UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 7 2007

OFFICE OF
WATER

The Honorable Barbara Boxer
Chair, Committee on Environment
and Public Works
United States Senate
Washington, DC 20510

Dear Madam Chair:

This letter is in follow-up to my October 23, 2007, letter to you in response to your October 3, 2007, request for information on the U.S. Environmental Protection Agency's (EPA's) activities concerning the use of biosolids. We have completed our compilation of the information you requested (see enclosed).

Thank you for the opportunity to share this information with you. If you have questions or if you need any further information, please contact me or have your staff call Christina Moody, in EPA's Office of Congressional and Intergovernmental Relations, at (202) 564-0260.

Sincerely,

Benjamin H. Grumbles
Assistant Administrator

Enclosure

The U.S. Environmental Protection Agency's (EPA's) Activities Concerning the Use of Biosolids - A Report for Senator Boxer

November 2007

Introduction:

This is a report for Senator Barbara Boxer concerning EPA's activities on biosolids from fiscal year 2002 to the present. In a previous response, dated October 23, 2007, EPA highlighted a few of the more substantive actions it has taken since 2002. These included the biennial reviews pursuant to the Clean Water Act (CWA), field research that measured certain environmental conditions associated with the test application and development of new analytical methods for measuring the concentrations of 57 specific prescription drugs, antibiotics, steroids, and hormones in sewage sludge.

More comprehensively, EPA's biosolids activities since 2002 have focused on five general areas: (1) EPA's Action Plan in response to the 2002 National Research Council Report recommendations, (2) investigating radioactivity in biosolids, (3) responding to a Center for Food Safety petition calling for a moratorium on land application of biosolids, (4) revising the Comprehensive Procurement Guidelines, and (5) initiating various other research activities. These activities are explained in more detail below. Additional biosolids or sewage sludge information that may be useful is also provided herein either by reference to a URL address or by enclosing a copy of the respective document, unless noted otherwise.

Background:

EPA uses the term "biosolids" interchangeably with "sewage sludge" throughout this report. Sewage sludge is a solid, semi-solid or liquid residue generated during the treatment of domestic sewage in a treatment works.

In 2000, EPA asked the National Academy of Sciences, National Research Council (NRC), to evaluate the scientific basis of EPA's regulations and standards for chemical and microbial (pathogens) pollutants in sewage sludge that is land-applied. In 2002, the NRC issued its report titled Biosolids Applied to Land; Advancing Standards and Practices. The NRC Committee concluded that "There is no documented scientific evidence that the part 503 rule has failed to protect human health. However, additional scientific work is needed to reduce persistent uncertainty about the potential for adverse human health effects from exposure to biosolids."

The NRC Committee recognized that land application of sewage sludge is a widely used, practical option for managing the large volume of sewage sludge generated at wastewater treatment plants that otherwise would be disposed of at landfills or by incineration. The Committee also identified a need to update the scientific basis of Part 503 to ensure that the current chemical and microbial standards are supported by current scientific data and risk assessment methods.

EPA's Biosolids Action Plan:

Upon release of the NRC report in 2002, EPA established a committee to respond to the

recommendations in the report. The EPA committee identified and prioritized each NRC recommendation, and developed an action plan to carry out the activities identified in response to the NRC recommendations. This action plan considered: (1) major concerns presented in public comments received on a preliminary response dated April 9, 2003; (2) the findings of the Water Environment Research Foundation (WERF) Research Summit in July 2003; (3) EPA's existing research commitments in response to areas in the NRC report; and (4) feasibility of responding to specific areas given available resources.

On December 31, 2003, per the activities above and in response to the NRC recommendations, EPA published its Action Plan in the Federal Register (68 FR 75531). EPA's Action Plan for responding to the NRC report included 14 regulatory and non-regulatory projects aimed at strengthening the biosolids program. Since the NRC issued its report in 2002, EPA has taken steps to enhance research to improve the sewage sludge program and to begin implementing recommendations by the NRC (e.g., a biosolids survey, the development of analytical methods for fecal coliform and Salmonella, progress towards determining causality between exposure to biosolids and alleged health effects, and the development of a rapid incident response program). Of the 14 projects, eight are completed and others are still in progress. The table in *Attachment A* summarizes the 14 projects in the EPA's Action Plan and the current status of each project.

Radioactivity in Biosolids:

In response to recommendations from the General Accounting Office in its 1994 report, *Nuclear Regulation: Action Needed to Control Radioactive Contamination at Sewage Treatment Plants* and a subsequent Joint House and Senate Hearing, the Interagency Steering Committee on Radiation Standards (ISCORS) formed in 1995, established a Sewage Sludge Subcommittee to conduct a Nuclear Regulatory Commission and EPA joint survey to collect information concerning radioactive materials in sewage sludge and ash from Publicly Owned Treatment Works (POTWs).

The information was used to perform dose modeling to help with the interpreting the results of the survey and developing guidance on managing radioactive materials in sewage sludge and ash for POTWs. Specifically, these activities were designed to (1) determine the extent to which radioactive contamination of sewage sludge and ash is occurring; (2) notify POTWs of the potential for radioactive materials to re-concentrate in the sewage sludge, and the possibility that POTWs may need to test or monitor their sludge for radioactive content; and (3) establish limits for radioactivity in sludge and ash to ensure the health of treatment plant workers and the public. The ISCORS' final outputs included three reports that are posted on the ISCORS website under its library of documents, available at http://www.iscors.org/library.html. The ISCORS effort to address the management of radioactive materials in sewage sludge and ash concluded that:

- The levels of radioactive materials found in sewage sludge and ash samples from most POTWs are generally low and the associated radiation exposure to workers and the general public is very low, and not likely to be of concern.

- The estimated radiation doses to potentially exposed individuals are generally well below levels requiring radiation protection actions. For unique POTW worker and on-site resident scenarios, doses exceeding protective standards could occur, primarily due to indoor

radon generated as a decay product of naturally occurring radioactive materials. Such exposures can be significantly reduced through the use of readily available radon testing and mitigation technologies such as those described in the Agency's guidance for controlling radon and indoor air pollution.

- Where the estimated annual dose from all radionuclides exceeds 10 mrem yr-1, ISCORS recommends that the POTW operator consult with their state radiation protection regulatory agency or seek the assistance of a radiation protection specialist, such as a certified health physicist, in developing a sampling and analysis plan. The 10 mrem yr-1 criterion is not a limit, does not include radon, and is not intended to suggest that higher dose levels are unacceptable.

Response to the Center for Food Safety Petition:

EPA received an October 7, 2003 petition from the Center for Food Safety, Washington, DC on behalf of itself and 72 other organizations. Specifically, the petitioners requested that EPA place an immediate moratorium on the land application of sewage sludge by taking the following actions:

1. Freeze the issuance of new National Pollutant Discharge Elimination System (NPDES) permits authorizing the land application of bulk sewage sludge;

2. Rewrite and reissue NPDES permits to require a method of sewage sludge disposal other than land application to replace all NPDES permits currently in force that allow the land application of bulk sewage sludge; and,

3. Initiate rulemaking to change the Part 503 Sludge Rule promulgated under the authority of the Clean Water Act (CWA) at 40 CFR Part 503 to eliminate land application as an acceptable practice for sewage sludge disposal.

After careful evaluation, EPA denied the petition in December 2003. EPA's response to the petition is enclosed in *Attachment B.*

Comprehensive Procurement Guidelines:

On September 7, 2007, EPA's Administrator signed a final rule that amended EPA's Comprehensive Procurement Guideline (CPG). EPA promulgated this amendment (CPG V) under the authority of sections 2002(a) and 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976 (RCRA), 42 U.S.C. 6912(a) and 6962.

This rule (CPGV) is the most recent installment in EPA's guidelines program intended to foster and support markets for recycled-content products. The rule modifies some aspects of a previously promulgated designation in the CPG Landscaping Products category. The key modification was that EPA expanded the definition of "compost" designated items to include compost made from biosolids and manure, as well as the previously covered compost made from

yard trimmings and food waste, and does not limit the designation to those four specific types of recovered organic materials.

EPA also added "fertilizer made from recovered materials" as a designated landscaping item. EPA's action in amending the description of the designated item did not authorize the application of biosolids on public land in any circumstances where such use would otherwise not be authorized under current Federal law and regulation. The effect of the changes is merely to add biosolids and fertilizer composed of biosolids to the items that EPA has concluded may be produced with recovered materials contents. Once a product is designated by EPA on the Comprehensive Procurement Guidelines, procuring agencies are required to purchase it with the highest recovered material content level practicable, given reasonable competition, product price, performance, and availability.

In addition, in a Recovered Materials Advisory Notice (RMAN V), EPA has provided further guidance to procuring agencies when purchasing compost and fertilizers. The RMAN V recommends specifications to assist procuring agencies in fulfilling their statutory obligation to purchase designated items with the highest percentage of recovered materials content practicable. Under the Resource Conservation and Recovery Act (RCRA), procuring agencies will be required to begin purchasing the newly-designated items on September 14, 2008. More information is available on the web at: http://www.epa.gov/epaoswer/non-hw/procure/rman5.htm.

Other Biosolids Activities:

A number of other EPA biosolids activities are ongoing. EPA continues the development of criteria for assessment of microbial risks to human health following exposure to biosolids, assessing microbial risk assessment models that focus on ingestion of *Salmonella* and other pathogens within biosolids, and development of microbial-ecology risk assessments for environmental release of antimicrobial substances. Other activities include those listed below.

Residual Control of Excess Phosphorus in Biosolids:

A final report was issued by George O'Connor of Florida concerning the use of drinking water residuals to control excess phosphorus levels in soils from land applied residuals (e.g., biosolids) and manures titled Land Application of Residuals and Manures in the Lake Okeechobee Watershed: P [Phosphorous] Considerations, February 2006. The experiment, with grant funds from EPA, provided an opportunity to track phosphorus forms and solubility in field situations over time. Researchers from the Florida Department of Environmental Protection concluded that wastewater treatment is an effective means for controlling phosphorus in soils. Phosphorus immobilized by wastewater treatment is stable and will remain fixed in soils for a long period of time. Implications are that phosphorus will not runoff and contribute to ambient water pollution. This document is included in *Attachment C.*

Composted Biosolids in Watershed Restoration:

EPA published a handbook intended for use in restoration of lands disturbed by forest management activities in the Pacific Northwest. The goal is to share information and to provide

examples of successful restoration projects using compost.

A final handbook involving the use of composted biosolids in watershed restoration efforts titled Compost Use in Forest Land Restoration (EPA832-R-05-004; July 2005) is available at: http://www.epa.gov/epaoswer/non-hw/green/pubs/compost-uw.pdf

Estrogenic and Androgenic Compounds in Biosolids:

This is an ongoing project by EPA's Office of Wastewater Management (OWM). This project is funded with CWA Section 104(b)(3) water quality cooperative agreement funds to Duke University to research the presence, fate and treatability of estrogenic and androgenic compounds in wastewater and biosolids (Cooperative Agreement #83292301, $100,000 in FY2005; project period 10/01/2005 - 03/31/2008). Results are expected in 2008.

Triclocarban in Biosolids:

Triclocarban is an antiseptic agent used commercially in soaps. This project, funded by EPA's Office of Wastewater Management using CWA Section 104(b)(3) water quality cooperative agreement funds for the University of Florida at Gainesville, is studying the fate and transport of biosolids-borne triclocarban (Cooperative Agreement #83288701, $87,400 from EPA's OWM in FY2005; project period 9/01/2005 - 8/31/2008). Results are expected in 2008.

EPA's Biosolids Research:

EPA relies on sound science to safeguard both human health and the environment. The EPA Office of Research and Development (ORD) is the scientific research arm of EPA. ORD's leading-edge research helps provide the solid underpinning of science and technology for the Agency. ORD conducts research on ways to prevent pollution, protect human health, and reduce risk. The work at ORD laboratories, research centers, and offices across the country helps improve the quality of air, water, soil, and the way we use resources. Applied science at ORD builds our understanding of how to protect and enhance the relationship between humans and the ecosystems of earth.

EPA's research efforts complement work being done by others outside the Agency. EPA plans to participate in and/or use, as appropriate, outside research to supplement the Agency's activities and to enhance the part 503 program. For example, recent studies by Rusin et al. (2003a) indicate that biosolids treatment processes are effective in reducing the density of Staphylococcus aureus in municipal sewage sludge. According to the researchers, biosolids are not a likely source of S. aureus exposure or infection following exposure to land application. Also, other recent studies (Pepper et al. 2006, Brooks et al. 2004, Brooks et al. 2005a, Pillai and Ricke 2002, and Tanner et al. 2005) conclude that overall community risk of infection from bioaerosols during land application was relatively negligible. Occupational risk during land application was higher than community risk, but is still low.

In some cases, EPA leverages research with those outside the Agency for better results. For example, EPA is collaborating with the Water Environment Research Foundation (WERF), the Center for Disease Control and Prevention, citizens, and others to investigate whether causality between biosolids exposure and reported health outcomes can be established. Also, EPA is working with WERF on activities related to developing quantitative microbial risk assessment, as well as communicating results to the public.

EPA initiated its own research in many different areas specifically recommended by the NRC. The research was described in a 2003 Water Quality Research Program Multi-year Plan (MYP). The plan is available at (http://www.epa.gov/osp/myp/wq.pdf).

The goals of the MYP are to provide approaches, methods and tools to assess the exposures and reduce the human health risks from biosolids contaminants. The results of the research provide information for EPA, States and others in updating biosolids guidance and regulations. Research projects include exposure and risk assessment, biosolids management, pathogens, analytic methods development, pollutant occurrence survey, and regulatory support activities.

A summary of EPA's research projects and other related activities along with a brief summary of each and the products produced is included in *Table 1*, which is attached. Copies of available completed or in progress research documents are attached behind *Table 1* or have their URL addresses provided.

New Biosolids Guidance Manuals:

New EPA guidance on biosolids by EPA is expected to include two manuals; (1) Alkaline Stabilization Manual for treatment of wastewater, and (2) an update to the Process Design Manual of 1995. These manuals should help provide treatment guidance and best management practices for managing treatment, use, and disposal of biosolids. The Alkaline Stabilization Manual is being peer reviewed and is expected to be issued in 2008. The Process Design Manual is expected to take approximately two years to complete.

Enforcement and Inspection:

Attachment D includes enforcement and inspection reports for EPA's Office of Enforcement and Compliance Assurance (OECA). The amount of resources spent on biosolids inspections and enforcement activities varies by EPA Region.

EPA Resources:

The following *Table 2* highlights the aggregate resources across EPA headquarters and Regional Offices for biosolids research, regulatory development, legal activities and implementation for the period 2002 to present.

Table 2. Summary of EPA's Biosolids Resources for the Period 2007 to 2008

Resource Area	FY 2002 Enacted	FY 2003 Enacted	FY 2004 Enacted	FY 2005 Enacted	FY 2006 Enacted	FY 2007 Enacted	FY 2008 Proposed Budget
$000	$700	$2,107	$2,664	$2,185	$2,500	$1,971	$1,592
FTE	9.7	13.4	16.4	16.9	17.1	15.85	11.35

Other information:

If you are interested, additional biosolids information may be found at the following websites:

- EPA's Office of Wastewater Management at http://www.epa.gov/owm/mtb/biosolids/index.htm
- EPA's Office of Science and Technology at http://www.epa.gov/waterscience/biosolids/

Attachment D

EPA Biosolids Inspection and Enforcement Summary

The following inspection and enforcement reports come directly from EPA's Headquarters (HQ) Office of Enforcement and Compliance Assurance (OECA).

EPA Enforcement and Compliance Assurance (OECA) Report

In response to your request, attached are three summary tables highlighting EPA's biosolids inspections and enforcement actions for FY 2002 to present. All of the enforcement actions are civil administrative actions. The attachments are as follows:

- Total # EPA Sludge/Biosolids Inspections at NPDES Majors and Minors at Facilities Inspections from 10/1/2001 through 10/14/2007, 1 page.
- Total # EPA Sludge/Biosolids Inspections at NPDES Major and Minors at Facilities Inspections from 10/1/2001 through 10/14/2007, All permit types at major and minor facilities, 19 pages.
- PDF file: Integrated Compliance Information System (ICIS), CWA 405 Enforcement Actions FY2002 thru 2007, 106 pages.

Regarding the portion of the request on biosolids-related budget information, OECA does not maintain data on biosolids-related funding and manpower. OECA's budget has not been media based or line item based in many years. OECA's budget categories are broad functional categories like compliance assistance, compliance monitoring, and civil enforcement, and reflect the Government Performance Results Act structure.

Three attachments for EPA OECA HQ follow.