

## **Health Survey of Residents Living Near Farm Fields Permitted To Receive Biosolids Fact Sheet**

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### **1. What was the purpose of the study?**

Faculty members and students at The University of Toledo and Bowling Green State University assessed the self-reported health status of residents in Wood County, Ohio. The residents were divided into two groups: (1) those residents living on or within one mile of farm fields that were permitted to receive biosolids; and (2) those residents living greater than one mile from biosolids-permitted farm fields.

### **2. What are biosolids and what are they used for?**

Biosolids, also known as sewage sludge, are the liquid, semi-solid and solid residues generated by the treatment of wastewater at municipal wastewater treatment plants. Before use as a soil amendment, the biosolids are treated more to further reduce pathogens (disease causing microorganisms), monitored, and regulated. Biosolids are rated in two categories according to how they are treated — Class B biosolids which are treated to reduce the amount of pathogens and Class A biosolids, which are treated further and contain no detectable levels of pathogens.

Biosolids are used as a less expensive alternative to chemical fertilizer and use of this material in this manner helps to conserve dwindling landfill space for more appropriate solid waste. They are used on agricultural fields, in gardens and parks, and to reclaim mining sites.

### **3. What is the current consensus on biosolids?**

It depends on who you talk to and we are not the ones to make policy decisions. However, if appropriately treated and managed, biosolids are an excellent source of organic carbon to improve soil quality and nutrients to enhance growth of vegetation.

### **4. Who regulates biosolids?**

The USEPA promulgated comprehensive National Standards for the Use or Disposal of Sewage Sludge codified at 40 Code of Federal Regulations Part 503 in 1993. The Ohio EPA has a biosolids program for the state of Ohio and the regulations were last revised in 2007 (effective October 1, 2007).

For more information:

USEPA Biosolids information: <http://www.epa.gov/owm/mtb/biosolids/index.htm>

Ohio EPA Biosolids Program: <http://www.epa.state.oh.us/dsw/sludge/biosolid.html>

## **5. How was the study conducted?**

The researchers mailed an 80 question health survey to 607 households and received a completed survey from 437 people living on or within one mile of the fields where biosolids application was permitted, and from 176 people living more than one mile from the fields where application was permitted. The authors allowed for up to 6 surveys per household.

## **6. Who funded the study?**

The U.S. Department of Agriculture. Many organizations are conducting biosolids research in the country, including universities. The research is being supported through grants from the federal government and by non-profit groups and associations focused on wastewater and biosolid treatment and management.

## **7. What were the major conclusions of the study?**

Taking into consideration the study's design and statistical limitations, the findings suggest an increased risk for self-reported respiratory, gastrointestinal, and general diseases among residents living near biosolids-permitted farm fields. Results revealed that some self-reported health-related symptoms were significantly elevated among the residents living near permitted fields, including excessive secretion of tears, abdominal bloating, jaundice, skin ulcers, dehydration, weight loss, and general weakness. The frequency of occurrence of bronchitis, upper respiratory infection and giardiasis were also significantly elevated. The findings suggest an increased risk for self reporting of certain respiratory, gastrointestinal and other diseases by residents living near farm fields on which the use of biosolids was permitted. It must be noted, however, that the study results did not show statistical differences or increased risk for several symptoms (i.e. diarrhea) that one would expect if biosolid exposure occurred among those living near the farm fields. Accordingly, the results remain inconclusive.

## **8. Do the results and conclusions from your published paper demonstrate that people who reside in close proximity to biosolids land application sites develop a variety of illnesses?**

No. Because these results are based on self-reported symptoms, it is possible that reporting bias and self-selection could have influenced results. Surveys that require self-reporting of data have limitations and should be interpreted with caution. Respondents may have the tendency to under-report behaviors that are socially undesirable, unhealthy, or illegal and over-report desirable behaviors screening. The accuracy of self-reported information also is affected by the ability of respondents to fully recall past behaviors or health screening results. Additionally, the symptoms and diseases were listed for respondents and the questions were not open-ended. This study did not firmly demonstrate that there is a threat to health by living near fields where biosolids are permitted. The study showed statistical associations, which is not the same as causation. Other influences may be at work, including the possibility that individuals living near biosolids-permitted fields relate odors and other biosolid debris to possible health effects and the possibility that the people surveyed may be more prone to report diseases and symptoms. This research is a starting point. Additional studies are needed to further determine any potential for health risk.

## **9. Have any of the illnesses reported in your paper been confirmed/documentated either by physicians and/or other qualified medical personnel? If not, how do these self reported illnesses affect the results and conclusions of your paper?**

No, the specific causes of symptoms that were reported in this study cannot be ascertained because although we asked respondents to report only medically diagnosed diseases, we did

not verify with medical records. There are major gaps in data that impeded the analysis including lack of objective data on specific environmental exposures, the lack of baseline health assessments among those who returned the surveys, and lack of objective measures of health status before and after the applications of the biosolids.

#### **10. What are the strengths of the study?**

First, it was conducted by university faculty members who have extensive experience and expertise in research design and statistical analysis and who are highly regarded in the public and environmental health science fields. The study is one of the most comprehensive health surveys performed on biosolids-permitted fields. The statistics are sound and the research methodology was used to eliminate as much bias as possible. Second, the article was peer reviewed, meaning an independent group of experts assessed whether study results should be published. Peer review is a bedrock of modern science. Third, the study appears in a widely read, highly respected journal in the field of public, environmental and occupational health science. Fourth, some of the findings in this study do agree with findings in other studies.

#### **11. What were some of the limitations of the study?**

While the disease symptoms documented in this study have also been documented in studies involving wastewater treatment plant workers, there also are symptoms/diseases that have been seen in wastewater treatment plant workers that were not seen among the survey group. The findings are interesting, but they are not proof that biosolids were the cause of any illnesses and we are not suggesting any policy action be taken based on this study. At the time of the study it was not known if biosolids were applied to the permitted fields. Other limiting factors include: the use of postal questionnaire compared to interviews and exposure misclassifications. Without taking these factors into account in the research design, we cannot be certain that the statistical association between living on or within one mile of biosolids-permitted fields and self-reported symptoms like excessive secretion of tears, abdominal bloating, jaundice and other symptoms is directly related to biosolids.

This study suggests that additional studies are needed.

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