



A Guide to Understanding Biosolids Issues

Biosolids recycling is a safe practice when done in accordance with the U.S. Environmental Protection Agency's (EPA) regulatory program (40 CFR Part 503) for biosolids as well as often stricter state requirements. Studies by EPA, the Water Environment Research Foundation (WERF) and the National Association of Clean Water Agencies (NACWA) have demonstrated that the beneficial land application of biosolids poses a negligible risk to human health and is becoming consistently and increasingly safer. The Water Environment Federation (WEF) and NACWA agree that additional research on biosolids application is necessary and will always be necessary to continue improving the biosolids application process, just as further study is required on much more widely used fertilizers such as manure and others.

WEF and NACWA believe the public should be secure given the scientific data that already exists regarding the safety of land applied biosolids (*see reference material supplied below*) and fully expects this sense of security to increase with further studies, some of which are already in progress. Such studies will further increase our knowledge about biosolids, develop technologies to reduce odor, and make treatment even more effective. In addition to further scientific study, national water quality organizations, led by the National Biosolids Partnership (NBP) — comprised of EPA, WEF and NACWA — are aggressively encouraging the implementation of the use by publicly owned treatment works (POTWs) of environmental management systems (EMSs) for biosolids. An EMS is a progressive management tool to enhance and complement regulatory requirements at the local, state, and federal levels, while at the same time providing a mechanism to respond efficiently to public concerns regarding biosolids.

What follows below is an overview of what biosolids are; where the science on biosolids is and is going; what initiatives EPA and other organizations can engage in to further ensure safe biosolids practices and public confidence; and the growing importance of EMS as this important national, natural resource increases in use and acceptance.

WHAT ARE BIOSOLIDS?

Biosolids are nutrient-rich organic materials from the treatment of domestic sewage in a wastewater treatment facility. Biosolids are a beneficial resource, containing essential plant nutrients and organic matter and are recycled as a fertilizer and soil amendment. When sewage solids are treated and processed, these residuals can be recycled and applied as biosolids to improve and maintain productive soils and stimulate plant growth. In the U.S., sewage solids must be treated to meet EPA's Part 503 sewage sludge regulatory requirements if they are to be recycled as biosolids.

EPA estimates that more than 7 million dry tons of solids are generated annually for use or disposal by the 16,000 wastewater treatment facilities nationwide. Several biosolids management options are available under the Part 503 regulations. Approximately 60% are land applied, composted, or used as landfill cover, 22% are incinerated, and the remaining 17% are

disposed of in landfills.

CURRENT STUDIES DEMONSTRATE THAT BIOSOLIDS ARE PROTECTIVE OF HUMAN HEALTH

NACWA and WEF believe that EPA's risk assessment for the 40 CFR Part 503 Rule, which governs the use and disposal of sewage sludge and biosolids, is adequate to protect human health and the environment when biosolids management practices prescribed in the rule are followed. Wastewater treatment and biosolids management programs across the country strive to carefully follow all applicable regulations and best management practices in the Part 503 and parallel state rules. Professionals managing biosolids concur with EPA's long-standing appraisal that biosolids recycling is a relatively low-risk activity. Nonetheless, there will always be new information and questions arising about various aspects of biosolids management. But, the questions being studied today are often about more subtle potential risks than those that have been studied and addressed intensively over the past thirty years (e.g. heavy metals). Decades of experience and hundreds of studies regarding biosolids recycling make it unlikely that there are any significant negative surprises yet to be discovered about this form of recycling.

A comprehensive National Academy of Sciences/National Research Council review of the Part 503 biosolids management program in 1996 found biosolids use on food and other crops presents "negligible risk" when conducted in accordance with federal regulations. Many state regulations are significantly more restrictive than the Part 503 regulations, thus further safeguarding public health and the environment. Wastewater treatment facilities are highly regulated under the Clean Water Act and other regulatory requirements. Pretreatment and pollution prevention programs, in particular, contribute significantly to enhancing biosolids quality. Biosolids recycling is a highly regulated management practice, even though biosolids are only applied on one percent of the nation's agricultural acreage. In comparison, other soil amendments and fertilizers that are applied on the majority of agricultural land (manure and commercial fertilizers), are minimally regulated, if at all, and no pathogen testing is done on them.

FURTHER STUDY WILL ENSURE BIOSOLIDS PRACTICES BECOME EVEN SAFER

Some citizens have had concerns with biosolids management practices that create odors and other potential nuisances that could interfere with quality of life in local communities. POTWs want to forthrightly address these concerns and intend to continue to work with EPA and with recognized scientific bodies as they pursue additional studies to further assess risks associated with pathogens and any other emerging biosolids issues. As ongoing studies of potential pathogen or other risks continue, biosolids management practices will need to be amended in accordance with latest scientific findings.

The water quality profession also understands those citizens with compromised immune systems living near land application sites may react differently to biosolids odors, or manure for that matter, than other people, and this is an area that needs further study. In the meantime, biosolids managers will continue their constant efforts to minimize potentially negative impacts to neighbors and the environment. It is important to note, however, that even as potential pathogen concerns are researched further, we have decades of experience with exposure to untreated wastewater, untreated wastewater solids, and biosolids (treated according to Part 503 regulations) - more than 100,000 water quality experts work at the 16,000 wastewater treatment

facilities around the U.S. every day. The May 2002 issue of *Water Environment & Technology*, a leading magazine in the water quality field, included a review of the literature on effects of exposure of people to pathogens in wastewater and biosolids. The conclusion was that wastewater workers — the most exposed population to wastewater-borne pathogens — are as healthy as the general population. There are no independently verified proven serious health impacts from biosolids recycling, despite allegations; however, there are anecdotal complaints of minor health impacts. The water quality and biosolids management professional community stands prepared to assist EPA in further determining the extent of any such impacts and in implementing activities that further protect human health and the environment.

Any field based on scientific analysis will always be advancing as knowledge progresses, and biosolids recycling will continue to advance. NACWA, WEF and WERF stand ready to help design, conduct, fund, and review additional studies — in fact, we are already doing so and have always been doing so. Several studies of pathogens in biosolids are now underway. For example, WERF has approved four such studies. One of these looks at the regrowth of pathogenic organisms in dewatered biosolids. A second study seeks to quantify airborne biological contaminants associated with land-applied biosolids. Yet another study looks at how sample processing affects the analysis of biosolids samples. And the fourth looks at constructing a dynamic model to assess microbial health risks associated with the beneficial reuse of biosolids. A recently completed WERF study also found that the physical, chemical, and biological characteristics of biosolids compare favorably with other soil amendments such as manure and commercial fertilizers.

EPA is also working with USDA on research measuring odors and bioaerosols from biosolids land application sites. Recently, the EPA completed data collection activities and has found that biosolids contain very nominal levels of dioxins and dioxin-like compounds and pose very low risk to human health and the environment with regard to that potential concern.

Research into new areas is needed by EPA and others to continue to help build public confidence by supporting further studies on pathogen issues in biosolids, animal manures and other similar by-products. EPA should support research on odor associated with biosolids processing and how to minimize odors through management of biosolids at the treatment plant and during subsequent processing or land application.

EPA INVESTIGATIONS SHOW NO LINK BETWEEN BIOSOLIDS AND HEALTH IMPACTS, NIOSH RESCINDS HAZARD ID

EPA has been criticized for not being more responsive in reviewing selected projects or situations where biosolids have allegedly caused problems. A 2002 Office of Inspector General (OIG) review of EPA's biosolids management program, however, vindicates EPA and found that the Agency had investigated each of the allegations reported. According to that report, whistleblowers reported 21 incidents they claim were never investigated. The OIG, however, found that EPA investigated 14; 5 were never reported to EPA at all; and 2 were not even biosolids related.

Additionally, the National Institute for Occupational Safety & Health (NIOSH), a division of the Centers for Disease Control, conducted a study in 2000 that raised some concerns with biosolids worker health and safety at a site in Ohio and published a report *Hazard ID #10: Workers Exposed To Class B Biosolids During And After Field Application*. NIOSH recently

rescinded this report because it had relied on inadequate data and poor research. NIOSH instead replaced the document with *"Guidance For Controlling Potential Risks To Workers Exposed to Class B Biosolids."* The new NIOSH Guidance is a refined and more scientifically accurate and useful document for those who work closely with Class B biosolids. The Guidance encourages biosolids workers and managers to assess their particular Class B biosolids management environments and select those protective measures that are appropriate for the particular level of potential worker exposure.

ENVIRONMENTAL MANAGEMENT SYSTEM — IMPROVING BIOSOLIDS PRACTICE

EPA needs to develop programs to document compliance with regulatory requirements to demonstrate the overall safety and success of the biosolids program. Over the past few years, with the support of Congress, the biosolids management profession has created a significant nationwide effort to further improve biosolids management programs—the National Biosolids Partnership (an alliance of the Water Environment Federation, National Association of Clean Water Agencies, and U.S. EPA), program of Environmental Management Systems (EMS) for biosolids. An EMS is a rigorous management system that ensures biosolids recycling is done in accordance with legal requirements and best management practices and is constantly improved. This progressive environmental program requires extensive public input and independent audits of biosolids programs. Several leading environmental groups and EMS experts are voicing support for this EMS program as a means to further ensure the greatest overall environmental benefit and public input in biosolids management.

The EMS mandates compliance with all regulatory requirements, but includes third party verification and public input as key elements. EMS implementation should help allay public fears, but visible oversight by EPA and responsible state agencies will still be necessary if the program is to secure broader public support.

EPA SHOULD EXPAND ITS SYSTEM TO TRACK QUALITY AND MANAGEMENT OF BIOSOLIDS

EPA decided several years ago to provide minimal support for the national biosolids program based on its perception that the risk of biosolids recycling is small. That situation has not changed and the risk is still small. However, EPA's lack of visible and viable oversight helps feed fears from the general public and Congress that EPA is not doing its job effectively in its role as a regulatory and enforcement agency. EPA must do a better job of ensuring Part 503 compliance and of documenting its compliance activities so the public knows that across the country, biosolids are being lawfully and appropriately managed.

The capability to effectively track the quality and management of biosolids is a vital component of a successful national biosolids management, oversight and enforcement program that can build public confidence. The water quality profession recommends that EPA allow electronic submissions of biosolids quality data from wastewater treatment facilities. Electronic submission of biosolids data would alleviate the need for regional staff to reenter this data and maintain accuracy by the submitter and would allow EPA to compile, analyze, and document this information in a timely fashion. To this end, EPA should upgrade and expand the use of the Biosolids Data Management System (BDMS) to store and monitor biosolids data for posting on its web site. The goal would be for the general public to be able to view biosolids quality data in each of the 50 states along with the volume of biosolids generated and distribution of the available beneficial use practices employed. This tool would greatly enhance communications

between the regions and states and can address a number of the concerns regarding EPA providing better record keeping of biosolids quality data and use practices. Congress should ensure that EPA has the funding resources to support this activity.

WEF and NACWA also applaud EPA's plans to include, pursuant to an April 2002 agreement in the *Gearhart v. Whitman* lawsuit, to:

- by April 1, 2003, publish a *Federal Register* notice explaining how EPA will respond to recommendations in the NRC's report and solicit public comment;
- specify whether EPA is planning any regulatory or non-regulatory means of addressing
- the NRC recommendations, and the time frame for taking final action on any planned activities, including a time frame for proposing rules, if any; and

publish its final plan for responding to the NRC recommendations in the *Federal Register* within nine months of the first notice

SUMMARY

Overall, biosolids recycling is a safe practice when done in accordance with the Part 503 and state requirements. Additional research needs to be, and will be, advanced and expanded. National water quality organizations are aggressively encouraging the implementation of EMSs as a progressive management tool to enhance and complement regulatory requirements at the local, state, and federal levels.

Audits conducted by EPA's OIG and a new National Academy of Sciences/National Research Council study should serve as an up-to-date "physical examination" of EPA's biosolids program. These critiques provide constructive recommendations for EPA to improve its oversight of the nation's biosolids management programs, including ongoing support for the EMS initiative and BDMS. It is prudent public policy to review practices such as water reuse and biosolids recycling every 5-6 years and those in the water quality and biosolids management field welcome these recent reviews.

Important Biosolids Web Sites

Water Environment Federation (WEF) - <http://www.wef.org>

National Association of Clean Water Agencies (NACWA) - <http://www.nacwa.org>

National Biosolids Partnership (NBP) – <http://www.biosolids.org>

Water Environment Research Foundation (WERF) - <http://www.werf.org>

U.S. EPA - <http://www.epa.gov/owm/bio.htm>

New England Biosolids & Residuals Association (NEBRA) - <http://www.nebiosolids.org/>

Northwest Biosolids Management Association (NBMA) - <http://www.nwbiosolids.org/>

Mid-Atlantic Biosolids Association (MABA) - <http://www.mabiosolids.org/>

Great Lakes By-products Management Association (GLBMA) – <http://www.glbma.org/>