microbiological measurements were performed under meteorological conditions which occur on 50% of the days in a year. Desired "worst case" conditions were not achieved completely during these measurements. Considering this the exposure to airborne culturable microorganisms in the residential area could at times have been even higher. The additional health burden from non-culturable microorganisms or allergenic and toxic parts of microorganisms, which also occur in bioaerosols, was not even assessable in the scope of the measurements.[5]

An association could be demonstrated in the present study between residential bioaerosol pollution (<200 m from the plant) and irritative airway complaints. This association was found when comparing with less exposed subjects living in the same neighbourhood further away from the same site (>400–500 m) and also, to a greater extent, when comparing with unexposed controls. Furthermore, an association of these complaints with the duration of bioaerosol exposure (>5 years) could also in part be demonstrated. If at least two irritative mucous membrane symptoms are reported in association with chronic exposure to bioaerosols, this is suggestive of airway inflammation.[9]

Complaints of airway inflammation are to be expected after frequent exposure to microorganisms in the range of concentration of 10^4–10^5 CFU m^{-3} air.[4] These concentrations are similar to those measured 200 m from the site in this study (table 2). Furthermore, due to the meteorological and topographical conditions, this exposure is likely to have existed frequently.

Irritative airway complaints (increased frequency of coughing, shortness of breath, and self diagnosed bronchitis) have already been reported in health studies concerning exposure to microorganisms: At workplaces with handling of garbage and compost, increased frequencies of airway related mucous membrane irritation, coughing, and tracheobronchitis, among others, have been reported[2 11]; similarly, airway symptoms have been reported in residents of mouldy or damp homes.[20–22]

The high OR found in both analyses, comparing highest exposed to unexposed controls as well as least exposed are not considered to be due to unrecognised bias. They are considered to result from high measurable concentrations of airborne microorganisms in residential air (200 m from the site), dropping sharply within 300 m and reaching near background concentrations at 550 m.

It could be shown that perceived odour annoyance, considered to be a strong bias on self reported complaints, had no influence on these irritative airway complaints (table 5). Odour annoyance was only associated with general complaints. This could have been expected on the basis of previous reports.[24–26] Comparable results were found when studying odour annoyed (90%) neighbours of another composting site. Rates of health complaints showed no association (versus controls in a neighbourhood without a composting site) with residency near the composting site (data not shown).

Examiners and study population were blinded to the results of microbiological measurements during the field work as samples for these measurements were obtained during the ongoing survey. Further aspects speak against a reporting bias, based on prejudices regarding the plant: self reported lifetime diagnoses of illnesses were not associated with exposure, although occurrence of some diseases (for example, infections and allergies) had been feared by the residents beforehand. They had stated this during the public event which took place prior to the survey. Furthermore, respondents knew interviewers would not be able to prove or disprove during the house calls whether reported illnesses actually existed.

Additional aspects speak against general over reporting of all health complaints in the neighbourhood of the composting site. Skin irritation (data not shown), occurring when in close occupational contact with waste,[2] was not reported more often, for instance. The same applies for perceived hay fever. It was reported least very close to the site (table 3).

Bioaerosol exposure from other everyday sources or exposure to respiratory irritants also cannot explain the findings of this study, as they were reported the same or less frequently by the group near the site than by the unexposed control group (table 1). Addressing a possible bias due to the low participation rate in the unexposed group, the following should be considered. In a sample with a low participation rate, those more health conscious or health impaired would be more likely to participate in this unexposed sample. This in turn would then lead to higher rates of health complaints in these controls compared to the exposed population, and underestimate the true health effects.

Specific allergic and infectious diseases are reported in subjects exposed to various bioaerosols working at composting sites, indoors, and in the environment.[3 4 13–15 17 19] Severe toxic-irritative reactions (ODTS, pulmonary mycotoxicosis, or toxic pneumonitis), occurring after a single inhalation of very high levels of spores (10^6–10^9 spores m^{-3} air),[3 6 8] and pulmonary haemorrhage[21] have also been described concerning occupational settings and in case reports of indoor environmental exposure. Actinomycetes and mould spores, as well as endotoxins and glucanes,[32] are discussed as their causes. There was no indication in the presented study that the exposure detected in the scope of this study led to any of the above illnesses in the five years since the composting site started operating. However, in this context the limitations of relying on self reported health status have to be taken under consideration.

In the present study, as claimed by others,[4 18] the health related problems of environmental bioaerosols were assessed by measuring microbiological pollution in the residential environment and simultaneously collecting medical histories. Odour annoyance, always associated with bioaerosols, was taken into consideration. To the authors' knowledge it was found for the first time that there can be a demonstrable bioaerosol pollution of the residential environment, which is in part still detectable at a distance of 550 m. This bioaerosol exposure in turn could be associated, as far as concentrations of bioaerosols and duration of exposure were concerned, with symptoms suggestive of airway inflammation also reported at respective workplaces.

Due to methodological shortcomings, cross sectional studies are not able to prove or disprove a causal relationship. Nevertheless it is believed that on the basis of this study irritative airway complaints pointing at MMI-like airway inflammation can be seen as associated with measurable residential bioaerosol pollution.

The health complaints found here in association with residential bioaerosol exposure were not accompanied by increased self reports of diseases diagnosed by a doctor. This

might have been anticipated, as on the one hand diagnosing airway irritation related to environmental exposure is not common by general physicians. On the other hand, higher rates of diseases with clear laboratory findings or organ impairment could not have been expected. Nevertheless, several considerations should be made when considering their relevance as far as public health is concerned. For airway inflammation related to bioaerosol exposure, a toxic or non-specific genesis is hypothesised. It can be accompanied by an increase in bronchial reactivity as a sign of an inflammatory process as well as possibly being the onset of chronic bronchitis.[2 7 9] An effect of the bioaerosol concentration in the residential air with regard to excessive tiredness and shivering (table 5) was also detected in the present study. At workplaces with garbage or compost handling, and in homes containing mould, single general complaints of general disturbances, for example, toxic pneumonitis, including shivering and tiredness, are often observed.[11]

This study forms the basis for further studies using more sophisticated designs (for example, prospective panel study) to study the clinical relevance of these irritative airway symptoms. Clinical parameters, for example, lung function examinations could be included, particularly since connections have been found in the workplace between symptoms of airway inflammation and changes in lung function.[9] Risk groups for airway effects (for example, children) could be particularly looked at. Due to the small sample of children this was not possible in the present study.

Furthermore, mucous membrane lavage could be carried out to document inflammatory changes and evidence of specific antibodies in the sense of exposure manifestation.[2 12] As the amount of time spent outdoors in the residential area is relatively small, and therefore exposure to outdoor air only represents a small part of the day, the possible accumulation in interior rooms of airborne microorganisms from emission sources should be measured in the future.

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Effects of bioaerosol polluted outdoor air on airways of residents: a cross sectional study

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Acute Aspergillus pneumonia associated with mouldy tree bark-chippings, complicated by anti-glomerular basement membrane disease causing permanent renal failure

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ABSTRACT

A non-immunocompromised man developed acute Aspergillus pneumonia after spreading mouldy tree bark mulch. Despite normal renal function at presentation, he developed rapidly progressive glomerulonephritis with acute kidney injury due to anti-glomerular basement membrane antibodies (anti-GBM) 4 weeks later. He remained dialysis dependent and died of sepsis 10 months later. We hypothesise that he contracted invasive pulmonary Aspergillosis from heavy exposure to fungal spores, leading to epitope exposure in the alveoli with subsequent development of GBM auto-antibodies.

1. Introduction

Goodpasture's Syndrome has been widely described in the medical literature. It is characterised by a rapidly progressive glomerulonephritis due to circulating anti-glomerular basement membrane (anti-GBM) antibodies. The subject of this report developed acute pulmonary Aspergillosis following exposure to fungal spores in mouldy tree bark whilst gardening and this led to Goodpasture's Syndrome. We believe that this is the first presentation of Aspergillosis induced Goodpasture's Syndrome to be reported in the medical literature.

2. Case

A 69 year old retired man with no significant medical history was admitted to hospital with a 5 week history of increasing dyspnoea and intermittent haemoptysis. He had worked in a metal foundry and cardboard works. Antibiotics in the community had not improved his symptoms. He was a lifelong smoker of 30 cigarettes per day.

On admission (day 0), his temperature was 37.2 °C, his pulse was 72, his respiratory rate 22 per minute and his blood pressure was 120/69 mmHg. His oxygen saturation on air was 90%, falling to 84% on walking. Bilateral crackles were present at the lung bases. Chest radiograph on day 0 revealed bilateral patchy infiltrates (Fig. 1a).

Initial blood tests revealed raised inflammatory markers (CRP 225 mg/L and leucocyte count 19.5×10^9/L with a neutrophilia). Creatinine was 70 μmol/L. Initial urine dipstick was unremarkable. He was treated with amoxicillin and clarithromycin for community acquired pneumonia. Spirometry on day+5 was as follows: FEV1 1.69 L (55% predicted); forced vital capacity 2.59 L (65% predicted): FEV1/FVC ratio 65%.

On day+6, a high resolution CT of his thorax revealed widespread fine nodularity, maximal in the midzones and ill-defined peribronchial inflammatory shadowing. There was bronchiectasis (which had improved on a follow-up scan 2 months later) and patchy "tree-in-bud" change, but no radiological features of pulmonary haemorrhage. At bronchoscopy on day+7, endobronchial biopsies showed non-specific inflammatory changes, with no granulomata seen. Transbronchial biopsy was not possible as the patient's oxygen levels fell and so the procedure was abandoned. Serum ANA was weakly

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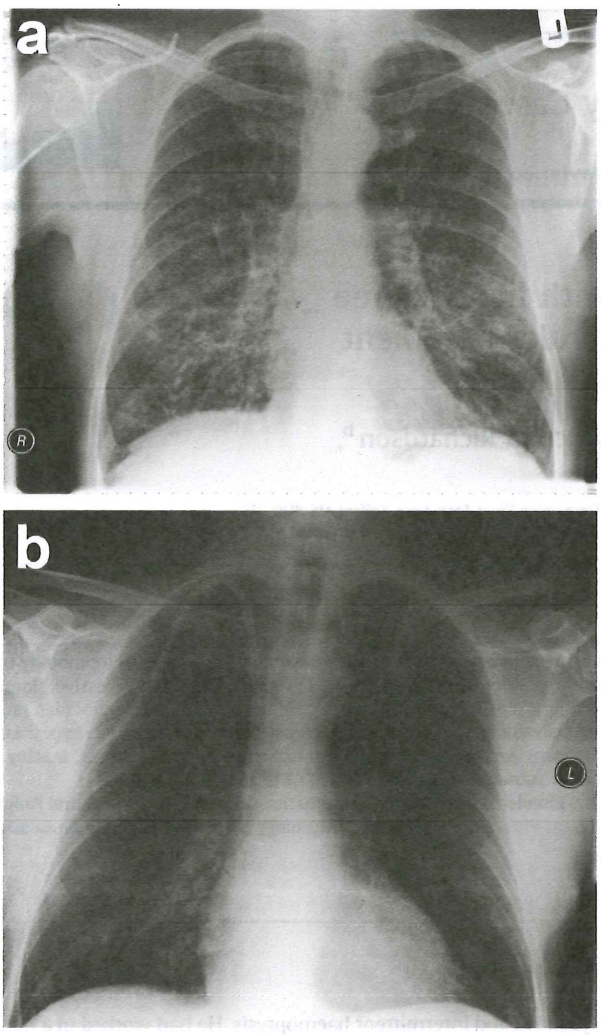

Fig. 1. Chest radiograph at presentation (a) and 2 months later (b).

positive at 1/100 (speckled pattern) with negative ENA and ANCA. Blood levels of IgG and IgA were borderline elevated. Serum IgE was elevated at 1049 ku/L. He had elevated IgG to *Aspergillus fumigatus* of 47 mgA/L (reference range up to 40 mgA/L) but his *A. fumigatus* IgE level was normal. Galactomannan assay was not available at the time of this case report. A diagnosis of acute invasive pulmonary Aspergillosis (IPA) was made and he was discharged home on day+13, on oral Itraconazole, 200 mg twice daily. His discharge creatinine was 80 μmol/L.

At clinic on day+27, his respiratory symptoms had improved substantially following treatment. His oxygen saturation was 95% at rest. He was able to climb 20 steps and the saturation did not fall below 90%. Spirometry was greatly improved at 2.4/3.9 (FEV1 78% predicted, vital capacity 90% predicted, FEV1/FVC ratio 61%). The chest radiograph showed substantial improvement (Fig. 1b). Direct questioning revealed that his symptoms had developed about 2 weeks after spreading eight, 40 L bags of foul smelling mouldy tree bark on the garden. This material was subsequently cultured in the National Aspergillosis Centre and it grew *A. fumigatus*, *Rhizopus* spp., *Sporobolomyces* spp. and bacteria (Fig. 2).

Blood results from clinic showed his renal function had dramatically deteriorated. His urea was 39.6 mmol/L and creatinine was 851 μmol/L. He was readmitted urgently and itraconazole was stopped. Renal ultrasound revealed no urinary tract obstruction.

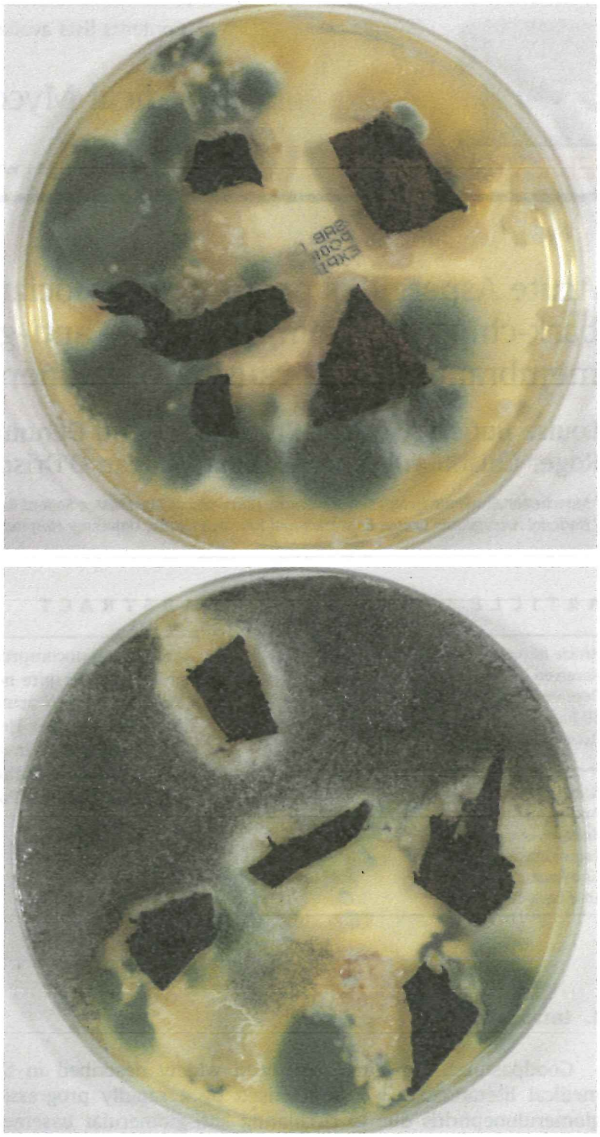

Fig. 2. Tree bark particles on fungal culture plates.

A renal immunology screen showed positive anti-glomerular basement membrane (anti-GBM) antibodies with a titre of 111 U/ml (ELISA assay) (reference range < 15 U/ml). Retrospective analysis of a blood sample from day 3 of his first hospital admission showed an anti-GBM titre of 67 U/ml at that time. Renal biopsy demonstrated necrotising crescentic glomerulonephritis with linear deposition of IgG along the basement membrane, consistent with anti-GBM disease.

On day+28, he was commenced on haemodialysis, pulsed methylprednisolone 500 mg once daily for 3 days, cyclophosphamide 750 mg (once monthly dose) and plasma exchange. Itraconazole was restarted due to the risk of reactivation of Aspergillosis. Despite these measures, he remained anuric. Subsequent anti-GBM antibody titres were significantly lower (20 U/ml 6 weeks post-presentation, 8 U/ml at 8 weeks and < 7 U/ml at 5 months post-presentation). Aspergillus IgG 6 weeks after his acute respiratory presentation had fallen to 7 mgA/L, and after 3 months total IgE was normal. Unfortunately the patient remained frail and

housebound despite haemodialysis and he died from severe sepsis and acute pneumonia 10 months after his first presentation.

3. Discussion

Invasive pulmonary Aspergillosis has specifically been reported in healthy individuals after spreading rotting tree bark whilst gardening [1–3]. In previous cases, massive inhalation of spores was thought to be the likely route of infection [3]. There is diagnostic difficulty in these cases and diagnosis is often made at post-mortem, because blood and sputum cultures have poor sensitivity [1,3]. Serological testing for Aspergillus IgG antibodies can be used in the diagnosis of IPA. In a study of patients developing IPA following bone marrow transplant, an IgG response to acute infection was noted [4]. *A. fumigatus* has been implicated in invasive disease.

Anti-GBM antibody disease is characterised by a rapidly progressive glomerulonephritis due to circulating anti-GBM antibodies. The target of these antibodies is the non-collagenous domain of the α3 chain of Type IV collagen [5]. There is a body of evidence to suggest that certain human leucocyte antigen (HLA) molecules, notably HLA-DR 15 and HLA-DR 4, are associated with the development of anti-GBM disease [6]. Subsequent analysis of our patient's HLA type revealed HLA-DR 17 and DR 4.

Hypothetically certain epitopes that are normally immunologically privileged can become exposed and perceived as foreign, leading to antibody development [7]. *A. fumigatus* conidia bind to type IV collagen (and fibrinogen), a process inhibited by free sialic acid and in particular N-acetylneuraminic acid [8]. Whether the binding of *A. fumigatus* to collagen IV in the lung altered the allergenicity of this major structural protein, allowing auto-antibodies to be formed, remains conjecture. It has been hypothesised that exposure to certain environmental factors may affect the molecular structure of α3NC1 domain, making antibody binding more likely [5].

Development of Goodpasture's syndrome has been reported following exposure to inhaled chemicals, drugs and in association with infectious disease [9]. Hidden epitopes may become exposed during these episodes.

We hypothesise that our patient contracted invasive pulmonary Aspergillosis due to heavy exposure to fungal spores whilst gardening. This led to epitope exposure in the alveoli with subsequent development of GBM auto-antibodies and acute renal failure, in an individual with pre-existing genetic risk factors. We believe that this is the first such presentation in the medical literature.

Conflict of interest

We have no conflicts of interest in the publication of this article, including financial ones to declare.

Acknowledgements

All co-authors have seen and agree with the contents of the manuscript and there is no financial interest to report. We certify that the submission is original work and is not under review at any other publication. The results presented in this paper have not been published previously in whole, or part, except in abstract form. The patient himself has since died and gave verbal consent for publication prior to his death. We have now obtained written consent from his wife for this case report to be published.

If our case report is accepted for publication we would wish the colour picture to appear in the printed journal (Fig. 2). We accept the charge for this.

The contributions of the individual authors are as follows. All of the authors were involved in the clinical care of the patient described in the case. Dr. T. Brockley performed the literature searches and drafted the discussion section. Dr. L. Butler drafted the case presentation. Both of the above authors were responsible for editing and revising the article prior to submission. Dr. O'Driscoll, Dr. Sinha, Professor Denning and Professor Richardson were involved in the editing process and also provided intellectual advice of critical importance regarding the proposed disease mechanism. Dr. Chisholm provided radiology advice regarding the patient. In addition, Dr. O'Driscoll initiated the writing of the article and edited each section. He also had final approval of the article prior to submission. Dr. Butler is the main contact correspondent. All authors have reviewed the article for final submission approval.

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MAJOR ARTICLE

Fulminant Mulch Pneumonitis: An Emergency Presentation of Chronic Granulomatous Disease

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(See the article by Bénet at al. on pages 682–6)

Background. Chronic granulomatous disease (CGD) is associated with multiple and recurrent infections. In patients with CGD, invasive pulmonary infection with *Aspergillus* species remains the greatest cause of mortality and is typically insidious in onset. Acute fulminant presentations of fungal pneumonia are catastrophic.

Methods. Case records, radiograph findings, and microbiologic examination findings of patients with CGD who had acute presentations of dyspnea and diffuse pulmonary infiltrates caused by invasive fungal infection were reviewed and excerpted onto a standard format.

Results. From 1991 through 2004, 9 patients who either were known to have CGD or who received a subsequent diagnosis of CGD presented with fever and new onset dyspnea. Eight patients were hypoxic at presentation; bilateral pulmonary infiltrates were noted at presentation in 6 patients and developed within 2 days after initial symptoms in 2 patients. All patients received diagnoses of invasive filamentous fungi; 4 patients had specimens that also grew *Streptomyces* species on culture. All patients had been exposed to aerosolized mulch or organic material 1–10 days prior to the onset of symptoms. Cases did not occur in the winter. Five patients died. Two patients, 14 years of age and 23 years of age, who had no antecedent history of recognized immunodeficiency, were found to have $p47^{phox}$-deficient CGD.

Conclusions. Acute fulminant invasive fungal pneumonia in the absence of exogenous immunosuppression is a medical emergency that is highly associated with CGD. Correct diagnosis has important implications for immediate therapy, genetic counseling, and subsequent prophylaxis.

Chronic granulomatous disease (CGD) of childhood, first described in 1959 [1], is caused by defects in 1 of 4 structural components of the reduced nicotinamide adenide dinucleotide phosphate oxidase enzyme. Mutations in the X-linked $gp91^{phox}$ account for ~70% of cases, and the remainder are autosomal recessive in $p22^{phox}$, $p47^{phox}$, and $p67^{phox}$ [2]. Patients with CGD are prone to develop characteristic bacterial and fungal infections due to pathogens such as *Staphylococcus aureus, Serratia marcescens, Burkholderia cepacia, Nocardia* species, and *Aspergillus* species [2, 3]. In addition, these patients develop steroid-responsive granulomatous complications, including inflammatory bowel disease, urinary tract obstruction, and wound dehiscence, presumably because of abnormal degradation of inflammatory mediators [2, 4, 5].

Unique to CGD among genetic immunodeficiencies is susceptibility to invasive infection with filamentous fungi, especially *Aspergillus* species, which typically occurs in the pulmonary system, is difficult to treat, and is the single greatest cause of mortality associated with CGD [3, 6]. In general, fungal infection in patients with CGD is more indolent than infection due to bacteria [3, 7], and patients rarely experience pulmonary cavitation or hemoptysis because of *Aspergillus* infection. High-level exposure to aerosolized fungi, such as that which can occur during mulching, may lead to an acute fulminant presentation, with fever, dyspnea, and pulmonary infiltrates, and to death. Two such cases of the

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initial presentation of CGD in adolescents and young adults led us to review cases to better characterize this clinical entity.

MATERIALS AND METHODS

The case records of 156 patients with CGD who were followed up according to approved protocols at the National Institutes of Health (NIH; Bethesda, MD) since 1986 were reviewed for acute presentations of fever, dyspnea, diffuse pulmonary infiltrates, and filamentous fungal infection. We also solicited cases from outside the NIH.

Patient 1. A previously healthy 14-year-old boy presented to his local hospital in the fall of 2004 with a 3-day history of fever, sore throat, and shortness of breath. A chest radiograph revealed bilateral infiltrates (figure 1*A*). One week previously, the boy had cleaned gutters containing dead leaves. Despite cefuroxime and azithromycin therapy for community-acquired pneumonia, his hypoxia worsened, leading to intubation and mechanical ventilation on hospital day 4. Meropenem, metronidazole, clarithromycin, and fluconazole were added to his treatment regimen, but respiratory failure progressed; high-dose methylprednisolone therapy was started for possible vasculitis. On hospital day 11, a lung biopsy specimen showed necrotic lung tissue with fungal hyphae and grew *Aspergillus fumigatus*. The dihydrorhodamine test result was consistent with CGD. Voriconazole, caspofungin, and IFN-γ therapy, as well as neutrophil transfusions, were initiated. High-level oxygenation requirements and deterioration of hepatic and renal function led to death 1 month after presentation. Autopsy revealed disseminated fungal infection, granulomatous foci in the lungs and brain with *A. fumigatus*, and extensive vascular invasion and infarction (in the lungs, kidneys, liver, and spleen) due to *Absidia corymbifera*. The patient was subsequently confirmed to have had $p47^{phox}$ deficiency.

Patient 2. A previously healthy 23-year-old female athlete presented to an emergency department in the summer of 2003 with acute onset of dyspnea 1 day after having performed heavy mulching. The initial chest radiograph was read as normal, and the patient was discharged from the hospital (figure 1*B*). Twenty-four hours later, her dyspnea worsened and was accompanied with fever and bilateral infiltrates (figure 2*A*). Antibiotic therapy for community-acquired pneumonia was initiated. The findings of bronchoscopic examination were not diagnostic. Fever and dyspnea progressed to hypoxia, and the patient required intubation and mechanical ventilation. A visually assisted thoracoscopic biopsy was performed on hospital day 8; observation of the specimen revealed intense pyogranulomatous inflammation, with invasive hyphae, and the specimen grew *A. fumigatus* and *Rhizopus* species (figure 3*A–C*). The dihydrorhodamine test result was consistent with $p47^{phox}$-deficient CGD. When the patient was transferred to the NIH (figure 4*A* and *B*), treatment with voriconazole, caspofungin, meropenem, and methylprednisolone led to gradual improvement. Her course was complicated by recurrent bilateral pneumothoraces and exacerbation of pulmonary inflammation upon reduction of prednisone therapy. A second biopsy was performed, and degenerating hyphal elements were seen but did not grow from the biopsy specimens. The patient recovered, with return to normal lung function (figure 4*C* and *D*). She had had several respiratory infections during infancy and an episode of "cat scratch disease," all of which had resolved with

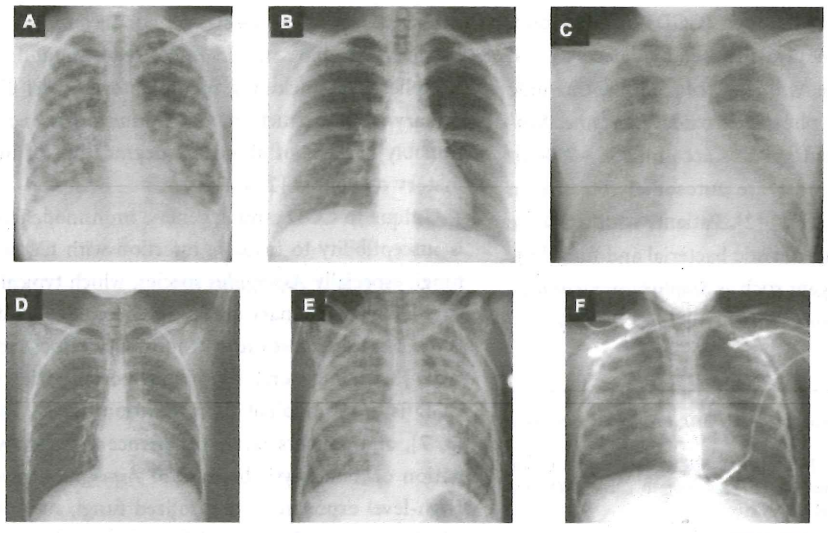

Figure 1. Chest radiographs at presentation for patients 1 *(A)*, 2 *(B)*, 4 *(C)*, 6 *(D)*, 7 *(E)*, and 9 *(F)*. Although the initial film of patient 2 was read as normal, the second films, shown in figure 2, were obtained <24 h later and showed bilateral infiltrates.

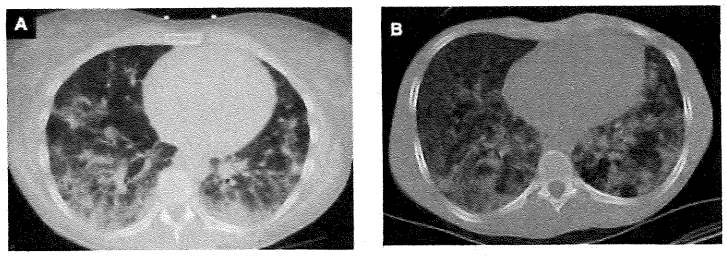

Figure 2. CT of the thorax from patients 2 *(A)* and 5 *(B)* that were obtained during hospitalization, showing bilateral pulmonary infiltrates

oral antibiotic treatment. She and her 25-year-old brother, who had had 2 episodes of "cat scratch disease" and 1 episode of cellulitis, were subsequently confirmed to have $p47^{phox}$ deficiency.

Patient 3. A 20-year-old man with known $gp91^{phox}$ deficiency who was receiving prophylactic trimethoprim-sulfamethoxazole (TMP-SMX) therapy presented in the summer of 2001 with a of 3-day history of fever, cough, and progressive dyspnea. For 3 weeks prior to hospital admission, he had been working in the forest, chipping wood. At hospital admission, he was hypoxic, with bilateral crackles. Despite treatment with amphotericin B, rifampin, and flucloxacillin, the patient required intubation 24 h after hospital admission because of respiratory failure. Sputum and tracheal aspirate cultures grew *A. fumigatus.* Respiratory worsening, with bilateral recurrent pneumothoraces, led to death 10 days after hospital admission. No autopsy was performed.

Patient 4. A 23-year-old man with known $gp91^{phox}$ deficiency who was receiving prophylactic TMP-SMX and itraconazole, as well as prednisone (5 mg every other day), for granulomatous bowel disease, presented to the NIH in the fall of 2001 with a 1-week history of fever, progressive cough, and flu-like symptoms after working in a lawn mower repair shop. His temperature was 39.8°C, and he had tachypnea and bilateral interstitial infiltrates (figure 1*C*). A treatment regimen of levofloxacin, ceftriaxone, TMP-SMX, liposomal amphotericin B, and solumedrol (1 mg/kg daily) was initiated. Percutaneous lung biopsy was performed, and the specimen grew *A. fumigatus, Aspergillus niger, Rhizopus* species, *Penicillium* species, and *Streptomyces thermoviolaceous.* Respiratory failure led to intubation, mechanical ventilation, and bilateral pneumothoraces. The patient died 1 month after presentation. Autopsy revealed extensive abscess formation in the lungs, with abundant hyphal forms consistent with *Aspergillus* species.

Patient 5. A 64-year-old man with known $p47^{phox}$-deficient CGD, insulin-dependent diabetes mellitus, and atherosclerotic coronary artery disease was receiving prophylactic TMP-SMX, itraconazole, and IFN-γ therapy. His initial diagnosis was reported elsewhere [8]. He presented in the fall of 2001 with a 1-day history of dyspnea and cough, oxygen saturation of 91% on room air, with bilateral pulmonary infiltrates (figure 2*B*). One week previously, the man had been mulching trees in his yard. A treatment regimen of intravenous ceftriaxone, TMP-SMX, amphotericin B deoxycholate, and solumedrol (60 mg every 12 h) was initiated. Bronchoscopic examination revealed branching septate hyphae, and specimens grew *A. fumigatus, A. niger,* and *Penicillium* species. Dyspnea and hypoxia led to intubation and mechanical ventilation on hospital day 5. The patient was extubated on day 14, and steroid therapy was gradually tapered. Although his fungal infection resolved, the patient's course was complicated by diabetes, congestive cardiac failure, and recurrent respiratory failure. He died of respiratory failure 1 year after admission to the hospital. No autopsy was performed.

Patient 6. A 16-year-old boy with known $gp91^{phox}$ deficiency who was receiving prophylactic TMP-SMX and IFN-γ therapy presented in the fall of 1999 with fever, cough, dyspnea, and bilateral patchy infiltrates 1 week after riding a tractor while harvesting a field of peppermint (figure 1*D*). On admission to the NIH, a treatment regimen of ceftriaxone, TMP-SMX, amphotericin B deoxycholate, and methylprednisolone (60 mg every 12 h) was initiated. Culture of bronchoalveolar lavage specimens grew *Aspergillus nidulans.* The patient's health gradually improved while receiving therapy, and he was discharged from the NIH after 1 month, with return to normal lung function while receiving itraconazole therapy (200 mg/day) .

Patient 7. An 8-year-old boy with known X-linked CGD who was receiving prophylactic TMP-SMX and IFN-γ therapy presented in the fall of 1999 with fever, cough, rhinorrhea, headache, fatigue, and normal chest radiograph findings 1 week after playing in a moldy garden shed. Therapy with ceftriaxone and gentamicin led to some improvement, but on hospital day 3, the patient became tachypneic and hypoxic, with bilateral infiltrates. Treatment with amphotericin B deoxycholate, vancomycin, TMP-SMX, and azithromycin was initiated. On transfer to the NIH (20 days after presentation), the boy had a temperature of 38.6°C and was tachypneic and hypoxic (figure 1*E*). Therapy was changed to levofloxacin, imipenem, amphotericin B deoxycholate, and prednisone (1 mg/kg daily). An open lung biopsy was performed, and the specimen revealed

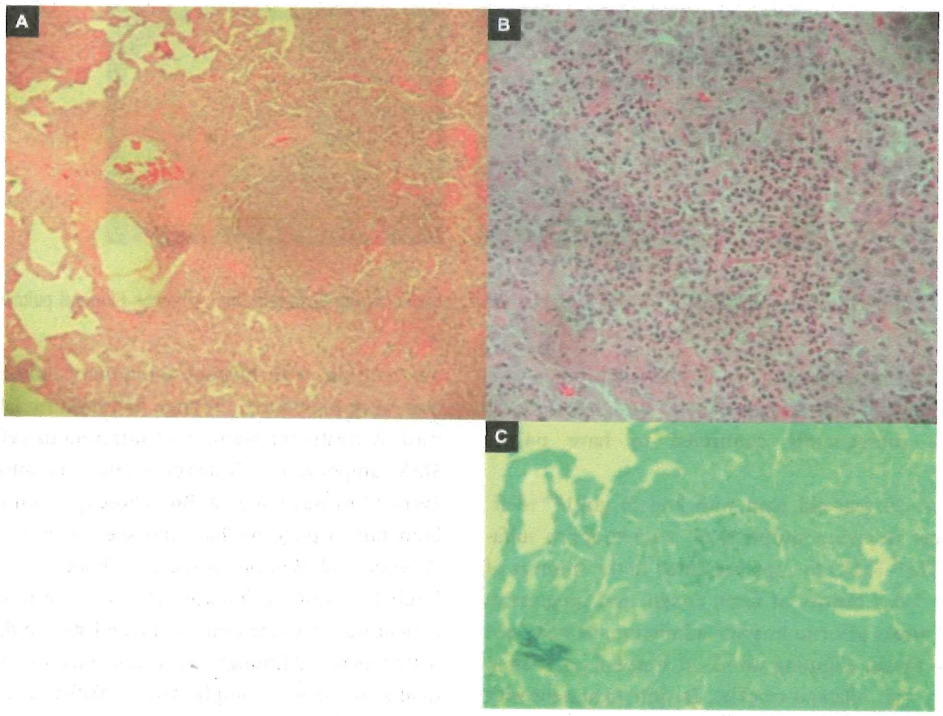

Figure 3. Photomicrographs of the lung biopsy specimen from patient 2 that was obtained on hospital day 8. *A,* Low-power view of lung parenchyma, showing intense pyogranulomatous inflammation with virtually complete effacement of lung architecture (hematoxylin and eosin stain; original magnification, ×100). *B,* Microabscess with visible hyphal structures centrally (hematoxylin and eosin stain; original magnification, ×400). *C,* Gomori-methenamine-silver stain of the section in *B,* showing numerous hyphae.

hyphae consistent with *Aspergillus* species; however, culture of the specimen showed no growth. The patient's health improved gradually, and steroid therapy was tapered. The patient was discharged from the hospital 22 days after NIH admission, with return to normal lung function while receiving amphotericin B deoxycholate therapy.

Patient 8. An 18-year-old man with known $p47^{phox}$-deficient CGD who was receiving TMP-SMX and IFN-γ therapy presented in the summer of 1995 with a 4-day history of fever, cough, dyspnea, nausea, malaise, and fatigue. Six days before hospital admission, he had swept a trailer that was used for hauling mulch. On admission to the NIH, he had a temperature of 38.4° C and was hypoxic, with diffuse bilateral infiltrates. Treatment with ceftriaxone, TMP-SMX, ciprofloxacin, amphotericin B deoxycholate, and methylprednisolone (60 mg daily) was initiated. Culture of bronchoalveolar lavage specimens grew *A. niger, Rhizopus* species, and *Streptomyces* species. Dyspnea and hypoxia worsened on hospital day 3, and granulocyte transfusions were started. The patient's health improved gradually, and he was discharged from the NIH after 1 month of itraconazole therapy (200 mg twice daily), with return to normal lung function.

Patient 9. A 10-year-old boy with a known $gp91^{phox}$ deficiency who was receiving prophylactic TMP-SMX and IFN-γ therapy presented to his pediatrician in the fall of 1991 with fever (temperature, 39.8°C), malaise, and anorexia. After 3 days without improvement, he was admitted to the NIH with fever (temperature, 38.7°C), tachypnea, and diffuse bilateral infiltrates (figure 1*F*). The patient had helped his father spread mulch several days prior to the onset of symptoms. Dyspnea and hypoxia led to intubation and mechanical ventilation. Treatment with ceftazidime, oxacillin, gentamicin, TMP-SMX, amphotericin B deoxycholate, and solumedrol (100 mg every 8 h) was initiated. Culture of bronchoalveolar lavage specimens grew *A. fumigatus, Rhizopus* species, and *Streptomyces* species. A decrease in respiratory function, bilateral pneumothoraces, and shock led to death 1 week after admission to the NIH. Autopsy revealed severe diffuse necrotizing *Aspergillus* pneumonia.

RESULTS

Clinical presentations. The above cases illustrate a temporal relationship between exposure to mold, especially mulch, and presentation with clinical pneumonia in patients with CGD. All patients presented within 10 days after an identifiable ex-

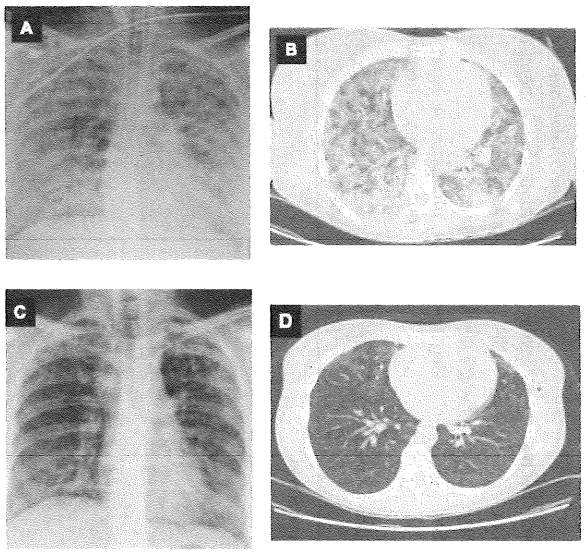

Figure 4. Chest radiographs and CT of patient 2 at transfer to the National Institutes of Health (day 10 of hospitalization; *A* and *B*, respectively) and 2 months after transfer (*C* and *D*, respectively). Note the remarkable resolution of infiltrates and the absence of pneumatoceles, despite the occurrence of pneumothoraces.

posure (table 1) to aerosolized organic material with symptoms of respiratory illness, including fever, flu-like symptoms, and cough. Dyspnea was present in 6 of 8 patients at initial evaluation, and hypoxia developed in all of the patients, except patient 6. Chest radiographs at the time of presentation revealed bilateral infiltrates in all of the patients, except patient 2, who was initially seen 1 day after exposure. By 3 days after the onset of symptoms, all patients had diffuse bilateral infiltrates. Clinical and radiographic progression was rapid. Patients presented with symptoms from May through November; cases were not reported during the early spring or winter.

Microbiologic examination. The diagnosis of fungal pneumonia was made on the basis of examination of bronchoalveolar lavage or lung biopsy specimens. Culture results were positive from at least 1 source in all patients, except patient 7, who had been extensively pretreated; however, examination of biopsy specimens revealed invasive fungal elements consistent with *Aspergillus* species. *A. fumigatus* was isolated from 7 patients, *A. niger* from 2, and *A. nidulans* from 1. Other organisms cultured specimens included *Rhizopus* species, *Penicillium* species, and *Streptomyces* species. The extent to which these organisms contributed to the clinical condition is unclear. Specimens from patient 1 revealed disseminated *Absidia corymbifera;* he had received high-dose steroidal therapy for presumed vasculitis, and this may have predisposed him to invasive infection with *Absidia* species. No routine bacteria were isolated. The rate of fungal coinfection with *Nocardia* species among patients with CGD is ~30% [7], but we recovered no *Nocardia* species from these patients, despite aggressive microbiologic search. However, all patients received antibiotics during their treatment, which would have treated infection due to *Nocardia* species. Environmental mulch specimens were obtained for culture for patients 2 and 9. Results of PFGE of environmental samples associated with patient 2 did not match the *Aspergillus* species found on culture of her lung specimen, possibly reflecting the heterogeneous nature of mulch. Two patients were supposedly receiving itraconazole prophylaxis at the time of presentation, suggesting that high levels of exposure can overcome prophylactic therapies.

Management and outcome. Initial treatment was empirical in all cases. In patients with known CGD, therapy was based on the organisms that were commonly pathogenic for these patients (table 1). Others were treated for community-acquired pneumonia. In patients whose disease progressed, steroid therapy was added, and lung biopsies were performed. For patients 1 and 2, identification of invasive aspergillosis led to the consideration of CGD. Most patients were treated with amphotericin B deoxycholate or a lipid formulation. Voriconazole and caspofungin were added only after biopsies were performed.

Five of the 9 patients died, 4 early in the course of treatment and 1 after a protracted hospitalization. Patients who survived had hospital stays of 4–6 weeks. The time from exposure to presentation and diagnosis did not appear to be linked to survival. Treatment was prolonged and included steroid therapy with a slow taper.

Genetics. Almost one-half of the patients in this series had $p47^{phox}$ deficiency, in contrast to the 25% rate of $p47^{phox}$ deficiency seen in most large series. The late presentation of CGD in patients 1 and 2 after a large exposure likely reflects the overall more-benign course of $p47^{phox}$ deficiency, which is often diagnosed later in life than is X-linked disease [6].

DISCUSSION

Invasive *Aspergillus* infection is a hallmark of compromised phagocyte immunity. Although most cases are extensively described in relation to neutropenia, it occurs in association with many immunocompromised states, as well as in association with emphysema, cavitary lung disorders, and hyper IgE syndrome. Chronic necrotizing pulmonary aspergillosis has been described in a few patients with severe underlying lung disease and low levels of circulating mannose-binding lectin [9]. Among genetic immunodeficiencies, CGD is the only one associated with invasive aspergillus infection in the absence of preexisting lung damage, occurring at a rate of ~0.15 fungal infections per patient-year [10, 11].

There have been rare reports of acute, often fatal, invasive aspergillosis in individuals thought to be immunologically normal [12–14]. Given the lack of other diseases associated with

Table 1. Clinical characteristics of 9 patients with mulch pneumonitis.

Patient	Age, years	Sex	Genotype	Season	Infiltrates	Hypoxia	Exposure	Time from exposure to presentation, days	Duration of hospital stay, days	BAL result	Lung biopsy result	Organisms on culture
1	14	M	$p47^{phox}$	Fall	Bilateral	Yes	Leaves	7	30	NP	Fungal elements	*Aspergillus fumigatus, Absidia corymbifera*
2[a]	23	F	$p47^{phox}$	Summer	No	Yes	Mulch	1	30	Not diagnostic	Fungal elements	*A. fumigatus, Rhizopus* species
3	20	M	$gp91^{phox}$	Summer	NP	Yes	Wood chips	<21	3	NP	NP	*A. fumigatus*
4	23	M	$gp91^{phox}$	Fall	Bilateral	Yes	Mulch	7	10	Negative	Inflammation	*A. fumigatus, Rhizopus* species, *Penicillium* species, *Streptomyces thermoviolaceous*
5	64	M	$p47^{phox}$	Fall	Bilateral	Yes	Mulch	10	354	Branching septate hyphae	NP	*A. fumigatus, Aspergillus niger*
6	16	M	$gp91^{phox}$	Fall	Bilateral	No	Hay	7	35	Negative	NP	*Aspergillus nidulans*
7[a]	8	M	$gp91^{phox}$	Fall	No	Yes	Garden shed	7	43	Negative	Fungal elements	None
8	18	M	$p47^{phox}$	Summer	Bilateral	Yes	Mulch	6	30	Negative	Negative	*A. fumigatus, A. niger, Rhizopus* species, *Streptomyces* species
9	10	M	$gp91^{phox}$	Fall	Bilateral	Yes	Mulch	Unknown	6	Branching septate hyphae	NP	*A. fumigatus, Streptomyces* species

NOTE. At the time of severe clinical illness, all patients had abnormal chest radiograph findings. BAL, bronchoalveolar lavage; NP, not performed.

[a] The findings of the initial chest radiographs of patients 2 and 7 appeared to be normal.

invasive aspergillosis and the similarity of those cases to the cases presented here, we suspect that they might represent undiagnosed CGD.

Environmental exposure to mold is ubiquitous. Conidia develop invasive hyphae, with an incubation period ranging from 2 days to 3 months [15]. The infectious inoculum for *Aspergillus* species is undefined, but in CGD mouse models, it was lower in the gp91^{phox}-deficient animals than it was in the p47^{phox}-deficient ones [16, 17]. Interestingly, patients 2 and 5, who were both p47^{phox} deficient, had spread mulch several times previously without ill effects.

The initial symptoms of this acute fungal pneumonitis overlap with viral syndromes, community-acquired pneumonia, and hypersensitivity pneumonitides. Failure of adequate therapy directed at common pathogens should lead to consideration of other etiologies, especially when the patient has a history of an immune defect, such as CGD.

All of our patients had large exposures and relatively short incubation periods, emphasizing the importance of obtaining a careful history of the type and degree of recent exposures when confronted with a compatible clinical scenario. Similar clinical characteristics in older individuals should not preclude consideration of the diagnosis, because CGD can present later in life [18].

Radiograph findings obtained early in the course of infection may have been negative, but all of the patients developed a similar diffuse radiographic result 2–10 days after the initial complaint. In contrast, most immunocompromised individuals, especially those with neutropenia, develop nodular or focal *Aspergillus* lesions [17], which are also seen in patients with the typical fungal pneumonia associated with CGD, confirming that this diffuse interstitial presentation after exposure to mulch is clinically and pathophysiologically distinct [3].

The clinical and radiographic pattern seen in association with this syndrome is reminiscent of that seen in association with other syndromes in which there are significant host response components, such as hypersensitivity pneumonitis, which may occur as a consequence of exposure to various environmental pathogens, including bacteria, mycobacteria, fungi, proteins, metals, or chemicals [19]. Farmer's lung and "hot tub lung" are caused by exposure to thermophilic actinomycetes and exposure to *Mycobacterium avium* complex, respectively [20]. They represent inflammation with or without infection, and patients with these syndromes can present with hypoxia, cough, fever, bilateral interstitial infiltrates with necrotizing or nonnecrotizing granulomas, and patchy interstitial pneumonitis [19]. Important to understanding the use of steroid therapy, gp91^{phox}-deficient mice who were made to inhale heat-killed aspergillus hyphae developed extensive granulomatous lung disease, whereas normal mice did not [21]. Therefore, at least part of this clinical picture is likely to be caused by the host immune response, even in the absence of invasive fungal infection.

Allergic bronchopulmonary aspergillosis is characterized by elevated anti-*Aspergillus* IgE, eosinophilia, fleeting pulmonary infiltrates, and reactive airways. It has been reported in individuals with CGD [22] and is a differential in this syndrome, but the diagnosis is complex. Antibodies and immediate cutaneous reactivity to *Aspergillus* species are typically demonstrated [19]. Histologic examination may reveal loosely organized granulomas, with prominent interstitial infiltrates and bronchiolitis. Acute presentations or exacerbations may include nodular pulmonary infiltrates, and CT may reveal bronchiectasis. However, allergic bronchopulmonary aspergillosis is not typically associated with invasive disease, and until recently, treatment of the infectious cause was not attempted. Successful use of high-dose steroids for the treatment of allergic bronchopulmonary aspergillosis is a strong argument for the resilience of the normal host defense against *Aspergillus* species, because steroid treatment for prolonged periods is rarely associated with invasive disease.

Invasive aspergillosis is usually diagnosed when clinical suspicion is raised in the appropriate clinical context and appropriate microbiologic data is collected. One of the surrogate markers of fungal infection, galactomannan, is less reliable in patients with CGD than in others [23]. Patients with CGD often receive treatment empirically, and such treatment should incorporate agents effective against relevant pathogens, especially if a specific exposure is known.

Survival for patients with invasive aspergillosis who do not have CGD remains dismal, at 34%–42% [24]. In contrast, overall survival for patients with CGD who are infected with *Aspergillus* species other than *A. nidulans* is considerably higher [3, 6, 11]. Therapy for invasive aspergillosis has changed markedly over the past 10 years, from amphotericin derivatives to the azole derivatives (i.e., itraconazole, voriconazole, and posaconazole) [25, 26] and echinocandins [27–30]. Although the morbidity and mortality among patients with fungal infections who have CGD will likely continue to decrease, overwhelming exposure, such as through mulching, will continue to be problematic. Patients should be cautioned regarding such exposures.

Although CGD is a primary immunodeficiency, steroid therapy successfully controls inflammation [5, 6], particularly in the gastrointestinal and genitourinary tracts. Steroid use has also been reported in individuals with CGD and invasive aspergillosis [31–33]. The defect in inflammatory control is likely to be caused by inadequate degradation of inflammatory mediators, such as LTB4, C5a, and fMLF [4]. Impaired metabolism of inflammatory mediators may play a role in the acute morbidity and mortality associated with invasive aspergillus disease and requires further evaluation in mouse models. Our current practice is to use high-dose steroid treatment (1 mg/kg per day

for 1 week, followed by gradual taper) early in the course of treatment to dampen the acute pulmonary inflammation in patients with CGD who present with pneumonitis after high-level symptomatic mulch exposure.

Acute invasive pulmonary aspergillosis in the absence of known iatrogenic deficiency or AIDS should prompt consideration of CGD, regardless of patient age, in the appropriate clinical context. Early and aggressive therapy, including therapy with antifungals and steroids, is crucial. Acute invasive *Aspergillus* pneumonia following mulch exposure may be pathognomonic for CGD.

Acknowledgments

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Potential conflicts of interest. All authors: no conflicts.

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HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
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Valdis Lazdins, Director

www.howardcountymd.us
FAX 410-313-3467
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March 9, 2017

Robert Long, Jr.
Leslie Long
2701 Woodbine Road
Woodbine, MD 21797

RE: CE 17-012; 2700 Woodbine Road

Dear Mr. & Mrs. Long:

In response to your complaint received January 23, 2017 and January 27, 2017 concerning the above mentioned property, please be advised, a representative of this Division inspected the property on February 24, 2017. The inspection failed to reveal any violations of the regulations. The activity that is occurring on the property is accessory to the principle use (tree farm) per the definition of "Farming" found in Section 103.0.Farming.h. As no violations of the Howard County Zoning Regulations were observed, there is no cause for further action by this Department and the case is being closed.

If you are interested in reviewing the case file for more details, please submit a written request to me at 3430 Court House Drive Ellicott City, MD 21043 or via email to alarose@howardcountymd.gov.

Thank you for referring this matter to the Division of Public Service and Zoning Administration. If you have any questions, please contact me or Inspector Tamara Frank at (410) 313-2350.

Sincerely,

Anthony N. LaRose, Zoning Supervisor
Division of Public Service and
Zoning Administration

YOU HAVE THE RIGHT TO APPEAL THIS DECISION TO THE HOWARD COUNTY BOARD OF APPEALS HEARING EXAMINER WITHIN 30 DAYS. ADMINISTRATIVE APPEAL PETITIONS MAY BE OBTAINED FROM THE DEPARTMENT OF PLANNING AND ZONING, 3430 COURTHOUSE DRIVE, ELLICOTT CITY, MD (410) 313-2350 OR ONLINE AT WWW.HOWARDCOUNTYMD.GOV

ANL:taf

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March 15, 2017

Robert Long, Jr.
Leslie Long
2701 Woodbine Road
Woodbine, MD 21797

RE: CE 17-012; 2700 Woodbine Road

Dear Mr. & Mrs. Long:

Please be advised, the letter closing the case was sent prematurely. **This case remains open,** and the issues raised in your complaints are still being studied by this Department. I apologize for any inconvenience.

If you are interested in reviewing the case file for more details, please submit a written request to me at 3430 Court House Drive Ellicott City, MD 21043 or via email to alarose@howardcountymd.gov.

Thank you for referring this matter to the Division of Public Service and Zoning Administration. If you have any questions, please contact me or Inspector Tamara Frank at (410) 313-2350.

Sincerely,

Anthony N. LaRose, Zoning Supervisor
Division of Public Service and
Zoning Administration

ANL:taf

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April 21, 2017

Robert & Leslie Long
2701 Woodbine Road
Woodbine, MD 21797

RE: CE 17-12
2700 Woodbine Road
Woodbine, MD 21797

Dear Mr. & Mrs. Long:

In response to your complaints received January 23, January 27 and March 6, 2017 concerning the business operating at 2700 Woodbine Road, a representative of this Division inspected the property on February 24, 2017. The inspection revealed the following violations of the Howard County Zoning Regulations:

Operation of a land clearing debris transfer station and/or sawmill, including the storage of related equipment and materials on RC (Rural Conservation) zoned property.

A zoning violation case was opened for this property and a Zoning Violation Notice was issued on April 20, 2017. Should the violations not be corrected in a timely manner, the County will pursue enforcement actions that include referring the case to the Howard County Hearing Examiner where civil fines of $250 to $500 per day may be imposed or referring the case to the Office of Law Seeking an injunction in the District Court.

Thank you for referring this matter to the Division of Public Service and Zoning Administration. If you have any questions concerning this case, please contact me at (410) 313-2350.

Sincerely,

Anthony N. LaRose,
Zoning Supervisor
Division of Public Service and
Zoning Administration

ANL:al.viol

CB-21
China Williams
3425 Huntsmans Run, Ellicott City

We are all in a Yogi Berra moment: it feels like deja-vu all over again. We get to argue all the same points and feel all the same frustrations and fears. Can we do District 5 residents a favor and stop making them drive all this way twice a year just to get irritated with each other?

There were opportunities last year to reach consensus, to create an additional revenue stream for agricultural land and to do it in an environmentally responsible way. Several health and safety amendments were proposed last year that would have minimized the risks of solid-waste processing. And each of those health and safety amendments was voted down.

Because the science was denied.
Because the health risks were dismissed.
Because protecting the groundwater and the air is inconvenient and expensive.

Luckily I am a fighter ~~like lost causes~~, and I am here again to say that this bill badly needs health and safety controls. It is right to err on the side of caution. It is right to look to the industry's best practices. We are an overachieving county and we can overachieve in our efforts to protect the health and safety of our residents.

And when it comes to helping our farmers navigate a volatile industry and survive in an increasingly suburbanized county, we can do that too BUT this is not the way.

Let's start overachieving with these amendments:

- Reduce the activity's allowable acreage -- Currently the MDE allows 5000 square feet of mulch and compost for farming purposes. That is 0.1 acre. This bill proposes 5 acres. Studies have shown that water contamination occurred at solid-waste processing sites of a little more than 1 acre. Use that range as your guide to determine safe amounts near private wells.
- Increase setbacks – The bill proposes setbacks from schools of only 500 feet. Protect the respiratory health of school children by increasing setbacks.
- Access to highways – I was encouraged to see the change in CB-21 that required direct highway access for combined mulching and composting activities. Extend direct highway access to separate facilities too.
- Close the loopholes – Add ownership requirements to keep farmland from becoming cheap industrial zones.
- Monitor and remediate – Follow the guidelines proposed by other states and create a monitoring system for trace elements. Provide financial assistance or fines for remediation. In cases of contamination, this financial burden should not fall on the private well owner.

Thanks for your time and consideration.

Testimony of Theodore F. Mariani
Howard County Council
RE ZRA 183 16 April 2018

First I would like to address the conceptual understanding of the intent of the ZRA and where there appears to be a disconnect with the ZRA text.Note all references are to proposed Bill No. 21-2018 (ZRA 183).

1) If the intent of the ZRA is to preclude the use of ALPP and MALPF properties for commercial exploitation thru Mulch and Compost production and sale why does the limitation on sales expire when " the outstanding purchase agreement " expires. (Refer to Text of Bill Section 9E - Pg 18) Does this mean the limitation ceases when the bonds are paid in full ? If so this is a major flaw. Many of the properties in the program will soon be reaching the final two or three years on the bond payout schedule . Thus this restriction could expire as early as 2020. Further some land owners could have accepted a cash payment in lieu of the installment sale option. Are these sites not now covered? The same could be said for the MALPF properties.
Tying the limitation on use to just the tax exempt issue to preclude a commercial activity ignores the existence of the underlying easement (a covenant on the land) that precludes commercial or industrial use on any property in either the ALPP or MALPF program. The ALPP easements are in perpetuity and cannot be abridged. The MALPF easements are in perpetuity unless the land owner can prove that "farming" under the easement restrictions is no longer economically feasible.

Thus the wording in the text is puzzling and undermines the intent of the ZRA.

2) The limitation on sale of excess product must apply to both retail and commercial buyers. A 5% limitation is spelled out for retail sales but there is no mention of commercial sales. (Section 4 A Pg 28) If the intent was a 100% prohibition on bulk commercial sales it should be clearly stated. Further the limitation on sales from ALPP and MALPF sites seems to be removed once the "outstanding purchase agreement" has expired. Further the method of controlling the level of sale of excess product (product not used exclusively on the farm where the product is produced) is vague. Will the County monitor this and if so how? The concept , proposed in prior versions of the text, of limiting the transport off the site to small non commercial tagged pick up trucks and farm tagged vehicles seems logical and easy to enforce. Why not reinsert this wording to assist monitoring of the activity.

3) Although the intent of the ZRA is to prohibit mulch and compost production on preservation parcels created through the cluster subdivision process , the text is not clear and subject to an evasion of the regulations. The only reference is in Section 4A , Pg 36 which is ambiguous at best.

4) Allowing the Hearing Examiner wide latitude in the reduction of setbacks from adjacent properties and the ability to allow unlimited retail sales from the NWWR site undermine the purpose and intent of the regulations.

The following comments address the specific sections of the proposed text:

Pg. 14 - #37 NWWR is listed as a matter of right in the M1 zone but where are the controls for Mulch production on these sites? Matter of Right NWWR can be defended for the M zones but there must be some level of control beyond the general "nuisance" clause .
Pg. 15- B4 M2 sites (See comments re M1 sites)
Pg. 17 - 9A Identifying a 3 acre composting site as "small" is misnomer especially if there is no limit on commercial sales.
Pg 18 - 9 C There is no mention of prohibition of commercial sales.
Pg. 18 - 9E Reporting should be annually not just once after the first two years.
Pg.18- 9E What is meaning of term "no outstanding purchase agreement" and what is its impact on the regulations.
Pg. 25 - O 2 H School setback refers only to a 500 foot setback from property lines .Some school buildings could be close to a property line . Thus 500 feet is not an adequate setback to safe guard the students and faculty . Why not impose an additional 1000 foot setback from any school building?
Pg. 26 - O 2 H Allowing the Hearing Examiner to drastically reduce setbacks beyond any reasonable level results in a severe of diminution of protection. As an example the 300 foot set back from an abutting residential property line could be reduced to only 50 feet.A 6 fold reduction . A more prudent approach would be to limit the reduction of the setback standards by not more than 20% which would result in a 240 foot setback from a property line and 400 feet from a residence.The regulations must be balanced so as to allow a farmer to produce compost and mulch and a resident the peaceful enjoyment of his home .This possible 20%

reduction would not apply to schools where there could be no reductions allowed.
Pg. 28- 4A The wording concerning the status of dedicated easements thru the cluster Subdivision process is not clear. It could be construed as allowing such parcels to be used for NWWR and Composting. I recommend that a clear and unambiguous statement be included that specifically prohibits NWWR and Composting on these parcels.
Pg. 28- 4 A Refers to a limitation for on site retail sales but there is no mention of prohibition of bulk commercial sales. Is this an oversight ?
Pg. 29- 4 H Setbacks. All of my comment regarding setbacks referenced to the text on Pg. 34 including the ability of the Hearing Examiner to drastically reduced setbacks, apply to this section.

The Council and Executive have made a great effort to balance the interests of all parties in this process but as shown in my comments a few clarifications and some modest refinements in the text would help in achieving a strong and enforceable regulation .

farmers to produce what they need for the farm itself. However, in CB21-2018, all of that language has been eliminated, watered down or made subject to major loopholes, thus opening the door to commercial operations.

Finally, it has been disappointing to see promises made by the winning candidates for County Council and County Exec in the 2014 election be broken. I have also witnessed professionals in the areas of health, fire and the environment be ignored, humiliated and in some cases threatened with the loss of their job while trying to inform DPZ and the Council on the health and safety issues of the current bill before us. This is local politics at its worst.

Given the extensive time spent by all, CB21-2018 should be tabled until loopholes are removed, agricultural preservation laws are maintained, and the health and safety of our residents fully considered.

John Allen, xxxxxxxxxxxxx.
I am reading this testimony on behalf of Richard Lober.
From Mr. Lober: My name is Rick Lober and I have been involved in the working groups and discussions on mulch and composting for the last 4 years.
Proposed bill CB21-2018 negates almost all input by Howard County residents groups, has little to do with farming, and is a gross violation of our County and State Agricultural Preservation Programs.
These programs allow the County or State to buy the development rights of farms in order to preserve the farm for agricultural use ONLY - in perpetuity. Last year the County purchased development rights for a total of 112 acres at a cost of $3.25 million dollars.
My understanding and discussion with many of the farmers who have become part of this program is that they are proud that they themselves, their parents or even grandparents made this commitment to maintain the farm as an agricultural activity for perpetuity.
However, the zoning regulations have been watered down over the years to allow commercial business owners to purchase these farms at a very low cost, place commercial operations on these farms, and reap the benefit of NO property taxes. Obviously much more desirable from a business standpoint than paying taxes on facilities that should be placed on M1/M2 lands.
Sponsors of CB21-2018 and DPZ personnel have given the false impression that commercial uses of ag preserve lands will not be allowed under this bill. However, while "retail sales" are limited to 5% of end product, there is no stipulation on "commercial sales" or large 18 wheel trucks entering or leaving the facility.
In addition, the bill defines ag preserve lands as only those that are continuing to receive payments from the County – not those that have been fully paid. This is a major loophole.
In the spring of 2017, assurances were made by County Council members and the County Executive that the bill would limit "commercial sales" to 5% for both mulch and compost, and restrict truck size on ag preservation lands. This clearly would stop commercial operators from using lands in ag preserve for industrial mulch and compost operations, thus allowing true

Sierra Club Howard County
Testimony in Opposition to CB21-2018
April 16, 2018

The Sierra Club policy is that farmland should be used for farming. Mulch and compost are used on farms, and they may be produced on farms from waste. Like any other commodity produced on a farm, these commodities should be saleable. However, no farm has enough waste, or needs enough mulch and compost, to justify industrial-scale processing onsite. At that scale, wood waste is shipped in by tractor trailer and mulch is shipped out by dump truck; everything from spoiled food to dead animals to manure is collected and decomposed for export as compost. In the industrial process, the raw materials are not produced on the land and the finished products are not used on the land. This is manufacturing, not farming.

Manufacturing should be done on land zoned for manufacturing, as this bill specifies. The processing setup should have dust filtration, leachate recovery, fire-fighting equipment, and whatever else is needed to safeguard the environment and the workers.

The land zoned for manufacturing is taxed at a rate that represents the cost to society of industrial pollution, noise, and heavy traffic, as well as the higher profits of factory production. Farmland, on the other hand, is subsidized with lower taxes and even payments for permanent preservation. Our zoning laws and our tax laws are meant to protect our countryside and our agricultural resources. To use farmland for industry seems like an exemption that serves only to allow an unfair business advantage to one industrialist over another.

To help farm-owners succeed at farming, we allow some conditional uses of farmland. These are side businesses that take up little land and add to, but don't replace, the agricultural income: a snowball stand, for example. Industrial manufacturing of mulch and compost is nothing like a snowball stand. A snowball stand doesn't occupy 3 acres of land, it doesn't require tractor-trailers to haul in the raw materials, it doesn't earn industrial profits and it doesn't endanger the health and safety of everyone around it.

We want to allow the small-scale agricultural production and sale of these commodities, but not allow large-scale industrial processing and sales. The difference is quantitative. We should be able to set limits by considering the volume of material collected and produced, the amount of land used, the amount of money earned, and the size and nature of the equipment used, to allow farmers to farm but prevent industrialists from exploiting our farmland for industry. The bill as currently written does not seem to close that loophole and therefore we must oppose it as written.

Joanne Heckman
Chair
Howard County Sierra Club

Lisa M. Markovitz

President, The People's Voice

3205 Corporate Court

Ellicott City MD 21042

CB21 Testimony – suggested amendments

Instead of talking about what has been discussed so very much already, I am going to use my time to bring you specific areas to please consider, that would hopefully address safety concerns, and still protect what the farmers need to do.

The contentious issues in this matter fall mostly upon the decisions about scale. What scale of composting and mulching reaches a level that is industrial, and doesn't belong outside industrial zones, or reaches a level of commercial that is too much for Ag Preserved parcels? Safety concerns, farm needs, economics, all the concerns seem to fall on this issue. How does one define "for the farm"?

To allow farmers to bring in whatever they need in materials to produce the compost and mulching they need for the farm, makes sense. To allow farmers to export what they produce from the farm's materials, or legitimate leftovers of supply, and even allow reasonable commercial profits on farm outputs, also makes sense. So, one has to look at importing and exporting levels here, together.

It could entail a large amount of import for a farm to bring in source materials to mulch, to use, what they need to use, on the farm. If a farm produces a lot from the farm resources and wants to sell, that could entail a high export amount. I think it is likely evidence of a larger commercial venture if a parcel is doing both.

The combination of high import and high export is a place to consider more restriction, taking into account annual averages for planning, etc. Although, any import restrictions should exempt small donations, so that businesses that pay to dump mulch in the land fill, could deliver for free to farms instead. Thank you to Joanne Heckman, for flushing out that idea with me.

In Howard County, I believe we should go lower on the height piles than the State, of 9 feet, and the Fire regulations we have, of, I believe 6. If large farms have higher piles, and then likely the equipment needed to turn the piles, they may need less acreage for serving the farm, than smaller farms whose piles don't go that high, because they don't have the equipment to turn

higher piles. Thus, I like seeing an acreage restriction always combined with a maximum percentage as well.

In any event, Ag Preserve parcels should not be allowed to go to higher acreage of one to five, because of their location only. That may address community issues of what is nearby, and traffic concerns, but it does not address the economic issue of having more restriction on the commercial usage there, as is required of those parcels. Again, be sure acreage and percentage caps are always together.

If people don't comply, enforcement is a concern. Maybe having a trigger of some sort, that would cause the "bad apples" to have their property tax categorization changed to industrial would be a good repercussion, since a proliferation of mulching plants versus farms, needs to not be an incentive. Maybe limiting the allowances per geographic area could be considered at the higher ends of allowed processing levels.

I am concerned the Hearing Examiner is allowed to change the setbacks too much. In other zoning areas, I believe it is more frequently seen to have a 20% variance subjectivity, rather than the 50% plus in the current Bill.

As for composting, some extra safety measures that would still allow best practices used currently on farms, could include not importing in carcass raw materials, especially non-indigenous animal carcasses. I acknowledge I don't currently have information on why farmers would need to import non-indigenous animal carcasses.

This is a complex set of issues and I hope you can allay concerns but retain what farmers need who are using mulch and composting for the benefit of their actual farms, without creating an allowance, much less an incentive for high commercial or industrial enterprises to locate on farmland.

Thank you.

Howard County Council, On behalf of the Ho. Co. Farm Bureau Board, I would like to thank the Dept. Planning & Zoning, you the Council members and the members of the Mulch Task Force, for all the time and energy you all have put into constructing CB-21 2018. It is not all that we had hoped it would be, but it is something we can work with on our farms. We would like to see the Ag Land Preservation Parcels treated the same as the other parcels in the RR and the RC districts, after all we are the future of agriculture, we promised to not sell our development rights and nothing more. We need to know that the county is behind us, even though we may be the minority in numbers, we are mighty on impact, with the average farm selling over $108,000 in sales each year. We also spend over $105,000 each year, on production cost.

I would like to take this opportunity to defend the American Farmers, as well as the Ho. Co. Farmers. We have endured hardships that most people would not even begin to understand. We have been unjustifiably mistrusted, we have been misrepresented and pushed around by the majority for so long, it has become a way of life for us. Most of us quietly go about our days working hard, honestly and diligently, making sure that no one is injured and making sure the public is not put at risk in any way. We travel on roads in our neighborhoods with our machinery and products, that used to be empty, and now are full of cars, and bicycles, that have impatient, disrespectful drivers and peddlers, that just want us out of the way.

The 293 Howard Co. Farms have had to diversify their businesses, to maintain their business plans, so we can afford to pay the constantly rising cost of taxes, fuel, insurance, machinery and buildings. As well as to hire some extra labor that we need, to get us to the end of a day, that starts at daybreak and ends well after dark. From our farms that feed us, to the nurseries, greenhouses and landscaping operations that beatify our communities, Howard Co. has always championed our rural roots. We continue to lead the way with rapidly growing technology, we lead the way with women-owned or operated farms, we have some of the best grain, cattle and horse farms in the country. We put together common-sense strategies to support our suburban neighborhoods and our rural lifestyle.

The American Farmer and the Ho. Co. Farmer's will continue to survive even against all odds, because we have the will, the stamina and the integrity to do our best against all who may put challenges in front of us, whether fair or not, we will survive, because we are Ho. Co. Farmers, who are American Farmers.

Respectfully, Howie Feaga

President of the Howard County Farm Bureau for over 10 years now, with over 1400 total members in Howard County.

Thank You !!!!

Jeff Harp Testimony CB-21-2018

I have previously presented two investigation reports performed by the Suffolk County Department of Health Services in NY that identify groundwater contamination caused by mulch facilities.

Each year that passes more evidence is discovered. I have submitted as part of my testimony a copy of a cover letter and comments issued to the NY Dept. of Environmental Conservation by the Suffolk County Department of Health Services. These comments are specific and include recommendations to amend the State's solid waste regulations governing the composting of natural wood waste to prevent impacts to human health.

I will read three of these comments for everyone here tonight:

Comment 4
Unpackaged finished mulch product stored on a site need to be regulated, as storage of these materials has been shown to cause groundwater contamination. Unpackaged product stored on the Gardens/Long Island facility in Yaphank was observed to significantly impact groundwater quality and a nearby private well.

In comment 13, the Health Department comments on existing regulations regarding a 200-foot setback:
Comment 13.
What is the justification for the 200-foot distance from a potable well? Department of Health Services has monitoring wells located 1,500 feet downgradient of a management site that exhibits water quality impacts above standards. This language should be revised to indicate that regulated activities must not have the potential to impact potable water wells.

In comment 20 they discuss facility size:
Comment 20:
What is the justification for exempting sites less than 2 acres? Relatively small sites that are located upgradient of a private well could potentially cause an impact to that well. For example, a 1.1-acre site in Moretown, Vermont was determined to be a likely cause of elevated manganese in a private well, significantly above the drinking water standard.

Mulch facilities cause groundwater contamination. If you allow these facilities in groundwater use areas, then the consequence will be contamination and impact to resident's health. The responsibility of the County Council is to adequately review the scientific information provided from testimony.

I request that the council provide this cover letter and comments along with copies of the two NY investigation reports to the Howard County Health Department and any other environmental regulatory authority for an official response. Therefore, upon review, the council should provide the Health Department's response (opinions and conclusions) to the community as part of the public record for this proposed legislation CB-21-2018. This is a reasonable request and one that should have already been performed.

COUNTY OF SUFFOLK

STEVEN BELLONE
SUFFOLK COUNTY EXECUTIVE

DEPARTMENT OF HEALTH SERVICES

JAMES L. TOMARKEN, MD, MPH, MBA, MSW
Commissioner

September 13, 2016

Melissa Treers, P.E.
New York State Department of Environmental Conservation
Division of Materials Management
625 Broadway
Albany, NY 12233-7260

Subject: Suffolk County Department of Health Services' Comments on Proposed Amendments to NYSDEC Part 360 Regulations

Dear Ms. Treers:

The Suffolk County Department of Health Services (SCDHS) appreciates the opportunity to comment on the proposed amendments to the Part 360 Regulations for Solid Waste Management Facilities in New York State. SCDHS is optimistic that many of the proposed changes will have a positive impact on the environment with respect to solid waste activities in New York State, in particular the proposed new regulations regarding mulching facilities.

In order to further strengthen the proposed regulations, particularly with respect to the protection of groundwater, SCDHS recommends that additional changes be considered. These include requiring impermeable surfaces to prevent leachate and runoff impacts to groundwater from vegetative organic wastes, assistance to property owners with private wells impacted from solid waste management activities, and enhancing NYSDEC's ability to require monitoring groundwater where impacts from a site are suspected. Additionally, with respect to the use of on-site soils during redevelopment, some language clarification, additional options for developers and review of SCOs not reflecting background concentrations in Suffolk County are recommended. Attached are our specific comments for your consideration.

Thank you for taking the time to consider our comments. Should you have any questions, or if you would like to discuss our comments further, please call Walter Dawydiak at 631-852-5804.

Sincerely,

Christina Capobianco

Christina Capobianco, CPA
Deputy Commissioner

Cc: Carrie Gallagher, NYSDEC, Regional Director
Richard Clarkson, PE, NYSDEC, Chief, Facilities Section, Division of Materials Management
James L. Tomarken, MD, MPH, MBA, MSW, Commissioner, SCDHS
Walter Dawydiak, PE, Director, Division of Environmental Quality, SCDHS

Public Health
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3500 Sunrise Highway, Ste. 124, PO Box 9006, Great River, NY 11739-9006
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Suffolk County Department of Health Services

Comments on:

Part 360: Solid Waste Management Facilities; General Requirements

Use of On-Site Soils during Re-Development

Section 360.12 (Beneficial Use), of the current regulations, contains a statement which allows the use of soils from a property being converted to a realty subdivision as long as it is approved by the local health department (see below for current regulation).

> *360-1.15 Beneficial use.*
> *(b) The following items are not considered solid waste for the purposes of this Part when used as described in this subdivision:*
>
> *8) nonhazardous, contaminated soil which has been excavated as part of a construction project, other than a department-approved or undertaken inactive hazardous waste disposal site remediation program, and which is used as backfill for the same excavation or excavations containing similar contaminants at the same site. Excess materials on these projects are subject to the requirements of this Part. (Note: use of in-place and stockpiled soil from a site being converted to a realty subdivision, as defined by the Public Health Law [10 NYCRR 72], must be approved by the local health department.);*

Under the proposed regulations such soils would be not be solid waste as long as they below Part 375 Unrestricted Soil Clean up Objectives (SCOs).

Comments:

1. Soils from redevelopment parcels do not appear to fall under the current or proposed definition of solid waste. Currently as written, a material is considered solid waste if it is discarded, i.e., "...spent, worthless, or in excess to the generator..." (Section 360.2 (a)(2)). In most cases these soils are used at the site and therefore not discarded. In addition, most of these cases presumably result from a lawful activity, such as the application of a pesticide, not from improper use or disposal of a material.

<u>Recommendation</u>: If it is NYSDEC's intent to regulate these soils as solid waste, the definition should be clearer.

2. If soils from redevelopment parcels are regulated as solid waste, is the intent to require off-site disposal of soils above unrestricted criteria? Using arsenic as an example, arsenic concentrations above unrestricted levels may be present across many acres of the property previously used for agricultural purposes and in many cases down to a foot of soil.

Recommendation: The SCDHS recommends that the regulations provide developers an option in which they can seek a case-specific beneficial use determination under Section 12 (d) by submitting a soil management plan to NYSDEC for approval.

3. For some contaminants, such as arsenic, the unrestricted use limits contained in Part 375 are based on rural upstate soil sampling and may not be appropriate for native soils on Long Island. The unrestricted soil clean up objective (SCO) for arsenic is 13 ppm. Data specific to Suffolk County indicates that background arsenic concentration in unimpacted, non-agricultural soils is approximately 4 ppm (unpublished 2002 SCDHS data; Sanok et al, 1995). Furthermore, previous soil management plans for redevelopment projects have been based on minimizing exposure to soil with arsenic above 4 ppm. Therefore, the proposed regulations would be less protective than past practices.

Recommendation: The relevance of SCO's that are not based on data reflecting background levels in Suffolk County and Long Island should be reviewed.

Comments on:
Proposed Part 360 (General Requirements)
Proposed Subpart Part 361-3 (Composting and Other Organics Processing Facilities)
Proposed Subpart 361-4 (Wood Debris and Yard Trimmings Processing Facilities)

General Comments

1) The NYSDEC Solid Waste Management Program should have a mechanism to provide assistance to private well users whose water quality is impacted by facilities performing solid waste activities. The NYSDEC Division of Environmental Remediation has such a mechanism (DER-24/ Assistance for Contaminated Water Supplies), along with a funding source. A companion mechanism for the solid waste program is needed.

2) There needs to be a clear, unequivocal statement that all facilities (*Exempt, Registered*, and *Permitted*) covered under Part 361-3 and Part 361-4 should expressly be prohibited from causing impacts to groundwater quality that exceed groundwater or drinking water standards. A similar statement expressly prohibiting impacts from dust and odors to surrounding properties should also be included.

3) The regulations should explicitly allow the NYSDEC to require groundwater monitoring wells if groundwater impacts are suspected at any type of facility (*Exempt, Registered* and *Permitted*).

4) Unpackaged finished product (such as compost and mulch products) stored on a site need to be regulated, as storage of these materials has been shown to cause groundwater contamination. Unpackaged composted material (product) stored on a site (Gardens/Long Island Compost facility in Yaphank) was observed to significantly impact groundwater quality and a nearby private well.

5) Section 361-3.5(7) requires that facilities handling particular types of material such as municipal solid waste, biosolids, septate, sludges, etc. must conduct activities such as waste storage, processing, leachate storage and product storage *"on surfaces that minimize leachate release into the groundwater under the facility and the surrounding land surface..."* This is presumably required due to concerns about these materials detrimentally impacting groundwater quality. Since the *Horseblock Road Investigation* report (July 2013), and the *Investigation of the Impacts to Groundwater Quality from Compost/Vegetative Organic Waste Management Facilities in Suffolk County* report (January 2016) both concluded that

vegetative organic waste management (VOWM) activities can cause significant impacts to groundwater quality, the requirement of the handling materials on surfaces that prevent leaching into groundwater should be expanded to VOWM facilities. The state of California is in the process of amending their regulations to require that certain types of composting activities be performed on impermeable surfaces for the protection of groundwater. The state of Illinois requires all landscape waste compost activities be performed on impermeable surfaces, or have an early detection groundwater monitoring system in place, due to concerns regarding detrimental impacts to groundwater. The state of Iowa requires that composting activities be performed on a low permeability base. It appears requiring VOWM activates be performed on a base that prevents impacts to groundwater from leachate and/or run-off would be consistent with current or pending requirements of other states. Due to the particular sensitivities involving contamination of groundwater designated as a sole source aquifer, consideration could be given to having the impermeable surface requirement for counties that have such a designation regarding their groundwater.

6) It is our understanding that a number of commercial VOWM sites accept and store animal manure at their sites to be provided as compost, or to mix with other composted material. It is also our understanding that this activity is not currently regulated. However, activities related to handling biosolids are regulated due such concerns as exposure to pathogens, potential groundwater and/or surface water impacts, etc. Since many of the same concerns regarding the handling of biosolids extend to the handling of animal manure, the regulation of animal manure at commercial VOWM sites should be considered to mitigate these concerns.

Specific Comments

Part 360

7) ***Exempt facilities 360.14 (b)*** *"A facility is no longer considered an exempt facility if it fails to comply with any operational conditions that apply or if the facility poses a potential adverse impact to public health and the environment. In either case, the facility must cease accepting waste and remove and properly dispose of all waste and products resulting from the processing of waste at the facility in accordance with department instructions."*

An *Exempt* facility causing groundwater and/or surface water quality to exceed groundwater, drinking water or surface water standards, in an area with a designated sole source aquifer, should also be required to cease accepting waste.

8) ***Permit application requirements and permit provisions 360.16 (c)(2)(iii)(b)*** *"the location of all public and private water wells, surface water bodies, roads, residences, public areas and buildings, including the identification of any buildings which are owned by the applicant or operator, on the property and within 800 feet of the perimeter of the property;"*

This provision should be expanded to 360.14 (*Exempt Facilities*) and 360.15 (*Registered Facilities*). In addition, all public and private wells and surface water bodies beyond 800 feet that could potentially be impacted from site activity should also be identified.

9) If impacts to public or private wells are identified as a result of *Exempt, Registered* or *Permitted* site activities, the facility owner should be required to mitigate the impacts. Additionally, if such impacts are from an *Exempt* or *Registered* facility, the facility should be required to obtain a permit.

10) ***Operating requirements 360.19 (b)(2)*** *"The owner or operator of a facility must operate the facility in a manner that minimizes the generation of leachate and does not allow any leachate to enter surface waters or groundwater except under the authority of a State Pollution Discharge Elimination System Permit."*

Since sections 361-3 and 361-4 of the proposed regulation states that "*Precipitation, surface water, and groundwater that come into contact with*"[the materials regulated under these sections] "*is not considered leachate*", there must be language that expressly prohibits this contact water (run-off?) from entering surface waters and groundwater, consistent with what is required for leachate. Also, the term "run-off" needs to be expressly defined.

Part 361-3 Composting and Other Organic Processing Facilities

11) ***Exempt facilities 361-3.2 (b)*** *"A composting or other organics processing facility that accepts no more than 3,000 cubic yards of yard trimmings, either processed or unprocessed, per year. This quantity does not include tree debris materials that are not intended for composting. For these facilities, precipitation, surface water, and groundwater that has come in contact with yard trimmings or the resultant product is not considered leachate; however, it must be managed within the site and must not enter a surface waterbody or a conveyance to a surface waterbody, or cause a violation of water quality standards promulgated in Part 750 of this Title.*

What is the justification for exempting facilities processing less than 3,000 cubic yards of material per year? Are these facilities less likely to negatively impact the groundwater, neighbors or the environment?

The contact waters that results when precipitation, surface water, and groundwater comes into contact with yard trimmings or the resultant product, needs to be defined , see Comment #9.

The following should replace the second part of the third sentence, after the word "*however*": *"it [run-off?] must be managed within the site and must not enter a surface waterbody or a conveyance to a surface water body, to groundwater, or cause a violation of water quality standards promulgated in Part 750 of this Title, or Part 703, Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations."*

12) ***Registered facilities 361-3.3 (a)(1)*** *"...precipitation, surface water, and groundwater that has come in contact with yard trimmings or the resultant compost is not considered leachate..."*

See comment #9 above.

"The facility must have a written runoff plan that is acceptable to the department that outlines the methods that will be used to prevent runoff from entering and leaving the site and minimizing the movement of organic matter into the soil under the site."

The following should be added to the end of the above sentence, after the word "site": ", *or cause impacts to groundwater or surface waters that result in a violation of groundwater, drinking water, or surface water quality standards."*

13) ***Registered facilities 361-3.3 (b)(7)*** *"The activities regulated under this section must be at least 200 feet from the nearest surface water body, potable water well and state-regulated wetland, unless provisions are implemented to prevent leachate from leaving the boundaries of the site in a manner acceptable to the department."*

What is the justification for the 200 foot distance from a potable well? SCDHS has monitoring wells located 1,500 feet downgradient of a VOWM management site that exhibits water quality impacts above standards. This language should be revised to indicate that regulated activities must not have the potential to impact potable water wells, surface waters, etc.

14) ***Permit application requirements 361-3.4 (b)(9)*** *"The method used to control surface water run-off and to manage leachate, including the method for treatment or disposal of leachate generated.*

Is the "run-off' referenced here the same as the "contact" water discussed in comment #9?

15) ***Design and operating requirements 361-3.5 (a)(1)*** – *"Unlined compost areas located on soils with a coefficient of permeability greater than six inches per hour may require installation of groundwater monitoring wells or other monitoring devices and groundwater monitoring, as determined by the department."*

What is the significance of 6 inches per hour, and what is the origin of this reference? Considering the sandy soils on Long Island, perhaps monitoring wells should be required at all permitted facilities in Nassau and Suffolk Counties.

16) ***Design and operating requirements Section 361-3.5 (a)(6)*** *"All Leachate must be collected and disposed in a manner approved by the department. For uncovered processing facilities, the leachate collection and treatment system must be adequate to manage the quantity of leachate generated at the facility based on rainfall intensity of one-hour duration and a 10 – year return period."*

Since section 361-3.5 (a) (5) states that precipitation coming into contact with yard trimmings or compost is not considered leachate, it is unclear why this section is referring to the quantity of leachate generated based upon an intensity of precipitation ("rainfall intensity of one-hour").

This should also be required for the "run-off" discussed in comment #9.

17) ***Design and operating requirements 361-3.5 (7)(iv)*** *"For composting facilities, product storage beyond the 50-day detention time requirement is not required to occur on a low permeability surface. For products other than compost, the department will determine when the product need no longer be stored on a pad."*

As previously indicated in Comment #4, the SCDHS has observed significant groundwater impacts from composted material (unpackaged product) stored on a site (Gardens/Long Island Compost facility in Yaphank) that detrimentally impacted a nearby private well. The storage of unpackaged product on facilities needs to be done in such a way as to prevent impacts to groundwater quality.

18) ***Design and operating requirements 361-3.5 (9)*** *"For uncovered processing facilities, the facility must be able to manage the quantity of leachate generated at the facility based on a rainfall intensity of one-hour duration and a 10-year return period."*

Since section 361-3.5 (a) (5) states that precipitation coming into contact with yard trimmings or compost is not considered leachate, it is unclear why this section is referring to the quantity of leachate generated based upon an intensity of precipitation ("rainfall intensity of one-hour").

19) ***Design and operating requirements 361-3.5 (a)(13) (i)*** *"a facility without a pad and leachate collection system must maintain a minimum separation of 200 feet to a potable water well or surface water body and 25 feet to a drainage swale."*

See comment #12

Subpart 361-4 Wood Debris and Yard Trimmings Processing Facilities

20) ***Exempt facilities 361-4.2 (b)*** *"A facility (including storage of incoming material and processed debris) that occupies no more than two acres..."*

What is the justification for exempting sites less than 2 acres? Relatively small sites that are located upgradient of a private well could potentially cause an impact to that well. For example, a 1.1 acre compost site in Moretown Vermont was determined to be a likely cause of elevated manganese in a private well (significantly above the drinking water standard, see attached). Language should be added that a site occupying no more than two acres may be exempt, provided there is no potential to impact potable water wells.

21) ***Registered Facilities 361-4.3(12)*** *"For the purposes of Part 360 and this Part, precipitation, surface water, and groundwater that has come in contact with debris and trimmings, both incoming and processed, is not considered leachate, but must be managed in a manner acceptable to the department. The facility must have a written runoff plan that is acceptable to the department that outlines the methods that will be used to prevent runoff from entering and leaving the site and to minimize the movement of organic matter into the soil at the site."*

With respect to the term "run-off", see Comment #9. The following should be added to the end of the above sentence, after the word "site": ", *or cause impacts to groundwater or surface waters that result in a violation of groundwater, drinking water, or surface water quality standards.*"

22) ***Registered Facilities 361-4.3(14)*** *"The following buffer zones from processing and storage must be followed: 200 feet to a water well or surface water body..."*

See Comment #12.

23) ***Design and operating requirements 361-4.5*** *"...Also, the facility must have stormwater controls that minimize the potential for organic matter to reach groundwater and surface water resources."*

Is the "*stormwater*" referenced in this section the same as the "*run-off*" discussed in Comment #9? If not, the word "*run-off*" should be added to the sentence along with "*stormwater*". Also, the following should be added to the end of the above sentence, after the word "*resources*": ", *or cause impacts to groundwater or surface waters that result in a violation of groundwater, drinking water, or surface water quality standards.*"

Comments on:
Proposed Part 360 (General Requirements)
Proposed Subpart Part 361-5 (*Construction and Demolition Debris Processing Facilities*)
and Proposed Part 364 (*Waste Transporters*)

Apparent Conflict

Section 361-5.7 C&D debris tracking from registered and permitted facilities states:

> (a) All material leaving a registered or permitted C&D debris processing facility, and any other material if required pursuant to a department-approved remedial plan, must be accompanied by a C&D debris tracking document prescribed by the department...

While, **SUBPART 364-2 EXEMPTIONS** states that the following transport is exempt from Part 364, including the requirement for a tracking document:

> (b)(6) C&D debris and historic fill in quantities less than or equal to 10 cubic yards in any single shipment.

This introduces an apparent conflict. Would a C&D shipment of less than or equal to 10 cubic yards leaving one of the facilities described in Section 361-5.7(a) require a tracking document as required by that section or be exempt from the tracking document requirements as indicated in Part 364.

To whom it may concern,

I would like to express my interest and concern with the CB21-2018 proposal. I would like to start with the concern for industrial activity in a rural setting. I have lots of questions as to the purpose behind CB21-2018 and any potential loop holes that would allow contractors to mulch, compost, or perform any industrial activities on the farm land adjacent to my home. My concern stems from an environmental, health, safety, hazard, congestion, and aesthetic perspective. There are many questions surrounding all of these issues that need to be addressed fully.

For Contractors-

- Has a traffic study been conducted by the county to fully understand the impact on residents and roads?
- What is the cost analysis of using an existing farmland forever property vs. cost and impact to county residents?
- Who would be doing the hauling? The farmers would have to contract services....
- Is the county stepping up patrols to ensure MDOT regulations are being met even on our back country roads? Who will ensure these trucks meet safety and other DOT regulations (especially for safety-back-up alarms in working order; etc.)?
- What does a trucking route look like; ie. How many trucks per hour? How many loads per truck per day (How many trips per truck)? Weight of loads and impact on roads? Hours of operation.
- What will be the accountability of contracted services in the event an accident happens?
- What is their clean-up plan in the event there is a spill on the road?
- What is their plan for contaminants? What will the impact be on the water source both from a supply and demand outlook and from a contamination outlook? Will testing be done periodically and at whose expense?
- What about dust?
- What about noise control?
- What is the environmental impact? Has there been a study?
- What would be the impact on the Triadelphia Reservoir?
- What are the hazards that have already been identified-conceded?
- Impact on bus routes? These stops include Elementary (ages 5 to 11), Middle (11-13) High School (14-18). There are many bus stops within 1/4 of a mile of the entrance to the 3 farms off Howard Rd.
- What about safety? With 10 months of school bus operations and residential traffic daily.
- Fire hazard?
- Health hazard?
- Environmental hazard? What would be the effect of a mulching plant on the surrounding farms (livestock and crops)?
- Lastly, what are the potential benefits to the surrounding community at large?

The approximate average of property tax per home in this area of Howard County is over $700.00 a month; running in the neighborhood of $8,000-11,000 a year in property taxes.

Respectfully,

Kim Scanio

Good evening. My name is Leslie Bauer. I live at 13815 Howard Road in Dayton. So here we are again...talking about mulch and composting...I am here to testify in support of CB21-2018. As I sit here looking at this bill once again, and once again listen to all of the negative testimony, I am left to wonder about several things.

If mulch & compost are so bad, why, as the weather is getting warmer and I drive around Dayton, do I see all these residents placing mulch in their flower beds, around their houses, around their wells, potentially contaminating the ground, contaminating their water.
If mulch & compost are so bad, why is this mulch spread all around the schools? If these children aren't exposed to it enough at home, they will certainly get their fill of it while they are at school.
If mulch & compost are so bad, why does the University of Maryland Extension and Master Gardeners offer a gardening series geared to teens/tweens called "Vegetable Gardening and Composting"?
If mulch & compost are so bad, why did Howard Soil Conservation District, at their annual mid-winter ag meeting for local farmers, include in their program a presentation about composting by Justen Garrity of Veteran Compost?

It seems that everywhere I go there is someone that promotes the use of mulch and composting. So why do you want to prohibit the farmer from producing it? From providing it to consumers?

Minimize our carbon footprint...buy local....does this not apply to mulch?

Unlike the people who have offered testimony in opposition of CB21-2018, who claim to have 'knowledge' about farming, like the person last fall who called out one of my neighbors for moving a 'Natural Wood

Waste Recycling grinder' across local roads in anticipation of setting up a composting operation - it was actually a grain combine being moved from one farm property to another in preparation for corn harvest - the people you see testifying here tonight in support of CB21-2018 are farmers and make their living farming. While there may not be many of us here, I consider these people my farm family, and I greatly value and respect each of them for the unique ability and talent that they bring to their own part of agriculture. Without hesitation, I would go to any one of them for their specific knowledge and advice on animals or crops, however I would know better then to ask them a medical, financial or legal opinion. I have a different set of trusted advisors and experts for that. When you want to know the truth about farming, go straight to the source and please ask a farmer. Don't rely on what others think they know about our business or the misleading information they have found on the internet.

I am sure that if I searched the internet enough, I could find the case that eating Captain Crunch for breakfast every morning can potentially cause cancer.

I hope that you will see through the rest of the noise in this room tonight and listen to what this group of farmers have to say about their future and their success. These people are the experts here tonight. They are people who truly are out-standing in the field, and I hope that you will vote in favor of CB21-2018. Thank you.

Leslie Bauer
Labauer5@verizon.net
443-912-1662

Leslie Collier Englehart
5200 Kalmia Dr.
Dayton, MD 21036

4/16/18

I have lived in Dayton for 37 years. I chose to live and raise my family here because I wanted clean water and clean air for them. I wanted them to know the peace of the countryside and to value this planet, you know, the one where all living things need clean air and. We have done our best to live lightly upon the earth, growing much of our own food, raising our chickens for eggs, minding our bee hives, planting trees. I buy our meat, Christmas trees, and pumpkins, and whatever produce I don't grow from our neighbors at TLV Farm. And, despite high property taxes, we plan to stay here in our retirement rather than migrate south . This is our home and we love it .

But greed has reared its ugly head and now certain of our super rich developer neighbors want to be super-super rich at the expense of our health, our peace, and possibly even our lives and the lives of our children. I want to make it absolutely clear that I do NOT include farmers in

this description. I refer to the developers who want even more money for themselves at the expense of their neighbors' health and safety.

I think certain questions have to be considered:

1) Are these developers' profits and tax savings more important than their neighbors' peace, property values, health, and even their lives?

2) When a child is killed trying to catch a school bus on Greenbridge Rd., (as has happened in this same situation in Virginia) or when children in the area become ill from breathing the particulates from an industrial operation, or when seniors who came here decades ago for the beauty and peace of the outdoors can no longer enjoy their gardens because being outdoors makes them sick, will those profiting from this business and the lower taxes from doing it on farmland step up and take moral and financial responsibility? I somehow doubt it.

Members of the County Council, please don't delude yourselves that the protections of CB-21-2018 are sufficient. Where there are loopholes to doing the right thing, the greedy will find them and exploit us all for their gain.

I call for amendments to this bill to close those loopholes. I call for total transparency from the County Council on any changes to those amendments. I call on my neighbors to support our county farmers by buying their meat and other produce. I call on my neighbors to stop using mulch. It is not a necessity, it is only a fashion. Preserve the farmland and preserve all of our health and safety.

And, Ms. Sigaty, if you wish to question my personal gardening habits as you did last time, I assure you again that all compost used in my garden is from my own property, or is from my neighbors' horses or sheep herd. Nothing I put in my garden or on my land is industrially produced (except perhaps grass seed occassionally).

For clarity to all, as we oppose the current zoning language in CB 21-2018 given the many obvious loopholes it creates, our **Amendment 1 by default absolutely prohibits the following on all RR and RC parcels:**

1. No commercial sale of mulch or compost product
2. No three axle or tractor-trailer trucks on/off the farm with mulch or compost product
3. No industrial grade tub grinders, normally used to support typical industrial mulching facilities
4. No mulching on Howard County ag preserve or State of MD ag preserve farmland
5. No retail sales of mulch or compost product onsite

Howard Soil Conservation District
14735 Frederick Road • Cooksville, MD 21723 • Phone 410-313-0680 • Fax 410-489-5674
www.howardscd.org

April 16, 2018

Honorable Mary Kay Sigaty, Chair
Howard County Council
George Howard Building
3430 Court House Drive
Ellicott City, MD 21043

Re: Howard SCD Board of Supervisors support for Council Bill No. 21-2018

Dear Honorable Chair Sigaty and Howard County Council:

The Howard Soil Conservation District Board of Supervisors would like to thank County Councilmembers Mary Kay Sigaty and Greg Fox for proposing Council Bill 21-2018 to address mulching and composting facilities in Howard County. The HSCD Board of Supervisors generally supports the proposed bill, but would like to work with the County Council to improve some aspects of the proposed legislation. In particular, we believe the size limitations outlined in the Bill are unnecessarily restrictive and not based on sound science or operational realities. We also question why mulch and compost are not just considered as an Accessory Use under the topic of "Value-added processing of agricultural products", as outlined in the current regulations. This would allow these operations in the RC and RR Districts as well as on County Preservation Easements, and would categorize them more appropriately as agricultural products.

Since 1945 the Howard Soil Conservation District has helped the citizens of Howard County to protect their soil, water, and other natural resources. The Howard SCD staff provide technical assistance to farmers and landowners interested in establishing conservation practices on their properties. We help plan, design, survey, and oversee construction of a wide array of best management practices which farmers implement to protect our local water resources and restore the Chesapeake Bay. Our agency also serves a vital role in protecting water quality by reviewing sediment and erosion control plans for construction sites.

One of our core partners in our efforts to improve water quality in the county and protect the Chesapeake Bay is the USDA Natural Resource Conservation Service (NRCS). NRCS has practice standards for hundreds of conservation practices we use to protect our natural resources. We have provided 2 of these practice standards along with our testimony so that you can see their importance and relevance to agricultural operations. The two practice standards pertain to mulching and composting facilities, NRCS practice code 484 and 317, respectively. The standards describe the use of these two components as agricultural conservation practices and reinforce the importance of both for the enhancement of natural resources.

CRITERIA

Facility Siting

Locate the composting facility where movement of odors toward neighbors will be minimized. Buffer areas, vegetative screens, and landscaping can help minimize negative effects of odors and visual resources.

Locate the facility a minimum 2 feet above the high water table. Soils that have a rapid permeability (>6.0 inches/hour) in the upper 40 inches of the soil profile require a concrete pad, clay, or synthetic liner. The compost area and access must be kept free of standing water and rutting.

Locate the composting facility outside the 100-year, 24-hour floodplain when possible. If the only practical alternative is to locate the facility within the 100-year floodplain, design the facility to protect from inundation and damage from the 25-year, 24-hour flood event. Divert runoff from outside drainage areas and maintain positive drainage away from the facility.

Construction activity within the 100-year floodplain requires permits or authorizations from the Maryland Department of the Environment and/or the U.S. Army Corps of Engineers. Obtain all applicable permits and authorizations prior to start of construction.

The area surrounding the composting facility will be subject to a high traffic load during loading, mixing, and unloading. Design these areas to meet the requirements of the Maryland conservation practice standard for Heavy Use Area Protection, Code 561.

Contaminated runoff from any composting facility without a roof must be controlled. This may be accomplished with distribution over a Wastewater Treatment Strip (Maryland conservation practice standard, Code 635) or transfer to a storage facility or other approved treatment method.

Leachate should not occur from any composting facility. If leachate does occur, this means the mix is too wet. Make adjustments to the composting mix by adding dry matter to eliminate leachate. Address this issue in the operation and maintenance plan.

Facility Type, Size, and Design

Type - Select the type of facility and composting method based on the availability of raw materials, the desired quality of the final compost, available equipment, manpower, management time, and available land.

Facility structural elements such as permanent bins, concrete walls and slabs, and roofs shall meet the requirements of Waste Storage Facility (MD-313).

Size and Design - Size all composting facilities in accordance with the Agricultural Waste Management Field Handbook, Part 651 Chapter 10, appropriate NRCS Design Worksheet(s), Extension Fact Sheet(s), or other methods as approved.

Dimension all structures to accommodate the equipment used for loading, unloading, and aeration.

Materials - Conform to the requirements of Maryland conservation practice standard for Waste Storage Structure, Code 313, for materials and structural design of composting facilities.

Composting

Compost Mix - Develop a compost mix that encourages aerobic microbial decomposition and minimizes nuisance odors. The "mix" for this system must be managed closely for the C:N ratio, moisture, and temperature.

Carbon-Nitrogen Ratio – The initial compost mix should result in a (C:N) ratio between 25:1 and 40:1. Compost with a greater carbon to nitrogen ratio can be used if nitrogen immobilization is not a concern.

Carbon Source - Choose a carbon source compatible with the organic by-product being composted. A good carbon source will mix well with the organic matter, provide air space for aerobic decomposition, and enhance aeration. Therefore, a good carbon source also acts as a good bulking agent.

Bulking Agents - Bulking agents are ingredients used to improve the structure and porosity of a mix. Bulking agents are typically dry and vary

in particle size (e.g., straw and sawdust), but could be old finished compost.

Add bulking agents to the mix as necessary to enhance aeration. The bulking material may be the carbon source used in the mix or a non-biodegradable material. If a non-biodegradable bulking material is used, provisions must be made for its salvage at the end of the composting period.

Moisture Content - The moisture range during the composting period should range from 40 to 65 percent (wet basis). Moisture contents above 65 percent invite fly production, anaerobic decomposition, and objectionable odors. Water may need to be added during the turning process if the compost is below 40% moisture. In general, the compost is too wet if water can be squeezed out and too dry if the mix doesn't feel moist to the touch.

Temperature Control – Manage the compost mix to reach and maintain the internal temperature for the duration of the composting process to meet the management goals.

When the management goal is to reduce pathogens, the compost temperature must be maintained above 130°F for a minimum of 5 cumulative days during the composting process. Monitoring internal temperatures is a good indicator of pathogen kill. A temperature log of the temperature profiles should be maintained.

Turning/Aeration – The frequency of turning/aeration should be appropriate for the composting method used to attain the desired amount of moisture removal and temperature control while maintaining aerobic degradation. Turning and aeration are functions of the composting process chosen and should follow the requirements of that system.

Pile Configuration - Windrows and static piles should be triangular to parabolic in cross-section and rounded on top to shed rainfall. Align windrows and static piles to avoid accumulation of precipitation. Maintain positive drainage parallel to the windrows.

Compost Period - Continue the composting process long enough for the compost mix to reach the stability level where it can be safely stored without undesirable odors. It shall also possess the desired characteristics for its use, such as lack of noxious odor, desired moisture content, level of decomposition of original components and texture. The compost period shall involve primary and secondary composting as required to achieve these characteristics.

Test the finished compost as appropriate to assure that the required stabilization has been reached.

Use of Finished Compost - Follow the requirements of the Maryland conservation practice standards for Nutrient Management, Code 590, and Waste Utilization, Code 633, for land application.

Federal, State, and Local Laws

Adhere to all federal, state, and local laws, rules and regulations for composting and utilization of the compost. It is the responsibility of the producer to secure any permits necessary to install structures and for properly managing the facility on a daily basis.

Safety

Incorporate safety and personal protection features and practices into the facility design and operation as appropriate, to minimize the occurrence of equipment hazards and biological agents during the composting process. These features may include warning signs, fences, ladders, ropes, bars, rails, and other safety devices to protect humans and livestock.

SPECIFICATIONS

Plans and specifications for the composting facility shall be in keeping with this standard and describe the requirements for applying the practice to achieve its intended purpose.

All phases of construction shall comply with the appropriate standards and specifications for the work items including, but not restricted to:

The contractor should furnish a certification statement that he has constructed/assembled any non-NRCS designed structure in accordance with the requirements/specifications of the designer/manufacturer.

OPERATION AND MAINTENANCE

Develop an operation and maintenance plan prior to design approval that is consistent with the purposes of the practice, its intended life, safety requirements, and the criteria for its operation.

Manage the compost piles for temperature, odors, moisture, and oxygen, as appropriate. Make adjustments throughout the composting period to insure proper composting processes.

Closely monitor temperatures above 165°F. Take action immediately to cool piles that have reached temperatures above 185°F.

The operation and maintenance plan shall state that composting is a biological process. It requires a combination of art and science for success. Hence, the operation may need to undergo some trial and error in the start-up of a new composting facility.

The plan must include but is not limited to the following:

1. Objective of the landowner or operator and the operation requirements;
2. The mix proportions, moisture requirements, and materials used;
3. The sizing requirements;
4. The timing of the composting process including loading, unloading, and turning or aeration of the material;
5. Temperature monitoring requirements, including a temperature log;
6. What must be done to prevent leachate problems;
7. Biosecurity requirements;
8. Safety requirements;
9. If available, frequently encountered mistakes in composting and brief "fix it" scenarios or a reference to;
10. References of sources of information or a reference to where they can be found.

SUPPORTING DATA AND DOCUMENTATION

Field Data and Survey Notes

The following is a list of the minimum data needed:

1. System plan sketch;
2. Topographic survey of the site showing building locations, elevations at structure location and location of dwellings, wells, floodplains, etc.;
3. Soils exploration showing seasonal high water table;
4. Operator data used to size the facility and documentation of the landowners decisions.

Design Data

Record on appropriate engineering paper. For guidance on the preparation of engineering plans see chapter 5 of the EFH, Part 650. The following is a list of the minimum required design data:

1. Comprehensive Nutrient Management Plan or Waste Management Plan including the Operation and Maintenance Plan;
2. Plan view including, location map, all system components, material and construction specifications;
3. Construction drawings, and component details;
4. Structure sizing computations;
5. Structure and component design and details;
6. Area grading plan;
7. Quantities estimate;
8. Job Class on plan;
9. Details of foundation drainage, when required;
10. Planting plan. This must meet the criteria, specifications, and documentation requirements of the Maryland conservation practice standard, Critical Area Planting, Code 342.

Construction Check Data/As-built

Record on survey notepaper, SCS-ENG-28, or other appropriate engineering paper. Survey data will be plotted on plans in red. The following is a list of minimum data needed for As-Builts:

1. Documentation of site visits on CPA-6. Include the date, who performed the inspection, specifics as to what was inspected, all alternatives discussed, and decisions made and by whom;
2. Actual dimensions of installed structure;
3. Verification of adequate foundation preparation;
4. Documentation of installation of foundation drainage;
5. Documentation of reinforcing steel and proper concrete installation, if applicable;
6. Condition of precast panels, if applicable;
7. Statement on seeding and fencing;
8. Final quantities and documentation for quantity changes, and materials certification;
9. Sign and date checknotes and plans by someone with appropriate approval authority. Include statement that practice meets or exceeds plans and NRCS practice standards.

REFERENCES

1. Arkansas Cooperative Extension Service. *Basic Operating Procedures.* University of Arkansas, 2201 Brookwood Drive, P.O. Box 391, Little Rock, Arkansas 72203. (501) 671-2000.

2. Arkansas Cooperative Extension Service. *Suggested Composter Size.* University of Arkansas, 2201 Brookwood Drive, P.O. Box 391, Little Rock, Arkansas 72203. (501) 671-2000.

3. Delaware Cooperative Extension Service, Delaware *Two-Stage Composter*; Construction Details, 1988.

4. USDA, Natural Resources Conservation Service. *Animal Waste Management Field Handbook*

5. USDA Natural Resources Conservation Service, *National Engineering Handbook*, Part 650

6. USDA, Natural Resources Conservation Service, *Maryland Field Office Technical Guide, Section IV, Standards and Specifications*;

7. USDA Natural Resources Conservation Service, *National Handbook of Conservation Practices*;

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD
MULCHING
(Ac.)

CODE 484

DEFINITION

Applying plant residues or other suitable materials produced off site, to the land surface.

PURPOSE

- Conserve soil moisture
- Reduce energy use associated with irrigation
- Moderate soil temperature
- Provide erosion control
- Suppress weed growth
- Facilitate the establishment of vegetative cover
- Improve soil quality
- Reduce airborne particulates

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all lands where mulches are needed. This practice may be used alone or in combination with other practices.

CRITERIA

General Criteria Applicable to All Purposes

The selection of mulching materials will depend primarily on site conditions and the material's availability. Mulch materials shall consist of natural and/or artificial materials that are environmentally safe such as plant residue, wood bark or chips, gravel, plastic, fabric, rice hulls, or other equivalent materials of sufficient dimension (depth or thickness) and durability to achieve the intended purpose for the required time period.

Prior to mulching, the soil surface shall be prepared in order to achieve the desired purpose.

The mulch material shall be evenly applied and, if necessary, anchored to the soil. Tackifiers, emulsions, pinning, netting, crimping or other acceptable methods of anchoring will be used if needed to hold the mulch in place for specified periods.

As a minimum, manufactured mulches shall be applied according to the manufacturer's specifications.

Mulching operations shall comply with federal, state, and/or local laws and regulations during the installation, operation, and maintenance of this practice.

Mulch material shall be relatively free of disease, pesticides, chemicals, noxious weed seeds, and other pests and pathogens.

Additional Criteria to Conserve Soil Moisture and/or Reduce Energy Use Associated with Irrigation

Mulch materials applied to the soil surface shall provide at least 60 percent surface cover to reduce potential evaporation.

Additional Criteria to Moderate Soil Temperature

Mulch materials shall be selected and applied to obtain 100 percent coverage over the area treated. The material shall be of a significant thickness to persist for the period required for the temperature modification.

Additional Criteria to Provide Erosion Control

When mulching with cereal grain straw or grass hay, apply at a rate to achieve a minimum 70 percent ground cover. Mulch rate shall be determined using current erosion prediction technology to reach the soil erosion objective.

When mulching with wood products such as wood chips, bark, or shavings or other wood

materials, apply a minimum 2-inch thickness.

When mulching with gravel or other inorganic material apply a minimum 2 inch thickness and shall consist of pieces 0.75 to 2 inches in diameter.

Additional Criteria to Suppress Weed Growth

The thickness of mulch will be determined by the size of the plant being mulched. Mulches shall be kept clear of the stems of plants where disease is likely to occur. Mulches applied around growing plants or prior to weed seedling development shall have 100 percent ground cover. Thickness of the mulch shall be adequate to prevent emergence of targeted weeds. Plastic mulches may be used.

Additional Criteria to Establish Vegetative Cover

Mulch shall be applied at a rate that achieves a minimum of 70 percent ground cover to provide protection from erosion and runoff and yet allow adequate light and air penetration to the seedbed to ensure proper germination and emergence.

Additional Criteria to Improve Soil Quality

Apply mulch materials with a carbon to nitrogen ratio (C:N) less than 30 to 1 so that soil nitrogen is not immobilized by soil biota. Do not apply mulch with C:N less than 20:1 to an area of designed flow in watercourses.

Use the Soil Conditioning Index to assess soil quality impacts and to determine the type and rate of the mulching material.

Additional Criteria to Reduce Airborne Particulate Matter from Wind Erosion

Mulch rate shall be determined using current wind erosion prediction technology to reach the soil erosion (movement of particulates offsite) objective.

CONSIDERATIONS

Evaluate the effects of mulching on evaporation, infiltration, and runoff. Mulch material may affect microbial activity in the soil surface, increase infiltration, and decrease runoff, erosion, and evaporation. The temperature of the surface runoff may also be lowered.

Mulch material used to conserve soil moisture should be applied prior to moisture loss. Prior to mulching, ensure soil under shallow rooted crops is moist, as these crops require a constant supply of moisture.

Mulch materials with a high water holding capacity and/or high impermeability to water droplets may adversely affect the water needs of plants.

Fine textured mulches (e.g. rice hulls) which allow less oxygen penetration than coarser materials should be no thicker than 2 inches.

Organic materials with C:N ratios of less than 20:1 will release nitrate-nitrogen which could cause water quality impairments.

Mulching may also provide habitat for beneficial insect and provide pest suppression.

Clear and infra-red transmissible (IRT) plastics have the greatest warming potential. They are transparent to incoming radiation and trap the longer wavelengths radiating from the soil. Black mulches are limited to warming soils by conduction only and are less effective.

Clear mulches allow profuse weed growth and may negate the benefits of soil warming. Black mulches provide effective weed control. Wavelength selective (IRT) plastic provides the soil warming characteristics of clear mulch with the weed control ability of black mulch.

Low permeability mulches (e.g. Plastic) may increase concentrated flow and erosion on un-mulched areas.

Consider potential toxic alleleopathic effects that mulch material may have on other organisms. Animal and plant pest species may be incompatible with the site.

Consider the potential for increased pathogenic activity within the applied mulch material.

Keep mulch 3 to 6 inches away from plant stems and crowns to prevent disease and pest problems. Additional weed control may be needed around the plant base area.

Deep mulch provides nesting habitat for ground-burrowing rodents that can chew extensively on tree trunks and/or tree roots. Light mulch applied after the first cold weather may prevent rodents from nesting.

Some mulch material may adversely affect aquatic environments through changes in water chemistry or as waterborne debris. Consider placing mulch in locations that minimizes these risks.

Consider potential effects of soil physical and chemical properties. Refer to soil survey data as a preliminary planning tool for assessment of areas. Consult the Web Soil Survey at: http://websoilsurvey.nrcs.usda.gov/app/ to obtain Soil Properties and Qualities information.

PLANS AND SPECIFICATIONS

Specifications shall be prepared for each site and purpose and recorded using approved specification sheets, job sheets, technical notes, narrative statements in the conservation plan, or other acceptable documentation.

Documentation shall include:

- Purpose of the Mulch
- Type of mulch material used
- The percent cover and/or thickness of mulch material
- Timing of application
- Site preparation
- Listing of netting, tackifiers, or method of anchoring, and
- Operation and maintenance.

OPERATION AND MAINTENANCE

Mulched areas will be periodically inspected, and mulch shall be reinstalled or repaired as needed to accomplish the intended purpose.

Evaluate the effectiveness of the mulch (application, amount of cover provided, durability, etc.) and adjust the management or type of mulch to better meet the intended purpose(s).

Removal or incorporation of mulch materials shall be consistent with the intended purpose and site conditions.

Operation of equipment near and on the site shall not compromise the intended purpose of the mulch.

Prevent or repair any fire damage to the mulch material.

Properly collect and dispose of artificial mulch material after intended use.

Monitor and control undesirable weeds in mulched areas.

REFERENCES

Agriculture and Agri-Food Canada. 2000. Plastic mulches for commercial vegetable production. Canada-Saskatchewan Irrigation Diversification Centre. Outlook, Saskatchewan.

Renard, K.G., G.R. Foster, G.A. Weesies, D.K. McCool, and D.C. Yoder, Coordinators. 1997. Predicting soil erosion by water: A guide to conservation planning with the Revised Universal Soil Loss Equation (RUSLE). U.S. Department of Agriculture, Agriculture Handbook No. 703.

Shaffer, M.J., and W.E. Larson (ed.). 1987. NTRM, a soil-crop simulation model for nitrogen, tillage and crop residue management. USDA Conserv. Res. Rep. 34-1. USDA-ARS.

Toy, T.J., and G.R. Foster. (Ed.) 1998. Guidelines for the use of the Revised Universal Soil Loss Equation (RUSLE) Version 1.06 on mined lands, construction sites, and reclaimed lands. USDI, OSMR.

USDA, NRCS. 2011. National Agronomy Manual. 190-V, 4th Ed. Washington, D.C.

Guide to Mulch Materials, Rates and Uses					
Mulch Materials	**Quality Standards**	**Application Rates**		**Depth of Application**	
		per 1,000 sq. ft.	per Acre		
Wood chips or shavings	Green or air dried. Free from objectionable coarse materials.	500-900 lbs.	6 tons	2" - 7"	Has about th application a less N/ton (1 Resistant to Decomposes
Wood Fiber Cellulose (Partly digested wood fibers)	Dyed green. No growth inhibiting factors. Air-dried 30% fibers 3.7 mm or longer.	30 lbs.	1500 lbs.		When applie critical areas Apply with hy required. Pa Use only on and during o Curosol or e hold mulch o
Leaves	No plastic bags, or household debris.	375-700 lbs.	8-15 tons	3" - 6"	Must be spre delivery. Mus next growing be done with Incorporatior with chisel pl should ' ev state a. or
Cornstalks, shredded or chopped	Air-dried, shredded into 8" to 12" lengths	150-300 lbs.	4-6 tons		Effective for slow to deco mulch on crc blowing.
Grass clippings	Unbagged, free of debris; minimal odor	700-1400 lbs.	15-30 tons	1 " - 2"	Obtain neces spread withir Incorporate \ crop establis

Guide to Mulch Materials, Rates and Uses					
Mulch Materials	**Quality Standards**	**Application Rates**		**Depth of Application**	
		per 1,000 sq. ft.	per Acre		
Filter Fabrics	Woven or Spun	Variable			
Straw or coconut fiber or combination	Photodegradable plastic net on one or two sides	most are 6.5 ft x 83.5 ft.	81 rolls		Designed to water flaw in 60 sq. yds pe
Gravel, Crushed Stone or Slag	Washed; Size 2B or 3A – 1-1/2"	9 cu. Yds.		3:	Excellent mu around wooc Use 2B whe Frequently u better weed
Hay or Straw	Air-dried; free of undesirable seeds & coarse materials	90-100 lbs. (2-3 bales_	2 T (100-120 Bales)	Cover about 90% of surface	Use straw wl for more tha wind blowing the most con material. Bes germinating
Peat Moss	Dried, compressed free of coarse	200-400 cu. ft.	1/2-1 T	2" - 4"	Most effectiv ornamentals unless kept v Excellent mc
Jute Twisted Yarn	Undyed, unbleached plain weave Warp 78 ends/yd 60-90 lbs/roll	48" x 50 yds or 48"x 75 yds.			Use without as in manufa

Guide to Mulch Materials, Rates and Uses					
Mulch Materials	**Quality Standards**	**Application Rates**		**Depth of Application**	
		per 1,000 sq. ft.	per Acre		
Excelsior Wood Fiber Mats	Interlocking web of excelsior fibers with photodegradable plastic netting	48" x 100" 2 sided plastic 48" x 180" 1 sided plastic			Use without for seed esta per manufac Approx. 72 l plastic on bo plastic for ce
Glass Fiber	1 /4" thick, 7/16" diameter holes on 1 " centers; 56 lb. rolls.	72" x 30 yds.			Use without with T bars a specification
Plastic	2-4 mils	Variable			Use black fo moisture cor control for sr

NRCS, MD

April 2012

Mulch Anchoring Guide Specification Sheet		
Anchoring Method or Material	**Kind Of Mulch To Be Anchored**	**How**
Mechanical		
Asphalt spray emulsion	Compost, wood chips wood shaving, hay or straw	Apply with suitable s following rates: asph use 200 gal/ac, on le asphalt: (rapid, medi gallons per sq/yd.; 4
Wood cellulose fiber	Hay or straw	Apply with hydro see mulching. Use 750 lb Some products cont
Pick chain	Hay or straw manure compost	Use on slopes steep slopes with suitable
Mulch anchoring tool or disk	Hay or straw, manure/mostly straw	Set in straight positic with suitable power e should be "tucked" ir
Chemical	Hay or straw	Apply Terra Tack AF water or Aerospray7 manufacturer's instru during rain. A f ou temperature hig..er t

NRCS, MD

April 2012

Mulch Anchoring Guide Specification Sheet		
Anchoring Method or Material	**Kind Of Mulch To Be Anchored**	**How**
Manual		
Peg and twine	Hay or straw	After mulching, divid approx. 1 sq.yd. Driv within 2" to 3" of soil surface by stretching crisscross pattern or around each peg wit pegs flush with soil v maintenance is plan
Mulch netting	Hay or straw	Staple the light-weig or plastic nettings to manufacturer's recor biodegradable. Most for foot traffic.
Soil & Stones	Plastic	Plow a single furrow covered with plastic, into the furrow and p plastic. Use stones t other places as neec
Cut-in	Hay or straw	Cut mulch into soil s spade. Make cuts in apart. Most success soils.

CB 21-2018 Testimony

James Nickel
4904 Green Bridge Rd
Dayton, MD 21036

April 16, 2018

	CB 21-2018 Candidate Positions and 2018 Election Guide	
	County Executive	
	[D] - Dr. Calvin Ball	See Note Below
X	[D] - Harry Dunbar	Should be confined to M1 & M2
	[R] - Allan H. Kittleman	See Note Below
	County Council District 001	
X	[R] - Raj Kathuria	Opposed to approval until all aspects of Public Safety are addressed. • Public safety should be the most important job of a public official. • Promotes best use of farmland and the rights of farmers to make and sustain a respectable living off the land.
X	[D] - Elizabeth "Liz" Walsh	Opposed to CB 21-2018 - Would Vote No
	[D] - Jon Weinstein	See Note Below
	County Council District 002	
	[D] - Opel Jones	TBD
	[R] - John Liao	TBD
	County Council District 003	
X	[D] - Hiruy Hadgu	Opposed to CB21-2018 for the following reasons: · The county government has not enforced existing regulations as evidenced by the numerous documented violations. · The Planning Board does not have the technical competency to take an informed vote on this complex zoning regulation. · The health and safety concerns raised by the community have not been addressed. See Also: Reaction to the Proposed CB60-2017
	[D] - Steven F. Hunt	TBD
	[D] - Greg Jennings	TBD
	[D] - Christiana Rigby	TBD
	County Council District 004	
	[D] - Deb Jung	TBD
X	[R] - Lisa Kim	Opposed to CB21-2018 for the following reasons: • We cannot make a determination as to what the real needs are as we have not enforced the existing code and regulations. Therefore we cannot assess legislation properly or fully. • We need to revamp existing supporting codes and regulations to aid in the enforcement efforts of the current codes and regulations related to mulching. • There is a lack of knowledge in the County government in multiple regards on such a complicated issue and therefore no reliable decision can be made in relation to a bill or legislation.
X	[D] - Ian Moller-Knudsen	Opposed to CB21-2018
	[D] - Janet Siddiqui	TBD
	County Council District 005	
	[R] - Jim Walsh	TBD
X	[D] - China Williams	Current legislation lacks adequate health and safety controls to allow industrial mulching and composting on agricultural land. I would like to see less acreage, greater setbacks (especially from schools), direct highway access only, and a monitoring and remediation plan if groundwater is contaminated.
X	[R] - David Yungmann	Cap commercial sales similar to retail sales cap to discourage full commercial intent.
	Notes	
	Note: No candidate opposes mulch and/or compost production for use on the farm.	
	County Executive and Council Positions on Prior Legislation - CB 60-2017	
	Note: County Executive Allan H. Kittleman sponsored previous legislation.	
	Note: Council Member Mary Kay Sigaty sponsored CB 60-2017 and CB 21-2018. Is a candidate for MD State Senate District 12.	
	Note: Council Member Greg Fox sponsored CB 60-2017 and CB 21-2018	
	Note: Council Member Jon Weinstein voted in favor of CB 60-2017.	
	Note: Council Member Dr. Calvin Ball voted "No" on previous legislation.	
	Note: Council Member Jennifer Terrasa voted "No" on previous legislation. Is a candidate for MD Delegate District 13	

CB 21-2018, In Favor Of

Keith Ohlinger
2790 Florence Road
Woodbine, MD 21797

Dear Howard County Council:

Four years ago or so back when CB 20-2014 was occurring, Council President Sigaty asked me if I was ready to serve. As one of your county farmers, I said "Yes, I will do anything I can to help." I have done the absolute best that I can and I do not know what else I have to offer. I have invited all of you and your staff to our farm and shared it with you freely. I have answered any questions, and discussed how the layers and interwoven regulations apply and impact us and the proposed legislation.

Our farm is the sum total of my life's efforts, it is my life's work. It will not function without compost; it will not function without ample local supply and local access to wood chips. I will not be able to expand and grow the business without them. I have had numerous experts in soil health, water quality, air quality, compost, regenerative agriculture, and ecology to name a few. Our soil health continues to improve, our water remains clean, and our pastures, animals and people are all healthy.

Please take my actions and dedication to this issue and our farm into consideration as you make your decision. I ask you to please support this bill; our farm cannot survive without it.

Very Truly Yours,

Keith Ohlinger

As a side note, up to this point I have discouraged the girls getting involved with this issue. I felt they should be sheltered from the nastiness as long as possible. However, as they so aptly pointed out to me today this is their farm too and they have every right to protect it (From their mouths to God's ears). I humbly submit my two beautiful daughter's personal testimony in support of this bill, Dani is 6, and Gabby is 10.

Dear Agriculture People,

I have heard from my dad that people do not want farmers to have compost. They do not understand that farmers need compost to have healthier soil. Please do not listen to them. We need things like compost to farm, and we can not risk having less-successful farms because we took away some of their materials. So please, do not listen to them.

Thank you.

- Gabby O.
(Kate's Daughter)

Dear peope if you don't Stop your beautiful Earth will be destroyed!

And don't pote compost in the Soil or your Earth will be destroyed!

from Dani Keith's Kid

Dear Council Members,

Raymond James Beeraft,
3075 Florence Rd
Woodbine, Md

I was born in this area and I have been a farmer all my life here. I grow things that humans and animals eat. This passed year I have been sick with pneumonia and sinuses trouble. When Oakridge Farms - Bonner was in operation, I was always sick, I am just getting better these pass months. I have 2 farms off 94 near Bonner. As a farmer I oppose this bill and I oppose every version that has come before CB21-2018 and this bill is worse than all the others that have come before. This area we live in is

farm country, NO large trucks, NO really loud noises
please. If Bonner is allowed to start running
again we will all suffer.

MARYLAND DEPARTMENT OF THE ENVIRONMENT
Land and Materials Administration • Resource Management Program
1800 Washington Boulevard • Suite 610 • Baltimore Maryland 21230-1719
410-537-3314 • 800-633-6101 x3314 • www.mde.maryland.gov/composting

Waste Diversion Infrastructure Recommendations Discussion

March 19, 2018
Talking Points

- **Improve food donation infrastructure.**
  - Obtain better data on existing infrastructure and gaps.
  - Consider financial incentives to expand infrastructure (e.g. increase refrigerated storage capacity; improve transportation networks; etc.).
  - Increase outreach and education on food donation opportunities.
  - Increase education on and consistent implementation of public health regulations regarding food donation.
  - Consider whether enhancements to existing liability protections and tax credits for donors are needed to improve participation in food donation programs.
- **Obtain status of the current infrastructure and practices for the use of food scraps as animal feed to better assess needs and challenges. – Discuss in future meeting**
  - Coordinate with MDA, MFB, haulers, and other agriculture groups to learn about current practices.
- **Consider whether the existing disposal ban on yard trimmings should be strengthened.**
  - Capacity largely already exists to accommodate the remaining yard trimmings, but is an expansion of the ban necessary given that most yard trimmings are already recycled (i.e. is this where we should target efforts?)
- **Encourage expanded composting capacity in underserved areas of the State.**
  - Consider financial incentives for additional processing and collection capacity.
  - Provide siting assistance.
  - Integrate composting and anaerobic digestion into community economic development initiatives.
  - Assist operators in upgrading existing yard trimmings composting facilities to process source separated food scraps.
- **Increase anaerobic digestion capacity.**
  - Identify markets for digestate.
  - Clarify regulatory requirements.
  - Explore the possibility of co-digestion at wastewater treatment plants.
- **Build small-scale composting infrastructure where larger facilities do not exist or are not economically feasible.**
  - Provide composting training and outreach on:
    - On-site residential (backyard) composting
    - Composting at community gardens and urban farms
    - On-farm composting
    - Composting on site at LFSGs

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House Bill 171 – Department of the Environment – Yard Waste, Food Residuals, and Other Organic Materials Diversion and Infrastructure

Study Group Meeting Agenda

Date: Monday, March 19, 2018; 10 A.M.- 12 P.M.

Place: Maryland Department of the Environment
Lobby Conference Rooms
1800 Washington Boulevard
Baltimore, MD 21230

10:00-10:10
- Welcome and Introductions - *All*
- Approval of minutes from January 24, 2018 meeting - *All*

10:10-10:40
- Current status of organics diversion infrastructure in Maryland- *MDE*

10:40-11:30
- Discussion of methods to address infrastructure needs – *Workgroup members*

  Suggested discussion topics include methods to:
  - Improve food donation infrastructure;
  - Better assess needs and challenges for the use of food scraps as animal feed;
  - Consider whether the existing disposal ban on yard trimmings should be strengthened;
  - Encourage expanded composting capacity in underserved areas of the State;
  - Increase anaerobic digestion capacity; and
  - Build small-scale composting infrastructure where larger facilities do not exist or are not economically feasible.

11:30-11:50 Comments from non-workgroup members – *Interested parties*

11:50-12:00 Wrap up and next steps - *MDE*

April 16,2018

Dear Council Members,

I saw the other day an email sent as submission of testimony to you on CB21-2018. It was written by James Nickel,dated April 6,2018 subject: CB 21-2018 Testimony- Preponderance of Negative Impact. I would like to add to that testimony with some additional evidence that was signed by twenty-six residents of Woodbine by the Howard Board of Health which can be found at this link " ltr from Woodbine to Howard County Board of Health". There are many more residents that requested to sign the letter but were unable to do so because of the time frame.

Also,attached are copies of letters written by private individuals who experienced the negative impact from mulch manufacture by Oak Ridge/Recycled Green.

My sincere appreciation goes to the members responsible for halting this "The Bad Actor's" latest obnoxious and detrimental operation. The neighbor's have breathed a sigh of relief after the many years of torture. Our air is fresh and clean. The loud thunderous noise, the beeping of the industrial equipment, the sometime 26 tractor trailer/dump trucks per hour,noxious odors, the cloud of dust and mud on the road has ceased. This type of activity has started as early as 5:00am. and has gone on after midnight 7 days per week.

People are enjoying the Peace and a Healthy Environment once again. The normal sound of farm equipment NOT industrial track hoes,front end loaders,trucks and tub or large horizontal grinders, is music to our ears.

As far as CB21 is concerned,Ms.Sigaty and Mr.Fox, you have opened up the opportunity to allow this operation to restart again,even adding a sawmill to confirm it. It is inconscionable that you would do this to citizens as you have been well informed about the adverse effects to the Woodbine residents. Should this bill pass you are accountable.

As a farmer and nurse,my suggestion would be to satisfy both sides and only allow compost/mulch on one acre "For the Farm,By the Farm,On the Farm". No retail sale,no wholesale,no removal of material once it enters the site. If a farmer has extra that's a plus. It can always be used at a later time.I know of a neighbor who has had approximately a half an acre as witnessed over the last twenty years and one landscaper/nurseryman with maybe the same.The majority of bonifide farmers are not interested in mulch and composting food waste.

Preserved farms are not intended to be dumps. Our easements clearly state no industrial,no commercial,no residential use. Anything other than this is a violation. Tax-payers should not be defrauded. Corporations should not benefit from purchasing farms and paying reduced agricultural property tax. No Tax dodging even if they are your friend.

Respectfully,

Leslie Long

Sunnyside
2701 Woodbine Rd.
Woodbine,Md. 21797

11/30/2017

Howard County Board of Health
8930 Stanford Blvd., Columbia, MD 21045

Carlessia Hussein, DrPH, RN - Chair
Darryl Burnett, MPH, CHES
Kevin Carlson, M.D.
Sheri Lewis, MPH
Paul Nagy, PhD
Deborah R. Rivkin
Robert Sheesley
Sue Song, PhD
Gary A. Stewart

Re: Complaints of Health and Safety Violations (Title 12, Howard County Code of Ordinances) against Erich Bonner and Oak Ridge Farm, 2700 Woodbine Road, Woodbine, MD 21797

Chairperson Hussein and Members of the Howard County Board of Health;

We undersigned residents hereby file formal complaints against Erich Bonner and Oak Ridge Farm with the Howard County Board of Health citing ongoing and long-standing health and safety violations of Title 12, Howard County Code of Ordinances, specifically violations of County regulations of "Air Pollution" and maintaining a "Nuisance" at 2700 Woodbine Road, Woodbine, MD 21797.

Oak Ridge Farm operates an unapproved[1] [2]wood waste recycling operation at Woodbine Road which has been found to be in violation of numerous regulations, previously fined and ordered shut down by Howard County Government for zoning violations (copy attached) and received violation notices from the Maryland Department of the Environment (copy attached) and acknowledged being in violation by Consent Order as well[3]. It is located in hazardous and noxious proximity to our properties and dwellings. By continuing its operations even after being found in violation by multiple agencies, Oak Ridge Farm displays willful disregard for the health and well-being of nearby residents, which we contend clearly constitutes both a serious health hazard and a public nuisance.

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[1] http://www.baltimoresun.com/news/maryland/howard/lisbon-fulton/ph-woodbine-mulching-decision-story.html

[2] See Numerous DPZ, MDE Violation Notices, attached.

[3] Also, per Consent Order, "IT IS HEREBY AGREED by and between Oak Ridge Farms, LLC, and the Department of Planning and Zoning and so ORDERED this day of January 12, 2015, that:

1. **Respondent Oak Ridge Farms, LLC, acknowledges being in violation of the Howard County Zoning Regulations** as cited in the Civil Citations on or about February 6, 2014.
2. Respondent Oak Ridge Farms, LLC, agrees to pay a one thousand dollar fine.
3. **Respondent Oak Ridge Farms, LLC' agrees that it will not manufacture mulch, including importing, grinding or exporting feedstock until such time as the Howard County Zoning Regulations are changed, if they are changed.**

Of particular import, recent written testimony to the Howard County Council by Dr. Victor E. Velculescu, M.D., Ph.D.[4], a noted oncologist, cites the following specific eight health concerns associated with wood dust, carcinogens and infectious agents and their affects upon residents[5], summarized herein:

1. *Wood dust is a carcinogen. This is well-established as has been indicated by many national and international organizations, including the American Cancer Society, WHO, CDC, and the Department of Health and Human Services. Importantly, wood dust is a carcinogen regardless of whether it arises from wood cutting occupations or from composting activities, as indicated in the 14th Report on Carcinogens from the US Department of Health and Human Services*
2. *Mulching and composting have health risks due to infectious agents.*
3. *Composting can lead to toxic and carcinogenic substances.*
4. *Dust from mulch and composting can lead to inflammatory effects.*
5. *Animal mortality and waste in composting can contaminate groundwater.*
6. *Composting facilities have health effects on nearby communities.*
7. *Infectious agents from mulch and composting facilities can pose health risks at significant distances.*
8. *Individuals living near composting sites have exposures similar to those in high risk occupations.*

As provided for under the Howard County Code of Ordinances, Title 12, Health and Social Services[6], we complainants hereby advise the Board that the ongoing serious violations of health and safety laws at the referenced site are inflicting damage to residents' health, livestock, crops and which interfere with the proper use and enjoyment of our properties. Further, we seek the Board's urgent action to immediately abate said dangerous and noxious violations.

Complaints

As a basis of request for these actions, we submit the following complaints against Erich Bonner and Oak Ridge Farm. They are not an exhaustive list of complaints and we reserve the right to enter additional claims in the future as needs may dictate.

Complaint 1 - Air Pollution (As per Section 12-108)

Oak Ridge Farm is the source of significant and nearly continuous noxious and harmful particulate airborne matter[7] produced by the trucking, grinding, turning, and composting of wood mulch products and other materials. This ongoing air polluting activity is documented in years of written complaints and

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[4] Dr. Victor E. Velculescu, M.D., Ph.D., Professor of Oncology and Pathology, Co-Director of Cancer Biology, Sidney Kimmel Comprehensive Cancer Center, Johns Hopkins University School of Medicine

[5] https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0ahUKEwi_7_jWmcHXAhWPGuwKHRPxDI0QFggrMAE&url=http%3A%2F%2Fcc.howardcountymd.gov%2FLinkClick.aspx%3Ffileticket%3DH7OSwuomuyY%253D%26portalid%3D0&usg=AOvVaw0uo7J4lbYWO-MvLH_mIK_D

[6] https://library.municode.com/md/howard_county/codes/code_of_ordinances?nodeId=HOCOCO_TIT12HESOSE

[7] "(c) Particulate Matter: (1) Emissions. A person may not cause or permit air polluting emissions from an unconfined source without taking reasonable precautions to prevent particulate matter from becoming airborne."

testimony to the Howard County Council, Howard County Planning Board and the Howard County Department of Planning and Zoning (DPZ), and as such are an undisputable matter of public record[8].

It has been well documented by many health professionals[9] and environmental scientists that:

a. Wood dust and associated airborne pathogens in particulate emissions are injurious to human life, plant life, animal life,
b. Such particulate emissions can be reasonably expected to continue to be injurious to same unless abated immediately. There is ample evidence that industrial sized NWWR and composting facilities can result in
c. increased health risks due to a variety of factors,[10] including infectious agents such as fungi and bacteria, wood dust which has allergic, mucosal, and cancer promoting effects and volatile organic compounds and endotoxins that have toxic and carcinogenic effects.
d. Further the Board is hereby advised that the presence of the above has unreasonably interfered with the proper use and enjoyment of the complainant's properties.
e. Similar facilities have been shut down in other areas due to documented health hazards and odors such as this typical example.[11]

Complaint 2 – Nuisance (As per Section 12-108)

Oak Ridge Farm is the source of significant and nearly continuous noxious and harmful odors, leachates, rodents, insects, and noises produced by the trucking, grinding, turning, and composting of wood mulch products and other materials. This ongoing nuisance is documented in years of numerous written complaints and testimony to the Howard County Council, Howard County Planning Board and the Howard County Department of Planning and Zoning (DPZ).

We assert the following in our complaint of maintaining a Nuisance at the referenced property:

a. That the Owner maintains the property in a condition that poses an actual or potential threat to health.
b. That the Owner allows activities to take place on the property which pose an actual or potential threat to health.
c. That the Owner allows activities to take place on the property which interfere with the complainant's proper use or enjoyment of their property.

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[8] https://www.youtube.com/watch?v=FtrOTX2hJAc

[9] E.g. - Dr. Victor E. Velculescu, M.D., Ph.D., Professor of Oncology and Pathology, Co-Director of Cancer Biology, Sidney Kimmel Comprehensive Cancer Center, Johns Hopkins University School of Medicine, and others

[10] "These include infectious agents such as fungi and bacteria, wood dust which has allergic, mucosal, and cancer promoting effects and volatile organic compounds and endotoxins that have toxic and carcinogenic effects. A review of the medical literature indicates dozens of examples of scientific articles throughout the world related to infectious agents in mulch, primarily leading to acute fungal pneumonia. Fungal spores can travel large distances - on the order of miles - and are of particular risk to immune comprised individuals, including children and the elderly. Many such infections can be lethal: one recent study found that of patients with fulminant mulch pneumonitis, half died due to infection and underlying kidney disease.", Report of Concerned Citizens of the Mulch/Composting Task Force, Appendix B, March 15, 2015

[11] E.g. - http://www.phoenixnewtimes.com/news/phoenix-mulch-plant-ordered-shut-down-following-pollution-complaints-7711994

d. That the Owner's operation of a nuisance includes significant risk of water pollution and potential contaminated well water supplies.[12]
e. That the Owner operates a facility that emits particulates and emissions from an unconfined source[13] that escape into the atmosphere, thereby creating noxious and hazardous conditions which prevent the reasonable use of residents' properties and present undue health and safety Board of Health shall schedule a hearing within ten days of the filing of the appeal and shall issue its decision within 15 days of the hearing.

Requested Actions of the Board of Health

Based on the above, we complainants urgently request the following:

a. That findings and declarations of "Air Pollution" and of "Nuisance"[14] be issued by the Board against the referenced facility and Owner, followed by exercising all available means afforded by the Statute to cause said operation to cease and desist immediately, and that all other "Remedies"[15] provided for under Section 12-112 of the County Code of Ordinances be utilized to achieve same, and,
b. that appropriate "fines"[16] be levied against Oak Ridge Farm for inflicting damages (even in the face of receiving multiple violations) against residents concerning health, property, plants, animals and the inability to reasonably enjoy our outdoor properties for many years, and,
c. that "abatement" and/or "lien"[17] provisions be applied to the nuisance condition, if needed, to bring about legal compliance and mitigate the public health hazard and permanently terminate the nuisance condition.

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[12] Manganese (Mn) concentrations have been observed at 13,000 ppb from one wood compost facility in Howard County, MD. Background levels of Mn in groundwater from the same area only average 20 ppb. Observed Mn contamination associated with wood waste composting facilities is two orders of magnitude greater than the allowable risk levels identified. In Howard County, there exists a shallow water table perched above fractured rock aquifers. Metals such as Mn are released from the soil by leachates from these types of facilities and can enter the water table, potentially feeding adjacent drinking water wells. Mn exposure is associated with neurological disorders such as dyslexia, autism and has been linked to low birth weight. Long-term exposure of elevated Mn causes symptoms similar to Parkinson's disease.

[13] Unconfined source means an article, machine, equipment or other apparatus that causes air polluting emissions which are not enclosed in a stack, duct, hood, flue or other conduit but which escape into the atmosphere through openings such as doors, vents, windows, ill-fitting closures, or poorly maintained equipment. Howard County Code of Ordinances, 12-108, "Unconfined Source"

[14] "Declaration of Nuisance. If the Health Officer believes that a nuisance condition exists as defined in subsection (a) above, the Health Officer may declare the existence of a nuisance."

[15] "Sec. 12.112. - Remedies. - (a) Civil Penalties: (1) The Health Officer may enforce the provisions of this subtitle using civil penalties pursuant to title 24, "Civil Penalties," of the Howard County Code." Further, that "The Health Officer may bring action in court to enforce compliance with an order to comply with this subtitle or to correct a nuisance."

[16] "Upon conviction under this subsection a person is subject to a fine: (i) For a first offense up to .... $100.00; (ii) For a second offense up to .... 500.00; and (iii) For a third or subsequent offense up to .... 1,000.00."

[17] Abatement; Lien. If a person refuses or fails to comply with the provisions of this subtitle or to correct a nuisance within the time specified in the notice of violation, the Health Officer may request the courts for permission to enter the property and to abate the violation or correct the nuisance. If the Health Officer abates the violation or corrects the nuisance, the Officer shall bill the person owning or renting the property for the cost of the work, plus administrative costs. If the person owning or renting the property refuses to pay the bill, the County shall place a lien upon the property for the amount of the bill. The lien shall be enforceable in the same manner as a lien for unpaid County taxes.

We would appreciate the opportunity to meet with the Board of Health to discuss the complaints, answer any questions, and provide any additional information that the Board may wish to obtain. We have additional information documenting personal health related maladies of persons and livestock and loss of enjoyment of our properties as a result of what we contend is the direct result of the operations of the referenced facility and Owner.

Respectfully Submitted,

Complainant's

Signature	Printed Name	Address
	Rob Long	2401 WOODBINE RD
	Leslie Long	WOODBINE, MD. 21797
	Michele O'Connell	2997 Florence Rd. Woodbine 21797
	James Scott Watson	2997 FLORENCE Rd Woodbine
	Steven Hart	2910 Woodbine Rd Woodbine MD 21797
	John O Secan	25 Haviland Hill Rd, Brookeville 20833
	Kristin Secan	25 Haviland Mill Rd Brookville 20833
	Carley Secan	" "
	Shannon Harvey	4161 Loop Rd Mt Airy MD 21771
	Donna Owens	2445 Jennings Chapel Rd Woodbine
	Molly Shaw	3015 Woodstock Rd Woodbine MD 21797
	George VanDoren	PO Box 77 Woodbine 21797-0077
	Jo Anne Horan	17494 Timbercreigh Way Woodbine Md 21797
	Gale McKissa	17501 Timberleigh Rd 21797
	Kimberly Covey	2910 Woodbine Rd Woodbine MD 21797

243-900-9

renting the property refuses to pay the bill, the County shall place a lien upon the property for the amount of the bill. The lien shall be enforceable in the same manner as a lien for unpaid County taxes.

In summary, we complainants would appreciate the opportunity to meet with the Board of Health to answer any questions and provide any additional information that the Board may wish to obtain. We have numerous written complaints and other evidence documenting both personal health related maladies and loss of enjoyment of our properties as a result of what we contend is the direct result of the operations of the referenced facility and Owner.

Respectfully Submitted,

Complainants Names and Addresses:

[illegible]	Karen Skaggs	8409 Glade Ct Columbia MD 21045
[illegible]	Heather Brandon	8409 Glade Ct. Columbia MD 21045
[illegible]	Jennifer King Deuber	2705 Woodbine Road Woodbine MD 21797
[illegible]	[illegible]	8161 Valley Dr Ellicott City MD 21043
[illegible]	[illegible]	11943 Simpers Rd Clarksville, MD 21029
[illegible]	[illegible]	3075 Florence Rd Woodbine
[illegible]	Crystal Bramwell	13645 Old Frederick RD Sykesville, MD 21784
[illegible]	Kelly Michaud	3800 Manor Lane Ellicott City MD 21042
[illegible]	Denise Nieves	2703 woodbine Rd
[illegible]	Sigfreda Nieves	Woodbine MD 21797

jen.kingdeuber@gmail.com – Jennifer King Deuber

* COPY

2121

I recently moved to Woodbine Rd in November. Last summer the increase of noise due to the mulching had subsided. Now as of January 2017 the noise from the mulching not only has increased but gotten much worse and extends much later into the night. My reason for moving to this area is because I love the tranquility of the agricultural farmland. Not only do I live here, I also have a horse that I ride here. My horse can be very reactive on a normal quiet day. This added noise and distraction can spook my horse as well as the other riders that ride through the farm and trails regularly. However, with the increase of speed, and noise of the trucks our safety is at risk. The trucks are destroying the quiet neighborhood. I have noticed increased dust and traffic to what used to be a quiet neighborhood. At times the noise sounds like things are exploding. I want to keep the farmland the way it used to be without the mulching industry located in Woodbine.

Dena Nagy

Sept. 6 2014

To whom it may Concern

In April of 2013 I moved into a small house, located on the farm owned by Rob and Leslie Long. The cottage was advertised as private cottage in a quiet, serene setting, surrounded by horse pastures.

And it appeared to be exactly that.

Until I was awakened one morning by the LOUD BANGING of, what sounded like, trash truck dumpsters, a sound you generally hear in the city NOT in the RURAL COUNTRYSIDE of Howard or Carroll counties! Not only did the dumpster sound awaken me in the morning but it continued at intervals for the entire day. Accompanying the loud dumpster like banging there was also a DEEP, LOUD, RESONATING and CONTINUOUS pounding that would at times vibrate in my house and rattle the windows!
In addition CONSTANT traffic from Tractor Trailers that were obviously NOT just traveling on the road but coming and going from a specific (and close location)

I questioned my landlord Rob Long about the noise and he explained about the Mulching Operation taking place on the property by Recycled Green directly across Woodbine Road from the Long farm, and less than a mile from my rented cottage.

The noise and disruption, as well as potentially toxic stench has continued for over the 16 months that I have lived there.

Because of everything stated above I am now experiencing headaches, allergy and respiratory symptoms, and feel FORCED to move for my health. I believe these issues are linked to the Operations at Recycled Green Products, as I have always lived on farms or in rural settings and never had these issues before!

I would like to add that after some research (their website) I found that Recycled Green is a CORPORATION dedicated to the removal, receipt and recycling of organic waste.
An operation such as this has NO place in AG and residential type communities.

Maggie Brant
2703 Woodbine Road
Woodbine, Md. 21797

Maggie Brant

To whom it may concern

Regarding Recycled Greens affect on the surrounding farm areas on Woodbine Road and Florence Road in particular the Horse Farm owned by Rob and Leslie Long.

In April 2012 I rented the small 200+ year old cottage located on the horse farm owned by Rob and Leslie Long. I lived there for 1 and 1/2 years, from April 2012 and leaving October 2014.

As I stated in an earlier letter the reason for choosing that particular location was the fact that it was:
(1) The house was positioned in the center of the pastures of a working horse farm
(2) It is Idyllic and pastoral
(3) Believed to be strictly Zoned Agriculture/Residential
(4) Away from INDUSTRIAL type businesses

I have lived on or near farms nearly all my adult life therefore I recognize and welcome the customary smells sights, sounds and required activities that accompany life on or near a farm of any type whether it is a crop farm, dairy or livestock operation, family or viable horse enterprise. I recognize the movement, and toil, of machinery used to ensure continued existence of farms comparable to the Long Farm.
Such as:
Tractors-Mowers-Backhoes-Skidloaders-Chain Saws-Weed Wackers-Leaf Blowers-ATV to name a few.

Larger pieces of equipments such as Combines, and Baiers are used TWO times a year on the Long farm.

On any working farm you will find a workshop that is needed and used to repair the above pieces of machinery.

On a farm with any livestock you will find a manure pile, on the Long Farm it was out of sight far from the houses.

On a Horse Farm you will find horse trailers parked in a readily available location.

I MOVED BECAUSE OF RECYCLED GREEN INDUSTRIAL business on Woodbine Road!!!

THE EXTREMELY AUDIBLE and OLFACTORY ASSAULT of their THUNDEROUS GRINDERS that DRONED ON, FOR HOURS DAILY, VIBRATING THE GROUND, and the INFILTRATING STENCH from the ROTTING, MOLDY, roots and tree debris that was being hauled in MULTIPLE TIMES DAILY by NOISY SEMI TRUCKS, dumping their loads with a REVERBERATING profound METAL THUMPING (think HUGE trash dumpsters being emptied ALL DAY LONG!!)

It is imperceptive to imply:

That these noises were imagined or exaggerated

That the noises and smells were because of the farm itself

That the reason I moved from the cottage was based on any reasons that had to do with house, the workings of the farm, or the Longs personally.

I have said before that an operation such as Recycled Green does not belong in a Farm Preservation area. These people take pride in their property, and are where they are for quiet idyllic landscape, Recycled Green has taken that from me, by forcing me to move, and is taking it from the landowners by stealing their solitude.

Sincerely

Maggie Brant

Maggie Brant
PO Box 391
Woodbine < Md 21797

17479 Timberliegh Way
Woodbine, MD 21797
January 29, 2015

Dear Mr. Long,

This will serve as a follow-up to our conversation of last week concerning the now-suspended industrial mulching activity on the Oak Ridge property at the southwest corner of Florence Road and Woodbine Road.

During the course of our talk you asked if I or any of my neighbors had experienced any issues related to that operation, and on reflection I did mention that there had been occasional comments regarding the very strong odor of fresh mulch on Timberleigh, especially after a bout of wet weather or a large summer thunderstorm. At the time, no one seemed to know from whence the smell originated; but then, surrounded by active farm land as we are out here, we tend to take certain sounds and odors merely as part of living out here in Western Howard, something to be expected and generally enjoyed.

The same we thought true and "typical" regarding the light coatings of dust on our vehicles from time to time, despite the fact that there was no actual harvesting activity occurring nearby, the usual source of such "dustings".

However, when it came to the question regarding nighttime activity, I indicated to you that I had indeed noticed on several occasions—in fact, for 3 or 4 evenings in a row sometimes and well into the night —the sound of what-I-would-normally-have-taken to be a harvesting machine, except that we were not then in any part of the normal harvest season. The engine noise was very loud and the sound of the back-up alarm distinctly audible. I stood in my front yard and managed to "localize" it to our immediate north, in the general direction of Oak Ridge. Since there is no tilled field as such between Timberleigh and Oak Ridge; and the sounds were too loud and clear to have emanated from Larriland's fields on the north side of Florence Road, I was certain that the source was Oak Ridge itself. I did not put two and two together until days later when I began noticing more and more large trailer trucks departing the site or heading up and down Woodbine Road, all loaded with wood waste or mulch.

Last Spring, as you will recall, we had our first community meeting up at the Lisbon Fire Station on the matter of Oak Ridge and the industrial mulching operation. At that time, Mr.Bonner packed many of us into buses and hauled us up to the site, where we witnessed first hand just what he had been doing for at least the previous 18 months-2 years on that property. There was the noisy bull dozer (with it's piercing back-up alarm) and the front loader and the large conveyer, several very large piles of material yet to be ground-up, and several more long, very large piles of mulch drying-out. It was clear at the time what we were seeing, and that was indeed a full-blown industrial mulching operation. Why Mr. Bonner thought it was a good idea to take us all up there to see it for ourselves I cannot say, but it was that visit more than any other reason which led me into looking further into the ramifications of his current use of that property.

Clearly there have been and remain a large number of issues regarding what-I-consider-to-be a perversion of the intent of the existing laws pertaining to agricultural preservation, not the least of which is what-amounts-to tax dodging and land de-valuation, something I happen to find particularly reprehensible, especially during this time of shrinking budgets on both the County and State levels. I'm quite certain that many of those old farmers who helped to craft the original legislation that resulted in the Farmland Forever signs we see hereabouts would roll over in their graves if they knew how their decades of effort were being dismissed and ignored.

At any rate, should you have any further questions regarding my or my family's experiences with the Oak Ridge operation, please let me know.

Sincerely,

Howard L. Smith Jr.

CC: file

2/2/15

CHRISTINE M. NIPER
NOTARY PUBLIC
FREDERICK COUNTY, MD
MY COMMISSION EXPIRES 6/15/2018

December 6, 2013

Howard County Farm Land Preservation
Howard County
3430 Courthouse Drive
Ellicott City, Md. 21043

AND

Maryland Department of Agriculture
Maryland Farm Land Preservation Foundation
50 Harry S. Truman Drive
Annapolis, Md. 21401

I am writing to express a concern regarding a business situated on a nearby Preservation Parcel. It is the operation doing business under the name Oak Ridge Farm LLC. The noise and air pollution from this operation is offensive to the neighboring farms.

No one knows better than those of you who dedicate your careers to preserving Maryland farmland how difficult this task can be. I don't think that operations like Oak Ridge Farm are the kinds of businesses that are appropriate for preservation parcels. I find it hard to imagine that preservation easements are being acquired only to allow operations of this sort. This kind of operation with its extreme noise, air pollution and heavy truck traffic is more appropriately suited for land zoned for heavy industrial use. I live almost a mile from this operation and I can hear its heavy machinery from inside my house with the windows and doors closed.

I ask you to take another look at this operation and consider whether this kind of so called alternative use fits with and compliments the desired farmland, rural ambiance that I'm sure is desired for our Maryland preserved farmland.

Thank you for considering my concerns.

Paul Shoffeitt

Paul Shoffeitt
2560 Jennings Chapel Road
Woodbine, Maryland 21797

November 29, 2014

TO WHOM IT MAY CONCERN

My name is Paul Shoffeitt. I live at 2560 Jennings Chapel Road, Woodbine, Maryland. My house is approximately one half to three fourths of a mile, as the crow flies, from the former mulch manufacturing facility on Woodbine Road operated by Oak Ridge.

In the winter of 2013 and in the early months of 2014 I could hear from within my house with the doors and windows closed the noise from the operations at the Oak Ridge facility. The noise was loud, intrusive and out of keeping with the character of this farming and residential community.

Paul Shoffeitt
2560 Jennings Chapel Road
Woodbine, Maryland 21797

State of MARYLAND
County of CARROLL

Subscribed and sworn to before me this 29 day of November
20 14 by Paul Shoffeitt

Notary Public

My Commission Expires: 9/4/2015