ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 63

[AD–FRL–7215–5]

RIN 2060–AH13

National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills

AGENCY: Environmental Protection Agency (EPA).

ACTION: Supplement to proposed rule.

SUMMARY: This action is a supplemental proposal to the national emission standards for hazardous air pollutants (NESHAP) for municipal solid waste (MSW) landfills. On November 7, 2000, EPA proposed NESHAP for MSW landfills and requested comments on bioreactors. Based on comments to the proposed rule and additional information and analyses, EPA is adding a definition of bioreactors to the proposed rule and is proposing timely control for bioreactors located at MSW landfills with a design capacity greater than or equal to 2.5 million megagrams (Mg) and 2.5 million cubic meters (m^3).

DATES: *Comments.* Comments are requested only on information and proposed requirements for bioreactors presented in this action. Submit comments on or before June 24, 2002. If a public hearing is held, written comments must be received by July 8, 2002.

Public Hearing. If anyone contacts EPA requesting to speak at a public hearing by June 3, 2002, a public hearing will be held on June 6, 2002.

ADDRESSES: *Comments.* By U.S. Postal Service, send comments (in duplicate if possible) to: Air and Radiation Docket and Information Center (6102), Attention Docket Number A–98–28, U.S. EPA, 1200 Pennsylvania Avenue, NW., Washington DC 20460. In person or by courier, deliver comments (in duplicate if possible) to: Air and Radiation Docket and Information Center (6102), Attention Docket Number A–98–28, U.S. EPA, 401 M Street, SW., Washington, DC 20460. The EPA requests a separate copy also be sent to the contact person listed below (see **FOR FURTHER INFORMATION CONTACT**).

Public Hearing. If a public hearing is held, it will begin at 10 a.m. and will be held at EPA's Office of Administration Auditorium in Research Triangle Park, North Carolina, or an alternate site nearby. You should contact JoLynn Collins, Waste and Chemical Processes Group, Emission Standard Division, U.S. EPA (C439–03), Research Triangle Park, NC 27711, telephone (919) 541–5671 to request a public hearing, to request to speak at a public hearing, or to find out if a hearing will be held.

Docket. Docket No. A–98–28 for this regulation and associated Docket No. A–88–09 contain supporting information used in developing the standards. These dockets are located at the U.S. EPA, 401 M Street SW, Washington, DC 20460, in Room M–1500, Waterside Mall (ground floor, central mall), and may be inspected from 8:30 a.m. to 5:30 p.m., Monday through Friday, excluding legal holidays. Copies of docket materials may be obtained by request from the Air Docket by calling (202) 260–7548. A reasonable fee may be charged for copying docket materials.

FOR FURTHER INFORMATION CONTACT: Ms. Michele Laur at Waste and Chemical Processes Group, Emission Standards Division (C439–03), Office of Air Quality Planning and Standards, U.S. EPA, Research Triangle Park, NC 27711, telephone number (919) 541–5256, facsimile number (919) 541–0246, electronic mail address ''*laur.michele@epa.gov.*''

SUPPLEMENTARY INFORMATION:

Comments. Comments and data may be submitted by electronic mail (e-mail) to: *a-and-r-docket@epa.gov.* Electronic comments must be submitted as an ASCII file to avoid the use of special characters and encryption problems. Comments will also be accepted on disks in WordPerfect® file format. All comments and data submitted in electronic form must note the docket number: (Docket No. A–98–28). No confidential business information (CBI) should be submitted by e-mail. Electronic comments may be filed online at many Federal Depository Libraries.

Commenters wishing to submit proprietary information for consideration must clearly distinguish such information from other comments and clearly label it ''Confidential Business Information.'' Send submissions containing such proprietary information directly to the following address, and not to the public docket, to ensure that proprietary information is not inadvertently placed in the docket: Attention Ms. Michele Laur, c/o OAQPS Document Control Officer (C404–02), U.S. EPA, Research Triangle Park, NC 27711.

The EPA will disclose information identified as CBI only to the extent allowed and by the procedures set forth in 40 CFR part 2. If no claim of confidentiality accompanies a submission when it is received by the EPA, the information may be made available to the public without further notice to the commenter.

Public Hearing. Persons interested in presenting oral testimony or inquiring as to whether a hearing is to be held should contact Ms. JoLynn Collins at the Emission Standards Division (C439–03), U.S. EPA, Research Triangle Park, North Carolina 27711, telephone (919) 541–5671, at least 2 days in advance of the public hearing. Persons interested in attending the public hearing must also call Ms. Collins to verify time, date, and location of the hearing. The public hearing will provide interested parties the opportunities to present data, views, or arguments concerning this supplemental proposal.

Docket. The docket is an organized an complete file of all the information considered by the EPA in the development of this rulemaking. The docket is a dynamic file because material is added throughout the rulemaking process. The docketing system is intended to allow members of the public and industries involved to readily identify and locate documents so that they can effectively participate in the rulemaking process. Along with the proposed and promulgated standards and their preambles, the contents of the docket will serve as the record in the case of judicial review. (See section 307(d)(7)(A) of the Clean Air Act (CAA).) The regulatory text and other materials related to this rulemaking are available for review in the docket, or copies may be mailed on request from the Air Docket by calling (202) 260–7548. A reasonable fee may be charged for copying docket materials.

World Wide Web (WWW). In addition to being available in the docket, an electronic copy of today's supplemental proposal will also be available on the WWW through the Technology Transfer Network (TTN). Following signature, a copy of today's supplemental proposal will be posted on the TTN's policy and guidance page for newly proposed or promulgated rules at the following address: *http://www.epa.gov/ttn/oarpg.* The TTN provides information and technology exchange in various areas of air pollution control. If more information regarding the TTN is needed, call the TTN HELP line at (919) 541–5384.

Regulated Entities. Categories and entities potentially regulated by this action:

Category	NAICS code	SIC code	Examples of potentially regulated entities
Industry: Air and water resource and solid waste management.	924110	9511	Solid waste landfills.
Industry: Refuse systems—solid waste landfills	562212	4953	Solid waste landfills.
State, local, and Tribal government agencies	562212 924110	4953	Solid waste landfills; Air and water resource and solid waste management.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. To determine whether your facility would be regulated by this action, you should carefully examine the applicability criteria in §§ 63.1935 and 63.1940 of the landfills proposed rule. If you have any questions regarding the applicability of this action to a particular entity, contact the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

Outline. The information presented in this supplemental proposal is organized as follows:

I. Statutory Authority

A. What Is the Source of Authority for Development of NESHAP?

Section 112 of the CAA requires us to list categories and subcategories of major sources and area sources of hazardous air pollutants (HAP), and to establish NESHAP for the listed source categories and subcategories. The category of major sources covered by today's supplemental proposal was on our initial list of HAP emission source categories as published in the **Federal Register** on July 16, 1992 (52 FR 31576). For ''major'' source MSW landfills (those that have the potential to emit 10 tons per year (tpy) of any one HAP or 25 tpy of any combination of HAP), the CAA requires us to develop standards that require the application of maximum achievable control technology (MACT).

Under section 112(k) of the CAA, EPA developed a strategy to control emissions of HAP from area sources in urban areas, identifying 33 HAP that present the greatest threat to public health in the largest number of urban areas as the result of emissions from area sources. Municipal solid waste landfills were listed as one of the 29 area source categories on July 19, 1999 (64 FR 38706) because 13 of the listed HAP are emitted from MSW landfills.

B. What Criteria Are Used in the Development of NESHAP?

Section 112 of the CAA requires that we establish NESHAP for the control of HAP from both new and existing major sources. The CAA requires the NESHAP to reflect the maximum degree of reduction in emissions of HAP that is achievable. This level of control is commonly referred to as the MACT.

The MACT floor is the minimum control level allowed for NESHAP and is defined under section 112(d)(3) of the CAA. In essence, the MACT floor ensures that the standard is set at a level that assures that all major sources achieve the level of control at least as stringent as that already achieved by the better-controlled and lower-emitting sources in each source category or subcategory. For new sources, the MACT floor cannot be less stringent than the emissions control that is achieved in practice by the best-controlled similar source. The MACT standards for existing sources can be less stringent than standards for new sources, but they cannot be less stringent than the average emissions limitation achieved by the best-performing 12 percent of existing sources in the category or subcategory (or the best-performing five sources for categories or subcategories with fewer than 30 sources).

In developing MACT, we also consider control options that are more stringent than the floor. We may establish standards more stringent than the floor based on the consideration of cost of achieving the emissions reductions, any non-air quality health and environmental impacts, and energy requirements.

Finally, the CAA allows NESHAP to reflect an alternative standard for area sources. The alternative standard provides for the use of generally available control technologies (GACT) or management practices to reduce emissions of HAP.

II. Background

On November 7, 2000, we proposed NESHAP for MSW landfills (65 FR 66680). When final, the rule will fulfill the requirements of section 112(d) of the CAA, which requires the Administrator to regulate emissions of HAP, and help implement the Urban Air Toxics Strategy developed under section 112(k) of the CAA.

In the November 7, 2000 proposed landfills NESHAP, we described differences in emissions rates over time from landfills operated as bioreactors as opposed to conventional landfills. We also requested additional information on emissions from bioreactors. We solicited comments on requiring installation of collection and control systems sooner after waste is deposited in bioreactor cells.

We received five public comments addressing bioreactors. The commenters agreed that because of the enhanced biodegradation of waste in bioreactors, they generate landfill gas, including organic HAP, at higher rates soon after waste placement. The industry commenters stated that research is ongoing and there is insufficient information to precisely estimate emissions from bioreactors. They recommended timely collection and

control of bioreactors, but strongly suggested that EPA issue guidance rather than rules until additional data are collected. Other commenters representing State agencies commented that many bioreactors had installed collection and control systems prior to initiating liquids addition, and that the landfills NESHAP should require installation of collection and control systems prior to initiating liquids addition for all bioreactors, regardless of landfill size.

We reviewed the public comments and other recent literature. We also gathered additional information on the number of bioreactors, their control levels, and the timing of collection and control system installation. This supplemental proposal describes the available information, presents a supplement to the November 7, 2000 proposed landfills NESHAP, and describes the rationale for the proposed supplemental requirements. The additional information and analyses are contained in Docket No. A–98–28.

III. Summary of Supplemental Proposed Requirements for Bioreactors

We are proposing timely installation of collection and control systems in bioreactors located at landfills with a total landfill design capacity of greater than or equal to 2.5 million Mg and 2.5 million m^3. These requirements would apply to bioreactors within landfills at both major and area sources if the landfills meet the design capacity criteria. The proposed supplemental control requirements apply only to active landfills (i.e., existing and new landfills that are still accepting waste as of the date of publication of the final rule or have the capacity to accept additional waste and are not permanently closed). The requirements would not apply to bioreactors at permanently closed landfills.

The supplemental proposal would require the same level of control for the bioreactor portions of landfills as would be required in the proposed landfills NESHAP (65 FR 66680, November 7, 2000) for conventional MSW landfills (i.e., a well-designed and operated gas collection system and a control device achieving 98 percent reduction or 20 parts per million by volume (ppmv) of nonmethane organic compounds (NMOC) as is required in the final new source performance standards/emission guidelines (NSPS/EG) at 40 CFR part 60, subparts Cc and WWW. However, if you own or operate a bioreactor at a landfill that is a new affected source, then you would be required to install the gas collection and control system in the bioreactor prior to initiating liquids addition, regardless of whether the landfill emissions rate equals or exceeds the 50 Mg/yr emissions rate criteria in the NSPS/EG. Startup of the collection and control system would be required within 90 days after initiating liquids addition. If the bioreactor is located at a landfill that is an existing affected source, then you must install and begin operating a collection and control system for the bioreactor within 3 years after publication of the final landfills NESHAP unless earlier control is already required by the NSPS/EG. You would be required to conduct a performance test and report the results within 180 days after startup of the bioreactor collection and control system.

The proposed timing for extending the collection and control system into new cells or areas of the bioreactor is also different from conventional landfills. Once control of your bioreactor is required, you would need to install collection and control systems in new areas or cells of the bioreactor prior to initiating liquids addition to that area, cell, or group of cells. Under the supplemental proposal, controls could be removed from the bioreactor portion of the landfill either: (1) When the criteria for control removal specified in the landfills NSPS/EG are met; or (2) when the bioreactor is permanently closed, liquids addition has ceased, and liquids have not been added to the bioreactor for at least 1 year.

At some landfills, a portion of the landfill is a bioreactor, and the remainder is designed and operated as a conventional landfill. In these situations, the control requirements and the timing of control installation for the conventional portion of the landfill would not change. We are not proposing to revise the NSPS/EG. Thus, you would continue to use the equations and factors in the NSPS/EG to calculate the annual uncontrolled NMOC emissions rate for your landfill as a whole (including the total waste placed in the bioreactor area and the conventional area). When your calculated uncontrolled NMOC emissions equal or exceed 50 Mg/yr, then you would install a collection and control system for the conventional portions of the landfill according to the schedule in the NSPS, or the applicable State, Tribal, or Federal plan that implements the EG.

IV. Rationale for the Proposed Requirements for Bioreactors

A. Why Is EPA Proposing Supplemental Requirements for Bioreactors at MSW Landfills?

Based on review of public comments and other available information, we have concluded that bioreactors are a distinct operation within MSW landfills, and that the appropriate timing of control for bioreactors is different from that for conventional landfills. The design and method of operation of bioreactors is different from conventional landfills, resulting in different emissions characteristics.

Conventional landfills are typically operated as ''dry tombs'' by minimizing the infiltration of liquids into the landfill. This can be accomplished by placement of bottom and side liners and by placement of a low permeability final cap over the waste. In addition, many sites install and operate leachate collection systems to remove leachate and thus minimize groundwater contamination. That method also results in a slower biodegradation process and a reduced rate of landfill gas generation. Some conventional landfills recirculate some or all of the collected leachate. A typical moisture content of the waste in a conventional landfill is approximately 20 percent, but it may be lower in arid areas or where all collected leachate is removed and infiltration is minimized.

A bioreactor is defined as an MSW landfill or portion of an MSW landfill where any liquid other than leachate is added in a controlled fashion into the waste mass (often in combination with recirculating leachate) to reach a minimum average moisture content of at least 40 percent by weight to accelerate or enhance the anaerobic (without oxygen) biodegradation of the waste. The minimum 40 percent moisture level is based on literature that suggests the moisture content of the waste should remain in the range of 40 to 70 percent to optimize bioreactor operation. Comments on the moisture level used in the bioreactor definition are requested. The EPA also requests comments on the proposed exclusion of the definition of landfills that recirculate leachate but do not add any other liquids. If you know of situations where leachate recirculation alone can reach a 40 percent moisture level and start and sustain bioreactor operation, please provide information.

The proposed definition of bioreactor includes hybrid bioreactors, which are managed so that the waste undergoes a short (e.g., 60 day) aerobic stage, after which the waste is covered over and operated as an anaerobic bioreactor for

several years. The long-term operation, emissions pattern, and applicable control techniques for hybrid bioreactors are similar to anaerobic bioreactors. The rapid biodegradation of waste in a bioreactor leads to more rapid generation of landfill gas compared to a conventional landfill.

The vast majority of bioreactors are anaerobic or hybrid bioreactors, with at least 24 operating as of 2001. The EPA expects a large number of anaerobic bioreactors to start operation in the next few years because of their economic benefits and potential environmental benefits. For example, operating a landfill as a bioreactor extends the use of current sites and reduces the need for new sites, reducing land use and associated environmental impacts, and land purchase costs. Preliminary information suggests that bioreactors also improve the quality of leachate potentially resulting in reduced environmental impacts if any groundwater contamination were to occur. Economic benefits include avoiding the costs of leachate treatment, transport, and disposal. In addition, bioreactors emit a similar total amount of gas as conventional landfills but emit it more quickly over a shorter amount of time, thus owners and operators can convert landfill gas to energy more economically.

Because of the rapid biodegradation of waste, landfill gas (including methane, NMOC, and organic HAP) is generated at a significantly greater rate in the first couple of years after waste placement in anaerobic and hybrid bioreactors compared to conventional landfills. For example, one study indicates that in approximately 90 days, bioreactor landfills generate gas at a rate similar to what a conventional MSW landfill generates at 2 years. Public comments and published studies confirm the greater landfill gas generation rates early in the life of anaerobic and hybrid bioreactors. Emissions rates cited in the comments and literature range from 2 to 10 times as much as conventional landfills. After peaking at a higher generation rate near the time of landfill closure, bioreactor landfill gas generation declines more rapidly than conventional landfill gas generation. The total long-term amount of landfill gas from an anaerobic bioreactor is expected to be approximately the same as from a conventional landfill with the same amount of waste because the total potential landfill gas generation depends primarily on the amount of material in the waste that can eventually be decomposed. However, bioreactor landfill gas generation is significantly higher than conventional landfill gas generation prior to and shortly after closure and significantly lower in the later years. References indicate that a bioreactor shortens the period of waste degradation and stabilization, and thus the period of most of the gas generation, from 30 to 50 years for a conventional landfill to 5 to 10 years for an anaerobic bioreactor.

Because bioreactors generate significantly more landfill gas, including organic HAP, earlier in their life than conventional landfills, the methods used in the proposed rule to calculate uncontrolled emissions and the required timing for collection and control system installation that apply to conventional landfills are not appropriate for bioreactors. The November 2000 proposed landfills NESHAP, which refer to the NSPS control requirements, would require landfills to estimate their NMOC emissions using specified equations and procedures. After landfills reach or exceed 50 Mg/yr of NMOC, they must install collection and control systems within 30 months. Gas collection must then be extended into each cell or area within the landfill within 2 years after waste is first placed in that cell or area if the area is at final grade or within 5 years if the area is still active.

For bioreactors, the 50 Mg/yr NMOC uncontrolled emissions rate would be reached sooner than calculated by the procedures in the NSPS/EG. Furthermore, because landfill gas generation rates from bioreactors are significantly higher in the early years after waste placement, allowing 30 months after uncontrolled estimated emissions reach 50 Mg/yr to install controls would allow a much higher proportion of total bioreactor emissions, including HAP, to be released uncontrolled. Modeling of a landfill in a non-arid location with a design capacity of 2.5 million Mg and a 20-year life indicates that the NSPS/EG Tier 1 procedures would not require control installation for 5 years. In this time, a bioreactor accepting the same amount of waste would have potentially emitted a total of 130 Mg of HAP and 680 Mg of NMOC. (This is based on a k value of 0.1 for the bioreactor, which may be conservatively low, so bioreactor emissions could be higher.) If the same landfill were in an arid climate, Tier 1 procedures would not require control installation for 8 years. In this time, a bioreactor accepting the same amount of waste would have potentially emitted 310 Mg of HAP and 1,600 Mg of NMOC. Due to the different emissions pattern of bioreactors, it is appropriate to require control at the start of bioreactor operation (initiation of liquids addition).

The timing of control system removal for conventional landfills also may not be appropriate for bioreactor landfills. Because emissions decline more rapidly, a bioreactor would require control for a shorter length of time than a conventional landfill.

Because of the differences in technical design, operation, and emissions pattern over time, we have examined bioreactors as a distinct type of operation within an MSW landfill affected source, evaluated the MACT floor and MACT for bioreactor operations within MSW landfills, and are proposing supplemental requirements for bioreactors.

B. How Did EPA Determine the Bioreactor Portion of the MSW Landfill MACT Floor?

A landfill that is an affected source under the MSW landfills NESHAP may include an area designed and operated as a bioreactor and an area designed and operated as a conventional landfill. When there are distinct operations that have different emissions characteristics within an affected source, EPA often examines these operations separately in determining the MACT floor for the source as a whole. Details of the bioreactor analysis are contained in Docket No. A–98–28. The conventional landfill component of the MACT floor for existing landfills remains as described in the November 2000 proposed landfills NESHAP.

First, we reviewed the information available to identify specific bioreactors, determined which are located at major sources, and determined the level of control and the timing of installation of control systems at these bioreactors. We then determined the control level for the average (or median) of the best-performing five bioreactors, because there are fewer than 30 bioreactors at MSW landfills that are major sources. Under the CAA, the MACT floor for existing sources is based on the best performing 12 percent of sources in a category, or the best five sources if there are fewer than 30 sources in the category.

Based on the available data, we identified 24 anaerobic bioreactors. We used information from the landfills NESHAP database and other data provided by contacts familiar with these landfills to determine which of the bioreactors are located at landfills with maximum uncontrolled emissions equal to or greater than major source levels for HAP. We used the population of ten bioreactors to determine the MACT floor for bioreactors. The population includes

both major and ''synthetic area'' sources. A synthetic area source is a source which would otherwise be a major source, if not for enforceable emissions controls that have been installed. For example, some landfills with uncontrolled emissions above major source levels have installed controls to comply with the landfills NSPS/EG. Synthetic area sources are included in the population used to determine the MACT floor because to exclude synthetic area sources from the MACT floor determination would exclude the best-controlled sources in the industry. The CAA does not suggest that we should exclude a control technology from consideration in the MACT floor because it is so effective that it reduces emissions from a source such that the source is no longer a major source of HAP.

We identified the controls in use at the ten bioreactors with uncontrolled emissions at major source levels and determined the installation date for the controls. We found that all ten of the bioreactors have gas collection and control systems meeting the control levels in the NSPS/EG. We also found that at least five of the gas collection and control systems were installed or are being installed prior to initiating liquids addition to the bioreactors. The control systems were installed in the bioreactors sooner than required by the NSPS/EG. Therefore, we determined that the MACT floor level of control for bioreactor operations within existing MSW landfills at major sources is installation of a collection and control system that meets NSPS/EG requirements, and that these controls be installed prior to initiation of liquids addition.

Under the CAA, the new source MACT floor is based on the best-controlled similar source. We reviewed the information to determine the best control technology in use at the ten bioreactors at major and synthetic area sources, and we looked at when the control systems were installed. The best-controlled bioreactor installed a collection and control system that meets NSPS/EG requirements prior to initiation of liquids addition; therefore, this is the MACT floor level of control for bioreactor operations within new MSW landfills at major sources.

C. How Did EPA Consider Beyond-the-Floor Options?

The NSPS/EG requirements for landfill gas collection and emissions reductions are the best available control for organic HAP emissions from bioreactors. Requiring control system installation before the initiation of liquids addition to the bioreactor is the earliest possible time to install these controls. Therefore, there were no options to consider that were more stringent than the MACT floor. The gas collection system required by the NSPS/EG (described in 40 CFR 60.753) is designed to capture as much landfill gas as possible and requires several parameters to be monitored to ensure that capture, including pressure, nitrogen or oxygen concentration, temperature, and surface methane concentration. There are no data indicating that collection systems are in use that are more effective than those required by the NSPS/EG. Similarly, there are no known technologies that can regularly achieve organic HAP reduction efficiencies greater than those specified in the NSPS/EG. The NSPS/EG rules require 98 percent reduction efficiency for NMOC, or a maximum outlet concentration of 20 ppmv if an enclosed combustion device is used. The reduction efficiencies can be regularly achieved by several types of control technologies with proper operation. Because there are no more stringent collection and control technologies or other emissions reduction techniques available, and this supplemental proposal requires installation and operation of the floor level of control as soon as possible, no options beyond-the-floor currently exist for new or existing sources.

D. How Did EPA Determine the Standard for Bioreactor Operations at Area Source MSW Landfills?

As described earlier in this preamble, MSW landfills were listed as one of 29 area source categories under section 112(k) of the CAA. Area sources can be controlled using MACT or GACT. In the proposed landfills NESHAP (65 FR 66677, November 7, 2000), we concluded that GACT is the same as MACT (the NSPS/EG level of control) for area source landfills that meet the NSPS/EG design capacity and uncontrolled NMOC emissions rate criteria. We also found that landfills below these criteria do not warrant control.

For the supplemental proposal, we have examined what constitutes GACT for area source bioreactors. We determined that for bioreactors at landfills with design capacities greater than or equal to 2.5 million Mg and 2.5 million m^3, GACT is the same as MACT (i.e., timely installation of gas collection and control systems that meet NSPS/EG requirements). In reaching GACT decisions, we considered the control techniques that are generally available for area sources and factors such as the emissions reductions, environmental impacts, and costs of these controls. Since bioreactors generate landfill gas at a faster rate, significant HAP emissions reductions will be achieved by requiring timely control of bioreactor operations at MSW landfills with design capacities greater than or equal to 2.5 million Mg and 2.5 million m^3. The reductions in HAP will reduce health risks and environmental impacts associated with the HAP present in landfill gas.

The costs of requiring timely control for bioreactor operations at area source landfills with design capacities equal to or greater than 2.5 million Mg and 2.5 million m^3 were also considered in reaching the decision that GACT is the same as MACT for these area sources. These landfills would, at some point in their life, be required to install controls required by the NSPS/EG because the estimated uncontrolled NMOC emissions rates would reach the 50 Mg/yr emissions rate criteria. Requiring timely control of bioreactor operations means that costs will be incurred sooner and emissions reductions benefits realized earlier. An analysis of net present value (NPV) costs shows that timely control of bioreactors at a landfill with a design capacity of 2.5 million Mg is generally not more costly than controlling a conventional landfill according to the NSPS/EG schedule. If the landfill gas is used for energy, the NPV control costs for bioreactors are lower than for conventional landfills and result in greater HAP emissions reductions. For these reasons, GACT for bioreactor operations at area source landfills with design capacities greater than or equal to 2.5 million Mg and 2.5 million m^3 was determined to be the same as MACT.

For bioreactor operations at area source landfills with design capacities less than 2.5 million Mg or 2.5 million m^3, EPA determined that GACT does not require control. Requiring bioreactors at landfills below the design capacity cutoff to install controls would result in additional control costs because they are not otherwise required to install control by the NSPS/EG. The 2.5 million Mg and 2.5 million m^3 capacity exemption excludes those landfills that can least afford the costs of collection and control systems, including small businesses and, particularly, municipalities. Furthermore, the analysis for the NSPS/EG found that a more stringent design capacity exemption level would greatly increase the number of landfills required to apply control while only achieving 25 percent additional emissions reductions. The selected design capacity criteria required control

of less than 5 percent of all landfills (at the time of the NSPS/EG promulgation), but reduced NMOC emissions by approximately 53 percent. While bioreactors have a significantly increased landfill gas generation rate early in their life, it is expected that their overall lifetime total landfill gas generation potential would not be significantly greater than that of a conventional landfill accepting the same amount of waste. Therefore, the previous analyses of potential long-term emissions reductions from control of small landfills would also apply to bioreactors based on data currently available on bioreactor operations. We request comment on exemption of small/area source landfills with bioreactor operations from this supplemental proposal. If information is submitted that shows these small/area source landfills with bioreactor operations have emission characteristics that are significantly different than conventional small/area source landfills, the data will be considered.

Other reasons for exempting small landfills are described in the proposed landfills NESHAP (65 FR 66677, November 7, 2000), and they also apply to bioreactors. For example, most existing area source landfills are closed, and their emissions are already declining. Most newer landfills are much larger than the design capacity cutoff and would be subject to the GACT control requirements. Therefore, requiring timely control of bioreactor operations at these large, open landfills would achieve significant HAP reductions at those landfills where it will be most cost effective.

E. What Is EPA's Rationale for the Specific Requirements for Bioreactors?

1. How Did EPA Select the Affected Source?

Selection of the affected source defines the boundary of the unit to which a proposed rule applies. This definition is used in combination with the date ''construction'' or ''reconstruction'' is ''commenced,'' as defined in 40 CFR 63.2, to determine whether an affected source is an existing source or a new source.

The supplemental proposal would not substantially alter the affected source definition in the November 7, 2000 proposed landfills NESHAP. The affected source for the proposed landfills NESHAP remains the entire municipal solid waste landfill. The bioreactor is not a separate affected source, but is an operation within the affected source (the landfill). Defining the affected source broadly maintains consistency with the NSPS/EG and the proposed landfills NESHAP. As defined in section 112 of the CAA, a new source is one that commences construction or reconstruction after the Administrator first proposes NESHAP applicable to a source. Therefore, a bioreactor is subject to the new source requirements if the landfill where it is located commences construction or reconstruction after November 7, 2000, the date of the original proposal. A bioreactor is subject to the existing source requirements if the landfill where it is located commenced construction or reconstruction on or before that date. The definition of new and existing source is consistent with the definition in the November 7, 2000 proposed landfills NESHAP. Note that the control requirements for bioreactors at new and existing sources are the same, but the initial compliance date is different.

2. How Did EPA Determine When Collection and Control Systems Must Be Installed and When They Must Start Operation?

For bioreactors that are located at landfills that are new affected sources, the proposed changes would require gas collection and control systems to be installed in the bioreactor prior to liquids addition because this has been determined to be the MACT and GACT level of control for bioreactors at landfills with design capacities greater than or equal to 2.5 million Mg and 2.5 million m^3. However, it may not be feasible to begin operation of the control system on the day that liquids addition begins. It can take a few weeks for the biodegradation process to generate large amounts of gas, for the gas flow and composition to stabilize, to tune the gas collection system, and to achieve stable operation of a combustion control device. In recognition of this time period, we propose to require that bioreactor gas collection and control systems begin operation within 90 days after the first date of liquids addition. Bioreactors have been able to begin operation of control systems on this schedule. Furthermore, studies indicate that after 90 days of operation, a bioreactor may generate as much landfill gas as a conventional landfill does in 2 years of operation. The NSPS/EG and the November 7, 2000 proposed landfills NESHAP require gas collection and control systems to be installed and begin operation in new cells or areas of a controlled conventional landfill within 2 years after waste is first placed in that cell or area for areas that are at final grade (5 years for active areas that are still accepting waste). Since bioreactors may reach similar gas flows in 90 days, it is consistent to require the control system in the bioreactor to begin operation within 90 days of liquids addition.

Bioreactors that are located at landfills that are existing affected sources will need time to design and install a control system. For these bioreactors, we propose to allow 3 years from the date the final landfills NESHAP are published to install and begin operating a collection and control system. This allows time for the bioreactor owner/operator to design, install, and begin operating the gas collection and control system. The 3-year period is consistent with the maximum time section 112 of the CAA allows for existing sources to achieve compliance with NESHAP. Note that if an existing source landfill is required by the NSPS/EG to install control in a bioreactor before the 3-year date, the supplemental proposal would not change the control installation date.

If an existing source landfill installs and begins to operate a bioreactor at a date later than 3 years after the final landfills NESHAP are published, then a collection and control system for the bioreactor would be required to be installed before the initiation of liquids addition. The control system would be required to begin operation within 90 days after the first date of liquids addition. The control system installation date is consistent with the CAA section 112 requirements that existing sources must be in compliance by 3 years after the effective date of the rule and must maintain continuous compliance after that date. It is also consistent with the findings of the MACT floor determination that the best performing existing sources control bioreactors from the time they initiate liquids addition. It is also reasonable because existing source landfills that choose to begin operating bioreactors more than 3 years in the future will know the bioreactor control requirements and will have sufficient time to plan for compliance by the date they initiate liquids addition. The requirement to begin operating the bioreactor control system within 90 days of initiating liquids addition is based on the rationale described in the previous paragraph for new sources.

An initial performance test to demonstrate compliance with the emissions limits would be conducted, and the results submitted within 180 days after the date the collection and control system must begin operation. This 180-day time period is generally consistent with the performance test requirements for conventional landfills

in the November 7, 2000 proposed landfills NESHAP and the NSPS/EG.

As with conventional landfills, as one area of the bioreactor is filled to capacity, waste will be placed in new cells or areas of the bioreactor over time. Conventional landfills must extend collection and control systems into new cells or areas of the landfill within 2 years of when waste is first placed in that area for areas that are at final grade, or within 5 years of when the waste is first placed in that area for active areas that are still accepting waste. For bioreactors, we propose that starting on the date control of your bioreactor is required, collection and control be extended into each new cell or area of the bioreactor prior to initiating liquids addition in that area. Timely control of each area within the bioreactor is necessary to control the higher HAP emission rates in the first 2 to 5 years of bioreactor operation. As previously noted, a bioreactor cell can very quickly (within about 90 days of operation) reach the same gas generation rate as a conventional landfill cell does in 2 years of operation. A bioreactor shortens the time of waste degradation and stabilization and, thus, the period of most of the gas generation, from 30 to 50 years for a conventional landfill to a period of 5 to 10 years for a bioreactor. Since significantly greater emissions occur in the first 5 years of bioreactor operation, controls should be extended into new bioreactor areas more quickly than in new areas of conventional landfills. This requirement is consistent with the way bioreactors are designed. Typically, horizontal gas collection systems are installed in the same area as the leachate recirculation system as the bioreactor is being filled. When the waste has been placed in the area and the leachate recirculation is started, the gas collection system will already be in place and can begin operation.

3. Why Are There Different Criteria for When Collection and Control Systems Can Be Removed From Bioreactors?

We propose to allow more timely removal of controls from bioreactor operations because bioreactor emissions rates decline more rapidly after closure than conventional landfill emissions rates. The NSPS/EG and proposed landfills NESHAP allow capping or removal of the collection and control system from a conventional landfill after it meets three criteria: The landfill is permanently closed, measured uncontrolled emissions are less than 50 Mg/yr, and the control system has been in place for at least 15 years, as contained in 40 CFR 60.752(b)(5). The NSPS/EG and proposed landfills NESHAP also allow for nonproductive areas of a landfill to be excluded from control if these areas contribute less than 1 percent of the total amount of NMOC emissions from the landfill, as described in 40 CFR 63.759(a)(3).

We are proposing that you can choose to cap or remove controls from the bioreactor when either (1) the criteria in the NSPS/EG are met; or (2) the bioreactor is permanently closed (as defined in the NSPS/EG), liquids addition to the bioreactor has permanently ceased, and no liquids have been added to the bioreactor for at least 1 year. We are proposing this option because the 15-year control period may not be appropriate for bioreactors because bioreactor emissions are highest during the period of liquids addition, which generally stops when most biodegradation has occurred and the waste is stabilized. After this point, gas generation declines rapidly. As gas flows and HAP emissions rates decline, methane concentrations may also decline, thus requiring supplemental fuel to combust landfill gas. Waiting to remove controls until 1 year after liquids addition has ceased will ensure that the period of maximum emissions is controlled.

Our analyses show that even allowing timely removal, the total mass of emissions controlled from a bioreactor will be greater than from a conventional landfill accepting the same amount of waste. Improved control of landfill gas emissions will occur because the requirement for timely installation of controls in bioreactors is concurrent with the period when bioreactor emissions are concentrated over a shorter period of time. The timing of this requirement results in a higher proportion of emissions being collected, which allows for better control of landfill gas emissions.

If a bioreactor complies with the requirements for collection and control system removal in the proposed landfills NESHAP, it will also be considered in compliance with the NSPS or the Federal plan that implements the EG. This will avoid conflicting requirements where the proposed landfills NESHAP allow timely removal of control systems from bioreactors, whereas the NSPS or Federal plan requirements include the 15-year criterion for all landfills and could appear to continue to require bioreactor control for a longer period of time than the proposed landfills NESHAP.

4. How Did EPA Determine When the Initial Semiannual Compliance Report for Bioreactors Must Be Submitted?

The date for submittal of the initial semiannual compliance report including performance test results depends on the date that control system startup is required. For conventional landfills, the first report must be submitted within 180 days of installation and startup of the collection and control system per 40 CFR 60.757(f). For conventional landfills, the date of installation and startup are the same date. For bioreactors at new sources, and bioreactors that begin operating at existing sources after the 3-year compliance date, the proposed bioreactor provisions specify that the collection and control system must be installed by the date of liquids addition. However, the control system would not be required to start operation on the date of liquids addition. The control system must start operation within 90 days after the date liquids addition begins. The first semiannual compliance report containing the performance test results is therefore due within 180 days of the required date for control system startup (i.e., 270 days after the initiation of liquids addition). This allows the same 180-day period from the date of control system startup that is allowed for other landfills. It also allows time for the source to gain familiarity with operating the new control device, schedule and conduct a performance test, receive the analytical results, and prepare a report. After the initial report, semiannual reports will be submitted every 6 months, the same as proposed for conventional landfills.

For bioreactors at existing sources, the landfill has 3 years from the date the final rule is published to install and begin operating a gas collection and control system. For these bioreactors, the proposed date for control system installation and startup are the same date, so the initial compliance report including performance test results is due within 180 days of installation and startup of the collection and control system. This is the same as required for conventional landfills under 40 CFR 60.757(f).

The date for submitting the initial semiannual compliance report for some bioreactors is different for conventional versus bioreactor landfills, however, an owner or operator may elect to streamline subsequent semiannual reporting. The EPA expects that a number of owners or operators may be required to submit semiannual reports for both the bioreactor and the conventional portion of their landfill.

To streamline reporting for such owners or operators, EPA is proposing to allow them to delay submitting the subsequent semiannual report for the bioreactor until the initial or subsequent semiannual report is due for the conventional portion of the landfill. The owner or operator cannot delay submittal of the subsequent semiannual report for the bioreactor by more than 12 months after submittal of the initial semiannual report. For example, if the initial compliance report for the bioreactor were submitted on December 30, 2002, then the subsequent semiannual report for the bioreactor would be due on June 30, 2003. Suppose the semiannual report for the conventional portion of the landfill is due on September 30, 2003 (but no later than December 30, 2003). The owner or operator may delay submitting the semiannual report for the bioreactor from June 30 until September 30, when the report is due for the conventional portion of the landfill. Subsequent semiannual reporting for the bioreactor and the conventional portion of the landfill would be on the same schedule.

5. Why Are Moisture Content Records Needed and How Can Percent Moisture Be Determined?

To be considered a bioreactor, a liquid other than leachate must be added, and the waste must have a minimum average moisture content of 40 percent by weight. We expect that most landfills where liquid other than leachate is added will meet the definition of a bioreactor. If a landfill owner and/or operator complies with the bioreactor control requirements, they do not need to keep records of percent moisture content. If a landfill owner and/or operator adds liquid other than leachate but the portion of the landfill into which the liquid is added does not meet the 40 percent moisture criterion, they do not need to comply with the bioreactor control requirements. They must, however, keep a record of their percent moisture calculation to show that the landfill is not a bioreactor.

The proposed landfills NESHAP allow landfills to use site-specific procedures to calculate moisture content, rather than prescribing one specific method. Because of differences in climate, rainfall, waste composition, bioreactor design, and other factors, a single calculation method would not be appropriate for all landfills. Furthermore, allowing site-specific approaches minimizes the recordkeeping burden by allowing landfills to use calculations they already have available, assuming the procedures and assumptions are documented and appropriate.

A range of appropriate methods for calculation of landfill moisture content exists. For example, a simplified mass balance approach can be used. A landfill can track the amount of incoming waste, estimate the incoming moisture content of the waste, track the amount of liquids added, and the water removed as leachate. They would then calculate the in-situ moisture content based on the initial moisture content plus the liquids added minus the liquids removed. In some cases, a more complex mass balance that considers the addition of moisture from rain and snow and the loss of moisture from evaporation is used. For example, a more complex mass balance would be appropriate where rainfall is high and the landfill cover and drainage system is not designed to prevent rain from penetrating into the waste.

Another estimation option for existing landfills that are already adding liquids includes measuring the moisture content of the waste in the landfill. However, given the heterogeneity of the waste, sampling in only one or a small number of locations may not provide a representative moisture level. For this reason, some sites may use a more intricate method of estimation, such as taking a large number of moisture content samples from throughout the landfill and analyzing them using a computer software package such as Geographical Information System. A statistical analysis of the results could provide an average percent moisture for the portion of the landfill to which liquid is added. However, it is expected that in most cases, a mass balance approach will be adequate to determine whether moisture content is below 40 percent, and comprehensive sampling will not be needed. For a landfill that has not yet started liquids addition, the sampling approach is not possible so a mass balance approach would be used.

6. Why Don't the Proposed Bioreactor Provisions Apply to Landfills That Are Closed?

It is unlikely that bioreactors would be created in landfills that are already closed. If a bioreactor were built in such a landfill, the NSPS/EG should already require control of the entire landfill, including the bioreactor if the landfill is larger than 2.5 million Mg and 2.5 million m^3, because landfills larger than the design capacity cutoff would reach 50 Mg/yr NMOC emissions before their closure date based on emissions calculation procedures in the NSPS/EG. Because these closed landfills will already have installed or be in the process of installing controls for the NSPS/EG, it is not necessary to require more timely control of bioreactors. In the less likely event that a closed landfill meeting the design capacity criteria never reached 50 Mg/yr uncontrolled NMOC emissions and never had to install controls, its emissions are already in decline so the bioreactor control provisions are not warranted.

F. What Other Issues Did EPA Consider?

The proposed bioreactor requirements apply to only those areas within a landfill that are being operated as anaerobic (including hybrid) bioreactors. The landfill continues to be subject to the NSPS or the applicable State, Tribal, or Federal plan that implements the EG and would also be subject to the landfills NESHAP requirements proposed on November 7, 2000 when they become final. This means that landfills would continue to comply with the NSPS/EG by calculating their annual NMOC emissions rates and installing collection and control systems in the conventional portions of a landfill within 30 months of the first annual emissions rate report showing that uncontrolled emissions have reached the 50 Mg/yr NMOC emissions rate cutoff.

To calculate annual emission rates for the NSPS/EG and the proposed landfills NESHAP and determine when to install control in the conventional portion of the landfill, the landfill should continue to include the entire mass of waste accepted in the landfill (including the bioreactor and the conventional areas of the landfill) when using the NSPS/EG emissions equations. This is the procedure currently required under the NSPS/EG, and it is not our intent to change the NSPS/EG requirements or to change the timing of when the conventional portions of a landfill would require control.

We considered two other options. The first option would be to require a landfill that includes both bioreactor and conventional areas to use a higher k value for the bioreactor or to measure uncontrolled emissions from the bioreactor and add them to emissions from the conventional portion of the landfill when calculating NSPS/EG control applicability. This would cause the landfill as a whole to reach 50 Mg/yr uncontrolled emissions sooner than calculated by the NSPS/EG procedures. It would, therefore, have the effect of requiring the conventional portion of the landfill to control emissions before the NSPS/EG would require control, thus penalizing landfills that use bioreactors in combination with

conventional areas. Therefore, this option was rejected. By requiring the bioreactor at such a landfill to install controls at the start of liquids addition and by not changing the emissions calculation procedure in the NSPS/EG, the proposed procedures address the problem of the increased landfill gas generation rate from the bioreactor without affecting when the conventional portion of the landfill is required to install controls.

The second option was to exclude the bioreactor from the annual NMOC emissions rate calculations required by the NSPS/EG. This would have the effect of changing the number of landfills that require control and the emissions reduction expected under the NSPS/EG. For example, a large landfill where half the area was operated as a bioreactor and half as a conventional landfill could escape control because emissions estimates from the amount of waste placed in just the conventional portion might not reach 50 Mg/yr NMOC, whereas emission estimates from the landfill as a whole would be well above 50 Mg/yr NMOC. The NSPS/EG envisioned controlling such landfills, and their control has been shown to be reasonable and cost effective. Therefore, the proposed landfills NESHAP provisions for bioreactors do not change the calculation procedures in the NSPS/EG and will have no effect on which landfills require control by the NSPS/EG, or the date that controls must be installed in the conventional portions of a landfill.

Aerobic bioreactors are a relatively new concept, and EPA knows of no full scale aerobic bioreactors in operation in the United States. A limited amount of information is available. In aerobic bioreactors, air and liquids promote aerobic decomposition of waste. The waste decomposes rapidly due to the presence of oxygen and moisture. The aerobic decomposition produces large amounts of gases including carbon dioxide. Compared to conventional landfills, the increased temperature and increased air flow through the waste may result in increased emissions rates of organic compounds (including organic HAP) soon after the aerobic bioreactor begins operation. However, aerobic landfill data are insufficient to characterize HAP emissions from this type of operation. In addition, the gas composition from a landfill operated only as aerobic bioreactor is expected to have higher levels of carbon dioxide, nitrogen, and oxygen, and significantly lower levels of methane. This may result in the gas being more difficult to safely combust, unless it is combined with a large flow of higher-methane gas from anaerobic areas of the landfill or with other fuels.

The EPA is not expecting a significant number of aerobic bioreactors to be built in the next several years (in contrast to the trend for anaerobic bioreactors). Concerns over the increased potential for landfill fires and added power costs have deterred use of aerobic bioreactor technology. Some pilot projects have created odor concerns and in some cases are no longer being operated. Given the fact that EPA knows of no full scale aerobic bioreactors in operation in the United States and that very few pilot projects are in operation or expected to startup in the near future, EPA has concluded that it is not necessary for the supplemental proposal to address aerobic bioreactors.

Portions of a landfill that are operated as aerobic bioreactors would continue to be subject to the NSPS/EG and the proposed landfills NESHAP requirements. If a landfill that includes an aerobic bioreactor meets the design capacity and uncontrolled NMOC emissions rate criteria in the NSPS/EG, a collection and control system must be installed in the landfill, including the aerobic bioreactor area, according to the schedule in the NSPS/EG. Landfills with pilot scale aerobic bioreactors have had some success in routing emissions from the aerobic bioreactor with other landfill area emissions for control in flares.

Section 112(f) of the CAA requires EPA to evaluate residual risks and promulgate standards to address residual risks within 8 years of promulgation of the NESHAP. At that time, we will consider any new information on the prevalence and emissions of aerobic bioreactors and determine if any additional requirements are appropriate.

V. Summary of Environmental, Energy, and Economic Impacts of the Proposed Requirements for Bioreactors

We expect a positive environmental impact and negligible economic impacts from the requirements of the supplemental proposal. One reason for the small economic impact is that the supplemental proposal would require gas collection and control for only the same landfills that are already required to install collection and control systems under the NSPS/EG and the proposed landfills NESHAP. It will not change the number of landfills that must apply controls.

In the previous analyses for the NSPS/EG and proposed landfills NESHAP, it was assumed that all landfills are conventional landfills and install and remove control systems according to the schedule in the NSPS/EG. To see if the supplemental proposal would increase emissions reductions, environmental, cost and economic impacts relative to those previously calculated, we compared the emissions reductions and costs for timely control of a bioreactor according to the schedule proposed in the supplemental proposal with the emissions reductions and costs for controlling a conventional landfill that accepts the same amount of waste and installs controls according to the NSPS/EG schedule. We found that greater emissions reductions are achieved by timely control of the bioreactor landfill. A bioreactor landfill with a design capacity of 2.5 million Mg achieves an emissions reduction of 1,770 Mg of HAP over the period of control, compared to 1,630 Mg of HAP reduction for a conventional landfill receiving the same amount of waste. The bioreactor is controlled for 13 years less than the conventional landfill, yet achieves greater emissions reductions. Similarly, a bioreactor landfill with a design capacity of 10 million Mg achieves emissions reductions of 7,300 Mg of HAP, compared to 7,040 Mg of HAP reductions for a conventional landfill receiving the same amount of waste. The bioreactor is controlled for 30 years less than the conventional landfill, yet achieves greater emissions reductions. This analysis leads to the conclusion that implementation of the supplemental proposal would achieve additional HAP emissions reductions, which will minimize any health impacts from exposure to HAP in landfill gas emissions and lead to other environmental benefits associated with reduction of other landfill gas constituents including NMOC, which contribute to photochemical formation of smog, and methane, a potent greenhouse gas. Odor problems will also be minimized.

The energy impacts of the supplemental proposal would be positive. Many bioreactors are expected to comply with the proposed rules by recovering landfill gas to generate energy. Our analysis shows that a bioreactor with a design capacity of 2.5 million Mg can generate a greater profit than a similar conventional landfill from sale of landfill gas for direct use (such as combustion in nearby boilers to provide steam to an industrial process or to heat a building). Similarly, using a combustion control device, such as an internal combustion engine, that generates electricity from the landfill gas is profitable for a 10 million Mg bioreactor, where it may not be

profitable for a similar size conventional landfill. The number of landfill gas direct use and electricity generation projects has grown in recent years, and industry commenters stated in the public comments that bioreactors provide an opportunity for economically feasible use of landfill gas to generate energy. To the extent that these energy recovery options are used instead of flares to comply with the supplemental proposal, this will result in the generation of additional electricity, offset the use of fossil fuels, and have a beneficial energy impact.

To determine if the cost of the supplemental proposal would increase the control costs previously predicted for the NSPS/EG and proposed landfills NESHAP, we analyzed the cost of control for bioreactors installing controls according to the schedule in the supplemental proposal compared to the costs for control of conventional landfills according to the schedule in the NSPS/EG. We examined costs for flares and energy generation options. The costs included capital, operating, and maintenance costs. For energy recovery options, revenues from the sale of landfill gas or electricity were included. Costs were expressed on a NPV basis because the costs of the landfill gas collection and control systems are highly variable over the life of the landfill. In addition, the timing of control system installation and the length of the control period will vary greatly based on landfill size, design, landfill gas flow rates, and gas composition. For fluctuating costs over a variable but long life of the landfill control system, this cost analysis compares the costs between various landfills and control options based on a NPV analysis. The NPV analysis removes the effects of the varying costs and lifetimes by converting them into a single present cost that is equal to the string of costs that the landfill would experience over its full lifetime.

For the flare control options, the NPV costs to control the bioreactor were slightly greater than the costs to control a conventional landfill. This is because the bioreactor would have to install control sooner, and the NPV calculation weighs earlier expenditures more heavily to account for the time value of money. However, the bioreactor NPV control cost is only about 10 percent greater than the conventional landfill control cost for all but one of the smaller landfill cases examined. For example, a bioreactor landfill with a design capacity of 2.5 million Mg, the NPV costs for a gas collection and flare system were estimated to be $1.5 million, compared to $1.3 million for a conventional landfill with the same design capacity. Furthermore, bioreactors experience cost savings compared to conventional landfills due to factors such as the reduced amount of land space needed to hold the same mass of waste, and reduced leachate treatment, transportation, and disposal costs. When such differences are considered, it is significantly less costly to build a bioreactor, even with the more timely control requirements, than to build a conventional landfill. This was true for all cases examined.

The examination of energy recovery NPV costs showed that the bioreactors are less costly, or more profitable, to control than conventional landfills in all of the cases examined. In many cases, timely control of a bioreactor using an energy generation option will result in a net profit rather than a net cost. For a bioreactor landfill with a design capacity of 10 million Mg that controls emissions by using an internal combustion engine that generates electricity for sale to the power grid, the revenues from the sale of electricity balance the costs of the gas collection and control system resulting in an estimated NPV cost savings (or net revenue) of approximately $0.1 million. A conventional landfill with the same design capacity is estimated to incur an NPV cost of approximately $5 million. Smaller bioreactors that can control emissions by collecting landfill gas and delivering it to a nearby industry, commercial establishment, or institution for direct use in a boiler, process heater, or other energy recovery system can also realize a greater net revenue than similar size conventional landfills.

Given these results, we conclude that the supplemental proposal would not increase the costs of control for most landfills compared to the previous cost analyses, and some landfills with bioreactors will experience reduced control costs. We expect the number of bioreactors to increase over the next few years given their potential environmental and economic benefits and pending regulatory clarifications. Overall, the supplemental proposal would have minimal economic impacts and may in fact have an overall beneficial economic impact. Additional information on this analysis, including additional cases examined, HAP emissions reductions, and NMOC emissions reductions are contained in Docket No. A–98–28.

VI. Administrative Requirements

A. Executive Order 12866, Regulatory Planning and Review

Under Executive Order 12866 (58 FR 51735, October 4, 1993), EPA must determine whether the regulatory action is ''significant,'' and therefore, subject to review by the Office of Management and Budget (OMB) and the requirements of the Executive Order. The Executive Order defines ''significant regulatory action'' as one that is likely to result in a rule that may:

(1) Have an annual effect on the economy of $100 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs, or the rights and obligations of recipients thereof; or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Pursuant to the terms of Executive Order 12866, it has been determined that the supplemental proposal is not a ''significant regulatory action'' because it will not have an annual effect on the economy of $100 million or more.

B. Executive Order 13132, Federalism

Executive Order 13132, entitled ''Federalism'' (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure ''meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.'' ''Policies that have federalism implications'' are defined in the Executive Order to include regulations that have ''substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.''

Under Executive Order 13132, EPA may not issue a regulation that has federalism implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by State and local governments, or EPA consults with State and local officials early in the process of developing the proposed regulation. The EPA also may not issue

a regulation that has federalism implications and that preempts State law unless EPA consults with State and local officials early in the process of developing the proposed regulation.

The supplemental proposal for MSW landfills will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. The EPA has concluded that the supplemental proposal may create a mandate on a number of city and county governments, and the Federal government would not provide the funds necessary to pay the direct costs incurred by these city and county governments in complying with the mandate. However, the supplemental proposal does not impose any additional control costs or result in any additional control requirements above those considered during promulgation of the 1996 EG/NSPS. In developing the 1996 EG/NSPS, EPA consulted extensively with State and local governments to enable them to provide meaningful and timely input in the development of that rulemaking. Because the control requirements of the supplemental proposal are substantially the same as those developed in 1996, these previous consultations still apply. For a discussion of EPA's consultations with State and local governments, the nature of the governments' concerns, and EPA's position supporting the need for the specific control requirements included in both the EG/NSPS and the supplemental proposal, see the preamble to the 1996 EG/NSPS (60 FR 9918, March 12, 1996). Thus, the requirements of section 6 of the Executive Order do not apply to the supplemental proposal.

C. Executive Order 13175, Consultation and Coordination With Indian Tribal Governments

Executive Order 13175, entitled ''Consultation and Coordination with Indian Tribal Governments'' (65 FR 67249, November 6, 2000) took effect on January 6, 2001, after publication of the proposed landfills NESHAP. Executive Order 13175 requires EPA to develop an accountable process to ensure meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications. ''Policies that have tribal implications'' is defined in the Executive Order to include regulations that have ''substantial direct effects on one or more Indian tribes, on the relationship between the Federal government and Indian Tribes, or on the distribution of power and responsibilities between the Federal government and Indian Tribes.''

The supplemental proposal does not have tribal implications. It will not have substantial direct effects on tribal governments, on the relationship between the Federal government and Indian tribes, or on the distribution of power and responsibilities between the Federal government and Indian tribes as specified in Executive Order 13175. Thus, the requirements of Executive Order 13175 do not apply to the supplemental proposal.

In the spirit of Executive Order 13175, and consistent with EPA policy to promote communications between EPA and tribal governments, EPA specifically solicits additional comment on the supplemental proposal from tribal officials.

D. Executive Order 13045, Protection of Children From Environmental Health Risks and Safety Risks

Executive Order 13045 (62 FR 19885, April 23, 1997) applies to any rule that: (1) Is determined to be ''economically significant'' as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, EPA must evaluate the environmental health or safety effects of the planned rule on children and explain why the planned rule is preferable to other potentially effective and reasonably feasible alternatives considered by EPA.

The EPA interprets Executive Order 13045 as applying only to those regulatory actions that are based on health or safety risks, such that the analysis required under section 5–501 of the Executive Order has the potential to influence the regulation.

The supplemental proposal is not subject to Executive Order 13045 because it is based on technology performance and not on health or safety risks. No children's risk analysis was performed because no alternative technologies exist that would provide greater stringency at a reasonable cost. Furthermore, the supplemental proposal has been determined to be not ''economically significant'' as defined under Executive Order 12866.

E. Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

The supplemental proposal is not subject to Executive Order 13211, ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use'' (66 FR 28355, May 22, 2001) because it is not a significant regulatory action under Executive Order 12866.

F. Unfunded Mandates Reform Act of 1995

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104–4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under section 202 of the UMRA, the EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with ''Federal mandates'' that may result in expenditures by State, local, and tribal governments, in aggregate, or by the private sector, of $100 million or more in any 1 year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires the EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least-costly, most cost effective, or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows the EPA to adopt an alternative other than the least costly, most cost effective, or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before the EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

The EPA has determined that the supplemental proposal does not contain a Federal mandate that may result in expenditures of $100 million or more for State, local, and tribal governments, in the aggregate, or the private sector in any 1 year. The EPA expects the requirements in the supplemental proposal to have a negligible economic impact. Thus, the supplemental proposal is not subject to the requirements of section 202 and 205 of

the UMRA. In addition, the EPA has determined that the supplemental proposal contains no regulatory requirements that might significantly or uniquely affect small governments because the burden is small and the supplemental proposal does not unfairly apply to small governments. Therefore, the supplemental proposal is not subject to the requirements of section 203 of the UMRA.

G. Regulatory Flexibility Act (RFA) As Amended By the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), 5 U.S.C. 601 et seq.

The RFA generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedures Act or any other statute unless the agency certifies that the rule will not have a significant impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of today's supplemental proposal on small entities, small entity is defined as: (1) A small business that is primarily engaged in the collection and disposal of refuse in a landfill operation as defined by NAICS codes 562212 and 924110 with annual receipts less than 10 million dollars; (2) a small governmental jurisdiction that is a government of a city, county, town, school district, or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of today's supplemental proposal for MSW landfills on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities (SISNOSE). The supplemental proposal will not impose any requirements on small entities. In gathering available data on the owners of the ten bioreactor projects that are the population of sources used to identify the MACT floor for the supplemental proposal, we found that none of the ten projects were owned by small entities that met the SBA definition. Given that the landfill capacity of no other bioreactor project from the available data was identified to be larger than the landfill capacity exemptions, these data provide evidence to support the determination that there is no SISNOSE associated with this action.

Although no small entities were identified, the supplemental proposal would impose minimal economic impact on small entities because controls for bioreactor operations would be applied sooner than under the NSPS/EG. In addition, there may be cost savings for most of the sources that install bioreactors as compared to using conventional landfill operations. Also, the design capacity exemptions of 2.5 million Mg and 2.5 million m^3 excludes smaller landfills that can least afford the costs of collection and control systems, which will include many landfills owned by small businesses and small municipalities.

We continue to be interested in the potential impacts of the supplemental proposal on small entities and welcome comments on issues related to such impacts. For more information on potential impacts to small entities, please consult the economic impact analysis for the proposed landfills NESHAP in the public docket.

H. Paperwork Reduction Act

An Information Collection Request (ICR) document has been prepared for the November 7, 2000 proposed landfills NESHAP by EPA (ICR No. 1938.01) and submitted to OMB for approval under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* A copy may be obtained from Sandy Farmer by mail at the Office of Environmental Information, Collection Strategies Division, U.S. EPA (2822), 1200 Pennsylvania Avenue, NW, Washington, DC 20460, by e-mail at farmer.sandy@epa.gov, or by calling (202) 260–2740. A copy may also be downloaded off the Internet at *http://www.epa.gov/icr*.

Burden means total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

An Agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for the EPA's regulations are listed in 40 CFR part 9 and 48 CFR chapter 15.

I. National Technology Transfer and Advancement Act

Under section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104–113, all Federal agencies are required to use voluntary consensus standards (VCS) in their regulatory and procurement activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, business practices) developed or adopted by one or more voluntary consensus bodies. The NTTAA requires Federal agencies to provide Congress, through annual reports to the OMB, with explanations when an agency does not use available and applicable VCS.

The supplemental proposal uses the same technical standards as the proposed rule and does not introduce new standards. Therefore, the requirements of the NTTAA do not apply to the supplemental proposal.

List of Subjects in 40 CFR Part 63

Environmental protection, Air pollution control, Hazardous substances, Reporting and recordkeeping requirements.

Dated: May 16, 2002.

Christine Todd Whitman,

Administrator.

For the reasons stated in the preamble, title 40, chapter I, part 63 of the Code of Federal Regulations is proposed to be amended as follows:

PART 63—[AMENDED]

1. The authority citation for part 63 continues to read as follows:

Authority: 42 U.S.C. 7401 *et seq.*

Subpart AAAA—National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills

2. Section 63.1935, as proposed at 65 FR 66683 on November 7, 2000, is amended by designating the existing paragraph in this section as paragraph (a) and adding new paragraph (b) to read as follows:

§ 63.1935 Am I subject to this subpart?

* * * * *

(b) If you own or operate a major or area source MSW landfill with a design capacity greater than or equal to 2.5

million Mg and 2.5 million m^3 that includes a bioreactor, as defined in § 63.1990, then you are subject to this subpart.

3. Subpart AAAA, as proposed at 65 FR 66684 on November 7, 2000, is amended by adding § 63.1947 to read as follows:

§ 63.1947 When do I have to comply with this subpart if I own or operate a bioreactor?

If you own or operate a bioreactor located at a landfill that is not permanently closed as of the date of publication of the final rule in the **Federal Register** and has a design capacity equal to or greater than 2.5 million Mg and 2.5 million m^3, then you must install and operate a collection and control system that meets the criteria in 40 CFR 60.752(b)(2), subpart WWW; the Federal plan; or EPA-approved and effective State plan according to the schedule specified in paragraph (a) or (b) of this section.

(a) If your bioreactor is at a new affected source, then you must meet the requirements in paragraphs (a)(1) and (2) of this section:

(1) Install the gas collection and control system for the bioreactor before initiating liquids addition.

(2) Begin operating the gas collection and control system within 90 days after initiating liquids addition.

(b) If your bioreactor is at an existing affected source and your bioreactor is not already required to install a gas collection and control system under 40 CFR part 60, subpart WWW; the Federal plan; or EPA-approved and effective State plan, then you must install and begin operating the gas collection and control system for the bioreactor within 3 years after the date of publication of the final rule in the **Federal Register**.

(c) If your bioreactor is at an existing affected source and you do not initiate liquids addition to your bioreactor until later than 3 years after the date of publication of the final rule in the **Federal Register**, then you must meet the requirements in paragraphs (c)(1) and (2) of this section:

(1) Install the gas collection and control system for the bioreactor before initiating liquids addition.

(2) Begin operating the gas collection and control system within 90 days after initiating liquids addition.

4. Subpart AAAA, as proposed at 65 FR 66684 on November 7, 2000, is amended by adding § 63.1952 to read as follows:

§ 63.1952 When am I no longer required to comply with the requirements of this subpart if I own or operate a bioreactor?

If you own or operate a bioreactor, you are no longer required to comply with the requirements of this subpart provided you meet the conditions of either paragraph (a) or (b) of this section.

(a) Your affected source meets the control system removal criteria in 40 CFR 60.752(b)(v), subpart WWW, or the bioreactor meets the criteria for a nonproductive area of the landfill in 40 CFR 60.759(a)(3)(ii), subpart WWW.

(b) The bioreactor portion of the landfill is a closed landfill as defined in 40 CFR 60.751, subpart WWW, you have permanently ceased adding liquids to the bioreactor, and you have not added liquids to the bioreactor for at least 1 year. A closure report for the bioreactor must be submitted to the Administrator as provided in 40 CFR 60.757(d), subpart WWW.

(c) Compliance with the bioreactor control removal provisions in this section constitute compliance with 40 CFR part 60, subpart WWW, or the Federal plan, whichever applies to your bioreactor.

5. Section 63.1955, as proposed at 65 FR 66684 on November 7, 2000, is amended by adding paragraph (c) to read as follows:

§ 63.1955 What requirements must I meet?

* * * * *

(c) If you own or operate a bioreactor that is located at an MSW landfill that is not permanently closed and has a design capacity equal to or greater than 2.5 million Mg and 2.5 million m^3, then you must meet the requirements of paragraph (a) and the additional requirements in paragraphs (c)(i) and (ii) of this section.

(i) You must comply with the general provisions specified in Table 1 of this subpart and in § 63.1960 through § 63.1985 starting on the date you are required to install the gas collection and control system.

(ii) You must extend the collection and control system into each new cell or area of the bioreactor prior to initiating liquids addition in that area instead of the schedule in 40 CFR 60.752(b)(2)(ii)(A)(2).

6. Section 63.1980, as proposed at 65 FR 66684 on November 7, 2000, is amended by adding new paragraphs (c) through (g) to read as follows:

§ 63.1980 What records and reports must I keep and submit?

* * * * *

(c) For bioreactors at new affected sources, you must submit the initial semiannual compliance report and performance test results described in 40 CFR 60.757(f), subpart WWW, within 180 days after the date you are required to begin operating the gas collection and control system by § 63.1947(a)(2).

(d) For bioreactors at existing affected sources, you must submit the initial semiannual compliance report and performance test results described in 40 CFR 60.757(f), subpart WWW, within 180 days after the compliance date specified in § 63.1947(b), unless you have previously submitted a compliance report for the bioreactor required by 40 CFR part 60, subpart WWW; the Federal plan; or an EPA-approved and effective State plan.

(e) For bioreactors that are located at existing affected sources but do not initiate liquids addition until later than the compliance date in § 63.1947(b), you must submit the initial semiannual compliance report and performance tests results described in 40 CFR 60.757(f), subpart WWW, within 180 days after the date you are required to begin operating the gas collection and control system by § 63.1947(c) of this subpart.

(f) If you must submit a semiannual compliance report for a bioreactor as well as a semiannual compliance report for a conventional portion of the same landfill, you may delay submittal of a subsequent semiannual compliance report for the bioreactor according to paragraphs (f)(1) through (3) of this section so that the reports may be submitted on the same schedule.

(1) After submittal of your initial semiannual compliance report and performance test results for the bioreactor, you may delay submittal of the subsequent semiannual compliance report for the bioreactor until the date the initial or subsequent semiannual compliance report is due for the conventional portion of your landfill.

(2) You may delay submittal of your subsequent semiannual compliance report by no more than 12 months after the due date for submitting the initial semiannual compliance report and performance test results described in 40 CFR 60.757(f), subpart WWW, for the bioreactor. The report shall cover the time period since the previous semiannual report for the bioreactor, which would be a period of at least 6 months and no more than 12 months.

(3) After the delayed semiannual report, all subsequent semiannual reports for the bioreactor must be submitted every 6 months on the same date the semiannual report for the conventional portion of the landfill is due.

(g) If you add any liquids other than leachate in a controlled fashion to the waste mass, and you do not comply with the bioreactor requirements in §§ 63.1947, 63.1955(c) and 63.1980(c) through (f), you must keep a record of calculations showing that the percent moisture by weight expected in the waste mass to which liquid is added is less than 40 percent. The calculation must consider the waste mass, moisture content of the incoming waste, mass of water added to the waste including leachate recirculation and other liquids addition, and the mass of water removed through leachate or other water losses. Moisture level sampling or mass balances calculations can be used. You must document the calculations and the basis of any assumptions.

7. Section 63.1990, as proposed at 65 FR 66685 on November 7, 2000, is amended by adding in alphabetical order the definition of ''bioreactor'' as follows:

§ 63.1990 What definitions apply to this subpart?

* * * * *

Bioreactor means a municipal solid waste landfill or portion of a municipal solid waste landfill where any liquid other than leachate is added in a controlled fashion into the waste mass (often in combination with recirculating leachate) to reach a minimum average moisture content of 40 percent by weight or greater.

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