

MYTH # 2

Composted Sewage Sludge (biosolids) is a Safe and Sustainable Organic Soil Amendment!

A Short History Lesson

Genotoxic Contaminated Compost from EPA to Your Lawn and Garden

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5/23/2011
Revision 7/1/2011

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Abstract

Sewage sludge compost is a biologically active solid waste composed of biofilms that include active and inactive bacteria, viruses, worms parasites as well as chemicals and the residue of treated sewage which includes nutrients and moisture (biosolids). The heat of composting removes moisture which dries (desiccates) bacteria causing them to go inactive (dormant). Studies have shown that bacteria may be reactivated up to one year after composting with the addition of moisture. Composted Class A sludge may also contain elevated levels of heavy toxic metals that would prevent it from being disposed of in a Part 503 surface disposal site. You may be exposed to unknown levels of chemicals, metals, and disease causing organisms which also may be taken up in vegetables.

Composting: A Good Idea Turned into a Deadly Myth

Composting organic waste is an admirable goal for society. Farmers have been composting animal manure for fertilizer for a very long time. In a simpler time they did not have to contend with thousands upon thousands of deadly chemicals and untold numbers of genetically modified antibiotic resistant bacteria in the compost. As a general rule, the few pathogenic organisms taken up by plants or released into water were of local origin to which the native population had developed immunity. The rule is still true to some degree for local communities in third world countries and some parts of the United States. Unfortunately, neither contaminated waste, or food now stays in local communities. In the modern world private property and agricultural land in distant communities have become the preferred dumping grounds for chemical and pathogenic contaminated wastes. There is an exception for toxic unlabeled composted sewage sludge contaminated with chemicals and pathogens marketed as organic biosolids compost soil amendment for home and school lawns and gardens.

In 2010, The Organic Consumers Association brought attention to the three year old San Francisco sludge compost give away marketing program. The program was temporarily shut down. The Food Rights Network, a non-profit, non-partisan research and advocacy project of the Center for Media and Democracy, then documented "Independent tests of sewage sludge-derived compost from the Synagro CVC plant -- distributed free to gardeners since 2007 by the San Francisco Public Utilities Commission in their "organic biosolids compost" giveaway program -- have found appreciable concentrations of contaminants with endocrine-disruptive properties."

http://www.sourcewatch.org/index.php?title=Food_Rights_Network

In a March 2011 article for the sludge industry rag "Biocycle", research associate professor, Sally

Brown, University of Washington School of Forest Resources at Seattle, called the Organic Consumers Association protesters "ecoterrorists", just because San Francisco had the good sense to stop its "organic" composted sludge give away program. The problem was it had organic chemicals and organic bacterial toxins and organic organisms that make you sick (pathogens) in it. There are corporations (includes municipalities) out there who certify their sludge as organic and pathogen free. The claim is that the "Organics" have met the standards established by US EPA 40CFR 503 for unrestricted use and distribution by complying with the time/temperature requirements to insure pathogen destruction. Part 503.32 for time and temperature does not even imply there is pathogen destruction. In fact EPA specifically allows Salmonella and other heat resistant pathogenic Enterobacteriaceae using its myth producing fecal coliform test. Only members of the Enterobacteriaceae family colonies that survive the high heat of the test are counted. Each colony is counted as one fecal coliform bacteria.

Most sludge experts don't even want to admit knowing what a fecal coliform is since EPA allows 1,000 most probable number or colony forming units per gram of sludge/biosolids in Class A sludge/biosolids compost. One EPA certified laboratory did a comparison study for me on soil samples contaminated by sludge:

Sample 1: Fecal coliform -- 90 colonies per gram
Salmonella -- >8,000 colonies per gram

Sample 2: Fecal coliform -- 30 colonies per gram
E. coli -- >8,000 colonies per gram

Sample 4: Fecal coliform -- 500 colonies per gram
Strep -- 1,000 colonies per gram

<http://thewatchers.us/pathogens/test-comparison.html>

Because of chemicals found in the sludge compost, it could be very dangerous. But that isn't all. As BioCycle reported in the June of 1996 article, "Pathogen Destruction and Biosolids Composting", even some of the most easily inactivated bacteria like E. coli and Salmonella don't comply with EPA's in-vessel composting requirements of going dormant after three days at 55 deg.C. The Part 503 three day limit automatically assumes sludge has reached the Class A status at which time it can be packaged and sold as a consumer garden product. The article stated researchers found mutant strains of bacteria that survived for 56 days (E. coli) and 90 days (Salmonella) at the thermophilic temperature before being inactivated by the lack of moisture or food.

If a foreigner sold, or gave away contaminated compost with chemicals and disease causing organisms in it that could cause disease, death, cancer, etc., he/she would be arrested and prosecuted as a terrorist. Somehow, it just doesn't seem right that corporations can put your life at risk by doing the same thing that would get a terrorist locked up, with the federal governments blessing. Especially, when there are over 76 million cases of "food poisoning" (1999 figure) every year, most with no established cause.

According to an Australian website, Brown is an International expert on sludge use. She even won the US EPA Clean Water Research Award, twice, for her work using sludge, aka biosolids. The University of Washington is within the King County Metro Sewerage District which instigated the name change

from sludge to biosolids. It was also the first to have to deal with a major biosolids tree kill on Weyerhaeuser land. It would appear Brown has failed to do basic research on the history of compost. <http://compost-for-horticulture.com/uploads/PDF/Background%20of%20Keynote%20Speakers.pdf>
<http://deadlydeceit.com/EPA-PR.html>



From Laws to Myths

In the year I was born, 1938, Congress passed the Federal Food, Drug, and Cosmetic Act (FFD&C Act). This law still requires manufacturers to show products are safe before marketing them. Historical and current data shows that neither Brown nor her mentor, USDA's Rufus Chaney, can show sludge/biosolids products are safe.

In the modern world it is illegal to lie to federal agencies. While technically, it is illegal for the agencies to lie to us, Congress did give them that option. Plus, they are great at building myths. With the federal money available for research there is no problem for scientists like Brown to build on the myths by pretending to have a lack of scientific data or consensus.

In the case of sewage sludge/biosolids/compost use, the idea to sell or give it away is based on the myths that: 1) municipalities are running out of landfill space; 2) sludge/compost is an organic waste; 3) biosolids is different from sludge; 4) composting heat kills all pathogens; 5) antibiotic producing soil bacteria and fungi will kill those pathogens the heat of composting didn't kill; 6) Escherichia coli, coli-like-forms (coliform), heat resistant coli-like-forms (fecal coliform) i.e., family Enterobacteriaceae, and fecal Streptococcus are not disease causing organisms; 7) the coliform Salmonella is the only pathogen of concern; 8) chemicals in compost do not cause cancer, or other serious illness, or death; 9) crops do not take up chemicals or pathogens; 10) strict laws and regulations protect public health from toxic mismanaged sludge/biosolids/compost; 11) farmers and consumers have no legal right to know they are being exposed to cancer causing chemicals and deadly pathogens in sludge/biosolids/compost products; 12) less than 10% of exposed people would become health effects victims; and 13) victims could not make the connection between illness, or death, and exposure to sludge/biosolids/compost.

While we do not intend to delve deeply into all of the myths associated with the use of sludge/biosolids/compost in this article, we will touch on many of them as we review the basic history of sludge composting. The basic point to remember is that if compost **can not** be sold at your local garden supply store as an unlabeled soil amendment, or given away by municipalities for use on private property as a fertilizer, it must be disposed of under permit in a licensed landfill. EPA set the myths in motion as it placed more restrictions on landfills and other regulated methods of disposal to force municipalities to move into unregulated methods of disposal. EPA reinforced the myths when it funded the Water Environment Federation (WEF) to hire a writer in 1994 to debunk the "Horror stories" created by the use of sludge/biosolids.

One current EPA claim is not just a myth, but an outright lie. It states:

“Biosolids are the nutrient-rich organic materials resulting from the treatment of sewage sludge (the name for the solid, semisolid or liquid untreated residue generated during the treatment of domestic sewage in a treatment facility). When treated and processed, sewage sludge becomes biosolids which can be safely recycled and applied as fertilizer to sustainably improve and maintain productive soils and stimulate plant growth.---- because of the strict Federal and state standards, the treated residuals from wastewater treatment (biosolids) can be safely recycled.”

<http://water.epa.gov/polwaste/wastewater/treatment/biosolids/index>

The first problem is that there are very few treatment facilities (and no major ones) in the United States that treat only domestic sewage (i.e., sewage in the pipeline between a domestic residence and a treatment plant). The second problem is that all of the industrial users tied into that domestic residential pipeline to the sewage treatment plant are allowed to dump 33 pounds of hazardous chemicals in it each month without notifying anyone. There is a one time annual notification requirement for up to 199 pounds of hazardous chemicals dumped in a month. Over 200 pounds a month of hazardous waste annually also requires a one time notification with slightly more information, especially when acute hazardous chemicals like dioxins are included. EPA states, “They [dioxins] are incredibly potent and lethal; highly mobile and persistent; soluble in fats; labeled as potential carcinogen, studies investigate reproductive and immune system problems.” EPA does not regulate, or test for, these chemicals in sludge/biosolids due to the costs involved.

http://www.ci.loveland.co.us/wp/Pretreatment/Hazardous_Waste/Hazardous_Waste.htm

<http://www.epa.gov/osw/hazard/correctiveaction/curriculum/download/hwid-list.pdf>

Needless to say, there is no way EPA can afford to investigate any health effect complaints due to all the hazardous chemicals and disease causing organisms in sludge/biosolids. In fact, by 2002, the EPA Inspector General (IG) found the Compliance and Enforcement Department had refused to get involved in the sludge scam – “disinvested from the program.” Not only that, the IG said, “EPA officials said investigating health impacts from biosolids is not an EPA responsibility; rather, they believe it is theresponsibility of the National Institute of Occupational Safety and Health, the Centers for Disease Control, and local health departments.” Not going to happen, EPA has more power.

When treated and processed, sewage sludge is still legally sewage sludge with unknown quantities of cancer agents and other disease causing chemicals and pathogens as well as mislabeled Enterobacteriaceae pathogens which are referred to as coliform or heat resistant fecal coliform indicators. There has never been a single study to indicate that treated sludge could be safely recycled to maintain productive soils and plant growth. Strict Federal and state standards only apply to sludge when it is safely disposed of in a landfill or recycled as a landfill cover by permit. As an example, certain part 503.13 “approved” sludge/biosolids/compost amendments contaminated with arsenic and chromium can not be disposed of in a regulated Part 503.23 Surface Disposal site, even with a permit.

EPA's Claims for Compost

EPA states,

Compost is organic material that can be used as a soil amendment or as a medium to grow plants. Mature compost is a stable material with a content called humus that is dark brown or black and has a soil-like, earthy smell. It is created by: combining organic wastes (e.g., yard

trimmings, food wastes, manures) in proper ratios into piles, rows, or vessels; adding bulking agents (e.g., wood chips) as necessary to accelerate the breakdown of organic materials; and allowing the finished material to fully stabilize and mature through a curing process. Mature compost, however, includes the production of high temperatures to destroy pathogens and weed seeds that natural decomposition does not destroy. While yard trimmings recovery typically involve leaf compost and mulch, yard trimmings can also be combined with other organic waste, such as food residuals, animal manure, and biosolids to produce a variety of products with slightly different chemical and physical characteristics.

There is a caveat, composting does not destroy pathogens.

EPA states the following should not be composted:

- * Pet wastes (e.g., dog or cat feces, soiled cat litter)

Might contain parasites, bacteria, germs, pathogens, and viruses harmful to humans

- * Yard trimmings treated with chemical pesticides

Might kill beneficial composting organisms

<http://www.epa.gov/epawaste/conservation/rrr/composting/basic.htm>

We have to wonder just what EPA meant by the term germs? Unless, it meant fungi that can be killers. In the 1981 EPA study, "Evaluation of the Health Risks Associated with the Treatment and+ Disposal of Municipal Wastewater and Sludge", compost workers at each composting site were exposed to markedly elevated level of *Aspergillus fumigatus*. Controls were not exposed. The findings show that there was a high frequency of isolation from oropharyngeal (throat airway) and anterior nares (nose airways) cultures in compost works versus the control groups. Four of nine Beltsville compost workers had positive CRP values (a marker of inflammation) versus none for the controls. Beltsville and Blue Plains (Washington, DC) compost workers also had higher antibiotic titers than the control group. One compost worker had an *A. niger* infection in the right ear. Despite treatment over several months there was erosion of 70% of the right tympanic membrane (eardrum). One workers chest X-ray showed an "abnormality ["fungus ball"] compatible with an occupationally-related disorder."

<http://thewatchers.us/EPA/4/1981-health-risk-rvaluation.pdf>

The best explanation of the previous caveat is found in the EPA's 2002 "Biosolids Technology Fact Sheet, Use of Composting for Biosolids Management" which promotes sludge composting while pointing out the major disadvantages of sludge/biosolids composting. Heat actually encourages the growth of some pathogenic organisms, especially fungi. EPA states the main disadvantages are:

Composting is not a sterilization process and a properly composted product maintains an active population of beneficial microorganisms that compete against the pathogenic members. Under some conditions ,explosive regrowth of pathogenic microorganisms is possible.

Potential environmental impacts may result from both composting operations and use of the compost product

Survival and presence of primary pathogens in the product.

Dispersion of secondary pathogens such as *Aspergillus fumigatus*, particulate matter, other airborne allergens

While healthy individuals may not be affected, immunocompromised individuals may be at risk.

The spores of *A. fumigatus* counts at composting facilities are high, and-- persons handling composted biosolids being exposed to these spores is also high (Epstein, 1998).

These organisms can potentially invade a normal, healthy human being and produce illness or debilitation

<http://www.epa.gov/owm/mtb/combioman.pdf>

History the Sludge Industry Experts Would Rather You Didn't Know

It is not a good idea for most people, especially those people with a compromised immune system to be exposed to composting activities, and especially, the food grown using composted sewage sludge/biosolids. The antibiotic-resistant coliform/fecal coliform, *Escherichia* (*E.*) *coli*, have been shown to survive and multiply in an activated sludge plant as well as in biosolids compost. Just as important, genetic transfer of DNA between unrelated species of bacteria is known to occur in the treatment plants creating human pathogens out of normally benign plant, soil and water bacteria.

In 1971, the Biological Waste Management Laboratory at the U.S. Department of Agriculture's Beltsville Agricultural Research Center began research on disposal of sludge on agricultural land. EPA's 1972 study "Microbiological Studies of Compost Plant Dust" found *Staphylococcus aureus*, gram negative bacilli, gram positive bacilli, and fungi were present in all areas sampled for bioaerosols. The other gram positive bacilli identified was streptococci. No attempt was made to identify other gram positive bacilli or fungi. The only gram negative bacilli identified were *Pseudomonas* and *Proteus*. They say no coliform (e.g., *E. coli*, *Salmonella*, *Shigella*, *Klebsiella*, etc.) were found.

<http://thewatchers.us/EPA/1/1972-staph-aerosol-compost-plant.pdf>

This was a case of ignorance is bliss. In 1982, Rita Colwell and associates reported in *Microbial Ecology* 1982; 8: 313 that environmental stressed bacteria such as *Vibrio* and *E. coli* entered a viable but nonculturable (VBNC) state, that is they are alive but can not be cultured by standard laboratory methods. While some sludge experts ignore the science, laboratory supply companies are shipping out dried VBNC bacteria every day to researchers. To sludge experts, if the disease causing organisms are not identified in a study, or readily culturable, they can't be a problem. There was no indication in the studies that streptococci and Staphylococci would both cause toxic shock syndrome and become invasive flesh eating killers causing necrotizing fasciitis, cellulitis, and myositis. *Staphylococcus* became the dominant killer between 1993 and 2005. Methicillin-resistant *Staphylococcus aureus* infections (MRSA) only caused 1,900 hospital stays in 1993. Yet, between 2000 and 2005, hospital stays triple from 128,500 to 368,300 hospital stays with a 5% death rate. The 18,000 deaths in 2005 exceeded those of HIV. *Pseudomonas* is a plant, soil and animal pathogen primarily associated with biofilms in the lungs of cystic fibrosis patients. However, it may also cause urinary tract infections, sepsis, pneumonia, pharyngitis, as well as gangrene, and necrosis. *Proteus* is a pus-producing bacteria causing diarrhea in infants, cystitis, urinary tract infections and hospital-acquired infections

The World Health Organization (WHO) sludge experts appear to have even less medical knowledge

exhibited in its 1981 report, "The Risk to Health of Microbes in Sewage Sludge Applied to Land" which indicated the coliforms *E. coli* and *Salmonella* are the only bacteria considered to be a problem in sludge. Pathogenic bacteria such as *Bacillaceae*, *Campylobacter* sp, *Clostridium perfringens*, other *Enterobacteriaceae* (coliform/fecal coliform), *Leptospira* sp, *Listeria* sp, *Mycobacterium* sp, *Pseudomonas aeruginosa*, *Vibrio* sp, and *Yersinia enterocolitica* were not expected to become a health problem for sludge disposal on agricultural or grazing land.

While *E. coli*, is the most important cause of calf scours (i.e., neonatal calf diarrhea), it can also be caused by *Salmonella*, *Clostridium perfringens* as well as coronavirus, rotavirus, *Cryptosporidium*, coccidia, yeast and fungi. Even with today's modern medicine, there still about a 5% death rate. *E. coli* was one of the first documented killers of human infants and their mothers. It has become one of the superbugs.. EPA doesn't even want to think about or test for bacteria that form endospores that survive and cause some very bad infections. When stressed by environmental factors or a lack of food, *Bacillus*, like *Clostridium*, form endospores (VBNC) which are resistant to high temperature, UV irradiation, disinfectants and antibiotics. *Bacillus* causes Necrotizing infections (flesh eating), food poisoning and anthrax. Three *Clostridium* epidemics (hospital, community and animal) are ongoing and expanding by 10% each year and now may surpass *Staphylococcus* (MRSA) as a hospital acquired infection. There are three major infectious strains involved: 1) *Clostridium tetani* which causes Tetanus through infected wounds, leading to Lockjaw; 2) *Clostridium perfringens* is common on meat and poultry and is the most common bacteria causing gas gangrene (necrotizing -- flesh eating) infections, as well as colitis, and food poisoning and inflammation of the small intestine; and 3) one strain of *Clostridium difficile* took on a new life in the 1990s to become the most deadly. According to CDC in the four years between 1999 to 2004, it became four times more lethal. Hospital stays doubled between 2000 and 2005 to about 300,000 almost matching that of MRSA. *Campylobacter* is now found in chicken, turkey, lamb, beef, duck, goose, game fowl, unpasteurized (raw) milk, and is a leading cause of foodborne illness associated infections: meningitis, pneumonia, miscarriage, and a severe form of Guillain-Barré syndrome as well as infections of the bloodstream (bacteremia) and heart valves (endocarditis). Other *Enterobacteria* cause food poisoning, Necrotizing (Flesh eating) infections, Urinary tract infections, Septicemia/Bacteremia Blood Poisoning, Respiratory Disease, Cerebrovascular Disease and Heart Disease. *Leptospira* causes lymphocytic meningitis, hepatitis, and nephritis. *Listeria* causes Abortion, stillbirth, preterm labor, sepsis, meningitis, CNS infection, diarrheal disease, necrotizing ring ulcer "flesh eating", antibiotic resistance and "circling disease" in cattle and death. *Mycobacterium* has become an antibiotic resistant superbug. Primary infections are caused by the tuberculosis and the leprosy organisms and may take up to 2 years to develop in a laboratory culture. *Pseudomonas* was discussed above. *Vibrio* sp has a 50 percent mortality rate and causes 95% of the deaths associated with seafood. It enters the blood stream through the epithelium of the gut causing septic shock and death. *Yersinia enterocolitica* is a brother to *Y. pestis* (Black Plague) which is still alive and well in the western part of the country. *Yersinia enterocolitica* has caused an outbreak of hospital acquired infant necrotizing enterocolitis. abscess formation (such as hepatic and splenic), and bacteremia as well as pharyngitis, meningitis, osteomyelitis, pyomyositis, conjunctivitis, pneumonia, necrotizing pneumonia, acute proliferative glomerulonephritis, and peritonitis.

The World Health Organization (WHO) report, also stated that in a 10 year study in Switzerland, the seasonal incidence of *Salmonella* infections could be related to the time of sludge application and the longevity of *Salmonella* (months) on grazing land. WHO noted, *Salmonella* "serotypes in cattle grazed on sludge-treated pastures has indicated a positive association and cycle of infection existing (man – sludge – animals – man)." It was found that meat inspections at the slaughterhouse could not control

the cycle and human infections, which had increased from 55 cases in 1955 to 3,695 cases in 1979. Composting was not an option, but pasteurization of sludge was required.

http://whqlibdoc.who.int/euro/r&s/EURO_R&S_54.pdf

It doesn't pay to listen to sludge experts who have no medical or veterinary experience. While most of the above named bacteria don't show up in standard tests, some have become superbugs and all are human pathogens. As a result, working with composted biosolids without personal safety protection equipment can be compared to playing Russian Roulette with a fully loaded gun and praying the trigger doesn't work. You have to remember two things. First, compost is never pathogen free and those who test sludge/biosolids for organisms must comply with rigid laboratory personal protection safety standards, due to the potentially life threatening pathogens. Second, if this "safe" compost product can not be sold or given away to unsuspecting consumers, it must be disposed of in a sanitary landfill – with a permit!

By 1980, EPA's Project Officer, James Ryan and USDA authors, Rufus Chaney, et al, had completed the "Manual for Composting Sewage Sludge by the Beltsville Aerated-Pile Method." The Beltsville Center eventually became a Superfund site. In the meantime, according to EPA, the Beltsville Aerated Pile Method of Composting sewage sludge "originated from an urgent need of both large and small municipalities for better methods to dispose of ever-increasing amounts of sewage sludge." According to them, "Composting offers a double-barreled solution to that problem. It not only disposes of sludge but also converts it into a product which is more aesthetically acceptable, safer from a health standpoint, and useful in many important practical applications as a soil amendment beneficial to the growth of plants."

The system was developed because municipalities were ordered to cease ocean dumping and "Most of the commonly used methods to dispose of this material are now considered to be either environmentally unacceptable, wasteful of energy, or very expensive." Composting is a simple process, "Complex organic molecules are decomposed into simpler compounds through the growth and activity of bacteria, actinomycetes, and fungi." The claim that "They generate sufficiently high temperatures to destroy human pathogens" is a myth. Bacteria, actinomycetes, and fungi include animal and human pathogens that may be VBNC, heat resistant, form endospores or thrive at higher temperatures.

THEY ACKNOWLEDGE SOME HEALTH ASPECTS OF SLUDGE COMPOSTING

No gram positive spore forming bacteria were acknowledged to be present. Some pathogenic bacteria and fungi form spores to prevent cell damage. Spores represent the most resistant form of life known; they tolerate extremes of heat and dryness, the presence of disinfectants, and radiation. However, they do say, "Workers at sludge composting facilities encounter disease risks: (a) from the pathogens normally present in sewage sludges, and (b) from fungi and actinomycetes that grow during composting. The former are often referred to as primary pathogens because they can initiate an infection in an apparently healthy individual. The latter are referred to as secondary pathogens because they usually infect only people weakened by a primary infection or by some other trauma such as lung surgery. Densities of secondary pathogens generally are increased by composting. The growth of secondary pathogens is not peculiar to composting sewage sludge but occurs also in many farm and garden operations, such as during the composting of leaves or other materials. Examples of primary and secondary pathogens, along with the diseases they cause, are presented in Table 6." Only a few primary pathogens are listed: 1) Salmonella enteritidis; 2) Entamoeba histolytica; 3) Ascaris

lumbricoides; and 4) Hepatitis virus. The only secondary pathogens listed were: *Aspergillus fumigatus* and *Micromonospora* spp. There is a warning, “people who are predisposed because of such conditions as diabetes, asthma, emphysema, or tuberculosis, or who may be taking such medication as corticosteroids, broad-spectrum antibiotics, or immunosuppressive drugs may be more susceptible to infection.” .

Salmonella enteritidis is one of several thousand strains of *Salmonella* that blossomed during the 1980s to become a major pathogen. Then infections spread from the Northeast to the West during the 1990s. Poultry, and especially eggs, have become the primary source of infection. According to CDC, “The elderly, infants, and those with impaired immune systems may have a more severe illness. In these patients, the infection may spread from the intestines to the blood stream, and then to other body sites and can cause death unless the person is treated promptly with antibiotics. “ **Entamoeba histolytica** is unusual in that it will protect bacteria in its gut and then vomit them back up. It may also cause enteric amebiasis, amebic colitis, amebic liver abscess, hepatic amebiasis, pleuropulmonary amebiasis, cerebral amebiasis. **Ascaris lumbricoides** is the largest of several round worm that infect humans. While it may not exhibit symptoms, it could cause pulmonary or potentially severe gastrointestinal complaints. In 1989, EPA listed **Aspergillus** as one of the 25 families of primary pathogens in sewage sludge. While it may only produce an allergic reaction, or a fungus ball in the lungs, invasive *Aspergillus* in the immune compromised individual is a life threatening situation. Symptoms may include:

- Bone pain
- Blood in the urine
- Chest pain
- Chills
- Decreased urine output
- Endocarditis
- Headaches
- Increased sputum production, which may be bloody
- Meningitis
- Shortness of breath
- Sinusitis
- Skin sores (lesions)
- Vision problems

<http://www.nlm.nih.gov/medlineplus/ency/article/001326.htm>

Micromonospora are gram-positive, spore-forming thermophilic bacteria. While some strains are used to produce antibiotics, others produce pulmonary fibrosis, also known as farmer's lung as well as respiratory irritation, and allergic reactions.

In the 1984 EPA study, “Evaluation of Health Risks Associated with Wastewater Treatment and Sludge Composting.” Compost workers showed an excess of abnormal skin, nose and ear conditions. several tests were suggestive of low grade inflammatory response. Viable units of the fungus *Aspergillus fumigatus* were found in cultures of throat and nasal swabs. Inexperienced workers experienced more gastrointestinal illnesses. Norwalk viruses contributed to 13% of the illnesses. The workers at the Metropolitan Sanitary District of Greater Chicago experienced twice as many deaths from leukemia and cancer of the esophagus as expected. Exposed compost workers experienced acute and/or chronic inflammation or infection of the skin, acute and/or chronic inflammation of the nasal mucosa and eyes,

and evidence of acute and chronic infections of the ear. Pulmonary disease was detected in one compost worker with four years experience. Exposure to high levels of *A. fumigatus* in the work place resulted in viable colony forming units of the fungi present in the respiratory tract.

<http://thewatchers.us/EPA/1/1984-health-compost-workers.pdf>

According to EPA's William Sanjour (retired), Toxic mulch or soil conditioners made from sludge was recognized as a major problem in the late 1970s. Thousands of Chicago-area back yards were contaminated in sludge give away programs. This was brought to light by the federal General Accounting Office. That program continued for one year following GAO 's warning to EPA. EPA's sludge regulation simply legalized the programs for municipalities to put the public at risk.

One of the recommendations in the “MANUAL FOR COMPOSTING SEWAGE SLUDGE BY THE BELTSVILLE AERATED-PILE METHOD (EPA600880022) 1980 “was that, “Some municipalities may find it advantageous to distribute compost to consumers at no cost, since this may be a least-cost option to the municipality.” That is especially true when you consider the toxic health effects of heavy metals taken up by plants. The document states, “Plant species, as well as varieties, have been found to differ markedly in their ability to absorb and translocate heavy metals, to accumulate them within edible organs of the plant, and to resist their phytotoxic effects. Leafy vegetables are usually sensitive to the toxic effects of metals and accumulate them;”

Recycling of sewage sludge as a compost.

After 40 years of promoting compost as a safe disposal method, there is still no assessment of health and environmental risk of using sludge. In EPA's 1980 “**A Guide to the Regulations and Guidance for the Utilization and Disposal of Municipal Sewage Sludge**”, EPA said, “This guidance document is not an assessment of health and environmental risk. It assumes that such risks will be adequately minimized when regulations and guidelines are followed.” EPA noted that “Incineration, composting and surface impoundments are considered treatment and volume reduction methods. Landfilling, ocean disposal and landspreading, and distribution and marketing are considered ultimate utilization and disposal methods.” EPA warned that sludge was subject to control as a hazardous waste. However, even though EPA did not require sludge to be tested, it was up to the municipality to determine if it is a hazardous waste. Municipalities are required to understand the Solid Waste Act where the term “hazardous waste” means a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or *infectious characteristics* may--

(A) *cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or*

(B) *pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.*

The sludge expert claims EPA did a 14 pathway risk assessment for chemicals in sludge. There is no doubt a lot of sludge experts were paid to produce this work. However, it was all for nothing as EPA admits in the 1995 document, “A Guide to the Biosolids Risk Assessments for the EPA Part 503 Rule”, page 110, that it only looked at 13 chemicals that were banned, had restricted use or no longer manufactured and it did not include that information in the risk assessment and there was no risk assessment for cancer or disease causing organisms.

http://www.epa.gov/owm/mtb/biosolids/503rule/503g_ch6.pdf

Composting involves stabilization by aerobic Mesophilic and Thermophilic bacterial decomposition. In plain terms oxygen using bacteria eat the organic part of sludge and then go dormant (VBNC) for lack of food or moisture. Since many of the bacteria turn nitrogen into ammonia, the amount of nitrogen in compost is much lower than in raw sludge. Furthermore, relatively high levels of heavy metals and/or toxic organic chemicals will limit the use of compost. More important, EPA said, **“there is a concern** for the possibility of an adverse health impact on compost workers and nearby residents from the inhalation of an excessive number of spores of the fungus, *Aspergillus fumigatus*.”

Liability concerns have plagued municipalities from the beginning. It is EPA's position that compliance with federal or state regulations guidelines concerning sludge use may provide a strong defense for POTWs against charges that they are responsible for adverse consequences caused by their sludge use programs. In the case of infectious organisms in sludge/biosolids, the refusal to include a list of organisms, or treatment methods, in the Hazardous Waste Regulations for the last 25 years implies there is no danger. Furthermore, EPA suggests, “written disclaimers of responsibility for the effects caused by sludge may also protect POTWs from liability. – Ultimately, such questions of liability are a matter for the courts to resolve and are primarily matters of state law.”

Many municipalities had reason to be concerned as they were giving away air dried sludge, including cities like Philadelphia with its “Philorganic”. Some municipalities were heat drying sludge and selling it as a commercial organic lawn fertilizer including Milwaukee's (Milorganite) and Houston's (Houactinite). Others like Kellogg, composted sludge and sold it as an unlabeled soil amendment called Nitrohumus.

After 80 years of dumping contaminated sewage sludge (biosolids) on the public as the commercial lawn fertilizer, Milorganite, in 2007, Milwaukee Metropolitan Sewage District (MMSD) finally got caught creating a superfund site. Five public parks and about 25 school yards were turned into hazardous polychlorinated biphenyls (PCBs) open dump sites. That has not been the only problem, Milwaukee had a major public relations problem with the Milorganite sludge product in 1987 when three San Francisco 49ers playing on fields spread with Milorganite sludge fertilizer contacted Lou Gehrig's disease (ALS). Lou Gehrig's disease has been associated with exposure to selenium. Milwaukee Journal reporters also found an unusual high number of ALS patients who had been exposed to Milorganite. While EPA promised an investigation, ten years later EPA instead paid WEF to produce a debunking fact sheet. <http://deadlydeceit.com/Milwaukee-story.html>

Reactivation of Pathogens in Compost

In 1981, Charles F. Russ and William A. Yanko, County Sanitation Districts of Los Angeles County, found that, “some enteric bacteria, upon desiccation, became dormant and in this state were highly resistant to both heat and radiation.” In their published study, “Factors Affecting Salmonellae Repopulation in Composted Sludges”, they revealed that they had kept composted sludge (92.8% total solids and 31.8% volatile solids with no detectable Salmonella), in the laboratory for over a year before reactivating the coliforms; Salmonella; Arizona spp; and citrobacter, by the simple process of raising the moisture content level up to 20%. This repopulation would have been missed by normal laboratory procedures as it took 5 days for the bacteria to increase by four orders of magnitude. <http://thewatchers.us/EPA/2/1981-salmonella-regrowth-compost.pdf>

In the 1987 EPA study, "Regrowth of Salmonellae in Composted Sewage Sludge" the authors noted, "Though composting effectively stabilizes and disinfects sewage sludges, the decrease in Salmonella may be only temporary, because this pathogen can survive and grow without a human host." In this case changing the standard test medium improved the detection of Salmonellae in 4 of 30 composted products from across the United States. Most telling is that all 30 composts, when radiation sterilized, supported Salmonella growth. Investigation revealed that suppression of Salmonellae growth was a result of competition by other bacteria who used the same materials for nourishment causing the Salmonellae to go dormant.. "Repopulation of compost by Salmonellae may occur through regrowth of the organisms existing in the compost at undetectable concentrations or through the growth of organisms introduced from an outside source." -- such as infected birds, reptiles, or other animals. "Growth and death rates were found to be moisture and flora associated."

It was found that 23 types of bacteria and 61 types of actinomycetes did not inhibit the growth of Salmonella. In fact, only six of 42 types of fungi had an inhibiting effect on Salmonella growth and then, only at the lowest temperatures found in the compost pile. When both Salmonellae and fungi were inoculated (spiked) into sterile compost there was no effect on Salmonellae growth. What is most interesting is that fungi was the major inhibitor of Salmonellae growth, the coliform bacteria played a larger part than actinomycetes in inhibiting growth. The authors fail to identify the pathogenic Enterobacteriaceae (coliform) that mimic Salmonellae in the tests: E. coli, Shigella, Klebsiella, Cedecea, Citrobacter, Edwardsiella, Enterbacter, Ewingella, Hafnia_alvei , Kluyvera, Koserella , Leminorella, Morganella , Pantoea, Proteus, Providencia , Rahnella, Serratia, Tatumella, etc, or the black plague bacteria, Yersinia

<http://thewatchers.us/EPA/1/1987-Salmonella-regrowth-compost.pdf>

<http://thewatchers.us/deaths/disease/table-1-coliform.html>

LA County microbiologist William Yanko did another compost study for EPA in 1988, "Occurrence of Pathogens in Distribution and Marketing Municipal Sludges". While Yanko was not as candid in this study as he was in 1981, he stated, "significant increases in bacterial populations, including salmonellae, occurred during subsequent production of commercial soil amendment products." Also, Yersinia was consistently found in static pile compost. Yersinia enterocolitica was a bacteria of emerging concern, but little appeared to be known about it. Yanko observed that its appearance was seasonal and, "Based on a small number of tests, the Yersinia appeared to be avirulent (not causing disease)."

Prior to 1976, the coliform Yersinia enterocolitica was generally not known to infect humans except for a few in Europe, Africa, Australia, and Japan. In 1975-76 it jumped to Canada and the United States with the first case of pulmonary disease. By 2006, there were eight documented pathogenic strains of Y enterocolitica in CDCs germ bank: (O:1, O:2, O:4, O:13, O:15, O:20, O:21, and O:34). These strains are freeze dried (desiccated) before being shipped to research laboratories and must be resuscitated before experiments can be carried out. Health effects include gastrointestinal and extraintestinal inflammatory conditions, including granulomatous appendicitis, malacoplakia, Yersinia abscesses, and Yersinia sepsis as well as pharyngitis, meningitis, osteomyelitis, pyomyositis, conjunctivitis, pneumonia, acute proliferative glomerulonephritis, and peritonitis.

On the other hand Yersinia pestis causes the Black Plague. CDC authorities state, "Outbreaks in people still occur in rural communities or in cities." While there is effective treatment today, it must be given promptly to prevent serious illness or death.

In the 2005 literature review, "Survival, Growth, and Regrowth of Enteric Indicator and Pathogenic Bacteria in Biosolids, Compost, Soil, and Land Applied Biosolids", Pepper, et al., state, "--, there has never been an established link between land application and illness." Actually, that is another Myth as we can see from the early compost studies. . The review confirms Gattie and Lewis's 2003 call for "A High-Level Disinfection Standard for Land-Applied Sewage Sludges (Biosolids)" to prevent the growth of pathogens in sludge used as a fertilizer .

<http://www.ehponline.org/members/2003/6207/6207.pdf>

The main benefits of Pepper's literature review is that it brings together most of the scientific double-speak in one paper. The concern is that it manages to perpetuate the myth that there is some magical difference between enteric indicators and human/animal pathogenic bacteria. So called real enteric indicators such as coliform and fecal coliform are pathogens once they leave the gut/colon. The only difference between coliform and fecal coliform is the temperature of the test for indicator members of gram negative Enterobacteriaceae family. The three conclusions arrived at were: 1) Salmonella and E. coli could regrow in heat dried or irradiated sludge; 2) growth or regrowth of Salmonella and indicators are inhibited in unsterilized sludge; and 3) Moisture, temperature and desiccation are the determining factors.

http://www.gwmc.ca/pdf_files/Survival,Growth,and%20Regrowth%20of%20Enteric%20Indicator%20and%20Pathogenic%20Bacteria%20in%20Biosolids,Compost....pdf

Uptake of Chemicals in Sludge

Chaney was one of the first to document bioaccumulation of cadmium in tobacco in 1984. "Chaney et al. (84)--- observed Cd (Cadmium) content in tobacco leaves to be 15 to 20 ppm at 1 ppm in the soil, and 45 ppm with 2 ppm Cd in the soil." Yet, on average, 85 ppm of cadmium could be allowed in compost. Cadmium attacks the lungs, kidneys and bones. There is no known good effect from the intake of cadmium in the human body.

EPA published a list of 21 organic chemicals and inorganic metals in 1989. five of the admitted twenty-one carcinogens in sludge are carcinogenic when inhaled in dust -- Chromium was one of these along with Arsenic, Beryllium, Cadmium, and Nickel. (FR 54, p. 5777) In spite of that fact, EPA said in 1993, "The Agency concluded that Congress intended that EPA develop the part 503 pollutant limits for a broader range of substances that might interfere with the use and disposal of sewage sludge, not just the 126 priority pollutants" (FR. 58, 32, p. 9327) In the 1995 document "A Guide to the Biosolids Risk Assessments for the EPA Part 503 Rule" (p. 110), EPA said it did not consider the metals to be carcinogenic for the 14 pathways evaluated. http://deadlydeceit.com/1989_503_cancer_list.html
<http://deadlydeceit.com/503-Riskassessment.html>

`All leafy vegetables are bioaccumulators of inorganic and organic chemicals. By 1998 EPA had identified a short list in its draft, "A Multimedia Strategy for Priority Persistent, Bioaccumulative, and Toxic (PBT) Pollutants – These pollutants pose risks because they are toxic, persist in ecosystems, and accumulate in fish and up the food chain.-- PBTs are associated with a range of adverse human health effects, including effects on the nervous system, reproductive and developmental problems, cancer, and genetic impacts.

- * aldrin/dieldrin [unregulated]
- * benzo(a)pyrene [unregulated]

- * chlordane [unregulated]
- * DDT(+DDD+DDE) [unregulated]
- * hexachlorobenzene [unregulated]
- * alkyl-lead [lead in gasoline]
- * mercury and compounds [allows 57 ppm in biosolids]
- * mirex [unregulated]
- * octachlorostyrene [unregulated]
- * PCBs [49 ppm allowed – 503.6]
- * PCDD (Dioxins) and PCDF (Furans) [unregulated]
- * toxaphene [unregulated]

The challenges remaining on PBT pollutants stem from the fact that they transfer rather easily among air, water, and land.” <http://www.epa.gov/pbt/pubs/pbtstrat.htm>

However, there are 19 inorganics that may bioaccumulate in leafy vegetable. These may cause cancer, liver and kidney disease as well as cerebro-vascular disease, etc.

<http://thewatchers.us/deaths/disease/table-inorganic-.html>

Then there is a short list of 27 Synthetic Organic Contaminants, including pesticides & herbicides that I have researched that also primarily cause cancer, liver and kidney disease as well as cerebro-vascular disease, etc. <http://thewatchers.us/deaths/disease/table-synthetic-organics.html>

And finally, a shorter list of 21 Volatile Organic Contaminants which primarily cause cancer, liver and kidney disease as well as cerebro-vascular disease, etc. <http://thewatchers.us/deaths/disease/table-volatile-organic.html>

The above lists are only a sample of EPA's many lists of dangerous chemicals including the estimated 80 – 100, 000 chemicals in production, not counting dangerous drugs. In the 1988 study for EPA, “Trace Organics and Inorganics in Distribution and Marketing Municipal Sludges”, Rodger Baird and Sylva M. Gabrielian, the County Sanitary Districts of Los Angeles County, attempted to create a data base for 15 toxic inorganics and 121 toxic organics in sludge from 26 cities that distributed and marketed their sludge as a commercial product. Their study failed to accomplish its purpose. They said, “Efforts to characterize major unknown organic components were limited to computer comparisons of GC/MS peaks to the NBS mass spectral library. In none of the cases was a tentative identification made.” Furthermore, “As a result, a significant portion of the major peaks were multi-component peaks whose identities remain completely unknown.” <http://thewatchers.us/EPA/1/1988-trace-organics-inorganics-DM-sludge.pdf>

The most important thing to remember is that in most cases exposure to these chemicals in compost do not cause immediate health effects. The effects of exposure may not be evident for days, weeks, months or even years. The same is actually true for some of the pathogens in compost even though exposure tend to have more immediate health effects for those with compromised immune systems.

Sludge to Biosolids

In 1991, Peter Machno, King County Department of Natural Resources Biosolids Management Program, proposed a WEF committee to change the name of sludge to something more acceptable to the general public. Dr. Bruce Logan, an Environmental Engineer, created the term “biosolids” for the

stabilized solids produced during secondary sewage treatment. During treatment bacteria bind solid particles as attached growth systems on trickling filters systems and rotating biological disks. These biofilms are sloughed off the attached growth systems as sludge (biological solids). In the activated sludge processes the bacteria grow as aggregates or flocs, and settle out in clarifiers as sludge. Upon treatment of these sludge solids, usually by anaerobic bacterial digestion, the readily available organics are consumed, leaving behind solids with much reduced oxygen demand. These stabilized solids are then referred to by the industry as biosolids.

Biosolids are composed of general household waste (domestic sewage) and an unknown quantity of industrial and hospital hazardous waste (e.g. toxic, genotoxic, corrosive, flammable, reactive, explosive, shock-sensitive) as well as active and dormant pathogens. Biosolids compost will: 1) contain infectious agents; 2) be genotoxic (cause DNA damage); 3) contain toxic or hazardous chemicals or pharmaceuticals; and 4) may be radioactive. Cell damaging cytotoxic elements in biosolids compost are extreme irritants and may cause dizziness, nausea, headache, or dermatitis.

Compost users are exposed to bacterial toxins, inorganic and organic chemical pollutants by inhalation of toxic organic dust or aerosols, absorption through the skin, and ingestion of contamination of food and water. Pathogens may enter the body: 1) through a puncture, abrasion, or cut in the skin; 2) through the mucous membranes; 3) by inhalation; and 4) by ingestion of biosolids/soil mixture, food or water. As EPA points out in part 503.9, results may be death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction), or physical deformations in either soil and water organisms, animals, humans or offspring of the organisms, animals and humans.

What this means is that exposure to the chemicals, toxins, and pathogens in sludge/biosolids compost could be responsible for the pandemic rise of: Acid Reflux, ADHD, Asthma, Autism, Bacterial colitis, Bipolar disorder, COPD, Esophageal cancer, Gastroenteritis, Flu-like deaths, MRSA, Necrotizing fasciitis "flesh eating" Strep and Staph, Organ transplants, Papillomasvirus reproductive organ and oral cancer, Pathogenic heart disease, Pathogenic Pneumonia, and Thyroiditis. .

http://thewatchers.us/1_index-pandemics.html

When it comes to organic sludge dust exposure, things do tend to get a little confusing. The Australian government issued its "Statement of Principles concerning Extrinsic Allergic Alveolitis in the Veterans Entitlements Act" of 1986. Basically it is an inflammatory response by the immune system to antigens inhaled on dust particles that will cause illness or death. The government recognized that working with sewage sludge was a very dangerous occupational risk. Three sources are:

- Sewage sludge contaminated with micro-organisms
- Fertilizer contaminated with micro-organisms
- Compost dust contaminated with micro-organisms

<http://www.rma.gov.au/SOP/97/057.pdf>

According to the Canadian Centre for Occupational Health and Safety (CCOHS), "The term extrinsic allergic alveolitis (EAA) refers to a group of lung diseases resulting from exposure to dusts of animal and vegetable origin." The recognized disease we are interested in here is "Sewage sludge disease" caused by dust of heat-treated sludge. The U.S. sludge industry ignores the potential threat.. However, if you become a victim, municipalities will claim it could be Air conditioner lung, Animal

handlers' lung, Bird fanciers' lung, Farmers' lung, or Hot tub lung.
<http://www.ccohs.ca/oshanswers/diseases/alveolitis.html>

As I reported in 2003, the same diseases have been called Toxic Organic sludge Dust Syndrome. Deaths doubled from the disease between 1980 and 1995. In 1994, the Swedish National Board of Occupational Safety and Health (SNBOSH) states, "Acute toxic alveolitis, otherwise known as "organic dust toxic syndrome" (ODTS), can accompany brief, occasional exposures to heavy concentrations of organic dust in agricultural environment. The contents of the dust inhaled can include fungal spores, bacteria, bacteria spores and endotoxins. Symptoms of illness often become apparent between 4 and 8 hours after inhalation of heavily concentrated organic dust". The SNBOSH states, "Persons employed in agriculture have a higher lung disease mortality rate than the population generally, despite fewer of them being smokers. Exposure to organic dust can also give rise to chronic bronchial catarrh, coughs, nasal catarrh and nasal congestion."

About the same time, the National Institute of Occupational Safety and Health (NIOSH) recognized that the United States had a similar problem. According to the NIOSH, "Chronic Obstructive Pulmonary Disease "(COPD) has become a major public health concern. In 1995, it ranked as the fourth leading cause of death in the United States, accounting for over 100,000 deaths--nearly twice as many as in 1980 [NCHS 1997]. In 1994, an estimated 16 million individuals in the United States had the diagnosis of COPD, representing a 60 percent increase since 1982". Unlike most reports we give the different version numbers rather than names. According to the NIOSH, "(COPD) includes chronic bronchitis (ICD-9 codes 490-491), emphysema (ICD-9 code 492), bronchiectasis (ICD-9 code 494), and chronic airway obstruction (ICD-9 code 496). These diseases are commonly characterized by irreversible airflow limitation. Some authorities include asthma (ICD-9 code 493) and hypersensitivity pneumonitis (ICD-9 code 495)" There is an interesting sidebar, "**Unlike some other lung diseases, the risk of HP is substantially lower among cigarette smokers, perhaps due to smoking effects on lung immunity [Schuyler 1998]. "** <http://deadlydeceit.com/NSA-139.html>

King County Washington Continues to Promote the Myth

King County Washington is an example of the mythological approach to promoting the use of sewage sludge and sludge composting by ignoring the potentially deadly consequences of infectious characteristics in sludge/biosolids. King County representatives in the Water Environment Federation (WEF) have been one of the driving forces in promoting sludge/biosolids as a safe fertilizer. To do this the promoters had to create the myth that the infectious organisms in sludge did not cause disease.

Roberta King, Biosolids Program Lead, King County [WA.] Wastewater Treatment Division, recently (5/2011) sent me a copy of their 2009 myth:

"MICROBIAL CONSTITUENTS OF BIOSOLIDS". On "Fecal Coliform Bacteria", the myth states, "These microorganisms, most of which are nonpathogenic, are common to most warm-blooded animals, and include Escherichia and Klebsiella species. Their presence in high numbers in biosolids does not confirm the presence of pathogens, but suggests the possibility of pathogen presence."

King said, "Current testing [for Class B] includes fecal coliforms, Salmonellae, as well as parasites (Ascaris species, Giardia lamblia,, Taenia species, Toxocara species, Hookworm,

Hymenolepis species, Trichuris trichiura) and enteroviruses, including polioviruses, Coxsackie viruses and ECHOviruses. [parasites and viruses address later]

She added, "GroCo is made by an independently contracted composting company. Their product is batch-tested prior to sale for Salmonellae, as required by EPA and Washington Department of Ecology."

To put it politely, claiming that most E. coli and Klebsiella are nonpathogenic is a 100 year old myth when scientists thought human E. coli only grew in culture at 112.1 degree Fahrenheit. The second part of the myth coverup is that fecal coliform is the name given to a very small uncommon fraction of E. coli, Klebsiella, Salmonella and other members of the gram negative Enterobacteriaceae family that have developed a resistance to high heat not attributed to clones. Common members of the Enterobacteriaceae family, including E. coli and Klebsiella, at normal temperature are called coliform. Nonpathogenic strains are attenuated laboratory strains used in commercial manufacturing processes. Most nonpathogenic E. coli are genetic clones of the laboratory cultured E. coli K-12 strain, which was a pathogen when it was isolated from a diphtheria patient in 1922. While our gut is a safe haven for many pathogens, where they do not exhibit pathogenic tendencies, once they escape from the gut and invade other body tissues, all bets are off. About 60,000 E. coli strains, most of which are clinical isolates have been collected. As a group E. coli causes inflammatory diarrhea, destruction of red blood cells and kidney failure (hemolytic-uremic syndrome), urinary tract infections, bacteremia, meningitis, severe, lung infection, pneumonia, abscesses in the lining of the lungs (empyema), both necrotizing "flesh eating" infections in the urinary tract and the abdominal cavity, etc.

http://thewatchers.us/2-1-E_coli.html

Like E. coli, Klebsiella pneumoniae has become a Superbug. It is second only to E. coli as a urinary tract pathogen. It is an enteroinvasive food-borne pathogen. By 1898 Harvard medical School had documented Klebsiella caused, pneumonia, endocarditis, gangrene of lung (necrotizing "flesh eating" infections), and acute otitis media. In 2000, 34 patients were infected with antibiotic resistant Klebsiella at Tisch Hospital in Brooklyn, NY, half died. In 2007, there was a Klebsiella outbreak in Israel in which 150-200 people died out of the 400 to 500 infected. According to the article, "Health Minister Yacov Ben Yizri on Wednesday rejected accusations that his ministry had underestimated the scope of the outbreak, saying the case was kept a secret to prevent mass panic."

<http://thewatchers.us/2-1-Klebsiella.html>

<http://www.ynetnews.com/articles/0,7340,L-3373478,00.html>

On Salmonellae Bacteria, the myth states:

"This enteric pathogen is sometimes found in human or animal fecal matter. Salmonellae are associated with outbreaks of gastroenteritis and typhoid, human diseases usually contracted through consumption of contaminated drinking water or food. Salmonellae survival in a forest or agricultural field is highly unlikely. Pathogenic microorganisms, including Salmonellae do not survive the warm, dry periods and the competition by naturally occurring organisms that all biosolids application sites experience (regardless of the time of year the biosolids are actually applied)."

A 1991 German study by D. Strauch, Institute of Animal Medicine and Hygiene, University of Hohenheim, "Survival of pathogenic micro-organisms and parasite in excreta, manure and sewage sludge", indicates the sludge experts failed to do proper research. Strauch said, "sewage sludge is

rightly described as a concentration of pathogens" because "most pathogenic agents can survive the treatment process" and the sewage treatment process causes some of the pathogenic disease organisms to be absorbed or enclosed in faecal particles. Moreover, it was reported that two groups of researchers had found pathogenic disease organisms will be taken up inside food crops. Strauch noted that Salmonella has survived in forest stands between 424 and 820 days. As a result, he said, "In any case, the agricultural utilization of hygienically dubious sewage sludge poses a risk for the whole national economy." <http://www.oie.int/doc/ged/D8196.PDF>

Our scientists have a different term for the pathogenic disease organisms absorbed or enclosed in faecal particles. The faecal particles became aggregates, then biofilms and now we know the biofilms have become sludge. We can now verify that Strauch was right in his observation that sludge posed a risk to the whole national economy. In promoting the use of disease organism contaminated sludge on crop and grazing land farm animals have picked up the diseases and helped spread them. The same is true for sewage effluent used as reclaimed water on food crops which are distributed across the country and around the world. Compost is the stealth weapon spread on home and school lawns and gardens as well as city parks and ball fields where the community at large can acquire the diseases. Mad cow disease rocked the British economy. Food borne illnesses caused by meat, spinach, lettuce, tomatoes, peppers, peanuts, etc, with the accompanying associated illnesses and deaths has put many consumers, farmers, distributors, manufactures and our economy at risk.

The incidence of nontyphoid salmonellosis has increased dramatically since the early 1980s. There are , over 2,200 pathogenic strains. "Each type can produce gastrointestinal upset, enteric fever, and specific localized infections, nausea and cramping abdominal pain, watery diarrhea, fever, vomiting, spread through bloodstream to infect other sites, such as the bones (particularly in people with sickle cell disease), joints, or heart valves (Merck)." Salmonella may produce arterial infections or endocarditis, pneumonia or empyema , meningitis, septic arthritis and osteomyelitis, necrotizing fasciitis, and like E. coli, kidney failure (hemolytic-uremic syndrome), etc. <http://thewatchers.us/2-1-Salmonella.html>

King County did remove Enterococcus bacteria from the 2009 myth, for good reason. The 2006 myth stated:

"These microorganism, most of which are nonpathogenic, may have a slightly better survival rate than fecal coliform bacteria, and consequently are a good indicator of fecal pollution in surface water. The group of organisms under the genus Enterococcus that are used as indicators are *E. faecalis*, *E. faecium*, *E. gallinarum*, and *E. avium*. Similar to fecal coliform, these Enterococcus species do not confirm the presence of pathogens, but suggest the possibility of their presence."

What that means is the gram positive Enterococcus species can withstand higher heat levels than the heat resistant forms of gram negative E. coli and Klebsiella. That is the only similarity to fecal coliform. Enterococcus species was originally associated with surface waters, soil, plants, and used in human probiotics. Today, this is a major hospital acquired pathogen causing urinary tract infections, wound infections, bacteremia, bacterial endocarditis, diverticulitis, meningitis, and Community acquired pneumonia, etc. From late 1980's to mid 1990's the rate of vancomycin resistant isolates increased 34-fold. <http://thewatchers.us/2-1-Enterococci.html>

On Viruses, the myth states:

“Biosolids from WPTP and STP are routinely analyzed for enteroviruses including polioviruses, Coxsackie viruses, and ECHO viruses. Vaccine-strain polioviruses are commonly found in wastewater as a result of oral polio vaccine use. Viruses multiply only within living cells, so their numbers cannot increase in raw wastewater, wastewater solids, biosolids, or the environment. Processing of wastewater to biosolids further reduces the numbers to very low or undetectable levels.”

There are other viruses that infect humans and some that can not yet be cultured. With the exception of the attenuated polioviruses, enteroviruses, Coxsackie virus and Echo viruses must be handled in a level II laboratory. According to the 2003 University of Washington Biosafety Manual, “Class 2 - Agents of potential hazard. This class includes agents which may produce disease of varying degrees of severity from accidental inoculation or injection or other means, but which are contained by ordinary laboratory techniques. Biosafety Level 2 facilities and practices are used in the laboratory.”

It is interesting that King County only tests for one class of Virus. There are many classes that will cause disease including one that causes obesity.

Adenoviruses, --gastrointestinal tract, conjunctiva, central nervous system, and urinary tract;

many species induce malignancy, human **Obesity**

**picornaviruses ---(enteroviruses, Poliovirus, Coxsackievirus, Echovirus, and hepatitis A virus),
memory loss and other neurological symptoms.**

<http://thewatchers.us/deaths/disease/table-virus.html>

The King County does acknowledge that:

“Parasites pose a potential risk to human health due to the existence of resistant stages of the organisms and low infective doses.”

There are two types of parasites, Helminths – worms/nematode and Protozoa – unicellular heterotrophic protist that form cysts. Both host bacteria and viruses and are Level II pathogens. Both are also highly resistant to environmental stresses.

<http://thewatchers.us/deaths/disease/table-worms.html>

<http://thewatchers.us/deaths/disease/table-protozoa.html>

What King County does not admit is that nematode parasites are known to graze on bacteria and viruses. These are the living animals that allow bacteria and virus to survive sewage and sludge treatment as they are protected from environmental forces. They have been known to transmit plant viruses since the late 1950s. According to USDA, “Nematodes help distribute bacteria and fungi through the soil and along roots by carrying live and dormant microbes on their surfaces and in their digestive systems.”

http://soils.usda.gov/sqi/concepts/soil_biology/nematodes.html

While King County does not test for fungi, many are Level II pathogens that grow best in the elevated heat of the compost pile.

<http://thewatchers.us/deaths/disease/table-fungi-yeast.html>

Conclusion

From the very first studies on methods of composting it is self evident that elements of the government

and municipalities have marketed a product that violates human nature and federal laws at the expense of public health. As science advanced, regulations were created to protect municipalities and allow the continuation of the dangerous sludge disposal programs by creating new myths. Untold sums of your tax money was funneled into outside organizations to produce public relation campaigns to debunk the “horror stories”, change the name of sludge to something more acceptable, change our perspective, and create studies of no value focusing on a few chemicals or disease causing organisms to convince the public there was no danger from sludge or sludge products.

Many highly educated people have become sludge experts based on the Part 503 regulation and misinformation from EPA, USDA, and their partners. To become sludge experts on composting they had to ignore a major part of their education – learning how to do basic research.

Many well meaning people have bought into the myth that sludge/biosolids composting is green recycling helping to save the planet as well as money. In the process they have exposed themselves and/or our children to school grounds and gardens as well as home lawns and gardens with dangerous levels of unlabeled toxic chemicals and pathogens, which could cause children and the elderly serious disabilities, illnesses as well as prematurely end their life. This is the final frontier with no federal or state laws, or agencies, to protect our children. It is time to raise our voices and stop this madness before it not only destroys our public health system, but the whole economy.