EPA-453/R-95-0136

Municipal Waste Combustion:

Background Information Document for Promulgated Standards and Guidelines -- Public Comments and Responses

Emission Standards Division

U.S. Environmental Protection Agency
Office of Air and Radiation
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

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1.0 OVERVIEW

On September 20, 1994, the Environmental Protection Agency proposed standards of performance for new municipal waste combustors (MWC's) and emission guidelines for existing MWC's under authority of section 129 of the Clean Air Act (Act). Public comments were requested on the proposal in the Federal Register. The EPA received a total of 153 letters commenting on the proposed standards and guidelines, submitted mainly by elected officials, State agencies, environmental groups, MWC owners and operators, industry trade associations, and MWC and air pollution control technology vendors.

Significant changes to the proposed MWC standards and guidelines are summarized and responses to each are in this document. This summary of comments and responses serves as the basis for the revisions made to the standards and guidelines between proposal and promulgation. Refer to the preamble to the final standards and guidelines for an abbreviated summary of the significant issues and changes to the proposed standards and guidelines. Additionally, a summary of the final standards is provided in table 1-1 of this document, and a summary of the final guidelines is provided in table 1-2 of this document. All significant changes made since the September 20, 1994 proposal are marked in tables 1-1 and 1-2 with the "*" symbol.

TABLE 1-1. SUMMARY OF STANDARDS FOR NEW MWC's (SUBPART Eb)[a]

(* indicates a significant change since proposal)

Applicability

The final standards apply to new MWC units located at plants with capacities to combust greater than 35 Mg/day of residential, commercial, and/or institutional discards. Industrial manufacturing discards are not covered by the standards. Any medical, industrial manufacturing, municipal, or other type of waste combustor plant with capacity to combust greater than 35 Mg/day of MSW and with a federally enforceable permit to combust less than 10 Mg/day of MSW is not covered.*

Plant Size (MSW combustion capacity)	Requirement
≤ 35 Mg/day*	Not covered by standards
> 35 Mg/day but ≤ 225 Mg/day (referred to as small MWC plants)	Subject to provisions listed below
> 225 Mg/day (referred to as large MWC plants)	Subject to provisions listed below

Good Combustion Practices

- o Applies to large and small MWC plants.
- o A site-specific operator training manual is required to be developed and made available for MWC personnel.
- o The EPA or State MWC operator training course must be completed by the MWC chief facility operator, shift supervisors, and control room operators.
- o The ASME (or State-equivalent) operator certification must be obtained by the MWC chief facility operator (mandatory), shift supervisors (mandatory), and control room operators (optional).*

TABLE 1-1. SUMMARY OF STANDARDS FOR NEW MWC's (SUBPART Eb)[a]
(CONTINUED)

- o The MWC load level is required to be measured and not to exceed 110 percent of the maximum load level measured during the most recent dioxin/furan performance test.

- o The PM control device inlet flue gas temperature is required to be measured and not to exceed the temperature 17^{o}C above the maximum temperature measured during the most recent dioxin/furan performance test.

- o The CO level is required to be measured using CEMS, and the concentration in the flue gas is required not to exceed the following:

MWC type	CO level	Averaging time
Modular starved-air and excess-air	50 ppmv	4-hour
Mass burn waterwall and refractory	100 ppmv	4-hour
Mass burn rotary refractory	100 ppmv	4-hour
Fluidized-bed combustion	100 ppmv	4-hour
Pulverized coal/RDF mixed fuel-fired	150 ppmv*	4-hour
Spreader stoker coal/RDF mixed fuel-fired	150 ppmv*	24-hour
RDF stoker	150 ppmv	24-hour

MWC Organic Emissions (measured as total mass dioxins/furans)

TABLE 1-1. SUMMARY OF STANDARDS FOR NEW MWC's (SUBPART Eb)[a] (CONTINUED)

o Dioxins/furans (performance test by EPA Reference Method 23)	
Large and small MWC plants	13 ng/dscm total mass (mandatory) or 7 ng/dscm total mass (optional to qualify for less frequent testing)*,[b]
o Basis for dioxin/furan limit	GCP and SD/FF/carbon injection
MWC Metal Emissions	
o PM (performance test by EPA Reference Method 5)	
Large and small MWC plants	24 mg/dscm (0.010 gr/dscf)*
o Opacity (performance test by EPA Reference Method 9)	
Large and small MWC plants	10 percent (6-minute average)
o Cd (performance test by EPA Reference Method 29)	
Large and small MWC plants	0.020 mg/dscm (8.7 gr/million dscf)*
o Pb (performance test by EPA Reference Method 29)	
Large and small MWC plants	0.20 mg/dscm (87 gr/million dscf)*
o Hg (performance test by EPA Reference Method 29)	
Large and small MWC plants	0.080 mg/dscm (35 gr/million dscf) or 85-percent reduction in Hg emissions

TABLE 1-1. SUMMARY OF STANDARDS FOR NEW MWC's (SUBPART Eb)[a] (CONTINUED)

o Basis for PM, opacity, Cd, Pb, and Hg limits	
Large and small MWC plants	See basis for dioxin/furan limit

MWC Acid Gas Emissions

o SO_2 (performance test by CEMS)	
Large and small MWC plants	30 ppmv or 80-percent reduction in SO_2 emissions
o HCl (performance test by EPA Reference Method 26)	
Large and small MWC plants	25 ppmv or 95-percent reduction in HCl emissions
o Basis for SO_2 and HCl limits	See basis for dioxin/furan limit

Nitrogen Oxides Emissions

o NO_x (performance test by CEMS)	
Large MWC plants	150 ppmv, except 180 ppmv is allowed for the first year of operation*
Small MWC plants	No NO_x control requirement
o Basis for NO_x limit	
Large MWC plants	SNCR
Small MWC plants	No NO_x control requirement

TABLE 1-1. SUMMARY OF STANDARDS FOR NEW MWC's (SUBPART Eb)[a] (CONTINUED)

Fugitive Ash Emissions	
o Fugitive emissions (performance test by EPA Reference Method 22)	
Large and small MWC plants	Visible emissions less than 5 percent of the time from the ash transfer system except during maintenance and repair activities*
o Basis for fugitive emissions limit	Wet ash handling or enclosed ash handling
Siting Requirements	
o Large and small MWC plants	(1) Siting analysis*, (2) materials separation plan, and (3) public meetings (including response to comments)
Performance Testing and Monitoring Requirements	
o Reporting frequency	Annual (semiannual if violation)*
o Load, flue gas temperature	Continuous monitoring, 4-hour block arithmetic average
o CO	CEMS, 4-hour block or 24-hour daily arithmetic average, as applicable
o Dioxins/furans, PM, Cd, Pb, HC1, and Hg	

TABLE 1-1. SUMMARY OF STANDARDS FOR NEW MWC's (SUBPART Eb)[a] (CONTINUED)

	Large MWC plants	Annual stack test (see reduced testing option for low emitters of dioxins/furans)*
	Small MWC plants	Annual or third year stack test*
o	Opacity	COMS (6-minute average) and annual stack test
o	SO_2	CEMS, 24-hour daily geometric mean
o	NO_x (large MWC plants only)	CEMS, 24-hour daily arithmetic average
o	Fugitive ash emissions	Annual test

* = a significant change since proposal, and the change is discussed in this preamble.

[a] All concentration levels in the table are corrected to 7 percent O_2, dry basis.

[b] Although not part of the dioxin/furan limit, the limit of 13 ng/dscm total mass is equal to about 0.2 to 0.3 ng/dscm TEQ. The optional reduced testing limit of 7 ng/dscm total mass is equal to about 0.1 to 0.2 ng/dscm TEQ.

TABLE 1-2. SUMMARY OF GUIDELINES FOR EXISTING MWC's (SUBPART Cb)[a]

(* indicates a significant change since proposal and the change is discussed in this preamble)

Applicability

The final guidelines apply to existing MWC's located at plants with capacities to combust greater than 35 Mg/day of residential, commercial, and/or institutional discards. Industrial manufacturing discards are not covered by the guidelines. Any medical, industrial manufacturing, municipal, or other type of waste combustor plant with capacity to combust greater than 35 Mg/day of MSW and with a federally enforceable permit to combust less than 10 Mg/day of MSW is not covered.*

Plant Size (MSW combustion capacity)	Requirement
≤ 35 Mg/day*	Not covered by guidelines
> 35 Mg/day but ≤ 225 Mg/day (referred to as small MWC plants)	Subject to provisions listed below
> 225 Mg/day (referred to as large MWC plants)	Subject to provisions listed below

Good Combustion Practices

- Applies to large and small MWC plants.
- A site-specific operator training manual is required to be developed and made available for MWC personnel.
- The EPA or a State MWC operator training course would be required to be completed by the MWC chief facility operator, shift supervisors, and control room operators.

TABLE 1-2. SUMMARY OF GUIDELINES FOR <u>EXISTING</u> MWC's (SUBPART Cb)[a] (CONTINUED)

- The ASME (or State-equivalent) provisional and full operator certification must be obtained by the MWC chief facility operator (mandatory), shift supervisors (mandatory), and control room operators (optional).*

- The MWC load level is required to be measured and not to exceed 110 percent of the maximum load level measured during the most recent dioxin/furan performance test.

- The maximum PM control device inlet flue gas temperature is required to be measured and not to exceed the temperature 17^{o}C above the maximum temperature measured during the most recent dioxin/furan performance test.

- The CO level is required to be measured using a CEMS, and the concentration in the flue gas is required not to exceed the following:

MWC Type	CO level	Averaging time
Modular starved-air and excess-air	50 ppmv	4-hour
Mass burn waterwall and refractory	100 ppmv	4-hour
Mass burn rotary refractory	100 ppmv	24-hour
Fluidized-bed combustion	100 ppmv	4-hour
Pulverized coal/ RDF mixed fuel-fired	150 ppmv*	4-hour

TABLE 1-2. SUMMARY OF GUIDELINES FOR EXISTING MWC's (SUBPART Cb)[a] (CONTINUED)

Spreader stoker coal/RDF mixed fuel-fired	200 ppmv*	24-hour
RDF stoker	200 ppmv	24-hour
Mass burn rotary waterwall	250 ppmv	24-hour

MWC Organic Emissions (measured as total mass dioxins/furans)

o Dioxins/furans (performance test by EPA Reference Method 23)

Large MWC plants	
MWC units utilizing an ESP-based air pollution control system	60 ng/dscm total mass (mandatory) or 15 ng/dscm total mass (optional to qualify for less frequent testing)*,[c]
MWC units utilizing a nonESP-based air pollution control system	30 ng/dscm total mass (mandatory) or 15 ng/dscm total mass (optional to qualify for less frequent testing)*,[c]
Small MWC plants	125 ng/dscm total mass (mandatory) or 30 ng/dscm total mass (optional to qualify for less frequent testing)*,[c]

o Basis for dioxin/furan limits

Large MWC plants	GCP and SD/ESP or GCP and SD/FF, as specified above
Small MWC plants	GCP and DSI/ESP

MWC Metal Emissions

TABLE 1-2. SUMMARY OF GUIDELINES FOR EXISTING MWC's (SUBPART Cb)[a] (CONTINUED)

o PM (performance test by EPA Reference Method 5)	
Large MWC plants	27 mg/dscm (0.012 gr/dscf)
Small MWC plants	70 mg/dscm (0.030 gr/dscf)*
o Opacity (performance test by EPA Reference Method 9)	
Large and small MWC plants	10 percent (6-minute average)
o Cd (performance test by EPA Reference Method 29)	
Large MWC plants	0.040 mg/dscm (18 gr/million dscf)
Small MWC plants	0.10 mg/dscm (44 gr/million dscf)
o Pb (performance test by EPA Reference Method 29)	
Large MWC plants	0.49 mg/dscm (200 gr/million dscf)*
Small MWC plants	1.6 mg/dscm (700 gr/million dscf)
o Hg (performance test by EPA Reference Method 29)	
Large and small MWC plants	0.080 mg/dscm (35 gr/million dscf) or 85-percent reduction in Hg emissions
o Basis for PM, opacity, Cd, Pb, and Hg limits	
Large MWC plants	GCP and SD/ESP/CI or GCP and SD/FF/CI
Small MWC plants	GCP and DSI/ESP/CI

TABLE 1-2. SUMMARY OF GUIDELINES FOR EXISTING MWC's (SUBPART Cb)[a] (CONTINUED)

MWC Acid Gas Emissions	
o SO_2 (performance test by CEMS)	
Large MWC plants	31 ppmv or 75-percent reduction in SO_2 emissions*
Small MWC plants	80 ppmv or 50-percent reduction in SO_2 emissions

TABLE 1-2. SUMMARY OF GUIDELINES FOR EXISTING MWC's (SUBPART Cb)[a] (CONTINUED)

o HCl (performance test by EPA Reference Method 26)	
Large MWC plants	31 ppmv or 95-percent reduction in HCl emissions*
Small MWC plants	250 ppmv or 50-percent reduction in HCl emissions
o Basis for SO_2 and HCl limits	
Large and small MWC plants	See basis for MWC metals
Nitrogen Oxides Emissions	
o NO_x (performance test by CEMS)	
Large MWC plants	
Mass burn waterwall	200 ppmv[b]
Mass burn rotary waterwall	250 ppmv[b]
Refuse-derived fuel combustor	250 ppmv[b]
Fluidized bed combustor	240 ppmv[b]
Mass burn refractory	No NO_x control[b] requirement
Other	200 ppmv[b]
Small MWC plants	No NO_x control requirement
o Basis for NO_x limits	
Large MWC plants	SNCR

TABLE 1-2. SUMMARY OF GUIDELINES FOR EXISTING MWC's (SUBPART Cb)[a] (CONTINUED)

Refractory MWC plants	No NO_x control requirement
Small MWC plants	No NO_x control requirement
Fugitive Ash Emissions	
o Fugitive Emissions (performance test by EPA Reference Method 22)	
Large and small plants	Visible emissions 5 percent of the time from ash transfer systems except for maintenance and repair activities*
o Basis for fugitive emission limit	Wet ash handling or enclosed ash handling
Performance Testing and Monitoring Requirements	
o Reporting frequency	Annual (semiannual if violation)*
o Load, flue gas temperature	Continuous monitoring, 4-hour block arithmetic average
o CO	CEMS, 4-hour block or 24-hour daily arithmetic average, as applicable
o Dioxins/furans, PM, Cd, Pb, HCl, and Hg	
Large MWC plants	Annual stack test*
Small MWC plants	Annual or third year stack test
o Opacity	COMS (6-minute average) and annual stack test

TABLE 1-2. SUMMARY OF GUIDELINES FOR EXISTING MWC's (SUBPART Cb)[a] (CONTINUED)

o	SO_2	CEMS, 24-hour daily geometric mean
o	NO_x (large MWC plants only)	CEMS, 24-hour daily arithmetic average
o	Fugitive ash emissions	Annual test*

Compliance Schedule

o Large MWC plants

State plans are required to include one of the following three retrofit schedules for compliance with regulatory requirements: (1) Full compliance or closure within 1 year following EPA approval of the State plan; (2) full compliance in 1 to 3 years following issuance of a revised construction or operation permit if a permit modification is required or 1 to 3 years following EPA approval of the State plan if a permit modification is not required, provided the State plan includes measurable and enforceable incremental steps of progress toward compliance; or (3) closure in 1 to 3 years following approval of the State plan, provided the State plan includes a closure agreement. If a State plan allows the second or third scheduling options (i.e., more than 1 year), the State plan submitted to EPA must contain post-1990 test data for dioxins/furans for all MWC units at large plants under the extended schedule. (See § 60.21(h) of subpart B of 40 CFR 60 for additional information relating to measurable and enforceable incremental steps of progress toward compliance).

o Small MWC plants

State plans must require full compliance or closure with regulatory requirements in 3 years or less following issuance of a revised construction or operation permit if a permit modification is required, or within 3 years following EPA approval of the State plan if a permit modification is not required.

TABLE 1-2. SUMMARY OF GUIDELINES FOR EXISTING MWC's (SUBPART Cb)[a] (CONTINUED)

o	State plans are required to specify that all MWC's at large MWC plants for which construction was commenced after June 26, 1987 comply with the guidelines for Hg and dioxins/furans within 1 year following issuance of a revised construction or operation permit if a permit modification is required, or within 1 year following EPA approval of the State plan, whichever is later.
o	State plans are required to specify that owners or operators of MWC's comply with the operator training and certification requirements by 6 months after startup or 1 year after State plan approval by the EPA, whichever is later, for large plants and by 6 months after startup or 18 months after State plan approval by the EPA, whichever is later, for small plants.

* = significant change since proposal, and the change is discussed in this preamble.

[a] All concentration levels in the table are converted to 7 percent O_2, dry basis.

TABLE 1-2. SUMMARY OF GUIDELINES FOR EXISTING MWC's (SUBPART Cb)[a] (CONTINUED)

[b] State plans may allow NO_x emissions averaging between existing MWC units at a large MWC plant. The daily weighted average NO_x emissions concentration from the MWC units included in the emissions averaging plan must comply with the following 24-hour limits: 180 ppmv for mass burn waterwall combustors; 220 ppmv for mass burn rotary waterwall combustors; 230 ppmv for refuse-derived fuel combustors; 220 ppmv for fluidized bed combustors; and 180 ppmv for other combustor types (excluding mass burn refractory combustors). Refer to the regulatory text of the emission guidelines for additional requirements. State plans may also establish a program to allow emissions trading between non-contiguous MWC plants. Such a program shall meet the requirements of the Open Market Trading Rule of Ozone Smog Precursors, proposed August 3, 1995 (60 FR 39668) as finally promulgated.

[c] Although not part of the dioxin/furan limit, the dioxin/furan total mass limits of 30 ng/dscm, 60 ng/dscm, and 125 ng/dscm are equal to about 0.4 to 0.7 ng/dscm TEQ, 0.8 to 1.3 ng/dscm TEQ, and 1.8 to 2.8 ng/dscm TEQ, respectively. The optional reduced testing limits of 15 ng/dscm and 30 ng/dscm total mass are equal to about 0.2 to 0.3 ng/dscm TEQ and 0.4 to 0.7 ng/dscm TEQ, respectively.

2.0 PUBLIC COMMENTS

2.1 LIST OF COMMENTERS

The public comment period was from September 20, 1994 to November 21, 1994. A total of 153 letters commenting on the proposed standards and guidelines were received: 95 were received on or before November 21, 1994, and 58 were received after November 21, 1994. Comments were submitted by elected officials, State agencies, environmental groups, MWC owners and operators, industry trade associations, and MWC and air pollution control technology vendors. These comments have been placed in the dockets for these rulemakings (docket No. A-90-45, category IV-D and docket No. A-89-08, category VI-B). Docket A-90-45 contains comments on the proposed New Source Performance Standards (NSPS) and emission guidelines. Docket A-89-08 contains comments on the proposal to withdraw the 1991 emission guidelines (subpart Ca). Many of the comment letters submitted to docket A-89-08 also address the proposed NSPS and emission guidelines and are included in the responses to comments on the proposed NSPS and emission guidelines whether they were submitted to A-89-08 or A-90-45. Tables 2-1 and 2-2, respectively, present a listing of all persons submitting written comments to each docket, their affiliation, and the recorded docket item number assigned to each comment letter.

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NEW SOURCE PERFORMANCE STANDARDS AND EMISSION GUIDELINES FOR MUNICIPAL WASTE COMBUSTORS (DOCKET A-90-45)

Item No.	Commenter and Affiliation
IV-D-01	T.A. Threet The Dow Chemical Company Midland, Michigan
IV-D-02	D. Anetha Lue Montenay International Corp. Miami, Florida
IV-D-03	W.H. Long PEDCO Inc. Cincinnati, Ohio
IV-D-04	F.P. Osman Evergreen Environmental, Inc. Harrisburg, Pennsylvania
IV-D-05	F.P. Osman Evergreen Environmental, Inc. Harrisburg, Pennsylvania
IV-D-06	Mayor L. Gray City of Stewartville Stewartville, Minnesota
IV-D-07	R. Magid Private Citizen Royal Oak, Michigan
IV-D-08	Mayor W. Bussell City of Eyota Eyota, Minnesota
IV-D-09	C. Scott Daniels Dutchess County Resource Recovery Agency Poughkeepsie, New York
IV-D-10	H.B. Thomas, Berry, Moorman, King & Hudson Submitting on behalf of the City of Madison Heights Madison Heights, Michigan
IV-D-11	Mayor C. Hazama City of Rochester Rochester, Minnesota
IV-D-12	G.L. Moilanen Sierra Environmental Engineering, Inc. Costa Mesa, California

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NEW SOURCE PERFORMANCE STANDARDS AND EMISSION GUIDELINES FOR MUNICIPAL WASTE COMBUSTORS (DOCKET A-90-45) (CONTINUED)

Item No.	Commenter and Affiliation
IV-D-13	J.S. Austin Refuse-Fired Steam Generating Facility City of Hampton Hampton, Virginia
IV-D-14	T. Gray, Perkin Elmer Real-Time Systems Division Norwalk, Connecticut
IV-D-15	W. Dean Applied Automation/Hartmann & Braun Bartlesville, Oklahoma
IV-D-16 (Facsimile of IV-D-78)[a]	M. Benoit Cement Kiln Recycling Coalition Washington, D.C.
IV-D-17	H.S. Cole Henry S. Cole & Associates, Inc. Washington, D.C.
IV-D-18	A.M. Szurgot American Ref-Fuel Houston, Texas
IV-D-19	D.S. Dee, Carlton, Fields, Ward, Emmanuel, Smith & Cutler, P.A. Submitting on behalf of the Osceola Power Limited Partnership Tallahassee, Florida
IV-D-20	C.R. Doolittle, D.W. Gustafson and T.L. Threet The Dow Chemical Company Midland, Michigan
IV-D-21	S.E. Ellis Cadence Environmental Energy, Inc. Michigan City, Indiana
IV-D-22	Deleted from Docket A-90-45, comment intended for another docket
IV-D-23	Deleted from Docket A-90-45, comment intended for another docket
IV-D-24	D. Driesen Natural Resources Defense Council Washington, D.C.

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NEW SOURCE PERFORMANCE STANDARDS AND EMISSION GUIDELINES FOR MUNICIPAL WASTE COMBUSTORS (DOCKET A-90-45) (CONTINUED)

Item No.	Commenter and Affiliation
IV-D-25	C.J. Curran and D. Lucas Department of Solid Waste Management, Montgomery County Dayton, Ohio
IV-D-26	D.B. Shea American Plastics Council Washington, D.C.
IV-D-27 (Identical to IV-D-26)[b]	D.B. Shea American Plastics Council Washington, D.C.
IV-D-28	L. Naake, D. Borut, and H. Hickman The Solid Waste Action Coalition Silver Spring, Maryland
IV-D-29	D.A. Wizda American Society of Mechanical Engineers International New York, New York
IV-D-30	The American Society of Mechanical Engineers Washington, D.C.
IV-D-31	N.H. Nosenchuck Association of State and Territorial Solid Waste Management Officials Washington, D.C.
IV-D-32	J.C. Smith Institute of Clean Air Companies Washington, D.C.
IV-D-33	R. Kaufman and A. Schaffer American Forest & Paper Association Washington, D.C.
IV-D-34	J.F. Marcus Department of Law, City of Chicago Chicago, Illinois
IV-D-35	J. Greenberg Browning-Ferris Industries Washington, D.C.
IV-D-36 (Facsimile of IV-D-78)[a]	M. Benoit Cement Kiln Recycling Coalition Washington, D.C.

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NEW SOURCE PERFORMANCE STANDARDS AND EMISSION GUIDELINES FOR MUNICIPAL WASTE COMBUSTORS (DOCKET A-90-45) (CONTINUED)

Item No.	Commenter and Affiliation
IV-D-37	R.S. Broom, Verner, Liipfert, Bernhard, McPherson and Hand Washington, D.C. Submitting on behalf of Pinellas County, Florida
IV-D-38	R.S. Broom, Verner Liipfert, Bernhard, McPherson, and Hand Washington, D.C. Submitting on behalf of the City of Tampa, Florida
IV-D-39	D.S. Dee, Carlton, Fields, Ward, Emmanuel, Smith & Cutler, P.A. Submitting on behalf of the Okeelanta Power Limited Partnership Tallahassee, Florida
IV-D-40	Mayor M. Krause City of Oronoco Oronoco, Minnesota
IV-D-41	J.T. Hestle, Jr. Nashville Thermal Transfer Corporation Nashville, Tennessee
IV-D-42	M.F. Stema Private Citizen Madison Heights, Michigan
IV-D-43	M.A. Gagliardo Northeast Maryland Waste Disposal Authority Baltimore, Maryland
IV-D-44	J.T. Cochran and T. Henderson The United States Conference of Mayors Washington, D.C.
IV-D-45	J.G. Brody Tellus Institute for Resource and Environmental Strategies Boston, Massachusetts
IV-D-46	B. McHenry Cemtech, L.P. Westchester, Illinois

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NEW SOURCE PERFORMANCE STANDARDS AND EMISSION GUIDELINES FOR MUNICIPAL WASTE COMBUSTORS (DOCKET A-90-45) (CONTINUED)

Item No.	Commenter and Affiliation
IV-D-47	O. Brenning for Clark County Citizens Against Incinerator Dangers Springfield, Ohio
IV-D-48	D. Copeland Occidental Chemical Corporation Niagara Falls, New York
IV-D-49	E. Berman and A. Johnston Molten Metal Technology Waltham, Massachusetts
IV-D-50	C.R.M. Ehlhardt Eli Lilly and Company Indianapolis, Indiana
IV-D-51	R.H. Colby and D.F. Theiler State and Territorial Air Pollution Program Administrators and the Association of Local Air Pollution Control Officials Washington, D.C.
IV-D-52 (Facsimile of IV-D-87)[a]	W.R. Darcy Connecticut Resources Recovery Authority Hartford, Connecticut
IV-D-53	P.J. Yaroschak Department of the Navy Washington, D.C.
IV-D-54	T.J. Richter Minnesota Resource Recovery Association St. Paul, Minnesota
IV-D-55	M. Brinker Greater Detroit Resource Recovery Authority Detroit, Michigan
IV-D-56	R.F. Anderson Wheelabrator Technologies, Inc. Washington, D.C.

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NEW SOURCE PERFORMANCE STANDARDS AND EMISSION GUIDELINES FOR MUNICIPAL WASTE COMBUSTORS (DOCKET A-90-45) (CONTINUED)

Item No.	Commenter and Affiliation
IV-D-57	E.H. Seeger, Vedder, Price, Kaufman, Kammholz & Day Submitting on behalf of the Lead Industries Association, Inc. New York, New York
IV-D-58	G. Postier Olmsted County Association of Townships Oronoco, Minnesota
IV-D-59	Mayor S. James Newark, New Jersey
IV-D-60	P. Ortner-Mukavetz Clean Air, Please! Madison Heights, Michigan
IV-D-61	G.R. Elliot Lafarge Corporation Southfield, Michigan
IV-D-62	Mayor D. Flury City of Dover Dover, Minnesota
IV-D-63	T.R. Rylander Town of Madison Madison, Connecticut
IV-D-64	A. Ellison and F. Sullivan Baron County Waste-To-Energy Facility Almena, Wisconsin
IV-D-65	John van der Harst Recycling Advocates of Middle Tennessee Nashville, Tennessee
IV-D-66	A.A. Mendonsa Office of the City Manager, City of Savannah Savannah, Georgia
IV-D-67	J.S. Bilmes Bristol Resource Recovery Facility Operating Committee Bristol, Connecticut

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NEW SOURCE PERFORMANCE STANDARDS AND EMISSION GUIDELINES FOR MUNICIPAL WASTE COMBUSTORS (DOCKET A-90-45) (CONTINUED)

Item No.	Commenter and Affiliation
IV-D-68	L.J. Liszewski Eastman Kodak Company Rochester, New York
IV-D-69	N. Stafki Northern States Power Company Minneapolis, Minnesota
IV-D-70	J.J. Gallagher Pasco County New Port Richey, Florida
IV-D-71	J.J. Poulton Waste Energy Partners Limited Partnership Joppa, Maryland
IV-D-72	M.B. Gamble Tacoma Public Utilities Tacoma, Washington
IV-D-73	R. Methier Georgia Department of Natural Resources Atlanta, Georgia
IV-D-74	J.S. Grumet Northeast States for Coordinated Air Use Management Boston, Massachusetts
IV-D-75	F.R. Caponi County Sanitation Districts of Los Angeles County Whittier, California
IV-D-76	G.W. Lancour McDonnell Douglas Corporation Saint Louis, Missouri
IV-D-77 (Facsimile of IV-D-61)[a]	G.R. Elliot Lafarge Corporation Southfield, Michigan
IV-D-78	M. Benoit Cement Kiln Recycling Coalition New York, New York

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NEW SOURCE PERFORMANCE STANDARDS AND EMISSION GUIDELINES FOR MUNICIPAL WASTE COMBUSTORS (DOCKET A-90-45) (CONTINUED)

Item No.	Commenter and Affiliation
IV-D-79	S.E. Ellis Cadence Environmental Inc. Michigan City, Indiana
IV-D-80	C. Kamper County of Olmsted Rochester, Minnesota
IV-D-81 (Replaced by IV-D-98)[c]	K.W. Rieke Ogden Projects, Inc. Fairfield, New Jersey
IV-D-82	D.L. Lockhart Solid Waste Authority West Palm Beach, Florida
IV-D-83[d]	R. Hodanbosi State of Ohio Environmental Protection Agency Columbus, Ohio
IV-D-84	Pellet Fuels Institute Edina, Minnesota
IV-D-85	Integrated Waste Service Association Washington, D.C.
IV-D-86	H. Magwood Bureau of Sanitation, City of Savannah Savannah, Georgia
IV-D-87	W.R. Darcy Connecticut Resources Recovery Authority Hartford, Connecticut
IV-D-88	J.F. Eggen United Power Association Elk River, Minnesota
IV-D-89	S.P. Blakeslee Intercounty Solid Waste Coordinating Committee Queesnbury, New York
IV-D-90	M.L. Mullins Chemical Manufacturers Association Washington, D.C.

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NEW SOURCE PERFORMANCE STANDARDS AND EMISSION GUIDELINES FOR MUNICIPAL WASTE COMBUSTORS (DOCKET A-90-45) (CONTINUED)

Item No.	Commenter and Affiliation
IV-D-91	K.S. Goekjian Town of Candia Candia, New Hampshire
IV-D-92	Representative N. DeMarinis House of Representatives, State of Connecticut Hartford, Connecticut
IV-D-93	C.D. Kellett Safety-Kleen Elgin, Illinois
IV-D-94 (Identical to IV-D-85)[b]	Integrated Waste Service Association Washington, D.C.
IV-D-95	W. Wilson Polk County Solid Waste Facilities Fosston, Minnesota
IV-D-96	Mayor K.L. Schmoke City of Baltimore Baltimore, Maryland
IV-D-97	C. Campbell Cement Kiln Recycling Coalition Washington, D.C.
IV-D-98	M.H. Levin, Nixon, Hargrave, Devans & Doyle Washington, D.C. Submitting corrected copies of comment on behalf of Ogden Projects, Inc., Fairfield, New Jersey
IV-D-99	L.A. Johnson Lee County Board of County Commissioners Fort Myers, Florida
IV-D-100	T.A. Sheridan Town of Waterford Waterford, Connecticut
IV-D-101	L.L. Bunn South Carolina Department of Health and Environmental Control Columbia, South Carolina

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NEW SOURCE PERFORMANCE STANDARDS AND EMISSION GUIDELINES FOR MUNICIPAL WASTE COMBUSTORS (DOCKET A-90-45) (CONTINUED)

Item No.	Commenter and Affiliation
IV-D-102	T.J. Maslany U.S. EPA, Region III Philadelphia, Pennsylvania
IV-D-103	T.M. Allen New York State Department of Environmental Conservation Albany, New York
IV-D-104	L.W. Bitter Davis County Solid Waste Management and Energy Recovery Special Service District Layton, Utah
IV-D-105[e]	M.M. Round Northeast States For Coordinated Air Use Management Boston, Massachusetts
IV-D-106	Representative M.K. McGratten State of Connecticut House of Representatives Hartford, Connecticut
IV-D-107	J.S. McCann The Lamphere Schools, Administration Center Madison Heights, Michigan
IV-D-108	W. O'Sullivan & K. Hart Department of Environmental Protection, State of New Jersey Trenton, New Jersey
IV-D-109	D.R. Schregardus State of Ohio Environmental Protection Agency Columbus, Ohio
IV-D-110	P.M. Tranchik U.S. Army Fort Dix, New Jersey
IV-D-111	A. Szurgot American Ref-Fuel Houston, Texas

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NEW SOURCE PERFORMANCE STANDARDS AND EMISSION GUIDELINES FOR MUNICIPAL WASTE COMBUSTORS (DOCKET A-90-45) (CONTINUED)

Item No.	Commenter and Affiliation
IV-D-112[f]	G.K. Crane Ogden Martin Systems, Inc. Fairfield, New Jersey
IV-D-113 (Identical to IV-D-62)[b]	Mayor D. Flury City of Dover Dover, Minnesota
IV-D-114	W. Wilson Polk County Solid Waste Facilities Fosston, Minnesota
IV-D-115	R. Kell and V. Kell Private Citizens Madison Heights, Michigan
IV-D-116	Representative B.R. Kolar State of Connecticut Hartford, Connecticut
IV-D-117	Representative S. Mikutel State of Connecticut Hartford, Connecticut
IV-D-118	H.S. Cole & Associates, Inc. Attachment to original comment, IV-D-17 Washington, D.C.
IV-D-119 (Facsimile of IV-D-116)[a]	Representative B. Kolar Connecticut House of Representatives Hartford, Connecticut
IV-D-120	A.M. Jackson Minnesota Pollution Control Agency St. Paul, Minnesota
IV-D-121	S.C. Brand Thermogenics, Inc. Albuquerque, New Mexico
IV-D-122	Representative W.O. Lipinski United States Congress submitting with M.W. Turlek of Lyons Incinerator Opponent Network Lyons, Illinois

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NEW SOURCE PERFORMANCE STANDARDS AND EMISSION GUIDELINES FOR MUNICIPAL WASTE COMBUSTORS (DOCKET A-90-45) (CONTINUED)

Item No.	Commenter and Affiliation
IV-D-123 (see IV-D-40)[g]	Mayor M. Krause City of Oronoco Oronoco, Minnesota
IV-D-124 (see IV-D-58)[g]	G. Postier Olmsted County Association of Townships Oronoco, Minnesota
IV-D-125 (see IV-D-80)[g]	C. Kamper County of Olmsted Rochester, Minnesota
IV-D-126	M.W. Turlek Lyons Incinerator Opponent Network Lyons, Illinois
IV-D-127	Mayor M. Krause City of Oronoco Oronoco, Minnesota
IV-D-128	Mayor L. Gray City of Stewartville Stewartville, Minnesota
IV-D-129	Mayor D. Flury City of Dover Dover, Minnesota
IV-D-130	C. Kamper County of Olmsted Rochester, Minnesota
IV-D-131	Mayor W. Bussell City of Eyota Eyota, Minnesota
IV-D-132	Mayor C. Hazama City of Rochester Rochester, Minnesota
IV-D-133	D.L. Segel SBA Associates Elmhurst, Illinois
IV-D-134	M.A. Gagliardo Northeast Maryland Waste Disposal Authority Baltimore, Maryland

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NEW SOURCE PERFORMANCE STANDARDS AND EMISSION GUIDELINES FOR MUNICIPAL WASTE COMBUSTORS (DOCKET A-90-45) (CONTINUED)

Item No.	Commenter and Affiliation
IV-D-135	G.S. Arslanian International Recycling, Ltd. Fairlawn, New Jersey
IV-D-136	G.K. Crane Ogden Martin Systems, Inc. Fairfield, New Jersey
IV-D-137	J.F. Eggen United Power Association Elk River, Minnesota
IV-D-138	Deleted from Docket A-90-45, comment intended for another docket
IV-D-139	M.J. Wax Institute of Clean Air Companies Washington, DC
IV-D-140	J. Greenberg Browning-Ferris Industries Washington, DC

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NEW SOURCE PERFORMANCE STANDARDS AND EMISSION GUIDELINES FOR MUNICIPAL WASTE COMBUSTORS (DOCKET A-90-45) (CONCLUDED)

Item No.	Commenter and Affiliation
IV-D-141	J. Eggen United Power Association Elkriver, MN

[a] Several commenters sent comments via facsimile and followed up by mailing a copy. In those cases where the facsimile and the mailed copy were assigned different docket item numbers, all comment summaries and responses refer to the docket item number of the mailed copy only.

[b] Two identical sets of comments were received from this commenter and assigned different docket item numbers. All comment summaries and responses refer only to the docket item number of the first of the two comments.

[c] This commenter submitted a corrected version of their original comments.

[d] This item was not summarized. It notified the Air Docket that substantive comments were forthcoming, and those comments were filed under IV-D-109.

[e] This item is an attachment to item IV-D-74 and is summarized under that item number.

[f] This item is an earlier draft of data submitted as part of item number IV-D-98.

[g] This comment is identical in every respect to the one in parentheses except that it is addressed to a different person. All comment summaries and responses refer only to the comment in parentheses.

TABLE 2-2. LIST OF COMMENTERS ON PROPOSED WITHDRAWAL OF THE 1991 SUBPART Cb EMISSION GUIDELINES FOR MUNICIPAL WASTE COMBUSTORS (DOCKET A-89-08)

Item No.	Commenter and Affiliation
VI-B-01 (Identical to A-90-45: IV-D-67)[a]	J.S. Bilmes Bristol Resource Recovery Facility Operating Committee Bristol, Connecticut
VI-B-02	D.H.M. Holihan City of St. Petersburg St. Petersburg, Florida
VI-B-03	P.G. Sunderland Department of Environmental Services, Arlington County Arlington, Virginia
VI-B-04	Mayor M.S. Savage and C. James City of Tulsa Tulsa, Oklahoma
VI-B-05	J.S. Hadfield Southeastern Public Service Authority of Virginia Chesapeake, Virginia
VI-B-06	C. Lake City of Dunedin Dunedin, Florida
VI-B-07	D.R. Schregardus State of Ohio Environmental Protection Agency Columbus, Ohio
VI-B-08	H. Lanier Hickman The Solid Waste Association of North America Silver Spring, Maryland
VI-B-09	J. Thomas Cochran The United States Conference of Mayors Washington, D.C.
VI-B-10	M.A. Gagliardo Northeast Maryland Waste Disposal Authority Baltimore, Maryland

TABLE 2-2. LIST OF COMMENTERS ON PROPOSED WITHDRAWAL OF THE 1991 SUBPART Cb EMISSION GUIDELINES FOR MUNICIPAL WASTE COMBUSTORS (DOCKET A-89-08) (CONCLUDED)

Item No.	Commenter and Affiliation
VI-B-11	L.W. Bitter Davis County Solid Waste Management and Energy Recovery Special Service District Layton, Utah
VI-B-12	M. Zannes Integrated Waste Services Association Washington, D.C.
VI-B-13	H. Stuart Broom, Verner, Liipfert, Bernhard, McPherson, and Hand, Washington, D.C. Submitting on behalf of Pinellas County, FL
VI-B-14	D.A. Len Montenay International Corporation Miami, FL
VI-B-15	G.A. Green Oregon Dept. of Environmental Quality Portland, OR

[a] Two identical sets of comments were received from this commenter and were assigned to different dockets with different docket item numbers. All comment summaries and responses refer only to the docket item number in docket A-90-45.

In several cases, commenters supported their comments by referencing comments submitted by other commenters. Rather than list the supporter's docket item number each time the supported docket item number is listed, those commenters that are supported by others are as follows: One commenter (IV-D-20) supported and incorporated by reference the comments submitted by the Cement Kiln Recycling Coalition (IV-D-78). Two commenters (IV-D-48, IV-D-50) supported the comments submitted by the Chemical Manufacturers Association (IV-D-90). One commenter (IV-D-56) supported the comments submitted by the Integrated Waste Services Association (IWSA) (IV-D-85). Four commenters (IV-D-64, IV-D-70, IV-D-87, IV-D-95) supported the comments submitted by the U.S. Conference of Mayors and/or its affiliate, the Municipal Waste Management Association (MWMA) (IV-D-44). Two commenters (IV-D-64, IV-D-88) supported the comments submitted by the Minnesota Resource Recovery Association (IV-D-54). One commenter (VI-B-04) submitted comments in support of comments submitted by the Solid Waste Association of North America (VI-B-08), the IWSA (IV-D-85), and the MWMA (IV-D-44).

2.2 ORGANIZATION OF COMMENT SUMMARIES

Chapters 3.0 through 12.0 present a summary of significant comments and EPA responses. The comments are grouped by subject areas, and the organization of topics is similar to the organization of the proposal preamble for the NSPS and emission guidelines.

Chapter 3.0 contains comments on the applicability of the proposed NSPS and emission guidelines and comments on the proposed emission limits for MWC organics, acid gases, metals, particulate matter, and nitrogen oxides. These include comments on selection of the maximum achievable control technology (MACT) floor and MACT requirements for control of MWC emissions, the selected size categories for MWC's, the proposed emission limits, good combustion practice requirements, and the testing, monitoring, and reporting provisions. Comments on the environmental, economic, and other impacts of the standards are also included.

Chapter 4.0 summarizes comments on the proposed NSPS siting analysis and materials separation plan requirements and the associated compliance demonstration and reporting provisions. The environmental, economic, and other impacts of materials separation are also discussed. In addition, chapter 4.0 contains more general comments on national strategies to promote municipal solid waste recycling.

Chapter 5.0 summarizes comments on the proposed NSPS standards for fugitive ash emissions including comments on selection of the standards and test methods for visible emissions. Chapter 6.0 includes other comments on miscellaneous issues related to the NSPS.

Chapters 7.0 through 10.0 summarize comments on the proposed emission guidelines for existing MWC plants. In many instances, comments apply equally to new and existing MWC plants regulated under the NSPS and emission guidelines. In such cases, the comment is fully summarized and is responded to under chapters 3.0 through 6.0 regarding the NSPS and only briefly mentioned under chapters 7.0 through 10.0 regarding the guidelines, referring the reader back to the NSPS section where the response to the comment appears. Only those comments and responses that pertain specifically to the emission guidelines are fully summarized and responded to in chapters 7.0 through 10.0.

Chapter 7.0 contains comments related to the guidelines for MWC emissions and compliance schedules for existing MWC units. Chapter 8.0 focuses on the Environmental Protection Agency's proposition to require materials separation provisions for the emission guidelines. Chapter 9.0 summarizes comments on the proposed emission limit for fugitive ash emissions; and chapter 10.0 includes miscellaneous comments on topics related to the guidelines.

Chapters 11.0 and 12.0 address comments on two issues related to the proposed guidelines. Chapter 11.0 summarizes comments on the withdrawal of the 1991 Municipal Waste Combustion Emission Guidelines (subpart Ca). Chapter 12.0 contains comments on Executive Order 12875.

2.3 LIST OF ACRONYMS AND ABBREVIATIONS FOR UNITS OF MEASURE

ACRONYMS

Act	Clean Air Act
Administrator	EPA Administrator
Agency	EPA
APC	air pollution control
APCD	air pollution control device
APCS	air pollution control system
ASME	American Society of Mechanical Engineers
BACT	best available control technology
BDT	best demonstrated technology
BID	background information document
CAAA	Clean Air Act Amendments
Cd	cadmium
CEM	continuous emissions monitor
CEMS	continuous emissions monitoring system(s)
CETRED	Combustion Emissions Technical Resource Document
CFR	Code of Federal Regulations
CKRC	Cement Kiln Recycling Coalition
CMA	Chemical Manufacturers Association
CO	carbon monoxide
CO_2	carbon dioxide
COM	continuous opacity monitor
COMS	continuous opacity monitoring system(s)
DAS	data acquisition system
DEP	Department of Environmental Protection

dioxins	polychlorinated dibenzo-p-dioxins
DOE	U.S. Department of Energy
DSI	duct sorbent injection
EPA	U.S. Environmental Protection Agency
ERC	emission reduction credit
ESP	electrostatic precipitator
EU	European Union
FBC	fluidized-bed combustor
FF	fabric filter (baghouse)
FR	Federal Register
furans	polychlorinated dibenzofurans
GCP	good combustion practice
HAP	hazardous air pollutant
HCl	hydrogen chloride
Hg	mercury
HWI	hazardous waste incinerator
ICP-MS	inductively coupled plasma mass spectroscopy
ITEQ	international toxic equivalents
IWSA	Intergrated Waste Services Association
LAER	lowest achievable emission rate
MACT	maximum available control technology
MB	mass burn
MB/WW	mass burn/waterwall combustor
MOD/EA	modular/excess air combustor
MSW	municipal solid waste
MWC	municipal waste combustor
MWI	medical waste incinerator
MWMA	Municipal Waste Management Association
NAAQS	national ambient air quality standard
NESCAUM	Northeast States for Coordinated Air Use Management
NESHAP	national emission standards for hazardous air pollutants
NLC	National League of Cities

NEPA	National Environmental Policy Act
NO_x	nitrogen oxides
NRDC	Natural Resources Defense Council
NSPS	new source performance standards
NSR	new source review
O_2	oxygen
OAQPS	Office of Air Quality Planning and Standards
OMB	Office of Management and Budget
OPI	Ogden Projects, Inc.
OSHA	Occupational Safety and Health Administration
Pb	lead
PCB's	polychlorinated biphenyls
PCDD/PCDF	polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans
PIC	products of incomplete combustion
PM	particulate matter
PQL	practical quantitation Limit
PSD	prevention of significant deterioration
PTC	power test code (see ASME)
PVC	polyvinyl chloride
QA	quality assurance
QRO	Qualification of Resource Recovery Facility Operators
RAC	reference air concentration
RACT	reasonably available control technology
RCRA	Resource Conservation and Recovery Act
RDF	refuse-derived fuel
REF	refractory
RRF	resource recovery facility
RSD	risk specific dose
SARA	Superfund Amendments and Reauthorization Act
SCA	specific collection area (Re: ESP's)
SCR	selective catalytic reduction
SD	spray dryer

SIP	State implementation plan
SNCR	selective noncatalytic reduction
SO_2	sulfur dioxide
SO_x	sulfur oxides
STAPPA/ALAPCO	State and Territorial Air Pollution Program Administrators and the Association of Local Air Pollution Control Officials
SWANA	Solid Waste Association of North America
SWPD	Solid Waste Processing Division (part of ASME)
TEF	toxic equivalency factor
TEQ	toxic equivalent (e.g., 2,3,7,8-tetrachlorinated dibenzo-p-dioxin toxic equivalent)
TSP	total suspended particulates
USC	United States Code
VOC	volatile organic compounds
WTE	waste-to-energy

ABBREVIATIONS FOR UNITS OF MEASURE

Btu	= British thermal unit
^oC	= degrees Celsius
dscf	= dry standard cubic foot (@ 14.7 psia, 68 ^oF)
dscm	= dry standard cubic meter (@ 14 psia, 68 ^oF)
^oF	= degrees Fahrenheit
gr	= grains
kg	= kilogram (10^{+3} grams)
lb	= pound
m^3	= cubic meter
mg	= milligrams (10^{-3} grams)
Mg	= megagram (10^{+6} grams)
MMBtu	= million Btu
ng	= nanogram (10^{-9} grams)
Nm^3	= normal cubic meter (@ 14.7 psia, 32 ^oF)
ppm	= parts per million
ppmv	= parts per million by volume

psia	=	pounds per square inch, absolute
tons/day	=	tons per day
tons/yr	=	tons per year
μg	=	microgram (10^{-6} grams)
yr	=	year

3.0 NEW SOURCE PERFORMANCE STANDARDS - MUNICIPAL WASTE COMBUSTOR EMISSIONS

3.1 SELECTION OF SOURCE CATEGORY

Comment: One commenter (IV-D-35) contended that the proposed NSPS and guidelines should not apply to "any mixture" of industrial waste and MSW, as stated in the preambles as follows: "Any mixtures of industrial process/manufacturing discards with nonprocess industrial waste or with household, commercial, or institutional waste is considered to be MSW." The commenter pointed out that under this requirement, an industrial boiler firing 1 percent MSW would be subject to the proposed NSPS and guidelines. The commenter argued that the proposed "any mixture" requirement (hereafter referred to as the "mixture rule") would subject almost all industrial waste to the proposed NSPS and guidelines, and such an action is unsubstantiated and runs counter to the goals of the Act. The commenter expressed surprise at the "mixture rule," since the preambles do not offer any substantive discussion as to why the "mixture rule" is necessary and passes the requirement off as a "minor editing" change in the definition of MSW (see 59 FR 48212). The commenter pointed out the EPA's own words in the 1991 promulgated NSPS (56 FR 5495) that industrial waste and MSW should not be subject to the same standard: "industrial process wastes are excluded from the definition of MSW. These wastes are usually different in character than MSW and were not intended to be covered under this standard." The commenter also cited language from the Act that commands the EPA to develop standards that are specifically applicable to industrial and commercial waste.

The commenter argued that the "mixture rule" runs counter to the goals of RCRA and State recycling laws. The commenter explained that the proposed "mixture rule" would discourage the use of industry source-separated materials, such as paper, plastics, and wood, that cannot be recycled back into products, as clean fuels. The commenter urged the EPA to drop the "mixture rule" and rely, instead, on the 30-percent cofiring definition of MSW.

Response: In the proposed standards, it was not the EPA's intent that industrial boilers, MWI's, and other incinerators (or boilers) combusting small amounts of MSW be subject to the proposal. It was also not the EPA's intent to redefine industrial waste and other non-MSW streams as MSW. The EPA had attempted to explain its intentions by example and by definition. The comments indicate that the EPA was not successful in its efforts.

At proposal, it was the EPA's intent that combustors firing principally MSW and located at plants with greater than 35 Mg/day aggregate combustion capacity be covered by the proposal. This would mean an MWC larger than 35 Mg/day combustion capacity and firing 100 percent MSW would be covered by the proposal and would not become exempt from the MWC regulation by simply firing a small amount of industrial waste or other non-MSW waste stream. For example, a combustor firing 100 percent MSW at a rate of 400 Mg/day would be covered by the MWC regulation. Coverage would not change if the owners decided to fire an additional 4 Mg/day industrial waste with the MSW stream.

The concept that the EPA was attempting to explain was that an MWC does not become a non-MWC simply by firing a small amount of non-MSW. The proposal was interpreted by some to mean that an industrial incinerator (or boiler) principally firing industrial waste (or other non-MSW) would become subject to the MWC regulation if it fired any amount of MSW. This was not the EPA's intent.

To clarify this point, the definition of MSW in the final NSPS and guidelines has been revised and does not include any reference to mixtures of industrial waste, medical waste, or non-MSW. Additionally, a provision has been added that any combustor, incinerator, or boiler firing less than 10 Mg/day MSW is not covered by the regulations. This provision supplements the 30 percent cofiring provision.

The 10 Mg/day criteria was selected after considering that a cofired combustor of 35 Mg/day capacity (lower size cutoff for the NSPS and guidelines) could fire up to 30 percent MSW (10 Mg/day) before being considered an MWC.

The owner or operator of a combustor, incinerator, or boiler can elect to exercise either the 30 percent cofiring exemption or the 10 Mg/day MSW de minimis cutoff exemption. The 10 Mg/day cutoff exemption is more appropriate for units firing small amounts of MSW.

Comment: Three commenters (IV-D-18, IV-D-35, IV-D-103) argued that mixtures of medical waste and MSW should not be regulated under the NSPS and guidelines, as stated in the NSPS and guidelines preambles: "any mixtures of medical waste with nonmedical hospital waste or with household, commercial, or institutional waste is considered to be MSW." One commenter (IV-D-35) argued that there is no scientific or public policy basis for this decision. Another commenter (IV-D-18) stated that according to the proposed NSPS and guidelines, medical wastes are not considered to be MSW. One commenter (IV-D-74) expressed support for the EPA's decision to exclude MSW and MWI's from the guidelines by choosing the 35 Mg/day lower size cutoff for applicability. This commenter noted that MWI's would be regulated by a separate rulemaking.

Three commenters (IV-D-18, IV-D-35, IV-D-103) indicated that the upcoming MWI rule should be considered in regulating medical waste mixtures. One commenter (IV-D-35) argued that until regulations for MWI's are finalized, there is no basis for regulating mixtures of MSW and medical waste, since medical waste is substantially different from MSW and may require different approaches in regulating emissions. One commenter (IV-D-18) supported an approach that would require that mixtures of medical waste and municipal waste be handled with the same care and concern with which a segregated medical waste stream would be handled and suggested regulating mixtures under the MWI rule. Two commenters (IV-D-35, IV-D-103) suggested that the EPA take a different approach in regulating mixtures of medical waste and MSW by requiring that sources combusting a combination of medical waste and MSW meet the more stringent of the standards that will be promulgated under section 111 of the Act. One commenter (IV-D-18) expressed recognition of the fact that there may be complications even in this suggested approach, such as a need for unique handling problems presented by medical waste, that may require a separate regulation. The commenter concluded, however, that their suggested approach would be more logically consistent with how the regulation of different source categories is developed under section 111 of the Act.

One commenter (IV-D-35) further argued that by defining medical waste mixed with MSW as MSW, the EPA is contradicting, and therefore undermining, existing State regulations that define medical waste mixed with MSW as medical waste, subject to more stringent management standards. The commenter explained that MWI's are currently regulated by various conflicting State and Federal regulations and that in the absence of coordinated Federal regulations, States have adopted medical waste regulations that define medical waste and set standards for medical waste treatment technologies.

The commenter (IV-D-35) urged the EPA to clearly state in the final rule the scope of the final rule as it relates to MWI's and to the forthcoming MWI regulations.

Response: Separate NSPS and emission guidelines are currently being developed under section 129 of the Act for MWI's, and it was not the EPA's intent in the proposed MWC NSPS and guidelines that MWI's be covered under the MWC rule unless the combustion capacity is greater than 35 Mg/day and more than 30 percent of the waste stream (on a unit basis) is MSW. As indicated by the commenters, the proposed definition of MSW was interpreted to mean that MWI's firing even very small quantities of MSW would be subject to the MWC rule. Because this was not the EPA's intent, the definition of MSW in the final standards and guidelines was revised to exclude reference to segregated medical waste streams. Refer to the EPA's response to another comment in this section for further discussion of this revision to the definition of MSW. Additionally, a provision was added to the definition of MWC to exclude from the definition any plant combusting a very small quantity of MSW (i.e., a plant with a federally enforceable permit limiting the plant to combusting less than 10 Mg/day of MSW).

As discussed elsewhere in this section, the 10 Mg/day cutoff is based on the exemption for cofired combustors. Any plant with total plant capacity greater than 35 Mg/day that combusts less than 10 Mg/day of MSW as part of its waste stream would have been considered under the proposed NSPS and guidelines a cofired combustor and would only have been subject to reporting and recordkeeping provisions for cofired combustors. The 10 Mg/day exemption will simplify this intended exemption for cofired combustors like MWI's that fire only very small quantities of MSW and reduce the reporting and recordkeeping burden. Under the final NSPS and guidelines, such plants are not to be considered cofired combustors or

MWC's and are not subject to any provisions of the final rules except an initial report providing a copy of the permit limiting the amount of MSW that may be combusted by the plant.

The EPA expects that only a few incinerators will be covered under both the final MWC regulations and the future MWI regulations. Few MWI's are larger than 35 Mg/day plant capacity, which is the lower size cutoff for applicability to the MWC standards. This lower size threshold was selected by the EPA after reviewing the population distributions of MWI's and MWC's. The MWI population includes more than 3,000 combustors with a single combustion unit per facility and an average size of less than 3 Mg/day combustion capacity. Since the EPA has added the provision to the final MWC NSPS and guidelines that excludes from the definition of MWC any plants combusting less than 10 Mg/day of MSW, most MWI's that fire segregated medical waste in combination with general hospital waste (MSW) will not be covered by the MWC rule. Those few large incinerators (greater than 35 Mg/day capacity) that cofire medical waste and MSW and where MSW is more than 30 percent of the input (and more than 10 Mg/day) will be covered by the final MWC regulations. Since both regulations are being drafted under section 129 authority and both address the same pollutants, the dual coverage simply results in the incinerator complying with the most restrictive regulation.

Comment: Four commenters (IV-D-18, IV-D-35, IV-D-85, IV-D-98) contended that the proposed definition of "MSW" for the NSPS and guidelines should be revised and clarified because they believe the definition of MSW is either unclear relative to segregated wastes or inconsistent with the proposed preamble language and with section 129 of the Act. The commenters indicated that the regulations, as drafted, will unnecessarily restrict MWC's from burning certain types of wastes from industrial manufacturing plants.

One commenter (IV-D-85) argued that nonsegregated industrial process waste should be included in the definition of MSW. Two commenters (IV-D-85, IV-D-98) indicated that the proposed definition of MSW, by excluding nonsegregated industrial process waste and nonhazardous industrial discards, will preclude these wastes from being combusted by MWC's. One of the commenters (IV-D-98) stated that some States have used the EPA's MSW definition to limit the scope of materials an MWC can combust under its operating permit. The commenter argued that Congress had intended that the definition of MSW apply solely for the purposes of sections 129 and 306 of the Act, such that the EPA must specifically state in the final rule that the definition applies solely for the purposes of sections 129 and 306 of the Act.

Three commenters (IV-D-18, IV-D-35, IV-D-85) pointed out an inconsistency between the preamble and regulatory text of the NSPS regarding the definition of MSW. The commenters cited the preamble to the NSPS, which states that "segregated" industrial process/manufacturing discards are not MSW, but "any mixture or industrial process/manufacturing discards with nonprocess industrial waste or with household, commercial, or institutional waste is considered MSW." One commenter (IV-D-35) indicated that the rule itself does not mention industrial waste in its definition of MSW, but does mention medical waste. Commenter IV-D-85 requested that the EPA specify in § 60.51b that a mixture of industrial process waste and MSW is MSW.

Response: The definition of MSW is intended to specify which types of waste trigger a combustion facility to be covered under the MWC rule. The definition of MSW does not define, as the commenters claim, limits to the types of waste than an MWC can combust. Nowhere is it stated in the rule that there is any limit on the type of waste an MWC can combust. In fact, the definition of "cofired combustor" specifically states that a unit combusting more than 30 percent MSW is an MWC. An MWC is not prohibited under this rule from combusting non-MSW items such as railroad ties, telephone poles, or industrial manufacturing wastes.

The definitions of MWC and MSW under subparts Eb and Cb are defined only for the purpose of these subparts. It is not necessary to specify this intention in the subparts because it is always the case that a term is defined within a subpart for the limited purposes of the specific subpart. If a State wishes to borrow the definition of MWC or MSW for the purpose of their authorized RCRA program, the State has that prerogative; however, a State is not required to utilize the definition of MWC and MSW under subparts Eb and Cb for the purpose of their authorized RCRA program.

Industrial/commercial manufacturing waste and medical waste were not included in the definition of MSW because the EPA is developing separate regulations covering the combustion of these materials under section 129 of the Act. Therefore, the definition of MSW in the final NSPS and guidelines will not refer to segregated medical waste or segregated industrial waste. However, the definition of MSW has been revised to clarify that MSW includes nonmedical waste discarded from hospitals (office paper, cafeteria waste, etc.). The proposed and promulgated definitions of MSW both specify that nonprocess wastes discarded by industrial facilities are included in the definition of MSW.

Comment: One commenter (IV-D-26) argued that the MWC rule should not apply to the pyrolysis of recycled plastics. The commenter explained that recovering plastics from MSW for use in the production of synthetic materials for clothing, monomers for plastics, lubricating oils, etc., is materials recovery since it involves recovering a liquid hydrocarbon product from solid waste rather than producing it from petroleum or other higher-value petrochemicals. The commenter argued that excluding plastics recycling from coverage under the MWC rule would be consistent with: (1) The current exemption in the MWC rule for metals recovery facilities, and (2) the RCRA, which defines "recovered material" as waste materials that have been recovered from solid waste. The commenter provided data indicating that 70 to 80 percent of the material recovered from MSW would be converted into plastic components and sold as liquid product (feedstock) to companies that use it to manufacture new petroleum-based products. The commenter indicated that 5 to 10 percent of the recycled plastic input into the plastic recycling process is sold as carbon for use in the production of miscellaneous products (e.g., activated carbon and rubber goods). The information provided by the commenter thus indicated that 10 to 25 percent of the plastic recovered from MSW for input into the process is noncondensible vapor that is used (combusted) within the recycling process to generate process heat.

Response: The commenter is correct that the EPA's current solid waste disposal policy encourages materials recovery. As stated in the EPA report "The Solid Waste Dilemma: An Agenda for Action" (EPA/530-SW-88-052), on a national basis, the preferred hierarchy of waste management is (1) Source reduction, (2) recycling of materials, and (3) incineration and landfilling. In consideration of this policy and the comment, the EPA concluded that, under certain conditions, a plant that recycles plastics and rubber should not be covered under the MWC NSPS or emission guidelines. A plastics/rubber recycling unit has been defined in the final rule as an integrated processing unit where plastics, rubber, and/or rubber tires are the only feed materials (incidental contaminants may be included in the feed materials) and they are processed into a chemical plant feedstock or petroleum refinery feedstock, where the feedstock is marketed to and used by a chemical plant or petroleum refinery as input feedstock. The combined weight of the chemical plant feedstock and petroleum refinery feedstock produced by the plastics/rubber recycling unit on a calendar quarter basis shall be more than 70 percent of the combined weight of the plastics, rubber, and/or rubber tires processed by the plastics/rubber processing unit on a calendar quarter basis. The plastics, rubber, or rubber tire fed to the plastics/ rubber recycling unit may originate from the separation or diversion of plastics, rubber, or rubber tires from MSW or industrial solid waste, and may include manufacturing scraps, trimmings, and off-specification plastics, rubber, and rubber tire discards. The plastics, rubber, or rubber tires fed to the plastics/rubber recycling unit may contain incidental contaminants (e.g., paper labels on plastic bottles, metal ring on plastic bottle caps, etc.). Pyrolysis/combustion units that are an integrated part of a plastics/rubber recycling unit (as defined above) are not subject to the MWC NSPS or emission guidelines if the owner or operator of the plastics/rubber recycling unit keeps records of (1) the weight of plastics, rubber, and/or rubber tires processed on a calendar quarter basis, (2) the weight of chemical plant feedstocks and petroleum refinery feedstocks produced and marketed on a calendar quarter basis, and (3) the name and address of the purchaser of the feedstocks. The combustion of gasoline, diesel fuel, jet fuel, fuel oils, residual oil, refinery gas, petroleum coke, liquified petroleum gas, propane, or butane produced by chemical plants or petroleum refineries that use feedstocks produced by plastics/rubber recycling units are not subject to the MWC NSPS and guidelines.

Comment: One commenter (IV-D-35) urged the EPA to modify the definition of "MSW" and "RDF" in order to exclude fuel products derived from certain source-separated portions of the

MSW stream from being subject to the proposed NSPS and guidelines. The commenter argued that materials separated are "inherently cleaner materials and do not suffer from the quality control constraints that mixed MSW does." The commenter indicated that including these separated materials in the definition of MSW would discourage the use by industrial boilers or furnaces of source-separated materials, such as paper, plastics, and wood that cannot be recycled back into goods as clean fuels. The commenter argued that this result would run counter to the goals of RCRA and State recycling laws. The commenter pointed out that two-thirds of the States have recycling laws that require them to reach a 50-percent recycling rate or 50-percent landfill diversion rate within the next several years. The commenter stated that energy recovery will be a key management technique for achieving these aggressive rates and will be an important source of swing demand when materials recycling markets are incapable of generating demand.

Another commenter (IV-D-33) urged the EPA to expand the category of fuels, including waste oil and tires, that are not subject to the proposed NSPS and guidelines by including solid waste-derived materials that provide energy value and that have been shown to have a net environmental benefit when compared to fossil fuel combustion alone. The commenter specifically discussed the qualities of pelletized paper fuel that would make this fuel a candidate for consideration. The commenter explained that pelletized paper fuel is made from paper that has been recycled but which cannot be used to make new paper and paperboard products by the pulp and paper industry. The commenter continued that this fuel can provide a high heating-value material (7,500 to 8,000 Btu), which, when cofired with coal, results in lower emissions of SO_2, HCl, and chlorine than combustion of coal alone. The commenter argued that there is no compelling policy or scientific reason not to grant single-component, MSW-derived materials used as fuels, such as pelletized paper, the same status as tires and waste oil. The commenter warned that failure to provide such an exemption could stifle an environmentally beneficial and energy-saving industry practice that is just now emerging.

Response: Industrial manufacturing waste is not MSW. A separate rulemaking is under development to address industrial waste. If the separated wastepaper and plastics mentioned by commenter IV-D-35 are discards from residential, commercial/retail, or institutional facilities as specified in the definition of MSW, then they are considered to be MSW. A combustor firing these separated materials would be covered by the NSPS and guidelines unless it (1) Qualifies as a cofired combustor (less than 30 percent of the waste stream is MSW), (2) fires less than 10 Mg/day of MSW, or (3) is a plastics/ rubber recycling unit (refer to discussion earlier in this section). Mixed wastepaper and RDF are considered to be MSW.

If the pelletized paper fuel identified by commenter IV-D-33 is produced from wastepaper discarded from residential, commercial/retail, or institutional facilities as specified in the definition of MSW, then the pelletized paper fuel is a form of RDF and is considered to be MSW. Section 129 specifically includes RDF in the definition of MSW. A combustor firing RDF made from MSW would be covered by the NSPS and guidelines unless it (1) Qualifies as a cofired combustor (less than 30 percent of the waste stream is RDF), or (2) fires less than 10 Mg/day of RDF.

Comment: One commenter (IV-D-53) contended that nonpower production plants (e.g., steam generation plants) that combust a single-item waste stream of used oil should not be subject to the proposed NSPS and guidelines. The commenter pointed out that the proposed rules specify that electric power generation facilities that combust a single-item waste stream of used oil are not subject to the proposed standards. The commenter contended that MWC plants that burn used oil for non-electric power production purposes (steam or process heat) should not fall within the scope of the proposed rules for the following reasons: (1) Such nonpower production plants are not "solid waste incineration units" as defined in paragraph (g)(1)(B) of section 129 of the Act, (2) combustion of oil is already covered by RCRA, section 6901, and (3) oil-fired boilers are very different from MWC's and were not considered in the determination of MWC MACT. The commenter discussed these three reasons in detail.

Response: Used oil is a liquid waste and not a solid waste, so used oil is not considered to be MSW. The definition of MSW has been revised under the NSPS and guidelines to specify that used oil does not fall under the definition of MSW. Combustion units that burn only used oil are not covered by the MWC NSPS and guidelines. Furthermore, any combustion unit firing a waste stream of used oil with MSW, in which MSW is less than 30 percent of the waste stream, would be considered a "cofired combustor" under the final NSPS and guidelines. Also, any combustion unit firing a waste stream of used oil with MSW, in which MSW makes up less than 10 Mg/day of the waste stream is exempt from the NSPS and guidelines. Cofired combustors and combustors firing less than 10 Mg/day of MSW are not subject to the NSPS and guidelines, as long as they submit a notification of their exemption and keep records of the daily amounts of MSW fired.

Comment: One commenter (IV-D-20) suggested that the EPA should revise the definition of "municipal-type solid waste" for the NSPS and guidelines to exclude renovation wastes since construction and demolition wastes are already excluded and, although renovation is a slightly different process, personnel involved in renovation activities would be doing the same things as construction or demolition workers.

Response: The proposed definition of MSW did not specifically mention renovation wastes because it was assumed by the EPA that renovation wastes are a subset of construction/demolition wastes, which are already excluded from the definition of MSW. However, to clarify this point, the term "renovation waste" was added to the list of wastes specifically excluded from the definition of MSW for the purpose of the NSPS and guidelines. Examples of construction/demolition/renovation wastes are wastes from demolished buildings, railroad ties, and telephone poles.

Comment: One commenter (IV-D-03) contended that the definition of "MSW" creates inconsistencies in the application of the NSPS and guidelines to industrial boilers burning waste materials. The commenter provided the following two examples: (1) Boilers burning tires that are manufacturing rejects or scrap paper recovered from the manufacturing process would not be subject to the regulation, whereas identical plants burning discarded tires or paper discards segregated for recycling from commercial, residential, and institutional establishments would be subject to the regulation, and (2) industrial boilers that burn tires that are manufacturing rejects and process scraps are likely to burn these same materials as commercial, residential, and institutional discards.

Response: The definition of MSW does not result in inconsistencies in the application of the NSPS and guidelines to industrial boilers burning waste materials. Under the final NSPS and guidelines, industrial boilers and other combustors that fire more than 30 percent MSW will be subject to the MWC NSPS. The MWC NSPS and guidelines are intended to regulate the combustion of MSW, not industrial process wastes. If the materials fired by the boiler are similar in content to MSW (e.g., paper) but are not MSW (e.g., scrap paper recovered from the manufacturing process), then the boiler will not be covered under the final MWC NSPS unless those materials are part of a waste stream including more than 30 percent MSW. However, the EPA is currently developing a regulation for industrial waste combustors under section 129 of the Act. Therefore, combustion of materials that are MSW (e.g., paper) and similar materials that are industrial process wastes (e.g., paper and scrap paper recovered from the manufacturing process) will ultimately both be considered for regulation under section 129 of the Act.

Comment: One commenter (IV-D-03) contended that industrial boilers producing process steam or electricity and fueled by a segregated single-item waste stream or from segregated waste streams comprised of materials with known chemical composition should not be subject to the MWC NSPS and guidelines that were designed to apply to incinerators burning mixed MSW. The commenter argued that if wastes are segregated to eliminate the inclusion of metals, then the facility should not be required to conduct annual metals testing. Another commenter (IV-D-101) suggested that tree trimmings, yard wastes, and clean unfinished lumber be added to the list of single-item waste streams for these power production plants.

Response: Section 129 of the Act specifies the exemption from the MWC rule for waste-fuel power generating facilities. The exemption as specified under paragraph (g)(1) of section 129 reads as follows:

> ...The term "solid waste incineration unit" does not include ...qualifying small power production facilities, as defined in section 3(17)(C) of the Federal Power Act (16 U.S.C. 769(17)(C)), or qualifying cogeneration facilities, as defined in section 3(18)(B) of the Federal Power Act (16 U.S.C. 796(18)(B), which burn homogenous waste (such as units which burn tires or used oil, but not including refuse-derived fuel) for the production of electric energy or in the case of qualifying cogeneration facilities which burn homogeneous waste for the production of electric energy and steam or forms of useful energy (such as heat) which are used

> for industrial, commercial, heating or cooling purposes . . .

This section 129 wording has been incorporated into the final MWC NSPS and guidelines under § 60.50b of subpart Eb to specify the exemption for waste-fuel power generating facilities required by section 129, replacing § 60.50b(d) and the definition of "waste-fuel power generating facility" under § 60.51b. These changes will assure consistency with section 129 of the Act.

Additionally, in the final MWC NSPS and guidelines "clean wood" is not included in the definition of MSW. This exemption was added to the final MWC rules for two reasons. First, studies of dioxin/furan emissions from wood-fired boilers show that the combustion of clean wood results in low dioxin and mercury emissions. Based on studies by the National Council of the Paper Industry for Air and Stream Improvement, Inc. (NCASI) (January 1995), dioxin/furan emissions for wood-fired boilers firing clean wood waste (i.e, wood, wood chips, bark, and wood residue) were reported to range on average from 7 to 19 ng/dscm (total mass). Based on studies presented at the C.P. Tappi Environmental Conference (1991) and by the New York State Energy Research and Development Authority (NYSERDA) (November 1992), data for wood-fired boilers show mercury emissions that range on average from 0.0004 to 0.01 mg/dscm. Additionally, the EPA expects that combustion of clean wood results in low emissions of other pollutants such as lead and cadmium. Secondly, the EPA is currently considering regulating air emissions from wood-fired boilers under a separate rulemaking. Clean wood is defined in the final NSPS and guidelines as wood or wood products including clean untreated lumber (which is defined in the proposed and final rule), tree stumps (whole and chipped), and tree limbs (whole and chipped). Clean wood does not include yard waste, which is considered to be MSW under the final rule. Yard waste is defined in the final NSPS and guidelines as including grass, grass clippings, bushes, and shrubs. Yard wastes are primarily generated by residential areas and are typically considered part of the MSW stream. By covering yard waste in the MWC rules, the EPA is encouraging composting rather than the incineration of yard wastes.

Comment: One commenter (IV-D-135) contended that nonpower production plants (e.g., steam generation plants) that combust a single-item waste stream of tires should not be subject to the proposed MWC NSPS and guidelines. The commenter pointed out that the proposed rules specify that only power generation plants that combust a single-item waste stream of tires are not subject to the NSPS and guidelines. The commenter contended that plants that burn tires for nonpower production purposes should not fall within the scope of the proposed rules for the following reasons: (1) The emissions from a small-scale dedicated tire-fueled plant will be identical whether the steam production is used to produce electricity or process steam, (2) tire-fueled plants producing process steam result in a reduction in the consumption and importation of fossil fuel, (3) tire-fueled plants provide a benefit to the environment by serving as a long-term solution to the growing waste tire problem. Additionally, the commenter indicated that whereas large dedicated tire-fueled plants are best suited to produce electricity with their steam production, the steam produced by smaller systems may be used in a wider variety of applications, such as for process steam, heat, air conditioning, drying grain, and actually using the steam for a retreading operation.

The commenter described a new technology called the "Recoverator" that combusts a single-item waste stream of used tires, produces steam for various uses, and recovers marketable byproducts from the tires, including unmelted recoverable steel and zinc-rich dust. The commenter requested that the EPA consider this technology to be an "alternative energy fueled boiler." The commenter provided an emissions test report based on tests conducted in Italy that provide data for PM, Pb, Cd, Hg, HCl, SO_2, and "clororganics" emissions from a Recoverator.

Response: The proposed MWC NSPS and guidelines have been revised to include the wording from section 129 of the Act that provides an exemption for certain plants that fire a single-item waste stream of tires and produce energy. In addition, the final NSPS and guidelines specifically exempt combustion of single-item waste streams of tires. There are no requirements for the production of electricity for this exemption. This exemption is consistent with the 1991 MWC NSPS and guidelines.

Comment: One commenter (IV-D-101) recommended allowing the waste fuels covered under the exemption for waste-fuel power generating plants in the NSPS and guidelines to be combusted both singularly or in combination. The commenter explained that they are aware of plants that have proposed to their municipalities to burn tires and yard wastes in combination, but did not pursue their proposals due to the MWC regulations. The commenter argued that these proposals would have benefitted both human health and the environment by keeping the yard wastes from landfills.

Response: Section 129 of the Act provides an exemption from the MWC rule for certain waste-fuel electric power generating facilities and cogeneration facilities that combust "homogeneous waste." Section 129 does not provide this exemption for mixed waste streams; therefore, a single-item waste stream of tires would be exempt from the final MWC NSPS and guidelines, but a mixed waste stream of tires and yard waste would be subject to the MWC NSPS and guidelines, because both tires and yard waste are considered MSW under the final rules. As mentioned above in this section, the EPA wants to encourage the composting of yard waste rather than the incineration of yard waste.

Comment: Four commenters (IV-D-20, IV-D-50, IV-D-68, IV-D-90) urged the EPA to clarify that combustion units required to have a permit under RCRA are not subject to the proposed NSPS and guidelines. Two of the commenters (IV-D-20, IV-D-68) requested clarification that HWI's are not included in the definition of "MWC" and not subject to the proposed rules. Two of the commenters (IV-D-68, IV-D-90) also requested clarification that metals recovery facilities are not included in the definition of "MWC" and not subject to the proposed NSPS and guidelines. Three of the commenters (IV-D-20, IV-D-50, IV-D-90) indicated that section 129(g)(1) of the Act supports this contention when it specifies that solid waste incineration units "do[] not include incinerators or other units required to have a permit under section 3005 of the Solid Waste Disposal Act [or] materials recovery facilities (including primary or secondary smelters) which combust waste for the primary purpose of recovering metals . . . ." Id § 7429(g)(1).

Response: Section 129 of the Act specifically exempts from the MWC NSPS and guidelines incinerators required to have a permit under section 3005 of the Solid Waste Disposal Act and materials recovery facilities that combust waste for the primary purpose of recovering metals. To be consistent with section 129, the final guidelines and NSPS specifically exempt these two categories of sources.

Comment: One commenter (IV-D-90) urged the EPA to eliminate the requirement included in the definition of "cofired combustor" that cofired units have federally enforceable permits limiting their fuel feed stream. The commenter pointed out that the statute [42 U.S.C. § 7429(g)(5)(B)] says nothing about permits, limits, or enforceability. The commenter opposed requiring units to obtain permits for the sole purpose of confirming their ineligibility for some requirement and asserted that it would be sufficient to require only that it be enforceable, which under current EPA practice does not require a permit. The commenter recommended that the EPA's goal of ensuring some sort of accountability could be adequately served by requiring cofired combustors to notify the EPA of their status, and potentially requiring them to report if they burn over 25 percent MSW in any reporting period.

Response: The commenter is incorrect that the EPA does not require a permit to ensure enforceability. In most cases, the only mechanism for ensuring enforceability of an operating condition (e.g., of percent MSW in the fuel feed stream) is a permit. Under the title V program, all MWC's are required to have a permit. Therefore, the EPA is not introducing any new requirements by requiring that a unit must have a permit that includes a limit on the amount of MSW to be included in the waste stream in order to qualify as a cofired combustor.

Comment: Three commenters (IV-D-20, IV-D-50, IV-D-90) requested that the EPA change the averaging time basis for determining whether or not a unit meets the definition of "cofired combustor" from a 24-hour period to an annual period. One of these commenters (IV-D-90) requested that, at a minimum, the EPA adopt a monthly averaging period. Two of the commenters (IV-D-20, IV-D-90) pointed out that section 129 of the Act does not specify an averaging period for determining the percentage of a unit's fuel that consists of MSW. These commenters (IV-D-20, IV-D-90) argued that the EPA's proposed averaging period of 24 hours is inappropriate for the following reasons. One commenter (IV-D-20) argued that the 24-hour averaging period would result in units "sliding in and out" of the rule's applicability on a daily basis. Both commenters (IV-D-20, IV-D-90) argued that many units burn different fuels "campaign-style," finishing an entire batch of one fuel before they start another. The commenters (IV-D-20, IV-D-90) argued that the 24-hour averaging period would add a substantial regulatory burden that serves no purpose, since ultimately the same amount of MSW would be burned.

Response: After further investigation of the problems associated with the daily averaging time included in the proposed definition of a cofired combustor, the EPA decided to lengthen the averaging time to a calendar quarter. Some facilities that burn biomass materials that include yard waste will have difficulty making a determination of cofired status on a daily basis. Biomass material including yard waste (which is MSW) and clean wood (which is not MSW) are often collected together, intermixed, and stored onsite or offsite for a period of time before being combusted. In such cases, once the mixed material is combusted, it is difficult to determine what percentage of the waste combusted daily was yard waste. This change is consistent with current refuse storage and recordkeeping procedures. This change will also address the concerns raised above by the commenters regarding plants "sliding in and out" of applicability to the MWC standards or guidelines on a daily basis.

Comment: Four commenters (IV-D-21, IV-D-61, IV-D-78, IV-D-97) contended that cement kilns should be excluded from applicability under the proposed MWC NSPS and guidelines. The commenters pointed out that the proposed NSPS and guidelines broadly define "MWC" such that cement kilns recycling MSW as fuel could be subject to the standards. Three of the commenters (IV-D-78, IV-D-21, IV-D-97) contended that cement kilns burning MSW cannot legally be covered under section 129 of the Act. The commenters discussed a variety of technical and environmental policy reasons that the cement kiln industry should not be covered under section 129.

One of the commenters (IV-D-97) contended that the EPA should not plan to exclude cement kilns from the proposed NSPS and guidelines by assuming that the definition of cofired combustor, with the 30-percent cutoff, will exclude cement kilns. The commenter stated that although they are not aware of any existing cement kilns that are including more than 30 percent MSW as part of their fuel, the percentage of MSW combusted in cement kilns may be increased in the future.

Response: As the commenters pointed out, no existing cement kilns combust more than 30 percent MSW as part of their fuel. Thus, no existing cement kilns would be subject to the final MWC guidelines. However, if any cement kilns combust more than 30 percent MSW and more than 10 Mg/day of MSW, thus qualifying as MWC's under the final NSPS in the future, they would be considered MWC's under the final MWC NSPS and subject to the MWC NSPS.

Comment: Two commenters (IV-D-26, IV-D-33) argued that "pyrolysis" should not be covered under the proposed NSPS and guidelines and should not be included in the definition of "MWC." One commenter (IV-D-26) pointed out that in the proposed regulatory text, the definition of "MWC" does not refer to "pyrolysis," but that the preamble to the NSPS proposes to include pyrolysis in this definition. The commenter contended that section 129 of the Act did not give the EPA the authority to regulate the pyrolysis of solid waste. The commenter cited section 129 language defining "solid waste incineration unit" as a unit that "combusts" solid waste. The commenter stated that "pyrolysis" is an improper characterization from both scientific and engineering perspectives. Both commenters (IV-D-26, IV-D-33) explained that pyrolysis, unlike "incineration" and "combustion," occurs in the absence, rather than in the presence, of O_2.

Response: At proposal, as indicated in the proposal preamble, it was the EPA's intention to include pyrolysis units in the definition of MWC. In the final NSPS, a definition has been added to clarify that, for the purpose of this rulemaking, a "pyrolysis/combustion unit" is a unit that first produces gases, liquids, or solids through the heating of municipal solid waste; then, combusts the gases, liquids, or solids produced; and, finally, vents the combustion emissions to the atmosphere. Pyrolysis/combustion units that are an integrated part of a plastics/rubber recycling unit are not subject to the MWC NSPS and emission guidelines if the owner or operator keeps certain records as specified in § 60.50b of the final NSPS. Refer to the discussion of plastics/rubber recycling units elsewhere in this section.

3.2 SELECTION OF AFFECTED FACILITIES

Comment: Six commenters (IV-D-24, IV-D-51, IV-D-65, IV-D-74, IV-D-91, IV-D-103) discussed the applicability of the proposed NSPS and emission guidelines to small plants. Five commenters (IV-D-24, IV-D-51, IV-D-65, IV-D-74, IV-D-103) contended that the NSPS should apply to plants smaller than 35 Mg/day, and three of these commenters (IV-D-24, IV-D-51, IV-D-65) contended that the emission guidelines should apply to plants smaller than 35 Mg/day. Another commenter (IV-D-74) suggested that only new plants smaller than 35 Mg/day, and not existing plants smaller than 35 Mg/day, should be regulated, as long as the majority of existing plants below 35 Mg/day are MWI's that will be regulated in a separate rulemaking. Four commenters (IV-D-24, IV-D-51, IV-D-65, IV-D-103) argued that excusing plants smaller than 35 Mg/day from standards encourages the construction and use of more poorly controlled smaller plants and suggested that the development of these smaller units should not be encouraged.

One commenter (IV-D-103) argued that all new MWC plants, regardless of size, should be subject to the requirements proposed for large MWC plants. The commenter continued that without this restriction, new smaller uncontrolled incinerators may replace larger existing MWC's, resulting in an adverse impact on public health and the environment.

Another commenter (IV-D-65) argued that smaller units: (1) Result in larger costs per ton for the public to bear, (2) are typically located in places where there is greater flexibility in disposal options, and (3) are often located nearer to food-crop producing activities. The commenter claimed that humans typically ingest far more emitted contaminants through food than through the air they breathe.

One commenter (IV-D-24) added that it has been shown that smaller plants can be responsible for the worst ambient impacts because - the commenter used New York City as an example - apartment house incinerators are antiquated, uncontrolled, badly operated, and emit at roof level. (For further discussion on health effects, refer to section 6.1.) The commenter advised that applying standards to these smaller plants would encourage their wastes to be treated at larger regional facilities that are controlled. The commenter cited two examples of regulations that are causing smaller plants to upgrade or close down: New Jersey's new Hg standard, which does not exempt small plants; and New York City's law designed to phase out 2,200 apartment incinerators and "small" commercial and institutional incinerators. The commenter recommended applying the NSPS to the smallest plants "right away."

One commenter (IV-D-91) supported the fact that the proposed NSPS and emission guidelines do not apply to MSW combustors of less than 25 Mg/day capacity. The commenter (IV-D-91) continued that the further tightening of controls on combustors less than 25 Mg/day would force their shutdown due to the controls being either technically impossible or cost-prohibitive. The commenter added that the result of such closures would be an increased usage of landfilling, which is a less desirable alternative.

Response: Very small waste incinerators (i.e., with plant capacity less than or equal to 35 Mg/day) are not being overlooked. They are currently being considered for rule making under section 129 of the Act as part of a category of combustors referred to as "other solid waste incinerators" (or "OSWI"). The OSWI rule is scheduled for promulgation by the year 2000. As noted in the preamble to the NSPS, those MWC*s with capacity less than or equal to 35 Mg/day (i.e., those MWC plants that will be considered under the OSWI rule rather than the MWC rule) are estimated to comprise less than 1 percent of the total nationwide combustion capacity of MWC's. Additionally, as evidenced by the commenter's examples of NY and NJ, State and local governments are free to establish additional standards to address specific local air quality concerns related to very small incinerators.

Regarding the comment that standards for small and large MWC plants should be equivalent, the final standards for new plants are equivalent for all pollutants except NO_X.

In order to be consistent and to prevent overlaps in future reporting requirements for MWC plants with capacity less than or equal to 35 Mg/day, the initial reporting requirement specified in § 60.50b(c) of the proposed NSPS for MWC plants with combustion capacity greater than 25 Mg/day but less than or equal to 35 Mg/day has been dropped in the final rule.

3.3 MODIFICATION AND RECONSTRUCTION

Comment: One commenter (IV-D-18) said it is unclear in the NSPS and emission guidelines what a "unit" is with regard to modification or reconstruction. The commenter stated that the EPA should clarify that a unit is the equipment used only for combustion and pollution control since operation of only that equipment can affect air emissions.

The commenter wanted to know how equipment common to more than one unit would be evaluated with regard to modification or reconstruction. The commenter provided an example of a three-unit facility with two redundant lime slaking systems that feed all three units. The commenter asked whether modifications to the lime slaking equipment would need to be apportioned to each of the three units, or whether this equipment is outside the definition of a "unit."

Response: With regard to modification or reconstruction, the definition of MWC was expanded to define the components of an MWC. An MWC unit subject to the standards includes, but is not limited to, the fuel feed system, grate system, flue gas system, bottom ash system, and the combustor water system. Generally speaking then, the MWC unit starts at the MSW pit or hopper and extends through (1) the combustor flue gas system, which ends immediately following the heat recovery equipment, or if there is no heat recovery equipment immediately following the combustion chamber; (2) the combustor bottom ash system, which ends at the truck loading station or similar ash handling equipment that transfers ash to final disposal, including all ash handling systems that are connected to the bottom ash handling system; and (3) the combustor water system, which starts at the feed water pump and ends at the piping exiting the steam drum. The MWC unit does not include air pollution control equipment, the stack, water treatment equipment, or the turbine-generator set. Accordingly, modification to equipment that falls outside the definition of a combustion unit would not need to be apportioned to the units when considering modification/reconstruction.

Comment: Two commenters (IV-D-18, IV-D-85) requested that the proposed definition of "modified solid waste incineration unit" be clarified. One commenter (IV-D-18) argued that a unit should be considered to be a modified solid waste incineration unit if a physical or operational change increased pollutant emissions above the unit's permitted emission limits, rather than above actual test results. The commenter pointed out that the intent of the definition should be revised to clarify this distinction. Otherwise, the commenter argued, facilities which have performed well in the past will be penalized. The other commenter (IV-D-85) favored the definitions as they stand in §§ 60.14 and 60.15 and stated they are much more useful and practical.

Response: According to section 129 of the Act, any "...physical change in or change in the method of operation of the unit which increases the amount of any air pollutant emitted by the unit for which standards have been established under [section 129] or section 111" qualifies that unit as a "modified solid waste incineration unit." The term "modified solid waste incineration unit" was specified in the proposal preambles for the NSPS and guidelines because section 129 of the Act defines this term. That definition of "modified solid waste incineration unit" specifies that a combustion unit is considered to be "modified" under section 129 if one of the following are true: (1) The cumulative costs of the modifications of the MWC unit, over the life of the unit, exceed 50 percent of the original cost of the construction and installation of the unit (not including the cost of purchased land), or (2) the modification is a physical change or change in the method of operation of the MWC unit that increases emissions from the unit of the regulated pollutants. Emissions increases are determined at 100 percent physical load and measured downstream of all APCD's. No consideration is given for load restrictions based on permits or other operational restrictions.

In the final rule, two new terms are defined to incorporate the section 129 definition of "modified solid waste incineration unit." The terms "reconstruction" and "modification" (or "modified municipal waste combustor") are defined to incorporate the section 129 definition of "modified solid waste incineration." The definitions are almost equivalent to the definitions of these two terms in § 60.14 and 60.15 of 40 CFR 60 subpart A.

3.4 SELECTION OF THE MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY FLOOR FOR MUNICIPAL WASTE COMBUSTOR EMISSIONS

3.4.1 General Comments on MACT Floor Selection

Comment: Several commenters (IV-D-18, IV-D-20, IV-D-30, IV-D-44, IV-D-75, IV-D-68, IV-D-85, IV-D-90, IV-D-98, IV-D-104, VI-B-11) criticized EPA's approach of choosing the best performing unit for new sources separately for each pollutant when determining the MACT floor (this approach is referred to by the commenters as "cherry picking"). The commenters asserted that no single plant can achieve the best control level for all regulated pollutants as determined by the EPA. Three commenters (IV-D-18, IV-V-85, IV-D-98) said that "cherry picking" inevitably results in a set of standards unachievable by any unit. One commenter (IV-D-20) urged the EPA to re-evaluate the data to assure that compliance is achievable simultaneously for all pollutants.

Several commenters (IV-D-30, IV-D-68, IV-D-85, IV-D-90, IV-D-98) pointed out that many pollutants are interrelated, including the following: CO and NO_X; PM, Cd, and Pb; SO_2 and HCl; PM and dioxins/furans; and CO and dioxins/furans. One commenter (IV-D-30) said that an example is that higher combustion temperatures reduce CO and dioxin/furan emissions while increasing NO_X emissions. Two commenters (IV-D-20, IV-D-75) said that this approach does not account for site-specific trade-offs in performance for multiple pollutants from the same source. One commenter (IV-D-98) said an analysis of data from large plants equipped with SD/FF controls showed that performance of units at the same plant (e.g., units 1 and 2 at the Warren MWC) vary widely, despite the fact that they combust the same waste, use the same control technologies, and are subject to the same operating procedures. The commenter submitted a subset of their data base, which is a revision to a PM and dioxin/furan data base previously submitted by the commenter to the EPA.

Response: The issue of interrelationship effects by combined APCD systems was considered by the EPA. The MACT floor emission levels for the NSPS at proposal required SD/FF/SNCR. A substantial data base existed for SD/FF technology, but a limited data base existed for combined SD/FF/SNCR technologies. The proposed NSPS emission levels (selection of MACT) would have required the additional use of carbon injection technology (SD/FF/SNCR/carbon injection). At the time of proposal no MWC existed that operated the combined control system that would have been required to meet the emission limits being proposed. Although no MWC units were yet in operation with this new generation of control systems (SD/FF/SNCR/carbon injection), the proposal was fully consistent with section 111 and section 129 requirements. Sections 111 and 129 require the EPA to develop and adopt technology-forcing NSPS for new sources. The new MWC's subject to the NSPS will be operated well into the next century.

To address concerns about the effects of pollutant interrelationships at proposal, the EPA was conservative in its assessment of combined performance levels of the pollution control systems. The proposed emission levels reflected this conservative assessment.

Since proposal, 12 MWC units located at 5 MWC plants have initiated operation of combined SD/FF/SNCR/carbon injection control systems. Data were received from Falls/Bucks County, PA; Onondaga, NY; Lee County, FL; Union County, NJ; and Hennepin, NJ. All of the units at all of the plants are in compliance with the proposed NSPS pollution emission levels. These recent test results support the approach that the EPA had taken at proposal in selecting the MACT floor and MACT emission levels. For the final rule, these recent test results support the selection of MACT floor emission levels and MACT emission limits that would require the use of carbon injection.

Refer to section 3.11 of this BID for the EPA's response to the legal issues raised by the commenters.

Comment: Several commenters (IV-D-18, IV-D-43, IV-D-44, IV-D-49, IV-D-75, IV-D-85, IV-D-96) responded to the EPA's request for comment on the basis of the MACT floor for new sources. Two commenters (IV-D-43, IV-D-96) supported the approach the EPA has taken in establishing MACT floors. Two commenters (IV-D-44, IV-D-49) argued that the EPA's discretion is limited by sections 112 and 129 of the Act to using only actual performance data. Three commenters (IV-D-18, IV-D-75, IV-D-85) supported the idea of using a permit basis to establish the MACT floor for new plants. Two commenters (IV-D-18, IV-D-85) objected to the idea of using a technology or actual emissions data basis rather than a permit limit basis for the MACT floor. The commenters reasoned that not all technologies perform equally well in all applications. One commenter (IV-D-49) said the EPA must use data representing results achieved by the best performing similar unit from plants which are determined to be best because they have superior control technology, superior performance maximized by GCP, and, ideally, materials separation. See section 3.11 for a more complete summary of the legal issues raised by the commenter.

Two commenters (IV-D-18, IV-D-85) objected to the idea of using actual emissions data rather than permit limits as the basis for determining the MACT floor. One commenter (IV-D-18) contended that the EPA's 1989 data base is out of date and would have to be substantially revised to serve as the basis for the MACT floor. One commenter (IV-D-85) said the highest emission data point over a period of years should be used. One commenter (VI-D-18) suggested that all performance data points, not just the most recent, should be averaged with a statistical confidence interval to be used as an emission data base; alternatively, the highest data point out of a set of data should be used.

Response: The EPA believes that a technology basis should be used in determining the MACT floor and MACT for the MWC NSPS, and has taken that approach. Refer to section 3.11 for a discussion of the legal issue. By reviewing performance data, the EPA determined the technology representing MACT (SD/FF/SNCR/carbon injection) and then defined the performance capability of that technology combination. The performance data base used to determine the capability of the technology representing MACT has been updated with data more recent than the 1989 data base. Data from plants that started operation in 1990 or more recently were used because recent plants will better represent new units. As suggested by two of the commenters, the MACT floor levels for new plants represent the upper bound of performance (i.e., the highest emission level) consistently achievable by a specific APCD determined to be MACT.

Comment: Several commenters (IV-D-28, IV-D-41, IV-D-43, IV-D-44, IV-D-56, IV-D-67, IV-D-85, IV-D-95, IV-D-96, VI-B-02, VI-B-05, VI-B-06) supported the EPA's decision not to rely on European data, and one commenter (IV-D-24) argued that the EPA should utilize European data.

Three of the commenters (IV-D-44, IV-D-56, IV-D-85) pointed out that the EPA cannot make meaningful comparisons with the proposed U.S. standards without a careful explanation of the dissimilarities between the European country and the U.S. Three of the above and two additional commenters (IV-D-28, IV-D-96, VI-B-02, VI-B-05, VI-B-06) said they supported EPA's "policy determination to reject blind adherence" to the EU's guidelines.

Two commenters (IV-D-28, IV-D-44) contended that many results reported by European plants appear to understate the actual performance because they lack the documentation and quality assurance procedures that are required in the U.S. to prove compliance. Two commenters (IV-D-44, IV-D-85) said that EU member countries do not agree on how to properly measure stack emissions for most of the EU pollutant emissions listed in the guidelines. The commenters (IV-D-44, IV-D-85) reported that the lack of a uniform, validated stack test method for pollutants such as dioxin has caused the EU to initiate a major study to compare various stack test methods. The two commenters said this effort is in progress.

Three commenters (IV-D-44, IV-D-75, IV-D-85) also agreed that EPA's proposed emission guidelines and NSPS are more stringent than EU guidelines in most respects, for large plants in particular. Four commenters (IV-D-28, IV-D-44, IV-D-56, IV-D-85) noted that the European guidelines do not address startup and shutdown excursions, while the U.S. plants will be limited to 3 hours. One commenter (IV-D-56) said plants in the Netherlands start up by igniting the MSW on the grate without auxiliary fuel burners and are allowed to exceed combustion-related standards, such as CO, for up to 10 to 12 hours during a cold startup.

Five commenters (IV-D-28, IV-D-43, IV-D-44, IV-D-56, IV-D-85) mentioned differences between EU and U.S. policy with respect to MWC's, in support of EPA's decision to not rely on European data. Four of the commenters (IV-D-28, IV-D-43, IV-D-44, IV-D-85) pointed out that the EU guidelines do not have the force of law as in the U.S. Several commenters (IV-D-43, IV-D-44, IV-D-56, IV-D-85) stated that there are differences in national policy related to solid waste management, differences in enforcement and testing to determine noncompliance, and differences in the governmental level which accepts financial responsibility. One commenter (IV-D-56) provided several examples of the differences in the reporting requirements and the German regulators' approach towards compliance. Two of the commenters (IV-D-44, IV-D-85) noted that the Western European countries combust 30 to 60 percent of their waste because of national policies related to the use of renewable fuels for energy and limiting the disposal of organic wastes in landfills. The two commenters stated that this policy guarantees a steady flow of household waste to MWC's, whereas the solid waste market in the U.S. is still highly competitive. These two commenters argued that EPA's statement that "existing plants in the EU with capacities greater than 144 Mg/day must meet the guidelines by December 1, 1996" is misleading because the EU guideline allows member countries to extend the effective compliance date and that, in fact, the current compliance 1996 date is actually an extension of the original 1993 compliance date. One commenter (IV-D-85) said the changes in the latest draft of the EU directive generally made the emission limit proposals two to five times less stringent. The commenters (IV-D-44, IV-D-85) asserted that the EU standards, which are merely guidelines, are becoming less stringent because plants have not demonstrated the ability to achieve the required performance. The commenters also pointed out that, in Europe, the cost of retrofits is borne almost entirely by the federal government in contrast to the U.S. where the cost is borne almost entirely by local governments.

One commenter (IV-D-24) stated that data from foreign MWC's should be used in calculating MACT floors and the standards for both new and existing sources. For new sources, the commenter cited current EPA guidance under section 112(j) which "allows States to use foreign sources in calculating a new source floor". The commenter presented data for new and existing sources from both EPA's performance data base and other sources, including European data. The commenter presented revised MACT floors based on this data, using both foreign and domestic data for new sources and domestic data only for existing sources.

Response: The EPA agrees that it is difficult to compare European performance data to U.S. performance data due to differences in test methods, QA standards, and reporting methods. As noted in the proposal preamble and by the many commenters above, there are differences between the EPA and EU guidelines with regard to regulatory flexibility, compliance, and test methods used to measure emissions. These factors must be considered when comparing the respective emission requirements. Also, as some of the commenters noted, there are differences in national policy towards combustion of MSW and funding of projects.

Although not precluded from using foreign data, the EPA has chosen to rely on the reasonably large pool of performance and permit data from domestic plants. For this reason, the data from European plants submitted by commenter IV-D-24 were not used in selecting the MACT floor emission levels, NSPS emission limits, or emission guidelines emission limits. The domestic pollutant emission data submitted by the commenter were reviewed by the EPA; however, the additional data would not change the MACT floor emission levels, NSPS emission limits, or guideline emission limits. The commenter's suggested standards and guidelines are based on the lowest emission level achieved by all units, whereas the EPA considers it more appropriate to allow for variability in performance of similarly well-designed and well-operated APCD's that represent the best type of control technology. The standards and guidelines are based on the upper bound of performance for units equipped with the technologies that would be required to achieve the emission levels selected as MACT, assuring that plants equipped can achieve these levels of control.

3.4.2 Municipal Waste Combustor Organics

Comment: One commenter (IV-D-98) said the MACT floor for the NSPS is based on SD/FF and this technology can not continuously achieve 20 ng/dscm. The commenter urged the EPA to select a dioxin/furan emission level of 60 ng/dscm as the NSPS MACT floor. The commenter said an analysis of the data submitted with their comment letter for 14 SD/FF-equipped plants show that eleven plants can achieve 20 to 30 ng/dscm consistently and that three plants exceed 30 ng/dscm. The commenter said long-term data from the units at the Fairfax MWC average 11 to 70 ng/dscm, with a plant average of 32 ng/dscm, which demonstrates the variability that can occur even between identical units at the same site. The commenter said the data used in the 1991 NSPS show that Stanislaus could achieve 10 ng/dscm and Babylon could achieve 30 ng/dscm, yet a review of the 5-year data from these plants would show the opposite results. The commenter concluded that these data prove the floor is not continuously achievable over the long term.

Response: At proposal, MACT (SD/FF/SNCR/carbon injection) rather than the MACT floor (SD/FF) was the basis for the proposed standards. Data from 12 units received since proposal indicate that new units equipped with SD/FF/SNCR/ carbon injection can comply with the proposed MACT-based standards. The final dioxin/furan emission limits remain the same as proposed.

3.5 SELECTION OF MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY FOR MUNICIPAL WASTE COMBUSTOR EMISSIONS

3.5.1 General Comments on Emission Limits

Comment: One commenter (IV-D-32) recommended that the NSPS Hg emission limits be phased in with the NSPS dioxin/furan emission limits, since they are both dependent on carbon injection and optimization will be necessary to accommodate site-specific Hg inlet levels. One commenter

(IV-D-98) recommended that the EPA promulgate an "optimization" process, particularly for organics, PM, and Hg. The commenter suggested that a 3- to 5-year optimization process would include an interim final limit, a consensus standard optimization protocol with procedures for parametric sensitivity tests, and a final limit that would include related fixed operating conditions. In support of this concept, the commenter pointed to the long-established practice of using similar test-burn protocols, which set final enforcement limits for plants that incinerate RCRA hazardous wastes. The commenter also mentioned the fact that several States such as New York are already using similar optimization approaches for MWC's. The commenter attached a copy of the NO_X control optimization protocol for the Huntington, New York MWC plant.

Response: The EPA is required by the Act to promulgate standards for these pollutants, not site-specific optimization programs. The EPA has proposed a three-year optimization schedule for dioxins/furans to allow those plants that commence construction after September 20, 1994, but on or before September 22, 1997, to meet an interim dioxin/furan emission limit of 30 ng/dscm total mass for the first 3 years following the date of initial startup. Thereafter, the plants will be expected to meet the final emission limit of 13 ng/dscm total mass. To encourage further dioxin/furan emissions reductions at each site, an option for reduced testing is being included in the final rule that allows a site to test only one unit per year as long as dioxin/furan emissions remain below a level of 7 ng/dscm. Refer to the periodic testing section (section 3.8.1) for a more detailed description.

A 3-year "phase in" for Hg is unnecessary. The performance levels required for dioxins/furans control are more stringent than for Hg. The final NSPS Hg emission limit is stringent but achievable. Although the final standards include the proposed 3-year phase in for dioxins/furans, not all plants are expected to require the phase-in period. Twelve MWC units at 5 MWC plants have initiated operation of SD/FF/SNCR/carbon injection control systems since proposal, and all 12 units are achieving the 13 ng/dscm dioxin/furan emission limits (in addition to achieving all of the other pollutant emission limits -- PM, Cd, Pb, Hg, NO_X, SO_2, and HCl).

Comment: One commenter (IV-D-98) recommended that long-term averaging of emission measurements be an alternative means of compliance, either on a cumulative or multi-year rolling average basis. The commenter stated that this method would minimize short-term perturbations, and would be especially appropriate for PM, Cd, Hg, and dioxins/furans.

Response: Long-term averaging of emissions is unnecessary. Monitoring and control of parameters such as load and PM APCD inlet flue gas temperature will reduce short-term perturbations of dioxin/furan emissions. The percent reduction option for Hg should be adequate to accommodate occasional spikes due to variability in the Hg content of the incoming waste stream. Recent tests from 12 units at 5 plants equipped with the APCD's that will be required to achieve the MACT emission limits (SD/FF/SNCR/carbon injection) indicate that new units are capable of complying with the standards. In fact, the data from these plants indicate that dioxin/furan emission levels lower than the final standards are achievable. An option for reduced dioxin/furan testing for plants achieving dioxin/furan emission levels lower than 7 ng/dscm is being promulgated. Refer to the periodic testing section (section 3.8.1) for a more detailed description of this option for reduced testing.

3.5.2 Municipal Waste Combustor Organics

Comment: Several commenters (IV-D-02, IV-D-18, IV-D-28, IV-D-37, IV-D-38, IV-D-41, IV-D-43, IV-D-44, IV-D-55, IV-D-56, IV-D-67, IV-D-68, IV-D-82, IV-D-85, IV-D-96, IV-D-104, VI-B-02, VI-B-04, VI-B-05, VI-B-06) protested the MACT standard for dioxins/furans being more stringent than the MACT floor. Several commenters (IV-D-43, IV-D-44, IV-D-56, IV-D-68, IV-D-82, IV-D-85, IV-D-104, VI-B-04) maintained that the results of limited pilot or experimental testing for dioxins/furans control are not sufficient justification for establishing more stringent standards. The commenters said the dioxin/furan emission limit is not based on emission levels at a specific plant and, therefore, has not been demonstrated to be achievable in practice as required by the Act. Four commenters (IV-D-28, IV-D-43, IV-D-44, VI-D-67) cited the 3-year optimization schedule as proof of the uncertainty of what dioxin/furan level can be achieved.

One commenter (IV-D-56) said the EPA's conclusion that carbon injection can achieve a 50-percent reduction in dioxin/furan emissions is only a theory, and using a theory to set a standard borders on arbitrary and capricious. Four other commenters (IV-D-28, IV-D-37, IV-D-38, IV-D-44) also disagreed with the EPA's assumption of 50-percent reduction for carbon injection. Another point of contention raised by two commenters (IV-D-18, IV-D-85) was that the Camden MWC testing program may have achieved its performance due to some factor other than carbon injection (e.g., higher PM concentrations for baseline runs than for the test runs). Several commenters (IV-D-18, IV-D-28, IV-D-85, VI-B-02, VI-B-05, VI-B-06) suggested that the EPA should collect more operating data from systems now coming on line with carbon injection before establishing limits.

Two commenters (IV-D-32, IV-D-75) said the proposed dioxin/furan standards are achievable using current technology with or without carbon injection. One commenter interpreted the proposal to mean that even though the standards were based on carbon injection, it is not required as long as the standard is met.

Response: The carbon injection data upon which the NSPS dioxin/furan emission limit is based were from full-scale tests at commercial MWC's, not experimental or pilot tests. The Camden MWC test was the primary test used to assess carbon injection performance prior to proposal. Data from several MWI's, an HWI, and several European MWC's were also available. This information is available in docket A-90-45, item number II-B-39. These tests, including data received since proposal, show that an additional 50-percent or greater reduction of dioxin/furan emissions can be achieved with carbon injection.

In addition, the phase-in period for new plants that commence construction after September 20, 1994, but on or before September 22, 1997, allows for fine-tuning of the carbon injection rates to determine the carbon injection rate needed for consistently achievable emission reductions, although new data indicate this phase-in period may not be necessary for MWC plants.

Since proposal, data have been received from 12 units at the following 5 new plants that are equipped with SD/FF/SNCR/CI controls: Lee County, Florida; Falls/Bucks County, Pennsylvania; Hennepin County, Minnesota; Union County, New Jersey; and Onondaga, New York. The dioxin/furan levels reported ranged from less than 1 ng/dscm to 11.6 ng/dscm total mass. Eleven out of 12 units at these plants are achieving dioxin/furan emission levels less than 7 ng/dscm total mass.

The data summarized above supports the EPA's conclusion that the MACT floor emission level for dioxins/furans is based on the use of carbon injection. The existing data support the use of carbon injection as a control technology for dioxins/furans and the achievability of the standards and guidelines. The dioxin/furan emission limit for new plants will be promulgated as proposed (13 ng/dscm). This dioxin/furan limit is consistent with the need to act now to ensure that dioxin/furan emissions from MWC's are minimized to the extent possible, in light of the concerns associated with dioxins/furans.

Additionally, the commenter (IV-D-75) is correct that if an MWC can meet the dioxin/furan limit and the limits for other regulated pollutants without the use of carbon injection, then carbon injection is not required by the NSPS or emission guidelines. A plant is free to use any technology as long as the emission limits are met.

Comment: One commenter (IV-D-104) discussed a Method 23 validation study, and indicated that some of the dioxin data used by the EPA for the proposed dioxin/furan NSPS is below the practical quantitation limit of the method and cannot be distinguished from background noise. The commenter determined the practical quantitation limit to be less than 10 ng/dscm total mass using propagation of error techniques.

Response: The EPA has reviewed available dioxin/furan data to determine the achievable performance levels of SD/FF. The target detection limit for this method is considered to be adequately low, such that the NSPS emission limit of 13 ng/dscm is not considered below detectable limits. The commenter's determination of a practical quantitation limit may be biased high because of the use of propagation of error techniques to make the determination.

3.5.3 Municipal Waste Combustor Metals (Other Than Mercury) and Particulate Matter

Comment: Five commenters (IV-D-18, IV-D-28, IV-D-85, IV-D-98, IV-D-137) stated that the NSPS emission limits for PM are very tight and will push FF's to the limits of their control capabilities. Two commenters (IV-D-18, IV-D-85) indicated that even well-run units may at times have excursions above the standard. The commenters (IV-D-18, IV-D-85, IV-D-98) maintained that, compounding the difficulty in meeting the tight limit, there is a possibility of interference by activated carbon with particulate control, particularly on ESP performance. Two commenters (IV-D-18, IV-D-98) indicated that tighter acid gas control and carbon injection will result in increased grain loading.

The commenters warned that it is inappropriate to establish a MACT standard for PM for new units when data are not available to prove they can be achieved on a continuous basis when activated carbon is being injected. One commenter (IV-D-98) said that although the tests at Camden did not indicate direct interference from carbon injection, literature reports that a significant reduction occurred in ESP PM efficiency following a carbon injection test at an SD/ESP-equipped plant. The commenter said the EPA should investigate this issue at the three plants that the EPA said were going into commercial operation in 1994. Two commenters (IV-D-18, IV-D-85) recommended that a limit of 0.01 gr/dscf (21 mg/dscm) can be reliably met, and noted that this would still be less than two-thirds of the 1991 NSPS limit.

Response: The EPA agrees that the proposed PM limits were very stringent. Based on data submitted by commenters, the EPA has revised the continuously achievable performance level for new plants from 15 mg/dscm (proposed) to 24 mg/dscm. Data received by the EPA from 12 units at 5 plants equipped with SD/FF's and carbon injection (Lee County, Onondaga County, Union County, Falls/Bucks County, and Hennepin County MWC's) indicate that all are achieving this PM emission level as well as the final emission limits for the other regulated pollutants.

Comment: One commenter (IV-D-18) disagreed with the EPA's approach of using actual test data for Cd and Pb independent of the actual PM emissions data. The commenter stated that Cd and Pb emissions should be considered to be a percentage of total particulate, and should be directly linked to the PM standard. The commenter claimed that from a technical point of view the Cd and Pb standards effectively negate the PM standard, and the commenter indicated that to achieve the Cd and Pb standards, a PM emissions level of 0.002 gr/dscf may be required (which is below the proposed PM standard of 0.007 gr/dscf). The commenter stated that if the EPA insists on establishing emission limits for Cd and Pb, they should be ratioed upward to 0.015 and 0.153 mg/dscm corrected to 7 percent O_2, respectively.

In support, the commenter pointed out that the EPA has indicated that control of Cd and Pb are generally related to control of PM emissions, that the potential for absorption of these metals is greatest on fine PM due to the increased surface area, and that the control efficiency of these metals may be lower than that for PM. The commenter said that the EPA reported the reduction from baseline levels to be 80, 94, and 98 percent for PM, Cd and Pb, respectively. The commenter indicated that for EPA's logic to be sound, the reductions for Cd and Pb should be lower than that for PM.

One commenter (IV-D-32) stated that the proposed PM, Pb, and Cd standards all are readily achievable. The commenter cited PM data from the Commerce, Marion County, Spokane, Warren County, Indianapolis, and Huntington MWC plants along with data from the docket as evidence that the proposed PM limits are achievable.

Response: The NSPS for Cd and Pb were based on emissions data from SD/FF-equipped units. The EPA agrees that control of these metals may be related to PM control.

The proposed emission limits for PM, Cd, and Pb represent over 99 percent control of uncontrolled levels of these pollutants from large and small plants (not 80, 94, and

98 percent, respectively, as cited by the commenter). As discussed elsewhere in this section, the final PM emission limit is 24 mg/dscm, which is an increase from the 15 mg/dscm level proposed; however, the final PM limit still represents over 99 percent control. Upon review of the EPA's data and in consideration of the revised PM standard, the Cd and Pb standards were also revised. The final Cd and Pb emission limits are 0.02 mg/dscm and 0.20 mg/dscm, respectively (proposed values were 0.01 mg/dscm and 0.1 mg/dscm, respectively). In addition to the emissions data in the proposal docket, data from five plants that have recently begun operation (Union County, Lee County, Onondaga, Falls/Bucks County, and Hennepin County MWC's) demonstrate that the emission limits for PM, Cd, and Pb are simultaneously achievable.

3.5.4 Municipal Waste Combustor Metals (Mercury)

Comment: Several commenters (IV-D-18, IV-D-37, IV-D-43, IV-D-44, IV-D-55, IV-D-56, IV-D-68, IV-D-85, IV-D-96, IV-D-98, VI-B-04) asserted that the Hg emission limit should be revised due to lack of demonstrated data.

Three commenters (IV-D-18, IV-D-85, IV-D-98) stated that the proposed Hg standard is based on a small number of short-term tests using temporary control equipment at only two facilities, and expressed concern as to whether EPA's carbon injection data are indicative of performance at long-term permanent installations. One commenter (IV-D-18) maintained that commercial application of technology often isolates problems not observed during short-term test runs.

One commenter (IV-D-98) said the two tests used by the EPA as the basis of the Hg standard lacked sufficient repetitions of both control and test runs to provide good statistical reliability to the numerical conclusions. The commenter referred to a paper which the commenter said demonstrates that the proposed limits are not achievable. The commenter said the paper analyzed the Stanislaus data and concluded that 95 percent of individual tests conducted to comply with the standard will achieve Hg reduction of at least 80 percent and an outlet concentration of 112 ng/dscm or less. The commenter warned that the EPA may not set a not-to-exceed limit in which at least 5 percent of the performance tests are expected to fail, and pointed out that the failure rate would be higher at the 85-percent Hg reduction level specified by the standard. The commenter said the EPA must set a limit lower than 80-percent removal.

One commenter (IV-D-85) said the reports from pilot test run by the EPA at an MWC with SD/FF/CI in 1991 specifically stated that achievable Hg outlet concentrations are 100 μg/dscm or 80-percent removal by weight. The commenter said the EPA failed to discuss the technical reasons why they chose to propose a MACT standard of 85-percent removal, which was not supported by the pilot tests.

Two commenters (IV-D-32, IV-D-108) agreed that the proposed Hg standards are achievable using current technology, including carbon injection. One commenter (IV-D-32) cited one report showing 99-percent Hg control efficiency by an SD/FF alone, and another showing greater than 98-percent reduction to a level below 0.050 mg/dscm using carbon injection with an SD/FF. The commenter also cited another paper which presented results of 0.070 mg/dscm using Sorbalit technology as an alternative to carbon injection. One commenter (IV-D-108) noted that the 85-percent reduction standard based on the Stanislaus and Camden County tests is reasonable since more recent data show actual efficiencies to be well above 95 percent.

<u>Response</u>: Activated carbon injection has been used commercially on MWC's in Europe and Canada, where the performance capabilities of this control technology have been demonstrated; however, it is not possible to compare data

gathered in Europe and Canada to U.S. data due to differences in test methods and other procedures. For these reasons, the EPA conducted testing at two U.S. MWC's (Stanislaus County and Camden County) to assess the capabilities of this control technology.

The EPA's initial analysis of data from the Stanislaus County MWC showed that 80-percent reduction was achievable. However, subsequent analyses based on the combined knowledge gained from the Stanislaus County, Camden County, and other tests concluded that higher Hg reductions could be continuously achieved by increasing the carbon feed rate. This analysis concluded that at a carbon injection rate of approximately 100 mg/dscm (0.8 lb carbon/ton MSW) the proposed limit of 80 mg/dscm or 85 percent reduction would be achieved. This analysis also examined the impact of further increasing carbon feed rates to achieve even lower Hg emissions and the impact of variability in the Hg content of MSW. The EPA did an economic analysis (refer to docket No. A-90-45; item number II-A-13) and determined that the costs of carbon injection are reasonable.

In addition to the EPA tests, five U.S. MWC's that began using activated carbon injection technology since 1994 (Union County, Lee County, Onondaga County, Falls/Bucks County, and Hennepin County MWC's) are meeting the proposed limits.

Comment: Two commenters (IV-D-55, IV-D-85) said the EPA failed to take into account the impact of switching from Method 101A to Method 29. The commenters were concerned that using Method 29 for performance testing will result in higher measured emission levels than the NSPS and emission guidelines if data used to set the NSPS and guidelines were collected using Method 101A.

Response: The difference between the methods, which was estimated based on a statistical analysis of Method 101A and Method 29 at Stanislaus (a report prepared for EMB statistically compared Methods 29 and 101A), does not impact the resulting NSPS and guidelines. What it is most important is that the activated carbon data from both the Stanislaus and Camden test programs were collected using Method 29. In September 1994, Method 29 was proposed for determining emissions from MWC's, MWI's, and power plants. The method is identical to EPA's Office of Solid Waste's multimetals method, except that a filtration and analysis step was added for Method 29 (see proposal for Method 29 59 FR 48259). The additional step protects against the loss of Hg in the manganese oxide precipitate that can form in the acidified potassium permanganate ($KMnO_4/H_2O_2$) impingers and results in similar sample preparation and analysis requirements for EPA Methods 29 and 101A. Thus, any Hg in the precipitate should have been included in the analytical sample. As such, the EPA is confident in the results achieved with Method 29.

Comment: Two commenters (IV-D-24, IV-D-108) recommended that the EPA require plants to conduct tests to determine optimal reagent injection rates. One commenter (IV-D-24) said operators should be required to adhere to these carbon and alkaline reagent injection rates at all times and provide authorities with records verifying regular purchase of each reagent consistent with the optimal usage rates. The commenter cited several references to support the importance of carbon and reagent feed rates in attaining desired control levels. The commenter also claimed that Hg regulations for MWC's promulgated by New Jersey in September 1994 have such a requirement. A second commenter (IV-D-108) also cited the New Jersey regulations and said that the State requires optimization of the Hg APCD's with reasonable reagent use and then requires monitoring of the minimum reagent injection ratio to ensure that the control efficiency is maintained. The commenter attached a copy of the New Jersey adoption document for the State rule (NJAC 7:27-27) adopted

September 23, 1994. The document includes comment summaries and responses on the proposed rule.

Response: For alkaline reagent for acid gas control, the EPA is not requiring a particular injection rate because SO_2 is required to be continuously monitored. The EPA proposed a requirement that plants using carbon injection for Hg control measure and record the amount of carbon injected for each 8-hour period of operation. This has been revised to a 1-week period. Refer to section 3.5.2 for a description of carbon feed rate monitoring for dioxins/furans and Hg.

Comment: Three commenters (IV-D-17, IV-D-65, IV-D-120) stated that the numerical emission limitation contained in the proposed NSPS and guidelines should be reduced from 0.08 mg/dscm to at least 0.065 mg/dscm. One commenter (IV-D-17) said this level should be considered an interim level with further reduction made incrementally over time to account for the "projected decline in mercury content" of waste products.

One commenter (IV-D-65) said this level is better because it forces more recovery of Hg. The commenter asked the EPA to adopt standards matching those currently proposed by New Jersey, as follows: 0.065 mg/dscm until January 1, 2000 and 0.028 mg/dscm thereafter.

One commenter (IV-D-120) recommended the use of a two-tier limit as was adopted in Minnesota. The commenter claimed that the EPA has effectively proposed a short-term limit of 80 μg/dscm, which takes into account the upper level of Hg emissions achieved by a well-operated MWC during a single testing event with a high degree of confidence. The commenter added that the EPA should establish a long-term emission limit of 60 μg/dscm, which will ensure that the atmospheric loading from MWC's is minimized and most accurately represents overall emissions to the environment. The commenter included a technical work paper which discusses how this long term value was established.

Response: The EPA has established limits that effectively control the emissions of Hg from MWC's based on the available domestic data. These limits include an emission limit of 0.080 mg/dscm and an alternative 85-percent reduction requirement that is more stringent than the 80-percent alternative reduction required by New Jersey. If, when the NSPS and emission guidelines are periodically reviewed, it becomes apparent that more stringent Hg limits are continuously achievable and cost effective, the EPA will revise the limits at that time.

Comment: One commenter (IV-D-32) informed the EPA that Hg trapped in spray drying and carbon injection processes is not released by sorbents via volatilization nor leaching. The commenter cited two reports in support.

Response: The EPA acknowledges this commenter's support.

3.5.5 Nitrogen Oxides

Comment: One commenter (IV-D-32) claimed a NO_X limit of 150 ppm with an alternative of 50-percent reduction in emissions could be achieved for a small incremental cost. The commenter presented data on 17 foreign and domestic plants equipped with SNCR. The commenter indicated that the guaranteed NO_X reductions ranged from 41 to 75 percent, with ammonia slip ranging from 6 to 25 ppm. The commenter noted that with independent injection level controls, reductions of 60 to 70 percent and 100 ppm are achievable with normalized stoichiometric ratios of 1.5 or greater and ammonia slip at or below 20 ppm. The commenter pointed out that without independent level control, a reduction of 50 percent and an emission level of 150 ppm are achievable. The commenter maintained that these levels can be guaranteed by vendors and the 150 ppm level provides flexibility to units with high uncontrolled levels. The commenter (IV-D-32) noted that

MB/rotary, fluidized bed, and MOD/EA combustors typically have uncontrolled levels below 150 ppm. In further support of a 150 ppm limit, the commenter noted that 75 percent of the MWC's in the U.S. are in ozone non-attainment areas or the northeast ozone transportation region, and the ozone Transport Commission's limit of 0.2 lb/MMBtu for NO_X from large boilers would correspond to about 100 ppm for a MB/rotary unit burning waste with a 5,000 Btu/lb heating value.

Response: The EPA has gathered and analyzed additional data since proposal. The additional data collected are from the Stanislaus MWC (collected January through March 1994 and June through August 1994). The data indicate that a NO_X level of 150 ppmv is achievable on a continuous basis. This corresponds to an average NO_X reduction from the Stanislaus MWC of 45 to 55 percent. The NSPS for large plants being promulgated is, therefore, 150 ppmv, which is lower than the 180 ppmv level proposed.

Comment: One commenter (IV-D-74) suggested that other control technologies such as flue gas recirculation be evaluated for control of NO_X emissions from small sources since the current proposal allows small plants to remain uncontrolled.

Response: Other control technologies have been examined (refer to EPA-600/R-94-208 and EPA-450/3-89-27d); however, the percent reductions attainable using many of these technologies are low and data are limited. Flue gas recirculation, for example, involves mixing cooled flue gas with combustion air to both lower O_2 in the combustion air supply and suppress flame temperatures by increasing inerts (N_2 and CO_2) in the combustion air system. Data indicate, however, that there is also an increase in CO emissions. Additionally, there are only limited quantitative data on the levels of NO_X reduction achieved by this technique (expected to be on the order of 10 to 30 percent). Although it was not the basis of the performance standards, an individual owner or operator of an MWC is free to select this or any other approach or technology to achieve the NSPS.

Comment: Several commenters (IV-D-28, IV-D-54, IV-D-55, IV-D-67, IV-D-85, IV-D-87, IV-D-99, VI-B-02, VI-B-05, VI-B-06) described concerns regarding ammonia slip from the use of SNCR for NO_X control. The commenters were concerned that ammonia slip at the 180 ppmv NO_X control level is not addressed in the proposed regulation.

Four commenters (IV-D-28, VI-B-02, VI-B-05, VI-B-06) said that New Jersey and New York are beginning to consider ammonia slip in their SIP's. One commenter (IV-D-99) noted that several States have ammonia slip emission limits as well as NO_X limits, and recommended that the EPA establish levels for both NO_X and ammonia that are consistent and practical based on existing technology.

Response: The NO_X levels being promulgated for new and existing MWC units at large MWC plants represent a 35- to 55-percent reduction from uncontrolled levels. Data show that this level of control is not associated with high levels of ammonia slip, which are expected to be less than 10 ppmv. While the EPA is not required to set a limit for ammonia under section 129, States are free to impose additional limitations as they deem appropriate.

3.5.6 Good Combustion Practices

Comment: Two commenters (IV-D-85, IV-D-98) said that the EPA has not defined the term "MWC unit load" in the proposal, such that the relationships between steam flow measurements, the definition of "maximum MWC unit capacity," and throughput limitations are not clearly established.

Response: The term "MWC unit load" is being defined in the final NSPS and guidelines as the steam flow of the boiler, which can be measured as steam flow or feedwater flow as described in proposed § 60.58b(i). The definition of "maximum

MWC unit capacity" (proposed § 60.51b) and the throughput limitation description (proposed § 60.53b(b)) are clarified to reflect this change in the definition of MWC unit load.

Comment: Several commenters (IV-D-18, IV-D-28, IV-D-30, IV-D-44, IV-D-75, IV-D-80, IV-D-82, IV-D-85, IV-D-98, IV-D-120) advised against removal of the flow orifice or flow nozzle, because welded-in devices are not designed for this type of repeated maintenance and would require shutdown of the unit for extensive periods. They also said that removal and bench calibration of entire steam flow measurement systems is expensive and unnecessary. One commenter (IV-D-75) said the factory-calibrated orifice plate should be adequate as long as it is used consistently. One commenter (IV-D-44) pointed out that because the water used is of such a high purity, there is little potential for the flow element to degrade. The commenter (IV-D-44) also noted that the accuracy of the flow element far exceeds the level required for the proposed 4-hour averaging period.

One commenter (IV-D-98) informed the EPA that flow elements recently removed at two MWC's that had been operating for 5 to 7 years were measured, and both flow elements were within the tolerances of their original manufacturing specification of 0.0005 inches. Four commenters (IV-D-44, IV-D-54, IV-D-80, IV-D-95) recommended that the steam flow measurement elements (orifice plate, vortex shredder bar, annubar, etc.) be visually inspected every 3 years.

Several commenters (IV-D-18, IV-D-28, IV-D-30, IV-D-85) recommended that instead of requiring removal of the flow orifice or flow nozzle, the EPA should require that the differential pressure transmitters be properly calibrated according to the manufacturer's recommendations prior to the annual dioxin/furan test. Two commenters (IV-D-54, IV-D-80) suggested that the signal conversion elements, which are subject to drift, be calibrated annually.

Response: Based on the commenters' input, the EPA is not promulgating any requirements for periodic inspection and calibration of orifice plates or other flow measurement devices. Absolute accuracy is not the key issue. What is important is the relative accuracy between measurements and relative accuracy will be maintained because the same plate used during the annual dioxin/furan test will continue to be used for load measurements until the next retesting. However, the promulgated rules do require annual calibration of the transducers and signal converters in accordance with the manufacturers' instructions and before each performance test. Records must be kept documenting calibration of instruments.

Comment: Several commenters (IV-D-18, IV-D-28, IV-D-30, IV-D-44, IV-D-54, IV-D-80, IV-D-85, IV-D-120) strongly recommended that alternative technologies other than the proposed measurement of steam flow be allowed for monitoring MWC unit load. One commenter (IV-D-75) suggested that a menu of options should be available for load measurement to afford operators flexibility, and should include alternatives such as gross power output and refuse charging rate. One commenter (IV-D-120) noted that not all plants use orifice plates, which makes the application of ASME PTC 4.1 inappropriate.

One commenter (IV-D-03) suggested that the measurement of load could alternatively be based on fuel feed rate (in Btu per hour) instead of on steam flow. Several commenters (IV-D-18, IV-D-28, IV-D-30, IV-D-44, IV-D-54, IV-D-85, IV-D-120) suggested operators should have the option to measure plant capacity using boiler feedwater flow, which has been properly corrected to account for sootblowing, desuperheating, blowdown, and miscellaneous flows. Two commenters (IV-D-74, IV-D-103) did not support the use of boiler feedwater flow as an alternative to steam flow measurement.

Two commenters (IV-D-54, IV-D-80) strongly recommended that alternative technologies other than the proposed ASME PTC procedures (orifice plate and differential pressure transmitter) be allowed for steam flow measurement if they exhibit equivalent accuracy. One commenter (IV-D-80) suggested that flexibility must be provided for MWC's that use other methods such as annubar, vortex shredder, or pitot.

Five commenters (IV-D-44, IV-D-74, IV-D-75, IV-D-98, IV-D-103) contended that, for a number of reasons, measuring flue gas volumetric flow rate is inadequate. One commenter (IV-D-44) cited several load measurement uncertainties regarding the use of flue gas volumetric flow rate.

One commenter (IV-D-44) informed the EPA that the ASME PTC 34 committee is evaluating use of a heat balance around the economizer (the "ECHB" method) to determine flue gas flow rate. The commenter said this method is felt to have a lower uncertainty, but it has not yet been quantified. One commenter (IV-D-103) recommended direct flue gas measurement as consistent with the requirement under 40 CFR 264.345(b)(4) under RCRA and under part 75. The commenter listed several measurement methods and said a detailed method description can be found in EPA 40 CFR 264, Part 75, and in the "Engineering Handbook for Hazardous Waste Incineration - Draft 2 of May 31, 1990".

Response: The EPA agrees that there are several possible alternative methods for monitoring MWC unit load, and that the best method may depend on site-specific conditions. With this consideration, the EPA is promulgating steam flow measurement and a water flow measurement alternative for the monitoring of MWC unit load and, as specified in the General Provisions, plants may petition the regulating authority for approval of an alternative method.

Comment: One commenter (IV-D-102) requested that the EPA clarify the CO averaging time for MWC's that are designed as coal/RDF mixed fuel-fired units but operate as RDF-stoker units. The commenter noted that the EPA has three options (in preferred order): (1) Require the compliance averaging time based on the design of the unit (4-hour for coal/RDF mixed fuel); (2) allow the averaging time to be based on the operation of the unit (24-hour for RDF-stoker) through a federally-enforceable permit amendment, but only after the owner/operator permanently removes from the MWC unit and plant property all components or equipment that were solely constructed/installed for the burning of coal; or (3) allow the permitting authority to define the operating mode in a federally-enforceable construction or operating permit and thus define the averaging time. The commenter asserted that the first option is preferred because it simplifies enforcement and is consistent with EPA's logic with respect to determining plant capacity.

Response: The coal/RDF mixed fuel CO standard originally promulgated in 1991 and in September 1994 was intended to be applicable to pulverized coal-fired boilers that cofire fluff RDF. The CO standards promulgated after consideration of these comments are to be 150 ppmv with a 4-hour averaging time for existing and new units. It should be noted that all coal/RDF mixed fuel units that fire less than 30 percent by weight of RDF are exempt from complying with the MWC emission standards by provisions of section 129 of the Act. These units will be required to meet the applicable emission limits for coal-fired units.

Coal/RDF mixed fuel units that employ spreader stoker combustors are required to comply with the CO emission limits for RDF spreader stokers, which contain a 24-hour averaging time. When switching from RDF to coal-firing, mixed fuel units must comply with the CO, load, and PM control device temperature requirements until all RDF has been cleared from the combustor grate. When RDF has been cleared from the combustor grate, the unit will be exempt from compliance with the MWC CO, load, and temperature requirements.

Comment: One commenter (IV-D-24) criticized the EPA for not gathering new data for CO and instead relying on the BID prepared for the 1991 standards and guidelines. The commenter claimed that this means the EPA has not complied with the requirements of section 129 of the Act.

Response: Section 129 of the Act does not require the EPA to collect new data for establishing CO levels. Section 129 requires that the control levels are established based on MACT. Currently there are few options available regarding CO control other than GCP. The CO levels determined to represent GCP in the 1991 NSPS and emission guidelines are still valid for each combustor type. The only changes that will be promulgated are clarifications for mass burn rotary refractory units, pulverized coal/RDF mixed fuel-fired combustors, and spreader stoker coal/RDF mixed fuel-fired combustors.

Comment: Four commenters (IV-D-24, IV-D-51, IV-D-74, IV-D-103) objected to a CO standard that varies by combustor type. One commenter (IV-D-24) maintained that this allows some plants to be lax in optimizing their combustion operations. Three commenters (IV-D-51, IV-D-74, IV-D-103) objected to any CO standard above 100 ppm. Two commenters (IV-D-74, IV-D-103) said it should be 100 ppm with a 4-hour average. One commenter (IV-D-51) alleged that the emphasis of the standards appears to be to minimize the release of dioxins/furans, rather than to control production of them. This commenter warned that the proposed limits do not mandate optimal burn conditions and, in effect, allow the production of high levels of dioxin. Two commenters (IV-D-74, IV-D-103) said there is a direct relationship between elevated CO and dioxin/furan formation. In support, these commenters cited an attached paper on MWI emissions and said that a test done at the Pittsfield MWC showed that CO levels above 100 ppm were associated with higher dioxin/furan emissions. These commenters described CO as a surrogate parameter for dioxin/furan information that is a lower cost alternative to dioxin/furan testing. Another commenter (IV-D-24) who also cited the ASME New York State Energy Research and Development Authority ("NYS/ERDA") Pittsfield tests said the tests showed that CO should be measured using a short-term (1-hour) averaging time to minimize dioxin/furan formation.

Three commenters (IV-D-24, IV-D-74, IV-D-103) contended that the proposed standards penalize more efficient combustors with stricter limits and allow less efficient combustor types to operate inefficiently. They contended that the less efficient combustors are at times capable of meeting less than 50 ppm and cited tests from Stanislaus, Commerce, Marion, Baltimore, and Clairmont which showed CO levels of 19 to 49 ppm. Pigeon Point was listed at 7 ppm and Oswego was listed at less than 20 ppm. One commenter (IV-D-103) claimed there is no evidence in the background document that a good faith effort was made to investigate those operating practices which optimize combustion. Two commenters (IV-D-24, IV-D-103) said the Penobscot, Maine plant, which the EPA includes in its data base and considers an example of good combustion by an RDF plant, has no impetus to operate any more efficiently than its lax permitted level of 400 ppmv, 4-hour average. One commenter (IV-D-24) also criticized the use of data from the mid-Connecticut MWC because of questionable operating conditions.

One commenter (IV-D-103) indicated that a 4-hour averaging period is appropriate because the majority of MB/WW units have a waste retention time on the grate of up to one hour which does not provide adequate time for an operator to make a good faith effort to correct upsets and still achieve a limit representative of GCP. The commenter cited an EPA MWC document for GCP (EPA-600/8-89-063) which indicates that the MB/WW combustors in Millbury, Maine will exceed a CO CEM emission level of 58.4 ppm once every year in a 4-hour block period.

Two commenters (IV-D-74, IV-D-103) listed five factors that contribute to high CO emissions in MWC's. Three commenters (IV-D-24, IV-D-74, IV-D-103) said the EPA's 1987 GCP guidelines stipulated that 50 ppm CO (4-hour average) with 6 to 12 percent O_2 is an indicator of good combustion.

Three commenters (IV-D-24, IV-D-74, IV-D-103) said Canada has a GCP requirement of 50 ppm CO and the Netherlands has a standard of 44 ppm (corrected from 50 mg/m^3). Two commenters (IV-D-74, IV-D-103) also cited the disparity between EPA's MWC standard and the HWI standard, which has a single limit for all new and existing incinerators. The commenters asserted that, in some cases, the combustors, control equipment, and pollutants are similar, and both MWC's and HWI's require similarly high combustion efficiency to minimize emissions. These two commenters recommended that the EPA review EPA's National Hazardous Waste Combustion Strategy and propose a similar approach which specifies high combustion efficiency.

Response: The CO concentration in the flue gas of each MWC is related to the specific combustion conditions within the unit. There are inherently different design and operating conditions between different types of MWC's. These differences and the fact that low CO emissions is a relatively new requirement results in differences in the CO emission limit that can be achieved by dissimilar MWC's.

For example, mass burn MWC's burn unprocessed waste in deep beds and the residence time of the waste within these combustors is approximately one hour. This large mass of waste burns slowly, releasing combustion gases into a rather large furnace volume. Careful metering of under and overfire air into different furnace zones by computerized distributed control combustion systems results in stable, carefully controlled combustion conditions and low levels of CO.

Spreader stoker/RDF combustors (also called RDF stokers) burn processed waste by pneumatically injecting it through feeders in the side of the furnace where it burns in a "semi-suspension" fashion. Approximately 40 percent is burned in suspension and the remainder is burned in a thin bed on a traveling grate at the bottom of the furnace. The residence time of the RDF on the traveling grater is approximately 20 minutes and the relative burn rate of waste is higher than in mass burn combustors. In spreader stoker RDF systems, the uniformity of combustion is highly dependent on RDF feed conditions. Variations in the RDF feed rate or RDF properties can result in fluctuations in combustion conditions that result in higher CO flue gas concentrations. Minor combustion upsets with associated CO excursions can also occur from RDF feed chute or RDF feeder blockages. The frequency and severity of feed upsets is both a function of the RDF processing plant and the RDF feed system design.

Carbon monoxide emission limits for each type of combustor are established using test or operating data to determine the emission limit and averaging time which a particular type of unit can achieve. State-of-the-art mass burn waterwall MWC's have inherently stable combustion characteristics and low CO levels. A 100 ppm CO emission limit with a 4-hour averaging time has been established for these types of units. In an EPA sponsored test at a mass burn combustor in Marion County, Oregon in 1987, the combustor was subjected to a number of different operating conditions including changes to the under-to-overfire air ratio and the overfire air distribution. CO concentrations at the inlet to the unit's spray dryer never exceeded 37 ppm and emissions under normal operating conditions were typically less than 20 ppm. While the unit was not attempting to control CO, the computerized distributed combustion control system maintained high combustion efficiency and low concentrations of CO.

Evaluation of long term emission data from other state-of-the-art mass burn waterwall facilities indicate that these types of facilities can achieve a 100 ppm CO emission limit on a 4-hour basis. In most cases these mass burn combustors will operate at long term averages of less than 50 ppm to comply with the 100 ppm (4 hour) emission limit. Experience indicates that operation at CO concentrations between 50 and 100 ppm may be required due to problems associated with the burning of wet waste.

Later in 1987, ABB Combustion Engineering began startup testing at the Mid-Connecticut Resource Recovery Facility in Hartford, Connecticut (Mid-Conn). The Mid-Conn facility contains three RDF spreader stoker combustors, each designed to fire approximately 660 tons/day of RDF. During startup, the units typically operated with flue gas CO concentrations of above 200 ppm. During a subsequent test program sponsored by EPA and Environment Canada it was found that by steady-state, CO emissions of less than 100 ppm could be achieved by proper adjustment of the under and overfire air flow. Improvements in the combustion control procedures were also made at the ABB Combustion Engineering facility in Detroit (the Greater Detroit Resource Recovery Authority Facility) which finished construction shortly after the Mid-Conn Facility. A statistical evaluation of CO emission data from the Detroit facility indicated that although it could achieve average long-term CO emissions of 70 to 80 ppm, it could only achieve an emission limit of 150 ppm on a 24-hour basis due to CO excursions associated with feed upsets.

The NSPS for RDF spreader stoker combustors promulgated in 1991 incorporated a 150 ppm emission limit and a 24-hour averaging time. However, the available data for RDF combustors indicate that they will have to limit long-term average CO emissions to the range of 70 to 80 ppm to compensate for feed upsets.

Carbon monoxide emissions from some types of commercially operating MWC's are substantially higher than for modular and mass burn units because until recently, attempts have not been made to minimize CO emissions. In some cases, emission limits of other types of combustors are higher than mass burn combustors because of a lack of data showing they are capable of achieving emission limits of less than 200 to 250 ppm.

The 4-hour CO emission averaging time is roughly the time period required for a dioxin/furan emissions test. It is also a reasonable minimum averaging period for combustors with relatively stable operating conditions. A 24-hour averaging period is needed for combustors that are prone to combustion upsets.

The 4-hour averaging periods for steam load and PM control device inlet temperature are consistent with the time period necessary to conduct a dioxin test. Data from EPA sponsored field tests have shown that compliance with a 4-hour steam load limit and a 4-hour PM control device temperature can be readily achieved in modern MWC's.

Comment: Three commenters (IV-D-24, IV-D-103, IV-D-108) asserted that a 4-hour CO standard alone is insufficient to ensure good combustion. One commenter (IV-D-24) suggested that a 6 to 12 percent O_2 standard be promulgated in addition to the CO standard. One commenter (IV-D-108) stated that in order to minimize products of incomplete combustion, shorter term criteria for temperature and O_2 should be specified. The commenter noted that O_2 and temperature are directly related to combustion efficiency and are routinely monitored. This commenter recommended that for MB/WW combustors, the EPA should require that the exit flue gas meet a minimum 5-minute O_2 concentration of 3.5 percent on a wet basis and 3.0 percent on a dry basis. The commenter noted that this recommendation was based on analysis of CEM data for three plants and with the input of the plant operators.

Two commenters (IV-D-103, IV-D-108) also recommended that minimum furnace temperature during waste combustion, after overfire air, be specified. The commenters also suggested requirements for controls such as automatic auxiliary burners that will fire at preset temperatures to ensure that minimum temperature is maintained at all times including startup and when wet waste is being combusted. One commenter (IV-D-108) contended that this minimizes emissions of combustible pollutants, some of which are not continuously monitored, such as dioxins/furans. The commenter (IV-D-108) recommended the following limits for MB/WW combustors: a minimum 1-minute average temperature of 1,500 ^{o}F for a 1 second residence time after overfire air injection, with auxiliary burners automatically fired at 1,550 to 1,600 ^{o}F. The commenter noted that New Jersey has successfully implemented this requirement for five operating MWC's. One commenter (IV-D-103) recommended a residence time for combustion gas of at least 1 second at no less than 1,800 ^{o}F. This commenter (IV-D-103) also recommended that control equipment for HCl reduction must be designed such that the flue gas temperature at the outlet from the control device does not exceed 300 ^{o}F, unless a demonstration is made that an equivalent collection of condensible heavy metals and toxic organics can be achieved at a higher outlet temperature or through the use of alternate technologies.

<u>Response</u>: Good combustion practices were developed by the EPA to minimize both formation and emission of dioxins/furans and other trace organics. There are three components to GCP: a CO emission limit, a load limit, and a temperature at the inlet of the PM control device. All three of these continuous compliance parameters have been shown to correlate with either formation or emission of dioxins/furans.

Low CO level is a surrogate parameter used to indicate the operation at combustion conditions conducive to the furnace destruction of trace organics. The load limit is used to control excessive entrainment PM (PM carryover) which can lead to formation of dioxins/furans downstream of the combustor. The PM control device inlet temperature limit is to limit formation of dioxins/furans on fly ash within the PM control device by controlling formation rates. Peak formation rates occur near 300 ^{o}C (570 ^{o}F) and decrease with decreasing temperatures. Below about 225 to 250 ^{o}C (435-480 ^{o}F) the formation rates are negligible. The temperature limit also controls partitioning of dioxin/furan between the solid and vapor phases. At lower temperatures, dioxins/furans remain absorbed on PM and are disposed with the collected fly ash. There is no evidence that dioxins/furans absorbed on fly ash can be volatilized at ambient temperatures nor leached in landfills.

The EPA spend a substantial amount of resources investigating, developing, and documenting GCP. The EPA's first effort resulted in a report on the combustion control of organics (Municipal Waste Combustion Study: Combustion Control of Organics, EPA/530-SW-87-021c, June 1987). This report on the control of organics contained tables summarizing recommendations for good combustion practices to control organic emissions from mass burn, RDF, and modular starved-air MWC's. Recommendations were included for a combustion temperature of 980 ^{o}C (1800 ^{o}F) at fully mixed conditions, a 50 ppm CO emission limit, a range of flue gas O_2 concentrations for each combustor, the use of overfire air for mixing, turndown restrictions, and the use of auxiliary fuel to correct for low temperatures or high CO.

In reviewing these recommendations, it was decided that only three parameters would be required to demonstrate continuous compliance with GCP. These include a CO emission limit to insure operation at combustion conditions which are indicative of the furnace destruction of organics, a load limit which is to control the amounts of PM which are carried out of the combustor with flue gases, and a temperature limit at the inlet of each PM control device to control formation of CDD/CDF within each control device.

Comment: Five commenters (IV-D-24, IV-D-28, IV-D-54, IV-D-80, IV-D-95) supported the monitoring and control of APCD inlet temperature. Three commenters (IV-D-28, IV-D-80, IV-D-95) supported the proposed requirement of a maximum inlet temperature, determined during the most recent dioxin/furan test, which cannot be exceeded by more than 30 ^{o}F, but urged the EPA to adopt a longer averaging period of 8 to 12 hours so that reasonable variability does not result in an excursion.

One commenter (IV-D-24) maintained that a standard for combustor flue gas temperature should be promulgated as part of good combustion practices. The commenter (IV-D-24) pointed out the importance of flue gas temperature based on the EPA's 1989 test program at the Montgomery Dayton South MWC. In a detailed discussion, the commenter claimed that the study showed that minor changes in design and operation had a significant effect on emissions of dioxin and other pollutants. The commenter (IV-D-24) acknowledged that some vendors claim that lower temperatures cause corrosion and operating problems, but argued that these problems can be avoided by proper design and operation.

Response: The maximum PM control device inlet temperature is selected by taking the highest average PM control device inlet temperature measured during any one of three successful performance test runs for dioxins/furans and by adding 17 ^{o}C (30 ^{o}F). The averaging time for the PM control device inlet temperature limit must be consistent with the averaging time for a single dioxin/furan performance test (approximately 4 hours). If an 8-hour averaging time was allowed for the inlet temperature, then a unit could theoretically operate for 4 hours at temperatures above those shown to be safe by the dioxin/furan performance tests.

The PM control device inlet temperature requirements help ensure that conditions for high dioxin/furan formation rates do not occur. The temperature at which low dioxin/furan emissions is achieved may differ between MWC units, and the requirements take that into account. Therefore, there is no need for a specific flue gas temperature requirement.

Comment: One commenter (IV-D-24) supported EPA's efforts to strengthen operator certification and training. The commenter recommended the following six improvements to the proposed requirements: (1) Limit the frequency and period of time that control room operators can fill in for chief facility operators and shift supervisors; (2) require that recertification exams be passed every 5 years (on new technologies and regulations); (3) to prevent the current potential conflicts of interest, require that no employee of a firm that has designed, operated, or constructed MWC's may create or be permitted access to exam questions; (4) to prevent future conflicts of interest, require that no employee of a firm that has designed, operated, or constructed the specific MWC at which an applicant is taking a site-specific exam, be permitted to sit on the examining board; (5) require applicants for operator certification to have either a technical baccalaureate degree or 60 credits in physical sciences and/or engineering at an accredited institution instead of the current requirement of a high school diploma or equivalent; and (6) require that the manual address in detail the operating conditions, such as temperature, injection rates, etc.

Response: The EPA appreciates the commenter's support for operator training and certification. While the EPA acknowledges the commenter's suggested revisions to the proposed requirements, they will not be incorporated into this rulemaking at this time. The certification and training requirements of the rule are adequate to assure that properly trained personnel are operating the plants. Additional prescriptive requirements would limit case-by-case flexibility and are not necessary to ensure proper operation. States are free to impose additional requirements if deemed necessary. Additionally, the EPA can reevaluate these requirements in subsequent reviews of the regulations.

Comment: Several commenters (IV-D-18, IV-D-28, IV-D-29, IV-D-30, IV-D-43, IV-D-44, IV-D-51, IV-D-73, IV-D-74, IV-D-85, IV-D-98, IV-D-103) agreed that operator certification and training are appropriate requirements, but disagreed with the timing, saying that the 6-month period is not adequate to fully train and schedule testing and certification. Five commenters (IV-D-51, IV-D-73, IV-D-74, IV-D-85, IV-D-103) pointed out that certification could be required before the end of 1995. The five commenters suggested that training and testing sites in numerous locations in every State will be required in order to offer all personnel sufficient opportunity to obtain training and certification. Given the number of operators that will now require training nationwide, the commenters (IV-D-28, IV-D-29, IV-D-30, IV-D-43, IV-D-85) urged the EPA to begin discussions with ASME to fully develop the training program, and indicated that a phase-in period may be needed. One commenter (IV-D-28) said the EPA should consider whether other training organizations should also be allowed to provide certification.

One commenter (IV-D-29) informed the EPA that applicants are required to document 6 months of satisfactory employment in the capacity of chief facility operator or shift supervisor as a prerequisite for full operator ASME certification. This commenter said the proposed rule is not clear whether an operator would be permitted to work as a chief facility operator or shift supervisor during the period prior to becoming eligible for full certification. This commenter also pointed out that the site specific examination is conducted by a three-member ASME board of examiners, including one technical representative from the resource recovery industry and one representative from the regulatory authority. The commenter indicated that lead times of 6 months are often necessary for the scheduling of exams.

Two commenters (IV-D-43, IV-D-44) suggested that a 2-year period for certification is more reasonable given the current state of the ASME certification program. One commenter (IV-D-85) said that 3 years is more appropriate, and an extension provision should be provided if delays result from the hazards of developing a new certification process.

Response: The EPA has discussed the issue of certification with ASME and agrees that the proposed schedule is unrealistic given the limited ASME resources for testing all those who require full certification. Because provisional certification is required by ASME as the first step in attaining full certification, the requirements are being revised such that all chief facility operators and shift supervisors have 1 year from promulgation or 6 months after startup to become provisionally certified by ASME (or State-approved equivalent). Also within the first year after promulgation or 6 months after startup, all chief facility operators and shift supervisors must complete or become registered to take the ASME (or State-approved equivalent) full certification exam. These changes will ensure that all operators are, at a minimum, provisionally certified and are scheduled to be fully certified as soon as can be accommodated by ASME (or State-approved equivalent).

Comment: Five commenters (IV-D-51, IV-D-73, IV-D-74, IV-D-98, IV-D-103) agreed that operator certification and training are appropriate requirements, but requested that the sections be clarified. Four commenters (IV-D-51, IV-D-73, IV-D-74, IV-D-103) requested guidance on what constitutes an equivalent State certification program, how a State should have its program reviewed for equivalency, and whether equivalent certification is transferrable from State to State. The current language is also not clear on whether the EPA is assuming any training and certification responsibility other than reviewing the equivalency of State programs. One commenter (IV-D-98) said the EPA should clarify its assessment of the ASME program so States that have already adopted it can implement it without hesitation. This commenter said that mandatory EPA training should not apply to individuals who have already received ASME or State certification under pre-existing State MWC rules by the time of NSPS promulgation.

Response: A State may develop and implement a program in lieu of the ASME certification program. It is up to each State to determine what constitutes an equivalent program. ASME certification is transferrable from State to State in accordance with ASME's guidelines. A State's certification is only good within the State of issue.

If a chief facility operator, shift supervisor, or control room operator has already received full ASME certification by the time the NSPS and emission guidelines are promulgated, the EPA operator training is not required. Training based on the site-specific manual is still required.

Comment: Two commenters (IV-D-51, IV-D-74) said no minimum criteria were provided for the mandated site-specific manual, and if the EPA intends to use the criteria published in the 1991 MWC standards, they should be incorporated into this rule. These commenters also said it is not clear whether State approval of the specific content of training manuals is required, and warned that this would be burdensome to State and local programs. The commenters asserted that the preparation of a manual should be an enforceable part of the permit, but neither the States nor the EPA should specify what the site-specific manual should contain, nor should the contents be subject to State and public review and comment. The commenters indicated that it would not be unreasonable to require that plant operators certify that each affected employee has been adequately trained using the manual. One commenter (IV-D-73) said the manual and its updates should be reviewed and approved by the State or local agency, but should not be required as part of a permit application until after the training and certification programs are in place.

Response: The contents of the site-specific manual will not be subject to EPA review or approval; however, each plant must develop a manual, make it readily available onsite, and document that the appropriate personnel have been trained with the manual. Twelve criteria for the manual were listed in the proposed regulations under § 60.54b(d). States are free to impose additional criteria or requirements for content review as deemed necessary.

Comment: Five commenters (IV-D-30, IV-D-51, IV-D-73, IV-D-74, IV-D-120) indicated that the training manual guidance is not clear. One commenter (IV-D-30) questioned whether the EPA has a training program or an official training manual. The commenter said that a copy of the EPA manual was made available to the ASME "SWPD" but was not generally available for release. The commenter (IV-D-30) also expressed concern, after reviewing the "Municipal Waste Combustor Operator Training Program" (EPA-453/B-93-020), that EPA's program does not meet the requirements of the ASME "QRO" certification process and recommended several ways that it could be modified.

Response: There are three separate training requirements in this rule. The first is the ASME QRO-1 provisional and full operator certification (or equivalent State certification) for chief facility operators and shift supervisors. The second is the EPA municipal waste combustor operator training program (or equivalent State training course) for chief facility operators, shift supervisors, and control room operators. The third is the training established by each site to review the site-specific operating manual for personnel including chief facility operators, shift supervisors, control room operators, ash handlers, maintenance personnel, and crane/load handlers.

The EPA operator training program was published in 1993 and has been distributed to ASME and the States as a model program that States may adopt or use as a guide for their own general training courses. Copies of the training program manuals are available through National Technical Information Services (NTIS). The EPA "Municipal Waste Combustor Operator Training Program" (course manual EPA-453/B-93-020 and instructor's guide EPA-453/B-93-021) is not intended to be equivalent to ASME's QRO-1 certification. It is general training in MWC operations for personnel responsible for operating an MWC plant, and will help prepare personnel for the ASME (or State-equivalent) certification.

Comment: One commenter (IV-D-85) said that operators of incinerators without heat recovery would be at a severe disadvantage and would have difficulty getting certified because the current draft certification exam includes numerous questions concerning safe operation of steam systems and turbine generators. The commenter said ASME will need additional time to develop questions specific to incinerator-only plants.

Response: The ASME QRO-1 does not currently apply to refractory type MWC's. Since the ASME does not currently have a certification program for refractory type MWC's, the EPA did not require operators of such MWC's to become certified. If and when the ASME develops certification requirements for refractory type MWC's, the EPA will consider them for incorporation into the MWC regulation. The EPA MWC operator training program and training with the site-specific manual is still required.

Comment: One commenter (IV-D-44) said it is not clear why the EPA is requiring the establishment of O_2/CO_2 relationships at plants opting to correct emissions using CO_2. The commenter stated that the uses of these data, beyond ensuring that an equitable O_2/CO_2 correlation standard exists, could lead to future difficulties for MWC operators.

Response: Some plants may now be complying with State emission regulations as referenced to 12 percent CO_2. Most likely, they will have a CO_2 monitor and a computerized data acquisition system which automatically report acid gas emissions referenced to 12 percent CO_2. Federal emission limits are expressed in terms of 7 percent O_2. To determine compliance with the Federal emission limits, the plant must determine the ratio of O_2/CO_2 to make corrections to plant data that are expressed in terms of 12 percent CO_2. During performance testing for dioxins/furans and metals, the test contractor should measure the flue gas concentration with a continuous emission monitor (CEM) for O_2. At proposal, the plant was required to perform at least three runs at full load and three runs at 50 percent load. This requirement has been revised to a minimum of three runs at the typical operating load of the unit. Comparisons between the plant CO_2 CEM and the test contractor's O_2 monitor can then be made to establish the ratio of CO_2/O_2 during the performance tests.

3.5.7 Size Categories for New Municipal Waste Combustor Plants

Comment: Three commenters (IV-D-24, IV-D-65, IV-D-103) disagreed with subcategorization based on size. One commenter (IV-D-24) stated that the EPA has failed to explain why small MWC plants have less strict standards than large MWC plants. The commenter argued that there is no technological or legal basis for allowing small plants to have higher emissions than large plants.

One commenter (IV-D-103) said standards based on size, while reasonable for existing plants, do not seem appropriate for proposed new plants. The commenter recommended that all new plants regardless of size be subject to those requirements currently proposed for large plants. Two commenters (IV-D-65, IV-D-103) warned of the dangerous potential for proliferation of small uncontrolled plants replacing existing plants, resulting in an adverse impact on public health and the environment. One commenter (IV-D-20) claimed that the EPA's MWC data base has many small plants that do not perform well because of low expectations by regulators and very lax standards and permits which encourage plant design using older, cheaper technology.

Response: The Act allows the EPA distinguish between different groups of units by taking into consideration size and costs. The final standards apply to MWC's at plants with aggregate capacities greater than 35 Mg/day. The standards subcategorize MWC's into small plants (35 to 250 Mg/day) and large plants (greater than 250 Mg/day) based primarily on combustion technology.

The EPA does not agree that a proliferation of uncontrolled small plants will replace existing units. When compared to existing plant guidelines, the new plant standards that would apply to new small plants are more stringent for all pollutants except Hg and NO_X. All new plants with aggregate capacities greater than 35 Mg/day will be required to meet the NSPS.

MWC plants with capacities less than 35 Mg/day are not being regulated under this rule; however, these plants are currently being considered for regulation under section 129 of the Act as part of the other solid waste incineration (OSWI) category (see 59 FR 66850). Refer to section 6.1 for further discussion regarding the health impacts of dioxins/furans.

3.6 IMPACTS OF MUNICIPAL WASTE COMBUSTOR EMISSIONS STANDARDS

3.6.1 Environmental

Comment: Several commenters (IV-D-37, IV-D-38, IV-D-44, IV-D-54, IV-D-64, IV-D-69, IV-D-80, IV-D-98, IV-D-127, IV-D-128, IV-D-129, IV-D-130, IV-D-131, IV-D-132, VI-B-03, VI-B-04) urged the EPA to consider the health and environmental impact of replacing incineration of MSW with other waste disposal options, such as landfilling, that they claimed will result from implementation of the proposed NSPS and guidelines.

Two commenters (IV-D-37, IV-D-38) explained that in Florida, landfilling presents several adverse health and environmental risks which are significantly greater than continuing to rely on waste-to-energy. The commenters mentioned Florida's high groundwater table, stating that the groundwater is susceptible to contamination from landfills, but is the principal source of potable water. The commenters also mentioned the air emissions that are released from landfills.

One commenter (IV-D-54) argued that the impacts on groundwater, the cost of future cleanups, and the cost to society for siting new landfills (as the only financially viable alternative) should be calculated and considered. Another commenter (IV-D-80) associated with an MWC plant in Olmstead County, Minnesota explained that the County is located over Karst geology, which is a type of formation that is very susceptible to groundwater contamination. Another commenter (IV-D-98) stated that landfills have recently been recognized by EPA as major uncontrolled sources of HAP's, having different and potentially more adverse effects on neighboring communities and the global environment than MWC's.

One commenter (VI-B-04) stated that environmental impacts are being transferred from air to water.

One commenter (IV-D-44) explained that a number of health risk studies have been performed that indicate that combustion poses a lower health risk than other solid waste disposal alternatives. The commenter provided the following two articles by Kay H. Jones to demonstrate this point: (1) "Risk Assessment: Comparing Compost and Incineration Alternatives," MSW Management, May/June 1991, and (2) "Comparing Air Emissions from Landfills and WTE Plants," Solid Waste Technologies, March/April 1994.

Response: "Flow control" is a term used to describe the ordinances used by municipalities to mandate where the MSW generated in their jurisdictions is to be disposed. It is also used to describe State control of the transportation of waste across State lines. Most MWC plants are constructed in conjunction with flow control ordinances that require that MSW from the surrounding communities be disposed of at the MWC plant. These ordinances are to ensure that the MWC receives enough MSW to operate and to generate the income required to cover operational expenses and fulfill bond obligations. Recently, however, flow control ordinances have been weakened by a Supreme Court decision.

The EPA did not analyze the potential environmental, health, and economic costs associated with alternative waste disposal options (e.g., landfilling) because at the time of the study, flow control was not an issue, and the EPA did not incorporate changes in quantity of waste combusted into their analysis. The increases in tipping fees estimated were not based on the market effects of changes in quantities of waste combusted and corresponding changes in price. Due to these modeling assumptions, a shift in the use of municipal waste combustion versus landfilling or other waste disposal option was not estimated.

Given that at the present time flow control is no longer a realistic assumption and landfilling is a viable alternative to combustion, various environmental, health, and economic costs of landfilling may become relevant. However, any shifts of MSW away from MWC's will generally result in MSW being sent to uncontrolled alternatives. The EPA has examined the relationship between flow control and human health (documented in EPA's "Report to Congress on Flow Control and Municipal Solid Waste," March 1995). The EPA finds that extensive and stringent regulations are in place for landfills for the purpose of protecting human health and the environment. For example, the environmental impacts for landfills are addressed through Subtitle D (i.e., all new landfills must have double liners). The EPA has also proposed NSPS (40 CFR 60, subpart WWW) and emission guidelines (40 CFR 60, subpart Cc) for landfills under section 111 (b) and (d) of the Act to control emissions of total nonmethane organic compounds from landfills. Additionally, a landfills NESHAP is scheduled to be developed by the year 2000. Thus, if the recent flow control decision by the Supreme Court or the MWC regulations by the EPA encourage more landfilling of MSW there seems no reason to posit an increased health or environmental risks.

3.6.2 Cost and Economic

Comment: Four commenters (IV-D-18, IV-D-55, IV-D-85, IV-D-98) contended that the EPA's costing analysis for the NSPS and guidelines is outdated (i.e. is based on data gathered for the economic impact analysis prepared for the 1989 proposed MWC NSPS and guidelines) and should be updated to ensure its validity.

One commenter (IV-D-98) recommended that the EPA update its economic analysis to take into consideration changes since 1989 in the following assumptions regarding "enterprise costs": (1) Use of the average long-term bond yield as of January 1988 to benchmark the public capital cost, and (2) a finding that costs to publicly-owned MWC's would be appreciably lower than for private firms, based on differences in what the EPA referred to as "the tax obligations and the discount rates faced by public versus private entities." Two commenters (IV-D-55, IV-D-98) added that the EPA should update EPA's 1989 derivation of what it termed an "appropriate" 4 percent rate to determine the annual capital costs of control equipment at publicly-owned MWC's. One commenter (IV-D-55) reported that the financing rate for the Greater Detroit Resource Recovery Authority, a large existing plant, was 9.25 percent. One commenter (IV-D-98) concluded that these outdated assumptions have resulted in a significant underestimate of the costs of financing emission controls at both new and existing MWC plants.

Response: The EPA conducted a sensitivity analysis to see how the selected interest rate of 4 percent versus higher interest rates for publicly-owned plants would effect the EPA's selection of Regulatory Alternatives II-A or II-B. The selected interest rate is meant to represent the "real" (i.e., inflation-free) cost of funds. To test the sensitivity of the average annual enterprise costs to the interest rate, the EPA recalculated the enterprise costs for public entities at discount rates of 5, 7, and 10 percent (alternative interest rates used for privately-owned plants) and compared these costs to the enterprise costs calculated (prior to proposal) using the 4 percent discount rate. As shown in table

TABLE 3-1. MWC II/III EMISSION GUIDELINES:
AVERAGE ANNUAL ENTERPRISE COSTS FOR PUBLIC ENTITIES

Regulatory alternative	Small MWC plants (35 to 225 Mg MSW/day) ($1990/Mg MSW)	Large MWC plants (over 225 Mg MSW/day ($1990/Mg MSW)
Interest Rate = 4 percent		
Reg. Alt. I-A	16.32	20.24
Reg. Alt. II-A	33.65	20.24
Reg. Alt. I-B	16.32	20.25
Reg. Alt. II-B	33.65	20.25
Reg. Alt. III	46.02	17.21
Interest Rate = 5 percent		
Reg. Alt. I-A	16.89	20.97
Reg. Alt. II-A	34.45	20.97
Reg. Alt. I-B	16.89	21.11
Reg. Alt. II-B	34.45	21.11
Reg. Alt. III	47.53	17.94
Interest Rate = 7 percent		

3-1, varying the interest rate to levels higher than 4 percent for public entities does result in higher potential enterprise costs; however, the increase in estimated costs is not large enough to affect the selection of regulatory alternatives for the proposed or final regulation (i.e., Regulatory Alternative II-A or II-B).

Comment: Two commenters (IV-D-85, IV-D-98) contended that the EPA is required to update its impact analysis for the reasons discussed elsewhere in this section and to make the updated analysis available to the public, as the basis for any standards more stringent than the MACT floor.

Response: The final standards for new sources are set at the MACT floor for all pollutants; therefore, the EPA the comment that the impact analysis must be updated as the basis for any standard that is more stringent than the MACT floor is not relevant.

Comment: Several commenters (IV-D-06, IV-D-08, IV-D-09, IV-D-11, IV-D-28, IV-D-37, IV-D-38, IV-D-40, IV-D-41, IV-D-55, IV-D-58, IV-D-62, IV-D-80, IV-D-84, IV-D-98, VI-B-02, VI-B-03, VI-B-04, VI-B-05, VI-B-06) noted that the recent Supreme Court decision (C&A Carbone, Inc v. Town of Clarkstown, New York No. 92-1402) concerning waste flow control could have a significant economic impact on the MWC industry, and urged the EPA to consider the impacts in it's economic analysis for the NSPS and guidelines. The commenters noted that without waste flow control, the cost of the proposed emission guidelines and NSPS would be very significant. Several commenters (IV-D-28, IV-D-41, VI-B-04, VI-B-05, VI-B-06) maintained that many political decision-makers are re-evaluating the use of MWC's as their primary method of solid waste management, and that several major facilities have announced their intention to permanently close because the community can no longer guarantee the source of solid waste supply to the MWC. Three commenters (IV-D-28, IV-D-98, VI-B-04) predicted that the proposed emission guidelines and NSPS, together with the two Supreme Court decisions, would encourage the shift from the use of MWC's to landfills.

Two commenters (IV-D-80, IV-D-98) mentioned the adverse impact that the above changes would have on tipping fees. One commenter (IV-D-80) explained that the EPA's estimate of the average cost impact on small MWC plants of $35/ton MSW will cause a 44-percent increase in tipping fees. The commenter continued that this type of increase without flow control will cause an economic crisis, causing their commercial haulers to haul their County's MSW to landfills located out of their

State without separation and processing. The commenter noted that this crisis would result in their County's defaulting on construction bonds, which would impact the County's bond rating and would adversely affect all of the County's solid waste facilities, including waste abatement, household hazardous waste management, and recycling programs.

Response: A number of commenters raised issues related to the EPA's assumption that there would be no change in waste volumes or flows if MWC's raised tipping fees to cover the costs of emissions control. The EPA made this assumption because flow control was feasible when this regulation was evaluated. The commenters argued that without flow control municipalities can no longer guarantee a given quantity of MSW for MWC's and that the problems raised by this removal of flow control would be exacerbated by the proposed regulations.

Traditionally, many local and State governments have controlled the ultimate disposition of MSW collected by private companies through their use of "flow control" as well as other mechanisms. Using flow control, governments dictate where private waste collection firms within their jurisdiction must take their MSW for processing, treatment, or disposal. Thus, government can guarantee private companies who finance the construction and operation of waste-to-energy and materials recovery facilities a certain flow of waste. These facilities cost several hundreds of millions of dollars to construct. Revenue from the sale of the energy or recovered materials and, more importantly, from tipping fees has been applied to facility costs, a component of which would be debt service on the facilities. The energy and recovered materials are sold in markets and thus their prices are subject to the discipline of competition. However, flow control confers a monopoly on the facilities, allowing the establishment of tipping fees in excess of costs. The profits earned can be applied to cover the cost of other non-revenue bearing programs such as source reduction, curbside recycling, household hazardous waste collection, education and outreach, and, in some limited instances, even Superfund cleanups, that comprise communities' ISWM programs. Flow control resulted in increases in MSWM costs of 100 to 600 percent in some cases (See "Municipal Solid Waste Management," September/October 1994, p.14).

In May 1994, the United States Supreme Court (in C & A Carbone, Inc. v. Town of Clarkstown) ruled that flow control is an unconstitutional impediment to interstate commerce thereby obviating the monopoly position of the designated facilities. This ruling makes MSW a commodity, subject to market forces. While there are several bills in Congress to restore this authority, to date, none have been passed.

Flow controls have been an important mechanism used to guarantee waste flows to MWC's. In 1992, 58 percent of MWC throughput was guaranteed by flow controls. Flow controls are especially important for the larger facilities (see EPA's "Report to Congress on Flow Control and Municipal Solid Waste'" March 1995). In the absence of flow control, the economic environment in which MWC owners must secure financing has changed. Table

TABLE 3-2. LANDFILL TIPPING FEES AT SELECTED STATES IN THE EASTERN U.S.

State	Average landfill tipping fees ($/ton)
Connecticut	65
Maryland	43
Massachusetts	65
Minnesota	50
New Jersey	74
New York	62
Virginia	25

Source: BioCycle's 1993 Survey, as reported in the EPA's "Report to Congress on Flow Control and Municipal Solid Waste," March, 1995.

3-2 shows the landfill tipping fees for selected eastern states (see EPA's report to Congress). Table

TABLE 3-3. AVERAGE COSTS OF WASTE-TO-ENERGY TECHNOLOGIES

Technology	Average cost ($/ton) Fixed costs	Variable costs*	Total
Mass burn	30	8	38
Modular	26	17	43
RDF	28	17	45

*Net of energy sales.

Source: As reported in the EPA's "Report to Congress on Flow Control and Municipal Solid Waste," March 1995.

3-3 shows the fixed unit cost (debt service) and variable unit cost of the three major categories of MSW combustor technologies (i.e., mass burn, modular, and RDF). In a competitive market framework MWC facilities would have to charge tipping fees equal to those of landfills, after accounting for any transport cost differences. To continue operating, MWC's would have to cover their opportunity costs (i.e., their variable costs.) The fixed costs are sunk, and thus while covering them may be of consequence to owners and debt holders they do not impact the viability of existing facilities. For new facilities capital costs are an opportunity cost and investors would have to anticipate revenues sufficient to cover them before undertaking the investment.

Given the large difference between the variable costs of the MWC technologies and landfill tipping fees, it appears that the costs of operating MWC facilities could rise fairly

significantly before operators would elect to close them. However, it is certainly conceivable that the loss of flow controls plus the cost of meeting the requirements of the regulation could make it difficult to cover debt service for some operators.

Current ISWM programs were developed by local governments in response to Federal mandates, State legislation, and pressure from local citizens to reduce, recycle, combust, and landfill, in that order of preference. The ISWM programs also address the concern that new Federal landfill construction and operation regulations will raise the cost of landfilling. States frequently have required local governments to complete complex MSW planning efforts, establish programs for dealing with certain components of the waste stream, and achieve mandatory recycling rates without providing funds to cover the costs of these requirements. The result of the ISWM programs has been a substantial increase in the recovery of recyclables from MSW and a concurrent reduction in the demand for landfill space. In 1993, the U.S. recovered 19 percent of MSW through recycling and 3 percent of MSW through composting. Sixteen percent of MSW was combusted, and 62 percent of MSW was landfilled (see EPA's "Reusable News," Winter, 1995).

The success of ISWM in reducing the need for disposal space and the development of large, low-cost landfills owned by MSWM providers drove a wedge between tipping fees at waste-to-energy and materials recovery facilities and landfill costs encouraging private MSWM service providers to utilize landfills. The recent Supreme Court decision has given private haulers the right to ship their waste to the lowest cost site no matter what location. This has put pressure on municipalities to lower tipping fees at waste-to-energy and materials recovery facilities to compete with landfills, including out-of-State landfills using low cost long-distance rail haul. Solid Waste Price Digest (November, 1992) estimates that the average landfill tipping fee is $28 per ton of MSW versus $56 per ton of MSW at MWC facilities. Tipping fee reductions for MWC's of as much as 50 percent have been reported in the literature (MSW Management July/August 1994, p.14). One of the side-effects of the Supreme Court decision may be the default of some of the municipal revenue bonds used to finance waste-to-energy and materials recovery facilities.

In its economic impacts analysis for the proposed and final MWC regulations, the EPA has assumed that the additional costs of operating MWC facilities to comply with the regulations would not induce shifts in the disposal of MSW if MWC's raised their tipping fees to cover these choices. In the post-Supreme Court decision world, that assumption is less tenable. The EPA finds that MWC costs are competitive with landfilling costs in high-cost sections of the nation (e.g., northeast) but that MWC tipping fees are generally higher than landfill tipping fees (see EPA's "Report to Congress on Flow Control and Municipal Solid Waste'" March 1995).

As documented in the EPA's report to Congress on flow control, the EPA has identified several ways that State and local governments may accomplish some of the same outcomes as flow control can produce. These include:

- government provision of collection services;
- contractor provision of collection services under government contract;
- franchising collection and hauling to designated facilities;
- subsidizing facilities from the general revenues; and
- supporting ISWM programs from the general revenue.

Thus, government can guarantee a continued source of MSW for MWC's, and they can provide funds to support the operation of these facilities from the general revenue. However, what flow control provided was a mechanism for obtaining funding directly from waste generators, especially commercial establishments. Without flow control, governments must raise taxes or displace other programs to subsidize MWC's and ISWM programs.

In summary, the EPA finds that if MWC's raise tipping fees to cover the costs of the regulations, then the likely result will be to encourage the shift of some wastes to other disposal options. The specific impacts are likely to be very place-specific, depending on the relative tipping fees of MWC's and other disposal options, transportation costs and institutional factors. If tipping fees are not raised, then operators of MWC's will have to finance the costs of the regulations out of current revenues.

Comment: Several commenters (IV-D-28, IV-D-41, IV-D-55, IV-D-84, IV-D-98) noted that the recent Supreme Court decision regarding ash management (the city of Chicago v. Environmental Defense Fund No. 92-1639) concerning ash management could have a significant economic impact on the MWC industry, and urged the EPA to consider the impacts in its economic impacts analysis for the NSPS and guidelines.

Response: The draft Federal policy on ash management referred to by the commenters has changed. The final Federal policy on ash management allows MWC's to combine bottom ash and other ash for the purpose of preparing an ash sample to test for toxicity. This final policy replaces the earlier draft policy requiring that the sample be prepared with only bottom ash, which is the most toxic ash produced by MWC's. Due to this decision, the impacts of the final ash management Supreme Court decision are not expected to be significant.

3.7 SELECTION OF FORMAT OF PROPOSED STANDARDS FOR MUNICIPAL WASTE COMBUSTOR EMISSIONS

Comment: Several commenters (IV-D-18, IV-D-28, IV-D-34, IV-D-43, IV-D-44, IV-D-54, IV-D-55, IV-D-56, IV-D-67, IV-D-80, IV-D-85, IV-D-98, IV-D-99, IV-D-108, IV-D-120, VI-B-02, VI-B-05, VI-B-06) supported an alternative percent reduction option for various pollutants and urged the EPA to retain the efficiency provisions in the final rule. Several commenters (IV-D-18, IV-D-28, IV-D-43, IV-D-44, IV-D-54, IV-D-56, IV-D-67, IV-D-80, IV-D-85, IV-D-98, IV-D-108) supported the percent reduction option for HCl and SO_2. Several commenters (IV-D-18, IV-D-43, IV-D-44, IV-D-54, IV-D-85, IV-D-98, IV-D-108, IV-D-120) supported a percent reduction alternative for Hg. One commenter (IV-D-54) suggested that the option be added to the NO_x standard. Two commenters (IV-D-34, IV-D-98) recommended that the option be added to the Cd and Pb standards.

One commenter (IV-D-28) noted that the earlier proposed emission guidelines and NSPS were proposed with only a numerical limitation, but changed at promulgation to include a percent reduction option. Comments and data were submitted during that comment period to the EPA supporting the change for acid gases because many units had already installed SD's that were based on percent reduction.

One commenter (IV-D-24) criticized the 85-percent reduction option for Hg and urged that this option be eliminated. The commenter contended that the percent reduction option would allow sources to emit pollutants at levels above the numerical level that is the MACT floor. The commenter contended that a percent reduction will discourage operational optimization and waste separation.

Several commenters (IV-D-18, IV-D-43, IV-D-54, IV-D-55, IV-D-56, IV-D-80, IV-D-85, IV-D-98, IV-D-99, IV-D-108) cited the variable nature of the incoming waste stream as support for a percent reduction option. The first commenter (IV-D-18) cited the fact that the control devices are only capable of achieving a certain maximum removal efficiency and that, other than properly operating an MWC unit and its control equipment, an operator can do nothing more to control certain emissions such as Hg, SO_2, and HCl and is subject to the variability in the incoming MSW. This commenter argued, that to meet the numerical limit during times of high inlet concentrations, the control equipment would have to be operated at extremely high removal efficiencies that may be beyond the capabilities of the systems.

Response: As determined during the 1991 promulgation, the EPA agrees that percent reduction options are necessary for HCl and SO_2 due to the inherent variability in the waste stream and the limitations of the control devices to a maximum level of reduction. The EPA also agrees that the percent reduction option is appropriate for Hg for the same reasons. The percent reduction option ensures that a well-operated unit with a well-operated control device is not penalized if a numerical emission limit is beyond the control capability of the control device during periods of unusually high inlet concentrations. The EPA does not agree that this option will discourage operational optimization. The EPA does not have data indicating that percent reduction options are necessary for NO_x, Pb, or Cd.

Comment: Several commenters (IV-D-28, IV-D-41, IV-D-49, IV-D-56, IV-D-73, IV-D-98, IV-D-104, IV-D-120, VI-B-02, VI-B-05, VI-B-06) discussed the use of total mass versus TEQ for dioxin furan emissions. Several commenters (IV-D-28, IV-D-73, IV-D-120, VI-B-02, VI-B-05, VI-B-06) urged the EPA to use a total mass emission rate instead of TEQ or a dual standard for dioxin/furan emissions. Several commenters (IV-D-28, IV-D-98, VI-B-02, VI-B-05, VI-B-06) informed the EPA that based on the commenters' analysis of dioxin data, the ratio of total mass to TEQ varies dramatically from plant to plant, ranging from 20 to 1 up to 100 to 1. One commenter (IV-D-73) said total mass is an appropriate and more straightforward approach as discussed in the comment summary BID for the 1991 rule. The commenter also pointed out that the Act does not require the use of TEQ's.

One commenter (IV-D-56) indicated that a standard based on TEQ is flawed because the EPA has never offered a technically convincing discussion of the relationship between total mass and TEQ.

One commenter (IV-D-120) said that it is difficult to compare dioxin/furan emissions between plants based on TEQ's. This commenter noted that combustor design and operators are only able to reduce the toxicity of a plant's emissions by controlling total amount released, and cannot manipulate the mixture of dioxins/furans. The commenter recommended that plants still continue to report the breakdown of emissions so that a TEQ can be determined. Two commenters (IV-D-73, IV-D-120) pointed out that the further refinements in the TEF's are expected.

Two commenters (IV-D-49, IV-D-104) urged the EPA to use a TEQ basis rather than a total mass emission rate basis for dioxin/furan emissions. The commenter stated that the TEQ basis provides a more meaningful and appropriate assessment of the emissions since it takes into account the toxicity of the various congeners. The commenter said many States and countries use a TEQ basis and this approach would simplify comparisons and create uniformity.

Response: Based on the response of the commenters and a review of the EPA's data, the EPA is promulgating the dioxin/furan standards and guidelines in terms of total mass. The EPA's emissions data base is in terms of total mass, and support of a standard in terms of TEQ's would require a recompilation of the data bases using TEQ data. In addition, the dual format appeared confusing to commenters.

3.8 PERFORMANCE TEST METHODS AND MONITORING REQUIREMENTS FOR MUNICIPAL WASTE COMBUSTOR EMISSIONS

3.8.1 Periodic Testing

Comment: Several commenters (IV-D-18, IV-D-28, IV-D-34, IV-D-43, IV-D-44, IV-D-55, IV-D-65, IV-D-69, IV-D-75, IV-D-80, IV-D-85, IV-D-90, IV-D-98) suggested that performance testing not be required of all identical units at a particular site every year. One commenter (IV-D-99) supported the annual stack test requirement for large MWC's. Four commenters (IV-D-28, IV-D-80, IV-D-90, IV-D-98) supported periodic stack testing for parameters not continuously monitored, but said that annual testing is excessive.

Three commenters (IV-D-18, IV-D-75, IV-D-80) suggested that annual performance testing on only one of the identical MWC units at the same site should be allowed if the performance tests from the previous year demonstrated that all requirements were achieved by all the identical units. Two commenters (IV-D-18, IV-D-75) said in the event that any emission parameter was not adequately demonstrated, that parameter should be tested on all units the next year. Several commenters (IV-D-43, IV-D-44, IV-D-85, IV-D-98) recommended that, once initial compliance is demonstrated, annual stack testing be rotated among identical units at a plant. Overall compliance would be demonstrated through similarities in CEM data from the units not subject to the full stack test. One commenter (IV-D-28) urged the EPA to revisit the requirements in light of the financial considerations involved for local governments and the duplication of data. Six commenters (IV-D-44, IV-D-55, IV-D-69, IV-D-85, IV-D-95, IV-D-104) said that annual testing is unnecessary and will place an unreasonable burden on plant owners and operators. One commenter (IV-D-85) said testing rotation has been successfully applied by State agencies such as in Massachusetts.

Response: The EPA has considered the commenters' suggestions for reduced periodic testing requirements for large combustors, and is promulgating an alternative schedule for dioxin/furan testing, the most costly of the tests required by this rule. The Administrator considers dioxin/furan emissions as important pollutants to reduce, and is providing the incentive of less frequent testing in exchange for lower dioxin/furan emissions. The incentive emission levels are as follows: 7 ng/dscm for all new plants; 15 ng/dscm for large existing plants; and, 30 ng/dscm for small existing plants. Any plant at which all MWC units achieve levels below the incentive level for two consecutive years may, thereafter, alternate testing between the units at the site. The plant may test one unit per year so long as each unit tested emits dioxins/furans below the incentive level. If an annual test indicates that a unit's dioxin/furan emissions are above the incentive level, then, beginning the subsequent year, the plant must revert to testing all units at that site annually until all annual performance tests over a 2-year period indicate that all units are achieving the dioxin/furan emission incentive levels.

For dioxin/furan emissions, small plants may comply with either the incentive limit schedule described above or the proposed schedule which allows small plants to test every third year once the MACT emission limits have been achieved for three consecutive years.

Comment: Five commenters (IV-D-18, IV-D-44, IV-D-54, IV-D-80, IV-D-98) recommended that the EPA delete the requirement for the annual opacity test using a certified observer. The commenters indicated that the requirement is redundant and is a poor substitute for a calibrated COM. The commenters said this will result in additional testing expense without perceptible benefit.

One commenter (IV-D-98) said that 40 CFR § 60.11(e)(5) expressly allows use of COM data in place of Method 9 under any NSPS or guideline which contains a Method 9 testing requirement.

One commenter (IV-D-18) said the required COM's are reliable devices and should be accepted for demonstration of compliance just as CEM's are accepted by the EPA for SO_2 emissions without the additional requirement of an annual stack test. Secondly, this commenter contended that there is not a direct correlation between what the opacity monitor reads and what the visible emissions observer reads. The commenter maintained that this is an apples and oranges comparison.

Response: The proposed standards and guidelines were based on stack tests using Method 9; therefore, the standards and guidelines will be promulgated based on periodic Method 9 stack tests. The annual stack test can be waived under the general provisions. The COMS is used as an indicator to initiate corrective actions or a retest of the MWC.

3.8.2 Continuous Monitoring

Comment: Two commenters (IV-D-24, IV-D-32) indicated that CEM's for HCl have been used extensively, both here and abroad. One commenter (IV-D-24) stated that Pennsylvania requires HCl CEM's for plants built after 1986, and that Westinghouse installed nine CEM's at the York and Delaware County MWC's. This commenter also contended that SO_2 cannot be used as a surrogate for HCl because sulfur varies independently of the chlorine content in the waste stream. The commenter did not submit data to support this statement. The other commenter (IV-D-32) said that Pennsylvania, Maryland, and New Jersey require HCl CEM's on new units.

Response: The EPA's current data indicate that HCl is preferentially removed and that high levels of SO_2 removal indicate high levels of HCl removal. Therefore, the SO_2 CEMS being required will provide an indication of HCl control. Based on the comments received, HCl CEMS will be available in the future. When available, the EPA will publish appendix B procedures for HCl and require HCl CEMS where appropriate. The standards for HCl are promulgated as proposed with compliance based on annual HCl stack tests.

Comment: Two commenters (IV-D-14, IV-D-15) provided information regarding their CEMS for HCl emissions in response to the EPA's request for availability, accuracy, precision, and cost data. One commenter's (IV-D-14) device measures HCl concentration through infrared spectroscopy. In addition to HCl, this device can also measure SO_2, NO_x, CO, CO_2, O_2, NH_3, and H_2O, simultaneously. This system is available and is being used in the United States (at least six MWC plants are listed by name). The system has been approved for HCl monitoring by New Jersey and Pennsylvania. The commenter claimed that the monitors are reliable and obtain valid data for about 95 percent of plant operating time. Detailed descriptions of the device's design and operation and maintenance procedures are also included with the comment. The commenter stated that the cost of a CEM system to monitor NO_x, SO_2, and CO is about $75,000, and the cost to add HCl and H_2O capabilities is about $37,000, for a total cost of $112,000. These costs do not include an optional data acquisition and reporting system.

In another commenter's (IV-D-15) device, the HCl concentration is measured through a solid state sensor, similar to the zircon dioxide sensor for O_2, except a solid silver ionic conductor is used. A more detailed description of the device's design is included with the comment. This system is expected to be available for sale in 1995. The commenter expects the cost of this HCl CEM system to be $30,000 to $40,000.

Response: The EPA appreciates the information submitted by the commenters regarding their HCl CEMS. However, as discussed above, the EPA has not published appendix B procedures for HCl. Once the EPA publishes appendix B procedures for HCl, the EPA will require HCl CEMS where appropriate. Refer to the previous comment for additional discussion of HCl CEMS.

Comment: One commenter (IV-D-14) provided information regarding their CEM for Hg emissions in response to EPA's request for availability, accuracy, precision, and cost data. The commenter's device measures Hg concentration through "Cold Vapor Atomic Absorption Spectroscopy after conversion of ionic Hg into the elemental Hg". A description of the device's design is included with the comment. The device is expected to be available for sale mid-1995. The cost is estimated to be $70,000 for a stand-alone system, and $55,000 for a system added on to an existing CEM system for NO_x, SO_2, CO, and HCl.

Response: The EPA appreciates the information submitted by the commenter regarding the Hg CEMS. While CEMS do exist for Hg, their performance history is not documented. Hg monitors continue to be evaluated by the EPA. There is no requirement for Hg CEMS in this rulemaking; however, States are free to impose such requirements if they choose.

Comment: One commenter (IV-D-24) stated that the final rule should require installation of CEM's for Hg or, if it does not, should state that the EPA believes that variability of Hg emissions is so slight that CEMS are unnecessary. The commenter described two technologies that have been developed and used. The first, called OPSIS Differential Optical Absorption Spectroscopy, was tested on the Hogdalen plant in Sweden in 1988, was found to be in agreement with the permanganate analysis technique, and was approved for used by the German government. The second, reported at EPA's 1991 MWC conference, continuously measured elemental and chloride forms of Hg by converting the chloride form to the elemental form by exposing it to condensate of the reducing agents existing in the flue gas.

Response: The Agency believes that there will be short term variability of Hg emissions on occasion due to variability in the incoming waste stream. However, the performance history of Hg CEMS is not currently well-documented and there is no requirement for Hg CEMS in this rulemaking. States are free to impose such requirements if they choose. Monitoring of the carbon injection feed rates, as applicable, will help to ensure that Hg reductions are achieved on a continuous basis.

Comment: One commenter (IV-D-20) urged the EPA to provide an alternative means of opacity compliance for units employing wet scrubbing systems, which have water-saturated plumes. The commenter claimed that at units with saturated stack gases, the moisture will interfere with the opacity measuring device.

The commenter informed the EPA that the unit described currently uses surrogate measurements that are outlined in both its air and RCRA permits to comply with opacity and PM requirements. The commenter suggested the following alternatives for units with ionizing wet scrubbers: ash feed rate, scrubber flow rates, or operational status of ionizing units. Pressure drop was the suggested alternative for units with venturi scrubbers.

Response: The commenter may petition the Administrator under the general provisions, § 60.13, for alternative means of measuring opacity.

Comment: One commenter (IV-D-98) said the proposed requirement for simultaneous availability of paired data for monitored pollutants and diluent gas, over 75 percent of the operating hours in 90 percent of the operating days per quarter, is an unreasonably burdensome increase over the requirements in subpart Ea, and is not necessary. The commenter recommended that the EPA allow data to be available for the specified minimum percentages of operating hours on an independent basis.

Response: The intent of the 75-percent and 90-percent data availability requirements is to ensure that an acceptable minimum amount of data are collected and to prevent prolonged periods of operation without a working CEM. Available data support these levels of availability. The EPA has revised the regulatory language to clarify that each pollutant data point is not required to be measured simultaneously with an oxygen data point. The regulation requires, however, that each pollutant hourly average be corrected by an hourly average oxygen value (i.e., data are "paired" on an hourly basis).

Comment: Several commenters (IV-D-28, IV-D-44, IV-D-54, IV-D-80) described concerns regarding the ability of CEMS to meet the required level of performance. One commenter (IV-D-44) noted that, while most instruments on the market are capable of meeting the 75-percent/90-percent availability requirement, plants frequently experience difficulties with other system components including probes, filters, sample lines, and conditioning systems which can and do impact system availability. The commenter requested that the EPA investigate the performance data used as the basis for this requirement to ensure that the data used represent the availability of the complete systems at a variety of locations on an MWC unit. Two commenters (IV-D-28, IV-D-80) urged a 3 to 5 year phased approach to the 90-percent CEM availability requirement.

Response: The EPA is confident that the 75-percent/ 90-percent data availability requirement is reasonable and achievable for the current level of CEMS technology. The data used to determine the quarterly achievable level of availability for CO, NO_X, opacity, and SO_2 CEMS were gathered from numerous quarterly compliance reports for four MWC plants during 1990 through 1993. The lowest minimum quarterly data availability achieved was 90 percent. Since 75-percent quarterly data availability has been required since the 1991 promulgation, and data show that 90 percent availability currently being achieved, there is no need to phase in this increased requirement.

Comment: One commenter (IV-D-74) recommended that the EPA incorporate into the final rule CEM requirements developed by NESCAUM. At a minimum, the commenter requested that the EPA require 90 percent data availability for gas monitors and 95 percent data availability for opacity monitors. The commenter attached a copy of the 1990 document titled "NESCAUM Recommendations on CEMS Performance and Quality Assurance Requirements for MWC Facilities".

Response: The EPA is confident that the 75-percent/ 90-percent data availability requirement is reasonable and achievable for the current level of CEMS technology. The data described in the previous response indicate that 90-percent quarterly data availability for opacity is achievable.

Comment: One commenter (IV-D-80) requested clarification of the terminology used in the proposal which refers to "paired CEMS hourly averages". The commenter assumed it means that pollutant concentrations must be corrected to standard O_2 or CO_2 concentrations.

Response: The commenter is correct. Calculation of the 24-hour geometric daily averages for SO_2, 24-hour arithmetic daily averages for NO_x and CO (as applicable), and 4-hour arithmetic daily averages for CO (as applicable) requires the use of hourly CEM data that has been corrected for O_2 (or carbon dioxide). The regulatory language has been revised to clearly specify that the data must be corrected for O_2 (or carbon dioxide) on an hourly basis. More frequent diluent corrections are not required but are acceptable.

3.8.3 Proposed Test Methods

Comment: One commenter (IV-D-20) requested that Method 6020 (ICP-MS) be included as an acceptable method to use for metals analysis. The commenter was not certain if Method 6020 is a final SW-846 method yet, but stated that this method is suitable for metals.

Response: The commenter is correct, and analysis of

Method 29 samples by ICP-MS is acceptable. Method 29 will be amended accordingly.

Comment: One commenter (IV-D-120) requested that, while the EPA has not proposed revising Method 23, it should consider allowing the combination of the toluene rinsate of the sampling apparatus (required by Method 23, section 4.2.4) with the remaining combined sample, rather than analyzing this rinsate separately (required in Method 23, section 5.1.6). The commenter informed the EPA that plant operators in Minnesota have combined the toluene with the remaining sample for the cost savings, even when this potentially results in higher overall dioxin/furan emissions in comparison to the federal emission limits. The commenter also pointed out that, most importantly, not including the results allows a plant with high dioxin/furan concentrations in the toluene rinsate to continue to emit an unregulated source of dioxin/furans, contrary to the purpose of the standards.

Response: The EPA proposed a revision of EPA Reference Method 23 on May 31, 1995 (60 FR 28378). The proposed revision includes the elimination of one rinsing and analysis step. For a more complete response to the issues raised by the commenter and additional information on this method, refer to docket No. A-94-22 and the EPA Technology Transfer Network (TTN) bulletin board.

Comment: Two commenters (IV-D-44, IV-D-98) questioned whether the proposed test methods have been validated. One commenter (IV-D-98) said that the EPA has not completed its general validation of test methods referenced in both the 1989 and current rulemakings with respect to MWC flue gases, nor has the EPA commenced any validation of these test method at the levels of compliance required by these proposals. The commenter said such validations are required by 40 CFR 60, appendix A (Test Methods) and by section 129(c)(3) of the Act.

One commenter (IV-D-44) asked whether Method 29, (for measuring Cd, Pb, and Hg) has been validated on MWC's and, if so, where can the documentation be found? The commenter asserted that the proposed Reference Method has evolved from methods intended for quantifying emissions from sources other than MWC's, such as hazardous waste disposal processes. The commenter's understanding is that the EPA standard procedures require that methods be validated for use on targeted source categories before they can be specified as the compliance method.

Response: The EPA believes that all of the methods specified for determining compliance with subpart Eb are valid for use on municipal waste combustors (MWC's). The docket contains several reports that deal with method validation studies conducted on these methods on MWC's and similar sources. Furthermore, each of these methods was used to collect the data from MWC's that is used to support the standard in subpart Eb. During the course of this data collection, each of the methods performed in an acceptable manner and met the respective quality assurance limits required by each method. Multiple samples were collected from each MWC using each method. Standard deviations calculated for each method using these data meet expectations for measurements of this type. The same can also be said of these values, even if they are calculated to include the variability associated with the source, as well as the variability of the method. It is therefore EPA's judgement that these methods are appropriate for performance test methods, and are considered validated methods for MWC's.

3.9 REPORTING AND RECORDKEEPING REQUIREMENTS FOR MUNICIPAL WASTE COMBUSTOR EMISSIONS

Comment: Five commenters (IV-D-18, IV-D-24, IV-D-55, IV-D-85, IV-D-108, IV-D-120) requested that the monitoring and recordkeeping requirements for carbon injection rates be further defined. Two commenters (IV-D-18, IV-D-85) said it is unclear if carbon usage should be tied to waste feed rate, boiler steam load, or some other parameter, and that the averaging time is also unspecified. Two commenters (IV-D-24, IV-D-108) recommended that the EPA require plants to conduct tests to determine optimal reagent injection rates. Two commenters (IV-D-18, IV-D-85) suggested that a plant-specific minimum carbon injection rate be established based on the steaming rate, which is already required to be measured and controlled to no more than 10-percent greater flow than that measured during the dioxin/furan performance testing. One commenter (IV-D-18) reasoned that plants may try to vary the carbon injection rate with the steam rate or the waste feed rate due to the high cost of carbon. This commenter also said a carbon usage rate based on pounds of carbon per 1,000 pounds of steam for the plant has been adopted by the Florida DEP in their MWC rulemaking for Hg emissions. Commenter (IV-D-18) also suggested that a daily average carbon injection rate be used for dioxin/furan control.

Two commenters (IV-D-18, IV-D-85) suggested monitoring carbon usage on a weekly basis. One commenter (IV-D-18) said that this was the basis used by the Florida DEP in their MWC rulemaking for Hg emissions. Two commenters (IV-D-18, IV-D-85) stated that the EPA has not demonstrated that recordkeeping and reporting on an 8-hour basis is possible, accurate, or necessary. The commenters indicated that measurement of carbon usage from a silo or bulk bag would be difficult except by tracking the quantity and frequency of activated carbon deliveries, which may only occur weekly. One commenter (IV-D-24) said operators should be required to adhere to the optimized carbon and alkaline reagent injection rates at all times and provide authorities with records verifying regular purchase of each reagent consistent with the optimal usage rates. A second commenter (IV-D-108) cited the

New Jersey regulations and said that the State requires optimization of the Hg APCD's with reasonable reagent use and then requires monitoring of the minimum reagent injection ratio to ensure that the control efficiency is maintained, since Hg cannot be measured continuously. The commenter attached a copy of the New Jersey adoption document for the State rule (NJAC 7:27-27) adopted September 23, 1994. One commenter (IV-D-102) argued that owners/operators of new and existing sources should be required to keep records of activated carbon use for each 1-hour period because the EPA field test data on the effectiveness of activated carbon are generally based on short term carbon injection rates.

Response: The EPA has clarified the monitoring and recordkeeping requirements as follows. The carbon injection rate requirement is not being directly tied to waste feed rate or steam load. Plants are required to monitor the settings of the carbon feed system during the performance tests for Hg and dioxins/furans. An hourly carbon feed rate shall be estimated from carbon feed system operating parameters such as screw feeder speed, hopper fill frequency, hopper volume, or other parameters or a combination of parameters, as appropriate to the feed system.

Once dioxin/furan and Hg compliance has been established, the carbon feed system must be operated such that the carbon feed system parameter (or a combination of other parameters) that is the primary indicator of the carbon feed rate must equal or exceed the level determined during the most recent performance test. For example, if screw feeder speed was determined to be the primary indicator of carbon feed rate, the screw feeder must be operated at a speed equal to or greater than the speed measured during the performance test. This is to ensure that an equal or greater carbon feed rate than that determined during the performance test is maintained at all times.

Once a carbon injection rate for control of dioxins/furans and Hg is determined during a performance test, the unit must operate at the same or a greater rate of carbon injection until the subsequent performance test. Any plant wishing to use a lower feed rate must perform a performance test demonstrating that the lower rate will achieve compliance with both pollutant emission limits.

In addition to monitoring the carbon feed system parameters, an hourly carbon feed rate must be estimated for each hour of operation for each unit and used to estimate the amount of carbon consumed during each calendar quarter by the MWC plant. This estimate should be approximately equal to the amount of carbon delivered to the plant each quarter.

3.10 STARTUP, SHUTDOWN, AND MALFUNCTION PROVISIONS

Comment: Three commenters (IV-D-24, IV-D-74, IV-D-103) argued that the NSPS and emission guidelines should require compliance with applicable emission limitations during startup, shutdown, and "upsets". The commenters reasoned that when auxiliary burners and APC equipment are operated properly, there is no need to excuse compliance during startup or shutdown. One commenter (IV-D-24) suggested that the final rule should require reporting of data needed to determine compliance at all times including startups and shutdowns. The commenter stated that the auxiliary burner located in the furnace should be used to bring the temperature in the furnace up to 1,800 ^{o}C prior to charging wastes and should be used to maintain the temperature across the furnace at 1,800 ^{o}C until the last bit of waste has passed through the combustor. Two commenters (IV-D-24, IV-D-74) also stated that upset conditions reflect a failure to observe good operating practice or maintenance. The two commenters suggested that if upset conditions cause a failure to meet emission limitations, they should result in a violation.

Response: As there is always the chance for uncontrollable instability during startup and shutdown, these periods are not representative operating periods and are not subject to the operational standards listed in this rule. These periods are limited to 3 hours. After 3 hours, data are used for compliance determinations.

Malfunctions are considered unavoidable and, therefore, are not considered violations. Malfunctions are also not subject to the operational standards listed in this rule. However, failures that are avoidable are not malfunctions and are subject to the operational standards. According to the general provisions in subpart A of 40 CFR 60, "Malfunction means any sudden, infrequent, and not reasonably preventable failure ... Failures that are caused in part by poor maintenance or careless operation are not malfunctions." Thus, if a failure occurs that is reasonably preventable, it could result in a violation if the operational standards are not achieved during the failure. The final startup, shutdown, and malfunction provisions have not been changed from those that were proposed.

Comment: Two commenters (IV-D-74, IV-D-103) pointed out that automatic waste cutoff measures should be included in the incinerator design to shut off the waste feed whenever critical operating parameters have been violated.

Response: While automatic waste cutoff measures are not required by the NSPS, such equipment could be used and could be considered by State agencies. The combination of emission limits, performance tests, and continuous monitoring of emissions and operating parameters that are specified in the standards were judged adequate to ensure combustors and control systems will be well designed, operated, and maintained and continuous emission reductions will be achieved. An equipment specification such as that described by the commenters is not necessary to ensure control.

Comment: One commenter (IV-D-103) stated that it is not appropriate to apportion a generic 3-hour time period for correction of malfunctions since different time periods may be required to rectify different problems.

Response: The 3-hour time period is useful and appropriate for correction of malfunctions. The General Provisions, and most rules, do not provide any time limit for malfunctions. To avoid a violation in these cases, the owner/operator has to demonstrate that it is a malfunction and that they have acted to minimize emissions and correct the malfunction as soon as practicable. In this rule, up to 3 hours worth of data may be dismissed during a malfunction period. If the malfunction is not corrected after 3 hours, the owner/operator can either shutdown the unit or plan to offset any emissions that are in non-compliance. As it is useful to have a time period and no data have been provided to support a longer or shorter time period, no change has been made to the regulation as proposed.

Comment: One commenter (IV-D-72) suggested that the CO standard in the NSPS and emission guidelines of 100 ppmv at a 4-hour interval should have a provision for startup, shutdown, or upset conditions. The commenter agreed that the levels are reasonable and achievable under steady-state conditions at the commenter's FBC, but the commenter stressed these levels are impossible to achieve under startup, shutdown, or upset conditions.

Response: The standards have a provision for startup, shutdown, or malfunction that applies to all the regulated pollutants. According to proposed § 60.58b(a)(1), "... the standards under this subpart apply at all times, except during periods of startup, shutdown, or malfunction. Duration of startup, shutdown, or malfunction periods are limited to 3 hours per occurrence." Note that the 3-hour clock does not start until waste is on the grate. After 3 hours, data must be included for compliance determinations. No change has been made to the final rule.

3.11 LEGAL CONSIDERATIONS

Comment: Two commenters (IV-D-24, IV-D-49) argued that the EPA has no legal basis for establishing the MACT floor for new plants based upon permit data, but rather should have based the floor on actual emissions data. The commenters argued that this improper use of permit limits resulted in MACT floors that were not as stringent as they should be. One of the commenters (IV-D-24) also argued that Congress intended the phrase, "average emission limitation achieved" in section 129(d)(3) to mean actual emission rates, and that Congress could not have intended to refer to permitted emission levels when actual emissions are lower than permitted levels. The commenter noted that although section 302(k) defines emission limitation, that section was adopted to clarify that emission standards may include work practice standards in response to a 1978 Supreme Court decision, and the EPA has never interpreted the phrase to require it to use permit data when actual emission data are available. Moreover, the commenter argued that nothing in the 1990 Amendments indicates that Congress intended such a result. The other commenter (IV-D-49) contended that only emissions data that are based upon a facility utilizing a superior control technology, using GCP's to maximize superior performance, and materials separation represent the best performing unit and the most stringent, maximum achievable control specified by the Act.

Response: The EPA did not base MACT floors for new MWC units upon permit data; thus, the commenters' arguments are inapplicable to the NSPS. (They are, however, addressed in the BID for the MWC emission guidelines that also are being promulgated today because the MACT standards for existing units were based upon regulatory and permit data.) As discussed in the proposal and promulgation preambles, the EPA based the MACT standards for new units on the capabilities of the technology that is used by the best controlled similar source for each category.

Comment: Four commenters (IV-D-20, IV-D-68, IV-D-90, IV-D-98) contended that the EPA lacks authority under the Act to construct the MACT floor by choosing the best performing unit separately for each pollutant. They argued that the language of section 129 requires the EPA to consider a single "best controlled unit" for all pollutants as the standard for determining the new-source MACT floor. The commenters further argued that the EPA's approach contravenes Congress' intent to reflect both plant-specific constraints and the technical limitations of pollution control technology. Two commenters (IV-D-90, IV-D-98) also stated that if Congress had intended for the EPA to use something other than the single best performing unit when it determined the MACT floor, it would have used different language.

Response: The EPA does not agree that the language of the statute requires the MACT floors to be based upon one overall unit. Rather, as set forth in greater detail below, the EPA believes that the statute and case law support its interpretation that it is legally permissible for the EPA to set the MACT floor pollutant-by-pollutant, as long as the various MACT floors do not result in standards that are not achievable. In any case, as the data presented in section 3.5 indicate, 12 MWC units are now operating with the combined technologies (SD/FF/SNCR and carbon injection) and all are in compliance with the limits being promulgated.

Statutory Language

Section 129(a)(2) requires the EPA to establish technology based emission standards that "reflect the maximum degree of reduction in emission of air pollutants listed under section (a)(4) that the Administrator, taking into consideration the cost of achieving such emission reduction and any non-air quality health and environmental impacts and energy requirements, determines is achievable . . .." Congress further specified in section 129(a)(2) the minimum reduction that could satisfy this requirement (i.e., the MACT floor) for new sources as "the emission control that is achieved in practice by the best controlled similar unit, as determined by the Administrator." This language does not expressly address whether the floor may be established pollutant-by-pollutant. The "emission control achieved by the best controlled similar unit" can be read either to mean emission control as to a particular pollutant, or emission control that is achieved by the unit as a whole.

Other statutory provisions are relevant, although they also do not decisively address this issue. Section 129(a)(4) requires MACT standards for, at minimum, PM, opacity, sulfur dioxide, hydrogen chloride, oxides of nitrogen, carbon monoxide, lead, cadmium, mercury, and dioxins and dibenzofurans emitted by MWC's. This provision certainly appears to direct maximum reduction of each specified pollutant. Moreover, although the provisions do not state whether there is to be a separate floor for each pollutant, the fact that Congress singled out these hazardous air pollutants ("HAP's") suggests that the floor level of control need not be limited by the performance of devices that only control some of these HAP's well.

<u>Legislative History</u>

One commenter (IV-D-98) cited the following exchange between Senators Dole and Durenberger to support its argument that Congress did not intend the EPA to establish the MACT floor pollutant-by-pollutant:

Dole: It is entirely possible that different technologies may reduce one pollutant better than another. For example, technology A may reduce heavy metals better than technology B while technology B may reduce particulates better than technology A; yet, _one would not be compatible with the other_. I would assume that the EPA would have adequate discretion to balance environmental benefits to determine _which technology_ on the whole represents a better MACT . . . .

Durenberger: The Senator is correct. Where differing air pollution control technologies result in one technology producing better control of some pollutants and another producing better control of different pollutants _but it is technically infeasible according to the MACT definition to use both_, the EPA should judge MACT to be the technology which best benefits human health and the environment on the whole.

Leg. Hist. of 1990 Clean Air Act Amendments at 1129 (Oct. 26, 1990) (emphasis added) [hereinafter _Leg. Hist._]. Rather than supporting the commenter's argument that it is improper for the EPA to determine the MACT floor pollutant-by-pollutant, the above exchange provides a strong indication that Congress intended for the controls for each pollutant to be optimized.

The quoted passage does not explain directly how the floor is to be calculated for multiple HAP's; however, it does state that all HAP's are to be reduced to the maximum extent possible and discusses how the EPA is to proceed _if_ there are two incompatible control technologies. Developing a separate floor for each HAP obviously promotes the type of maximum per-pollutant reduction contemplated by the Report. _See also Chemical Manufacturers Ass'n v. EPA_, 870 F.2d 177, 239 (5th Cir. l989) and 885 F.2d 253, 264 (5th Cir. 1989) (on rehearing) construing the technology-based standards of the Clean Water Act as allowing the EPA to "determine the 'best' plant upon which to base [Best Available Technology] limitations on a pollutant-by-pollutant basis." Since the air toxics provisions of the Clean Air Act are substantially modelled on those of the Clean Water Act (see, remarks of Sen. Durenberger, 136 Cong. Rec. S516, Jan. 30, 1990), the fact that a pollutant-by-pollutant approach is permissible under the Clean Water Act further supports the EPA's interpretation that it also is permissible under the CAA to set MACT standards pollutant-by-pollutant, as long as the standards are achievable. As discussed in section 3.5, the EPA has collected data that demonstrate the achievability of the final standards promulgated today.

In summary, Congress has not spoken to the precise question at issue; however, the EPA's interpretation that a MACT floor can be determined for each HAP surely achieves the CAA's statutory goals and policies in a reasonable manner. The central purpose of the amended air toxics provisions, including section 129 and section 112, was to apply strict technology-based emission controls on HAP's. See e.g., H. Rep. no. 952, 101st Cong. 2d sess. 338. The floor's specific purpose was to ensure that consideration of economic and other impacts could not be used to "gut the standards." Leg. Hist. at 2897 (statement of Rep. Collins). As Representative Collins further noted, "[t]here needs to be a minimum degree of control in relation to the control technologies [i.e., more than one technology] that have already been attained by the best existing sources." Id. (emphasis added). The EPA's approach of developing floors pollutant-by-pollutant fulfills this objective.

Conversely, an alternative interpretation would tend to result in least common denominator floors where multiple HAP's are emitted, whereby floors would no longer be reflecting performance by the best performing sources. For example, if the best performing 12 percent of facilities for HAP metals did not control organics as well as a different 12 per cent of facilities, the floor for organics and metals would not reflect best performance. Having separate floors for metals and organics in this example certainly promotes the stated purpose of the floor to provide a minimum level of control reflecting what best performing sources have demonstrated ability to do. Accordingly, for all of the above reasons, the EPA based the final rule on MACT floors that were determined pollutant-by-pollutant.

Consideration of Cost

One commenter (IV-D-49) stated that section 129(a)(2) precludes the EPA from considering costs and other impacts when setting the MACT floor. The EPA agrees with this comment. Pursuant to section 129(a)(2), the EPA did not consider costs when it determined the MACT floors.

Comment: Several commenters (IV-D-20, IV-D-85, IV-D-90, IV-D-98) argued that the EPA's method for choosing the best performing unit separately for each pollutant results in MACT floors that are too stringent, and the available data indicate that several of the standards, including some set at the MACT floor, are not achievable continuously. The commenters asserted that it is established beyond a doubt that to satisfy the legal achievability criteria, the EPA must show that all affected units will be able to meet continuously the promulgated limits through proper use of the control technology under foreseeable, worst-case operating conditions.

Response: The EPA agrees with the comments that promulgated standards must be achievable, but disagrees with the conclusions drawn by the commenters that the standards promulgated today either cannot be achieved continuously, or must be standards that are already being achieved in the industry. (See section 3.4 for a response to the technical issues raised by these comments.) First, as discussed in section 3.4.1, the EPA obtained emissions data for 12 MWC units for all pollutants that are regulated under the final NSPS, and the data show that the final emission standards for all pollutants are achievable by all 12 units. These 12 units are representative of MWC's that will be subject to the NSPS. The EPA has placed data in the docket that establishes that the MACT standards promulgated today are achievable. Secondly, even in the absence of this data, the standards would be permissible, because an achievable standard does not have to be one that already is routinely achieved in industry; the standard only must be "within the realm of the adequately demonstrated system's efficiency . . .." Essex Chemical Corp. v. Ruckelshaus, 480 F.2d 427, 433-34 (D.C.C. 1973). See also Chemical Manufacturers Ass'n v. EPA, 885 F.2d 253, 264 (5th Cir. 1989) (while upholding technology-based water standards determined on a pollutant-by-pollutant basis, the court stated that "the fact that no plant has been shown to be able to meet all of the limitations does not demonstrate that all the limitations are not achievable").

Comment: One commenter (IV-D-98) contended that the EPA must apply section 129 according to its purposes and not those of section 112. The commenter stated that regardless of Congress' intent with respect to parallel provisions in section 112, the EPA must interpret section 129 provisions such that they reflect Congress' intent to regulate MWC's separately from section 112 HAP's.

Response: As the responses to the individual legal comments raised in this document indicate, the EPA based the NSPS and the emission guidelines on the requirements of sections 129 and 111 and the legislative history applicable to these sections.

Comment: One commenter (IV-D-20) argued that in drafting section 129(a)(4), Congress did not intend for the EPA to establish a "no control" emission limitation if MACT for a subcategory does not control for a particular pollutant. The commenter thus disagreed with the EPA's conclusion that section 129(a)(4) required it to promulgate a NO_X emission limitation at small MWC plants and existing large mass burn/refractory MWC's when the EPA had determined that MACT for these units was "no control." The commenter further stated that despite the EPA's statements in the proposed rule that the proposed "no control" limitation of 500 ppm for these units was neither intended to result in emission control, nor to require any testing, reporting, or recordkeeping, some States would feel obligated to impose such requirements in order to determine the MWC's compliance status with respect to this limitation.

Response: The EPA agrees with the interpretation given by the commenter that Congress did not intend for section 129(a)(4) to require an emission limitation where MACT for a pollutant in a subcategory is "no control." To eliminate any confusion on implementation of the standards, the final rule does not include a numerical NO_X emission limitation for MWC's at small plants and existing large mass burn/refractory MWC's. As stated in the preamble to the proposed rule, the EPA did not expect that the "no control" limit would be exceeded; thus, the final rule simply clarifies that at this time, the EPA is not requiring NO_X emission controls on these units, nor any testing, reporting, or recordkeeping with respect to NO_X emissions from these units.

4.0 MUNICIPAL WASTE COMBUSTOR NEW SOURCE PERFORMANCE STANDARDS - SITING REQUIREMENTS

4.1 SITING ANALYSIS

4.1.1 Selection of Siting Analysis Requirements

Comment: Several commenters (IV-D-02, IV-D-18, IV-D-43, IV-D-44, IV-D-75, IV-D-80, IV-D-84, IV-D-96, IV-D-98) objected to the proposed siting requirements because they are duplicative of impact analyses and siting analyses already required in existing Federal, State, and local programs and are, therefore, unnecessary. The commenters argued that the EPA should rely on these existing analyses, rather than new ones.

One commenter (IV-D-84) argued that the proposed siting requirements are duplicative of NEPA requirements, with the possible exception of the visibility issue. However, visibility and visual impacts are aesthetic and local zoning issues according to the commenter. The commenter stated that the proposal will only give MWC opponents additional opportunity to use "not-in-my-backyard" arguments against proposed MWC's.

One commenter (IV-D-98) stated that the EPA, in preparing the proposed siting requirements, has ignored the fact that any new MWC facility will be required to conduct full local and State land-use and zoning reviews before a community can commit to a project. The commenter suggested that the air quality and other environmental impact analyses mandated by NSR and State NEPA-type requirements will already provide the type of data contemplated by the proposal. The commenter recommended that, at most, the siting analysis should include a provision that SIP's require a health risk assessment as a component of pre-construction permit applications for any proposed major source.

Five commenters (IV-D-18, IV-D-43, IV-D-44, IV-D-54, IV-D-80) argued that the proposed requirements should be removed because they are duplicative of and require nothing more than the current NSR program. Two commenters (IV-D-54, IV-D-80) added that the proposed siting requirements contain none of the specificity of the NSR program, such that the proposed program will be meaningless and impose unnecessary costs.

Several commenters (IV-D-28, IV-D-43, IV-D-44, IV-D-67, IV-D-98, IV-D-99, VI-B-02, VI-B-05, VI-B-06) stated that the proposed siting requirements must be more explicit in what an applicant would be required to perform. Three commenters (IV-D-44, IV-D-67, IV-D-98) argued that the NSPS must contain substantive requirements to guide the applicant and the EPA when determining whether the siting analysis and response to public comments are adequate. Four commenters (IV-D-28, VI-B-02, VI-B-05, VI-B-06) stated that, without clear and unequivocal guidance for the siting analysis, third parties may legally challenge MWC applicants for failure to comply with the intent of the rule.

One commenter (IV-D-98) added that the proposal contains no criteria by which a particular site selection may be endorsed or rejected and apparently requires no more than the analyses needed for NSR. The commenter argued that without clear criteria, the proposal could conflict with the Due Process Clause of the Constitution [see, e.g., Parham v. J.R., 442 U.S. 584 (1979)].

One commenter (IV-D-44) recommended that if the EPA does not expect the applicant to do more under the NSPS than under the NSR program, the proposed rule should say so explicitly.

Response: The EPA is required by section 129(a)(3) of the Act to adopt siting requirements for MWC's "that minimize, on a site-specific basis, to the maximum extent practicable, potential risks to public health or the environment." The siting requirements under this rule were intentionally structured to be similar to NSR in order to make use of available information and general enough to avoid conflicts between the programs. The siting analysis required under the NSPS will allow plants to use the same information for complying with both NSR and NSPS requirements as well as other existing Federal, State, and local programs. This rule*s siting requirements will not cause added delay if they are done concurrently with NSR impact analyses and other requirements.

The siting requirements should not subject the MWC to legal challenges on whether the intent of the rule has been complied with. The NSPS siting requirements simply require a procedure to be followed in siting an MWC as required under section 129. As long as the procedure in the rule is followed (i.e., the analysis is performed and public notice and comment requirements are followed), the MWC has complied with the section 129 requirements.

Comment: Five commenters (IV-D-28, IV-D-44, IV-D-67, IV-D-98, IV-D-99) concluded that it would be unreasonable for an applicant to provide background data for all nine pollutants regulated by the proposed NSPS for other emission sources in the area of the proposed MWC. The commenters pointed out that many of these data would be unavailable and that it would be expensive or impossible to obtain. The commenters requested clarification on the requirements for an air quality impact analysis.

Two commenters (IV-D-44, IV-D-99) recommended that if the EPA requires a siting analysis, the NSPS should make it clear that applicants need to use only the data that are publicly available from the EPA or the State agency. The commenters argued that the applicant should not be required to collect additional ambient air quality data, meteorological data, or stack test data to conduct the siting analysis.

One commenter (IV-D-98) speculated that, even if monitoring data on all pollutants regulated by the proposed NSPS could be reasonably obtained for other sources in the area, siting an MWC would be impossible because the EPA's own Draft Reassessment of the Health Effects of Dioxins and Furans states that "any more emissions of dioxin are unacceptable."

Response: The wording in the proposed siting requirements in proposed § 60.576(b)(1) that specifically required the owner or operator of a proposed MWC plant to "[take] into account the impact of other major industrial facilities near the affected facility" has been removed in the final NSPS. Instead, the siting requirements specified in section 129(a)(3) of the Act have been cited in the final NSPS (under § 60.57b), as follows: "[the siting analyses shall] minimize, ..., to the maximum extent practicable, potential risks to public health or the environment." Interpretation of this provision for the purpose of preparing a siting analysis for a specific affected facility will be determined by the regulating agency (usually the State).

Comment: Several commenters (IV-D-07, IV-D-42, IV-D-43, IV-D-44, IV-D-67, IV-D-47, IV-D-60, IV-D-107, IV-D-115) recommended that the proposed siting requirements include specific siting restrictions. Two commenters (IV-D-43 and IV-D-44) stated that although the proposed siting requirements may quantify the potential impacts of a proposed MWC plant, the siting requirements would not minimize the potential risks unless they specifically restrict or prohibit the placement of an MWC in certain areas, similar to the EPA's siting requirements for landfills.

Six commenters (IV-D-07, IV-D-42, IV-D-47, IV-D-60, IV-D-107, IV-D-115) recommended that the siting requirements include a set-back provision that would prohibit an MWC from being built within a certain distance of residences, schools, hospitals, or heavily populated areas. One commenter (IV-D-47) supported the proposed siting analysis but recommended that any new MWC be located no closer than 20 kilometers (12 miles) from any heavily populated area.

Response: There is insufficient basis for choosing a single uniform set-back requirement to apply nationwide. Exposure will depend on many factors such as MWC and control design, topography, meteorology, and population activity patterns in the area. The difficulty of setting a uniform number is evidenced by the fact that different States currently have different requirements for siting new plants. A site-specific analysis with public input is the best way of allowing consideration of local factors in local siting decisions. The final rule includes no requirement for a mandatory set-back. The final rule allows localities the flexibility to determine on a site-specific basis whether a set-back restriction is the best approach to minimize potential risks to public health or the environment as required under section 129. Refer to section 4.1.4 for further discussion of the legal basis for the final siting provisions.

4.1.2 Public Meeting Provisions for Siting Analysis

Comment: Several commenters (IV-D-28, IV-D-43, IV-D-44, IV-D-67, IV-D-84, IV-D-85, IV-D-108, VI-B-02, VI-B-05) objected to the proposed public meeting requirements because they would be duplicative of the public review process already provided for at the Federal, State and local level.

Three commenters (IV-D-28, VI-B-02, VI-B-05) stated that the U.S. Treasury Department already requires public notice and comments prior to the issuance of Industrial Development

Bonds, a typical MWC financing mechanism. One commenter (IV-D-84) also stated that public hearings are already required under NEPA. Five commenters (IV-D-28, IV-D-44, IV-D-67, IV-D-84, IV-D-85) noted that EPA's own PSD and NSR programs already require public notices and the opportunity for public hearings and comments.

Eight commenters (IV-D-28, IV-D-43, IV-D-44, IV-D-67, IV-D-84, IV-D-108, VI-B-02, VI-B-05) stated that additional requirements for public hearings are also unnecessary because many State and local governments already require such hearings as part of the air permitting process or as part of the zoning and land use planning process. Therefore, these commenters argued, the proposed requirements would be duplicative and unnecessary and only increase costs without providing any additional benefit or useful information.

One commenter (IV-D-84) added that public hearing requirements should be left to the State and local elected officials and not to Federal employees that are not located near the project site. A second commenter (IV-D-85) stated that local land use decisions are the province of local government. Finally, one commenter (IV-D-108) opposed the public hearing provisions because the commenter's State is already conducting public hearings and the State has developed solid waste advisory councils.

Response: Additional public meetings would not need to be held in order to satisfy the siting requirements under this rule. Because the siting analysis is based on the NSR requirements, it is anticipated that if a public meeting is scheduled to address the environmental impact analysis required by the NSR program, the same public meeting could also be used to discuss the siting analysis required by this rule. The same meeting(s) could also be used to comply with other requirements such as NEPA and State and local zoning requirements.

The public meeting provisions allow local authorities to get involved. Most States, and some local agencies, are delegated the authority to implement and enforce the NSPS.

4.1.3 Reporting and Recordkeeping Requirements for Siting Analysis

Comment: One commenter (IV-D-111) recommended that the siting requirements be clarified to indicate that NO_X offset commitments are not required as part of an initial application to construct, but should "allow sources to secure the offset at any time up until the source commences operation." This would be consistent with the Nitrogen Oxide Supplement to the General Preamble of the Act (Federal Register, November 25, 1992). The commenter warned that offsets cannot be identified early in the permitting process because permit limits are often subject to revision and because offsets may become unavailable from a potential source if the area containing the source becomes or reverts to nonattainment status for ozone.

Response: As indicated in an earlier comment response, the NSPS siting requirements are based on the NSR requirements. The NSPS siting requirements are intentionally general in nature to prevent conflicts between this and other program requirements and to allow other program requirements that have already been established to provide guidance in situations that the NSPS requirements do not address. The issue of when NO_X offsets are required to be identified and committed to is not addressed in the NSPS but has already been addressed in the Nitrogen Oxide Supplement mentioned by the commenter. As the commenter correctly identified, the EPA*s policy on NO_X emission offsets is that emission reduction credits that are federally enforceable and in effect by the time the permitted source commences operation can be claimed as offset credits. This policy will be codified in future versions to the NSR regulations, which is the appropriate forum. The EPA*s policy on obtaining offset credits until operation commences is already in place, eliminating uncertainty regarding the number of offsets required to meet emission limits and changes in attainment area status. Therefore, the final rule has not been changed from that proposed.

4.1.4 Legal Authority to Issue Siting Analysis Requirements

Comment: A number of commenters (IV-D-10, IV-D-28, IV-D-43, IV-D-44) indicated that the EPA had failed in the proposed rule to minimize potential risks from MWC's to public health or the environment.

Response: The EPA's proposed siting requirements had two components. The first component was based upon PSD requirements, and required an analysis of the impact of the affected facility on ambient air quality, visibility, soils, and vegetation. The second component required the permitting authority to take into account the impact of other major industrial facilities near the affected facility. Several of the commenters listed above stated that the proposed rule failed to comply with the direction of Congress to develop for new units "siting requirements that minimize, on a site specific basis, to the maximum extent practicable, potential risks to public health or the environment." Section 129(a)(3). The commenters argued that the siting requirements must include more than an NSR-type program in order to protect public health and the environment, and that the proposed rule only required risks to be quantified, but did little or nothing to minimize potential risks as required by the statute. As discussed in section 4.1.1, some commenters (IV-D-28, IV-D-44, IV-D-67, IV-D-98, IV-D-99) further argued that it will be difficult or impossible to satisfy the second component of the proposed rule because the applicant in many instances will not be able to determine the emissions from other local facilities.

The EPA agrees with these comments and has revised the proposed rule. Under the final rule, owners and operators of proposed new units must conduct an analysis of the impact of the affected facility and select the site that minimizes, on a site specific basis, to the maximum extent practicable, potential risks to public health or the environment. The final rule requires all new units to conduct a PSD type review as part of its siting analysis. In addition, the final rule gives local governments the discretion to determine, on a site specific basis, and taking into account both the specific facts that are peculiar to the location(s) being considered and the public's input, whether the proposed location for the new MWC minimizes potential risks to the public health and the environment. Included in this analysis is the potential impact to sensitive areas and/or individuals, such as schools, health care facilities, children, and the elderly.

The final rule also requires owners and operators of new MWC's to submit a materials separation plan as part of the siting analysis. The materials separation plan is to be tailored to the area that will be served by the MWC, thereby providing for the consideration of the public and permitting authority one method for removing pollutants before combustion. The final rule, however, does not require that materials separation be adopted; it only requires materials separation to be considered as part of the siting analysis for new MWC units.

<u>Comment</u>: Several commenters (IV-D-04, IV-D-99, VI-B-02, VI-B-06) argued that the siting requirements for new MWC units that are also being promulgated only should apply to entirely new MWC's, and not modified or expanded units. Two commenters (VI-B-02, VI-B-06) contended that the EPA only had authority to issue siting requirements for <u>new</u> sources, but not for <u>existing</u> sources. One commenter (IV-D-99) contended that the siting requirements should not apply to the expansion of

existing plants, where the expansion was considered in the original siting analysis and approval. The commenter cited a case where the siting, design, and permitting process for an existing two-unit plant included provisions for adding a third unit in the future. Another commenter (IV-D-51) recommended that an existing unit that undergoes modifications that result in a significant change in its potential emissions be required to undergo a siting evaluation, including a risk assessment, as part of the permit modification review process.

Response: As required by the express terms of the Act, the final rule's siting requirements apply to both new units and units that are modified, as that term is defined in section 129(g)(3) of the Act. Section 129(a)(3) of the Act expressly requires the EPA to develop siting requirements for new units, and new units are defined in the Act to include modified solid waste incinerator units:

> The term "new solid waste incineration unit" means a solid waste incineration unit the construction of which is commenced after the Administrator proposes requirements under this section establishing emissions standards or other requirements which would be applicable to such unit or a modified solid waste incinerator unit.

42 U.S.C. § 7429(g)(2) (emphasis added). Modified solid waste incinerator units are defined in section 129 as:

> [A] solid waste incineration unit at which modifications have occurred after the effective date of a standard under subsection (a) of this section if (A) the cumulative cost of the modifications, over the life of the unit, exceed 50 per centum of the original cost of construction and installation of the unit (not including the cost of any land purchased in connection with such construction or installation) updated to current costs, or (B) the modification is a physical change in or change in the method of operation of the unit which increases the amount of any air pollutant emitted by the unit for which standards have been established under this section or section 7411 of this title.

42 U.S.C. § 7609(g)(3).

Accordingly, the express terms of the statute require owners and operators to perform siting analyses for any existing MWC that is modified within the meaning of section 129(g)(3). Under the final rule, such analyses require the owner or operator to propose the location that minimizes, on a site specific basis, to the maximum extent practicable, potential risks to public health or the environment. Although it may not be feasible to relocate an existing MWC, such an analysis nonetheless remains appropriate when evaluating whether an existing MWC should be modified and/or expanded. A review of the siting analyses may establish that expanding an existing unit (as opposed, for example, to building a new unit in a different location) will not minimize the potential risks to human health and the environment. Excluding existing units undergoing modifications within the meaning of section 129(g)(3) from the siting requirements is both contrary to the Act and would defeat the goal of minimizing risks.

One commenter questioned whether existing units that are modified in order to comply with the emissions guidelines promulgated today under a separate final rulemaking notice would be required to comply with the NSPS should the cost of the modifications exceed the 50-percent threshold of section 129(g)(3). Changes made to an existing MWC solely to comply with an emission guideline are not considered a modification or reconstruction and would not subject an existing MWC to comply with the NSPS. In addition, the final rules promulgated today require units to employ good combustion practices, which constitute a relatively low percentage of the overall cost of the unit. Thus, adoption of GCP's will not trigger the 50 percent threshold.

Comment: Several commenters (IV-D-10, IV-D-28, IV-D-43, IV-D-44) argued that in order to fulfill Congress' intent that the siting requirements minimize potential risks to the public health and environment, the requirements specifically must restrict or prohibit the placement of an MWC in certain areas, similar to the EPA's siting requirements for landfills. One commenter (IV-D-10) cited the September 24, 1992 <u>Congressional Record</u> and a letter from Max Baucus, a member of the Senate Committee on Environment and Public Works, to support this contention.

<u>Response</u>: The EPA does not believe that the potential risks to public health and the environment can <u>only</u> be minimized through specific physical set-back requirements, but it does agree that factors such as location (including proximity to schools and health care facilities) and the potential impact of emissions from a proposed MWC site on sensitive individuals must be taken into account when performing the siting analyses required by the final rule. The final rule allows localities the flexibility to determine which location minimizes the potential risk to human health and the environment, based upon the various factors that are unique to each site, without prescribing universal physical setback standards. It also places the burden on owners and operators of new MWC's (as that term is defined in section 129(g)(2)) to justify their ultimate site choices in a public forum, thereby allowing the permitting authority to consider the public's input when it determines "<u>on a site specific basis</u>" whether the proposed site minimizes the potential risk to human health and the environment.

<u>Comment</u>: One commenter (IV-D-10) contended that limiting the siting requirements to units that file initial construction permit applications after the date of <u>promulgation</u> is inconsistent with section 129(g)(2) of the Act, which defines a new municipal waste combustor unit as one that either commences construction after the rule is <u>proposed</u> or is a modified MWC. The commenter noted that under the proposed rules, an owner or operator can avoid the siting

requirements merely be filing a construction permit application before the NSPS are promulgated.

Response: The EPA agrees with these comments. The proposed applicability date for the siting provisions is not consistent with the section 129 requirements. In the final rule, the EPA has included siting requirements for MWC's for which construction is commenced after September 20, 1994; however, the siting requirements are different for those facilities for which construction is commenced between proposal and promulgation. The final rule includes the following requirements for the following two groups of affected facilities: (1) Affected facilities for which the initial application for a construction permit under 40 CFR part 51, subpart I, or part 52, is submitted after the date of promulgation, must prepare a siting analysis and materials separation plan in accordance with the provisions specified in the final rule (the siting provisions have been revised since proposal; refer to other discussions in this section for a summary of the changes); and (2) affected facilities for which construction is commenced after September 20, 1994 and that are not subject to requirement (1) above are required to prepare a siting analysis in accordance with 40 CFR part 51, subpart I, or part 52, as applicable.

4.1.5 Applicability of the Siting Requirements

Comment: Several commenters (IV-D-04, IV-D-99, VI-B-02, VI-B-06) argued that the siting requirements for new MWC units that are also promulgated today under separate notice only should apply to entirely new MWC's, and not modified or expanded units. Two commenters (VI-B-02, VI-B-06) contended that the EPA only had authority to issue siting requirements for new sources, but not for existing sources. One commenter (IV-D-99) contended that the siting requirements should not apply to the expansion of existing plants, where the expansion was considered in the original siting analysis and approval.

The commenter cited a case where the siting, design, and permitting process for an existing two-unit plant included provisions for adding a third unit in the future. Another commenter (IV-D-51) recommended that an existing unit that undergoes modifications that result in a significant change in its potential emissions be required to undergo a siting evaluation, including a risk assessment, as part of the permit modification review process.

Response: As required by the express terms of the Act, the final rule's siting requirements apply to both new units and units that are modified, as that term is defined in section 129(g)(3) of the Act. Section 129(a)(3) of the Act expressly requires the EPA to develop siting requirements for new units, and new units are defined in the Act to include modified solid waste incinerator units:

> The term "new solid waste incineration unit" means a solid waste incineration unit the construction of which is commenced after the Administrator proposes requirements under this section establishing emissions standards or other requirements which would be applicable to such unit or a modified solid waste incinerator unit.

42 U.S.C. § 7429(g)(2) (emphasis added). Modified solid waste incinerator units are defined in section 129 as:

> [A] solid waste incineration unit at which modifications have occurred after the effective date of a standard under subsection (a) of this section if (A) the cumulative cost of the modifications, over the life of the unit, exceed 50 per centum of the original cost of construction and installation of the unit (not including the cost of any land purchased in connection with such construction or installation) updated to current costs, or (B) the modification is a physical change in or change in the method of operation of the unit which increases the amount of any air pollutant emitted by the unit for which standards have been established under this section or section 7411 of this title.

42 U.S.C. § 7609(g)(3).

Accordingly, the express terms of the statute require owners and operators to perform siting analyses for any existing MWC that is modified within the meaning of section 129(g)(3). Under the final rule, such analyses require the owner or operator to propose the location that minimizes, on a site specific basis, to the maximum extent practicable, potential risks to public health or the environment. Although it may not be feasible to relocate an existing MWC, such an analysis nonetheless remains appropriate when evaluating whether an existing MWC should be modified and/or expanded. A review of the siting analyses may establish that expanding an existing unit (as opposed, for example, to building a new unit in a different location) will not minimize the potential risks to human health and the environment. Excluding existing units undergoing modifications within the meaning of section 129(g)(3) from the siting requirements is both contrary to the Act and would defeat the goal of minimizing risks.

One commenter questioned whether existing units that are modified in order to comply with the emissions guidelines promulgated today under a separate final rulemaking notice would be required to comply with the NSPS should the cost of the modifications exceed the 50-percent threshold of section 129(g)(3). Changes made to an existing MWC solely to comply with an emission guideline are not considered a modification or reconstruction and would not subject an existing MWC to comply with the NSPS. In addition, the final rules promulgated today require units to employ good combustion practices, which constitute a relatively low percentage of the overall cost of the unit. Thus, adoption of GCP's will not trigger the 50 percent threshold.

4.1.6 Miscellaneous

Comment: One commenter (IV-D-45) argued that it is the responsibility of the EPA or the industry, rather than the community that is at risk, to prove that the MWC is safe. According to the commenter, the EPA has allowed the siting of MWC's without adequate study by the EPA or the industry to prove that they are not harmful to public health. The commenter pointed out that, in contrast, the Food and Drug Administration requires that new drugs be proven safe and effective before they are marketed and the Federal Aviation Administration requires that new aircraft be structurally safe before they are marketed or used by airlines.

Response: The proposed NSPS and emission guidelines limit MWC emissions to the maximum extent possible in order to minimize risks to the public and the environment. The proposed siting requirements also minimize risks by identifying those sites, on a case-by-case basis, that may present unreasonable risks. However, as with new drugs and with aircraft, it is impossible to eliminate all risk without also eliminating the benefits of the technology. The proposed NSPS is a compromise that reduces risks in consideration of local inputs.

Comment: One commenter (IV-D-108) stated that it is inappropriate for the EPA to be involved in local siting decisions because of EPA's lack of involvement in MSW management and planning and facility siting, and EPA's lack of knowledge of local siting concerns. The commenter argued that siting decisions must remain at the local level. Adding a redundant level of Federal regulation and oversight would waste State and local resources, require an unprecedented level of EPA involvement in local decisions, and slow the entire process, according to the commenter.

Response: The NSPS siting requirements are structured so that the process and all decisions will occur at the State and local level. The proposed siting requirements establish a procedure to ensure a minimum level of review with local public input for all new MWC's. Where current siting practices are consistent with the proposed NSPS, those practices will be accepted as compliance with the NSPS. Almost all States and several local agencies have been delegated the authority to implement NSPS. Therefore, no change is required to the proposed language. The agency delegated implementing authority, rather than EPA, will make siting decisions.

4.2 MATERIALS SEPARATION PLAN

4.2.1 Selection of Materials Separation Plan Requirements

Comment: One commenter (IV-D-57) noted that if materials separation is inappropriate for some subareas, it is possible it may be inappropriate for an entire service area and a mandatory plan may, therefore, be unnecessary. Requiring a plan at every site would be inconsistent with EPA's goal of adapting waste management to the needs of each community, according to the commenter.

Response: There may be some cases where materials separation may be inappropriate for an entire service area of an MWC. However, as stated in the EPA report "The Solid Waste Dilemma: An Agenda for Action" (EPA/530-SW-88-052), integrated strategies are needed for waste disposal and, on a national basis, the preferred hierarchy of waste management is (1) source reduction, (2) recycling of materials, and (3) incineration and landfilling. In order to make the determination that materials separation is not appropriate for a service area and that a materials separation plan is, therefore, unnecessary, the applicant must follow the analysis and public comment procedures in the NSPS and consider the feasibility and benefits of recycling and materials separation.

The applicant must prepare a draft materials separation plan and hold a public meeting to accept comments on the draft plan. The applicant must then develop a document that summarizes and responds to the public comments on the draft plan. The applicant must then prepare a final materials separation plan. Based on the initial analysis and public comments, the draft and final materials separation plans may conclude that materials separation is not appropriate in the service area of the proposed MWC. However, the applicant must still accept public comment on the initial determination, respond to the comments, and provide a rationale for the final determination. The final NSPS has been revised to account for those situations in which a materials separation plan is not appropriate for an entire service area.

Comment: Four commenters (IV-D-43, IV-D-44, IV-D-51, IV-D-56) stated that the proposed materials separation plan should only be required as a condition to obtain a permit, but should not become a condition of an air permit.

One commenter (IV-D-51) agreed that recycling and waste reduction should be encouraged and considered when sizing a new MWC and recommended that a materials separation analysis be required and made available for public review. However, the commenter recommended that the inclusion of a plan in the actual permit be optional because the public review may indicate that no plan is needed for a specific MWC.

Response: The materials separation plan provisions are a one-time procedural requirement and do not contain any enforcement provisions. The materials separation plan provisions are intended to ensure that new MWC's are sized appropriately for the amount of MSW generated in a service area after all appropriate source reduction and recycling measures of public interest have been implemented. The materials separation plan provisions only require the owner or operator of a proposed MWC to consider the effect of current and projected material separation and recycling programs in the service area of the MWC on the quantity and character of MSW that will be brought to the MWC. The NSPS also requires the owner or operator to solicit and consider public input on the effect of these recycling and separation programs on the projected size of the MWC. The NSPS does not require the owner or operator to implement the activities specified in the plan after the plan has been finalized.

Comment: Several commenters (IV-D-18, IV-D-73, IV-D-74, IV-D-103, IV-D-120, VI-B-02, VI-B-05) recommended that the NSPS should be more specific as to the requirements of the material separation plan. One commenter (IV-D-18) stated that the proposed NSPS provide no standard for ratifying or evaluating the impacts of a proposed plan and, therefore, leave the opportunity open for legal challenges to any project on the basis of the materials separation plan. One commenter (IV-D-103) questioned whether the proposal was intentionally left vague to allow for flexibility in plan requirements. Two commenters (VI-B-02, VI-B-05) urged the EPA to provide clear procedural requirements to guide the applicant and the EPA in determining when a materials separation plan and the applicant's responses to public comments were adequate.

One commenter (IV-D-73) noted that without specific guidance from the EPA, the requirements of the plan would be largely determined by input from the people who attend the public hearings.

One commenter (IV-D-120) did not support the materials separation plan requirement because it did not specify measures that would minimize air emissions or the impacts of controlling air emissions (e.g., measures affecting ash quality). The commenter stated that the proposed requirement appeared to be an effort to encourage recycling, but such an effort would be misplaced in this rule because only about 16 percent of MSW is incinerated.

Response: An applicant for a new MWC would not be left open to legal challenges on the basis of the materials separation plan as long as the applicant fulfilled the procedural requirements in the NSPS for public review and comment on the materials separation plan. The public review and comment process is intended to result in a materials separation plan that reflects local public input, including input from those attending public meetings, and is tailored to the particular needs of the service area of the MWC. For these reasons, the materials separation plan requirements do not specify performance levels, separation system elements, or the materials to be separated.

The materials separation plan provisions require the MWC applicant to consider current and projected MSW generation rates and the impact of source reduction and recycling on the quantity and character of the MSW that serves as the MWC feedstock. These are important factors in determining the size of the MWC and, therefore, are appropriate siting considerations within the scope of this rulemaking. The materials separation plan provisions are not intended to directly address or reduce MWC air emissions of specific pollutants. However, the materials separation plan requirements may indirectly encourage recycling in some cases.

Comment: One commenter (IV-D-74) supported the materials separation plan requirement and recommended that the EPA specify that certain items be separated or eliminated from the MSW stream, including fluorescent light tubes, sources of dioxins/furans (PCB's, plastics, and chlorinated aromatic hydrocarbons), and appliances containing Hg. According to the commenter, emissions are directly related to the incineration of products in the waste stream, particularly those that contribute to emissions of heavy metals and dioxins/furans.

One commenter (IV-D-24) recommended that the final rule require plans for both new and existing MWC's to phase-out incineration of the following: batteries (including, but not limited to, Hg, silver-oxide, and nickel-cadmium batteries), fluorescent light tubes, Hg thermometers, switches and thermostats, metal-containing inks, plastics with metal pigments or stabilizers, chrome-tanned leather clothing, leaded glass, gypsum, PVC bottles, PVC or "PVDC" wrap, and bleached paper. The commenter also recommended a 25-percent reduction in the incineration of the following materials: bi-metal cans, aluminum cans, yard waste, and food waste. The commenter (IV-D-24) recommended that the plan require separation of any material that can be shown to result in achievable emission reductions, defined to include, but not limited to, any source reduction that is cost-effective or provides a net profit to the operator or to the municipality contracting for MSW services. The plans should spell out in detail how these wastes would be separated, recycled, or otherwise treated.

The commenter (IV-D-24) referred to several studies to support the commenter's recommended materials separation requirements to reduce HCl and dioxin/furan emissions by preventing sources of chlorine from entering the MWC. The commenter noted that in Japan in the 1970's, half of the municipalities chose a plastic separation program to comply with a nationwide HCl emission limit of 430 ppm (International Cooperation Agency, Japan, Solid Waste Management and Night Soil Treatment, Volume I).

One commenter (IV-D-17) recommended that the EPA require collection and separation programs to prevent Hg-containing materials from entering the waste stream and to remove Hg and other metal-containing materials. The commenter stated that these pollution prevention strategies represent a more effective environmental strategy than focusing on add-on controls. However, the commenter stated that the EPA should not abandon support for advanced control measures.

Response: The proposed materials separation plan requirements do not specify the materials to be separated. The materials separation plan requirements are intended to ensure that MWC's are properly sized to account for current and future MSW generation rates and the impact of current and future source reduction and recycling on the character and quantity of MSW that will be the MWC feedstock. However, the materials separation plan requirements do not preclude a local authority from separating any specific materials. In addition, MWC owners and operators are free to use any control technology they choose to comply with the numerical emission limits (including separating specific materials), as long as they demonstrate compliance.

The commenters provided no data to indicate that the commenter's recommended separation requirements for specific materials and items would be economically feasible or would reduce emissions below the numerical emission limits established in this rulemaking. Additionally, the commenter provided no data on the actual HCl emission reduction that were achieved through the Japanese plastic separation program. The Japanese HCl emission limit of 430 ppm is many times higher than the NSPS emission limit of 25 ppm.

Comment: One commenter (IV-D-24) noted that tests at an MWI indicate that a high chlorine content in the feed from PVC plastics and bleached paper can overcome GCP (indicated by a 50 ppm CO concentration) and result in dioxin/furan emissions of over 1,000 ng/dscm (Jenkins, A.C., et al., "Evaluation Test on a Hospital Refuse Incinerator at Saint Agnes Medical Center, Fresno, California," California Air Resources Board, January 1987). Based on these results, the commenter stated that one potential method to reduce dioxin/furan emissions is for the EPA to ban PVC items from MWC's and to require a phase-out of the bleaching of paper products.

Response: Medical waste incinerators are being regulated by a separate set of emission standards under the Act because of differences in feedstock, combustor type, and control technology. The NSPS emission limit for dioxins/furans of 13 ng/dscm is far less than the 1,000 ng/dscm cited by the commenter. The emission guideline limit for existing units at large plants is 30 ng/dscm for units with non-ESP based APCD's and 60 ng/dscm for units with ESP-based APCD's, and the limit for existing units at small plants is 125 ng/dscm. These are also far less than 1,000 ng/dscm.

Comment: One commenter (IV-D-24) cited a study at an incinerator that measured the dioxin/furan emissions at three different chlorine concentrations ("Results of the Combustion and Emissions Research Project at the Vicon Incinerator Facility in Pittsfield, Massachusetts -- Final Report," #87-16, prepared for New York State Energy Research and Development Authority by Midwest Research Institute, June, 1987). Although the commenter states that the study's authors concluded that the test results were not statistically significant, the commenter says that the study supports the need to reduce PVC in waste and the proposition that dioxin/furan emissions are directly proportional to chlorine content.

Response: The authors of the study cited by the commenter concluded that the results are not statistically significant and do not show any relation among the three chlorine feed rates and dioxin/furan emissions. Therefore, these results do not support the commenters argument that dioxin/furan emissions are directly proportional to chlorine content and that PVC in MSW must be reduced.

Comment: One commenter (IV-D-24) argued for the removal of paper and plastic from MSW since European studies have shown that these items may account for about 13 percent and 10 percent, respectively, of the Hg found in MSW ("Energy from

Waste," Summary of a study by the National Energy Administration and the National Swedish Environment Protection Board, Stockholm, 1987). The commenter also cited two studies indicating that metals in the flue gas may catalyze the secondary formation of dioxins/furans (Stieglitz, L. "New Aspects of PCDD/PCDF Formation in Incineration," International Workshop on Municipal Waste Incineration, National Incinerator Testing and Evaluation Program, Environment Canada, Montreal, Canada, October 1-2, 1987; Environment Canada, "The National Incinerator Testing and Evaluation Program: Environmental Characterization of Mass Burning Incinerator Technology at Quebec City," Report EPS 3/UP/5, June, 1988).

Response: The preferred MSW management hierarchy is: (1) Source reduction, (2) recycling of materials, followed by (3) incineration and landfilling. According to this hierarchy, recyclable paper and plastic should be removed from MSW. However, not all paper and plastic can be recycled, so these materials must be either combusted for energy recovery or landfilled. Also, it is not known whether the Hg content of paper in Europe is comparable to that in the U.S. because of differences in paper making processes and printing inks. The use of Hg in printing inks was discontinued in the U.S. in 1991; therefore, any Hg found in paper is most likely due to background levels in the raw materials.

Mercury is contained in many materials other than paper and plastics, so removing the latter from MSW would not necessarily decrease Hg concentrations in the MSW or in the uncontrolled emissions. The commenter provided no data demonstrating that removing all paper and plastic would reduce Hg emissions below the Hg emission limits in the NSPS. In any case, the final regulation will achieve greater than 85 percent control.

Comment: One commenter (IV-D-24) stated that the State of New Jersey Department of Environmental Protection has concluded that its Battery Reduction Law and Toxics in Packaging Law "will have a considerable effect on emissions" by reducing Hg and other heavy metals in MSW. The New Jersey Department of Environmental Protection estimated that fuel cleaning would reduce Hg emissions by 70 to 95 percent, according to the commenter. Finally, the commenter stated that studies have shown that removing gypsum board and yard waste from MSW would reduce emissions of SO_2 and NO_X, respectively. The commenter concluded by stating that there is no evidence suggesting that ambitious source reduction would have a trivial impact on emissions and that the EPA would have to provide evidence to conclude that the impact of source reduction would be trivial.

Response: No data were provided to demonstrate that New Jersey's Battery Reduction Law and Toxics in Packaging Law have reduced Hg emissions below the numerical emission limits in the NSPS or that the Hg reductions estimated by the New Jersey DEP have been achieved. No data are available to the EPA that would indicate that source reduction could reduce SO_2 and NO_X emissions to levels below the numerical emission limits in the NSPS or could achieve greater emission reductions than the NSPS requirements. However, nothing in the NSPS precludes an owner or operator from using source reduction as a control technique to comply with the numerical emission limits.

Comment: Several commenters (IV-D-18, IV-D-43, IV-D-44, IV-D-54, IV-D-56, IV-D-57, IV-D-80, IV-D-85, IV-D-98, IV-D-104) argued that there is no technical basis for materials separation requirements in an air quality regulation and that the EPA has failed to demonstrate that materials separation would yield any air quality or nonair quality benefits or reduce the risk to the public. One commenter

(IV-D-44) pointed out that the EPA has consistently concluded that a materials separation program should not be included in the NSPS for MWC's. The commenter noted that the preamble for the 1991 NSPS (subpart Ea) expressly rejected a proposal for a materials separation program (56 FR 5496 - 5499) and that there has been no change in the scientific or technical data to justify a reversal of EPA's policy.

One commenter (IV-D-57) stated that the EPA has not adequately justified the need for a materials separation plan because the preamble does not show that materials separation will be practicable or needed to minimize potential risks to public health or the environment.

One commenter (IV-D-80) recommended that the materials separation requirements be deleted because no correlation between materials separation and emissions has been established to date. If such a correlation exists, the commenter agreed that materials separation could be pursued as an alternative to other emission control options.

Five commenters (IV-D-43, IV-D-44, IV-D-67, IV-D-85, IV-D-104) noted that previous BACT and PSD determinations by the EPA have consistently concluded that materials separation programs do not improve MWC emissions. One commenter (IV-D-85) stated that PSD remand studies for the Brooklyn Navy Yard Resource Recovery Project have shown that there is no NO_x reduction when yard waste is removed. The same commenter also noted that the WASTE Project at the Burnaby/Vancouver, British Columbia (Canada) MWC show that there are no emissions or ash leaching benefits from the removal of certain heavy metals from MSW.

One commenter (IV-D-104) cited two 1994 papers by Rigo, Ferraro, and Wilson that concluded that fuel-bound nitrogen is emitted more as N_2 than as NO_x in MB/WW MWC's and, therefore, there are no changes in NO_x emissions that are statistically related to the quantity of yard waste, wood, food, textiles, or rubber in the MSW.

The same commenter (IV-D-104) also noted that published data from the WASTE Project demonstrate that HCl and metal emissions are not related to the concentration of chlorides or metals in the waste. The commenter stated that the WASTE Project demonstrated that adding over seven times the normal amount of Pb to an MWC in the form of lead-acid batteries resulted in no increase in Pb emissions (Chandler, Rigo, and Sawell, 1994; Rigo, Chandler, and Sawell, 1993). The commenter noted that the two papers that he attached to his comment letter conclude that recycling of lead-acid batteries should be encouraged, but banning lead-acid batteries or spending large sums of public money to police diversions appears to be unwarranted because the environmental significance of introducing limited numbers of batteries into MWC's is limited.

The same commenter (IV-D-104) also noted that the WASTE Project's Cd spiking experiments measured only a marginally statistically significant increase in Cd emissions when Cd was added in the form found in MSW. The authors of the WASTE Project report concluded that commercially available PVC and plastics using Cd colorants are probably not the source of Cd emissions or occasionally high Cd leachate concentrations in MWC ash (Chandler, Rigo, and Sawell, 1994).

The same commenter (IV-D-104) also noted that the HCl CEM data from the WASTE Project indicate that HCl emissions downstream of a SD/FF are not correlated with the amount of PVC waste entering the MWC. According to the commenter, this result contradicts EPA's assertion in section 8.0 of the "Economic Impact Analysis for Proposed Emission Standards and Guidelines for Municipal Waste Combustors" (EPA-450/3-91-029) that separating chlorine-containing materials from the waste stream would reduce HCl emissions.

Finally, the same commenter (IV-D-104) noted that through the waste characterization study at the Burnaby MWC, Rigo and Chandler (1994) concluded that many environmentally significant metals are constituents of natural waste components and are not necessarily introduced during manufacturing processes. The paper by Rigo and Chandler concluded that there is a disparity between the popular perception of the source of some metals in MSW and their actual location. For example, batteries accounted for only 4 percent of the Hg in the Burnaby MSW; the majority is found in low concentrations in the combustible fraction of MSW, including paper, wood, and yardwaste. According to Rigo and Chandler, the presumption that simply separating a metal will reduce concentration in stack emissions and other residue streams must be questioned because of a lack of correlations between waste components and metal concentrations.

Response: The intended purpose of the materials separation plan provisions is to be a planning process with public input. It applies only to new MWC's. As part of the siting requirements, the materials separation plan is intended to ensure proper sizing of new MWC's to account for the impact of current and projected MSW source reduction and recycling programs within the context of ISWM. Ensuring the proper sizing of MWC's and thorough consideration of MSW source reduction, considering public input, will result in the use of municipal waste incineration only to the extent that incinerating is necessary, thereby minimizing air quality impacts from MWC's. Therefore, the materials separation plan provisions are consistent with previous EPA determinations and other available data concerning the effect of materials separation on MWC emissions.

4.2.2 Impacts of Materials Separation Plan Requirements

Comment: Two commenters (IV-D-28, IV-D-84) stated that the proposed materials separation plan will put MWC's at a disadvantage and encourage landfilling. One commenter (IV-D-84) stated that the plan will encourage hauling of MSW across State lines to regional landfills. The commenter noted that a curbside separation plan would add $100 to $200 per ton to the cost of MSW disposal and a mixed waste processing plant would add $40 to $80 per ton to the cost of MSW disposal. The commenter also noted that the impacts of these costs would be compounded by the absence of a policy that would allow States to control waste flow within their boundaries.

Response: The materials separation plan provisions in the NSPS are not prescriptive and do not require any specific recycling or materials separation activities, only a public discussion of these activities relative to the projected size of the planned MWC. Therefore, the cost impacts of these procedural requirements are expected to be minimal and will have little, if any, effect on the cost of MSW disposal or on a community's decision to select MSW combustion versus landfilling. For similar reasons, the materials separation plan provisions will not affect whether MSW is taken across State lines to regional landfills.

The costs of recycling and materials separation will be highly variable from one community to another and will be affected by recent and future decisions on the issue of flow control. However, the procedural requirements of the NSPS will identify those activities that are appropriate for a specific MWC and will, therefore, account for the economic effect of decisions on the issue of flow control.

Comment: One commenter (IV-D-99) warned that increasingly strict environmental requirements on local governments, such as the proposed materials separation plan, carry a cost that threatens the viability of recycling and composting programs because budget cuts to balance these environmental costs increasingly come from recycling and mulch programs.

Two commenters (IV-D-75, IV-D-96) added that the proposed materials separation requirements represent a costly and unnecessary duplication of the requirements already in place in many municipalities.

Response: As discussed in the previous response, the cost impacts of the procedural materials separation plan requirements are expected to be minimal and will have little, if any, effect on the cost of MSW disposal. The cost of developing a materials separation plan is not a significant component of the total cost of the NSPS. The cost impact of the complete NSPS and the effects on local budgets are discussed more fully in section 3.6.2 of this document.

The materials separation plan provisions are not a duplication of the current recycling and material separation efforts because current efforts can become the basis of the materials separation plan. The only added burdens would be the public meetings and documentation associated with incorporating the existing program into the materials separation plan. In many cases, the required meetings on the separation plan could be combined with other meetings already being held for PSD/NSR, zoning, or other State or local requirements, and would not be an additional cost burden. Therefore, the additional costs of the materials separation plan should be minimal and should not affect the viability of existing recycling and composting programs.

4.2.3 Compliance Provisions for Materials Separation Plan Requirements

Comment: Four commenters (IV-D-02, IV-D-18, IV-D-31, IV-D-99) recommended that owners and operators of MWC plants in areas that already have plans meeting the goals of the separation plan should not be subject to the requirement to develop a materials separation plan.

Three commenters (IV-D-31, IV-D-85, IV-D-108) recommended that the NSPS should contain a provision that would allow applicants to meet the materials separation plan requirements by conforming with existing local, regional, or State MSW reduction or management plans that are already achieving the desired results, although not necessarily involving all of the proposed procedures. One of the commenters (IV-D-108) described the materials separation legislation and programs in place in the commenter's State, which include State-wide mandatory recycling of glass containers, aluminum cans, newspaper and leaves. The commenter pointed out that, in addition, nearly every county in the State also requires the recycling of vehicle batteries, used motor oil, corrugated cardboard, mixed paper, grass and brush, white goods, and wood wastes.

One commenter (IV-D-31) recommended that the NSPS should allow an applicant to waive the materials separation plan requirements if the applicant can demonstrate that current recycling programs in the service area have saturated the markets for recyclable materials to the point where further materials would negatively impact other recycling programs. The owner or operator would be required to monitor markets and develop a materials separation plan when market conditions were favorable.

Response: The materials separation plan provisions in the NSPS are procedural and are not prescriptive. The provisions do not require the owner or operator to undertake any specific material separation or recycling activities; merely to consider the effect of current or future programs on the quantity and character of MSW in selecting the size of the MWC. The materials separation plan developed according to the procedures in the NSPS could use existing programs as a starting point. Furthermore, the information collected in the public meeting and comment process required by the NSPS may indicate that current activities are adequate and no additional activities are required in the service area of the

MWC. However, the procedural requirements of the NSPS must still be followed to determine whether additional actions are warranted or feasible in light of the proposed MWC.

If current recycling programs in an area have saturated the markets for recyclable materials, then that fact will be reflected in the materials separation plan developed during the procedures required by the NSPS. In such a case, the materials separation plan may require no additional separation and recycling beyond that already performed. Nothing in the NSPS would preclude an owner or operator from including a provision in the materials separation plan to add or remove certain materials separation or recycling activities at a later time in response to market changes that make recycling more or less favorable.

4.2.4 Public Meeting Provisions for Materials Separation Plan Requirements

Comment: One commenter (IV-D-31) stated that public input is appropriate but should not be used to stall project development. The commenter recommended that the presentation of the materials separation plan and the siting analysis should be consolidated into one public meeting.

Response: The NSPS requires that the materials separation plan be developed prior to conducting the siting impact analysis because the size of the MWC will be affected by the outcome of the materials separation plan development process. Once the size of the proposed MWC is determined, the siting impacts can be more accurately assessed. As a result, the NSPS requires separate meetings to present the materials separation plan and the results of the siting analysis. It is expected that the two public meetings will occur one to 2 years apart.

Comment: Six commenters (IV-D-18, IV-D-31, IV-D-43, IV-D-44, IV-D-85, IV-D-108) objected to the proposed public hearing and review requirements because they are redundant of public review that already occurs. Two commenters (IV-D-43 and IV-D-44) argued that it is unnecessary to require a hearing to discuss materials separation programs in the context of an air permit. The commenters noted that hearings are already conducted as part of the comprehensive planning process and as part of the air permit process. The commenters also argued that it is incorrect to assume that there would be no public discussion or hearings in the absence of an EPA mandate.

One commenter (IV-D-85) argued that the procedural requirements of the proposed materials separation plan are unnecessary and unrealistic because the initial decision to build an MWC is part of a municipality's overall MSW management plan. The commenter indicated that waste reduction plans and regional MSW management planning are addressed in State MSW management plans, including public participation components, adopted since the 1984 amendments to RCRA. According to the commenter, by the time that a facility is applying for an air permit, all MSW management decisions will have been made and there should be no need for additional public hearings on the issue.

One commenter (IV-D-108) opposed the public participation provisions because they are already conducting public hearings and have developed solid waste advisory councils at the State level. Therefore, the proposal would impose a redundant layer of Federal requirements, according to the commenter.

One commenter (IV-D-18) objected to the proposed materials separation requirements because they are redundant to State solid waste management planning requirements, including public participation, implemented since the 1984 amendments to RCRA.

<u>Response</u>: Hearings and meetings are already conducted as part of the air permit process. In fact, the siting requirements were developed to mimic the existing NSR

requirements, such that the public meeting to cover the siting analysis could be the same hearing required as part of the State's permitting process. However, there is nothing in the NSPS that would preclude an owner or operator of a proposed MWC from combining the materials separation plan or siting analysis public meetings with any other public meeting required as part of another Federal, State, or local permit review process, as long as two separate meetings are held, one to focus on the materials separation plan and one to focus primarily on the siting analysis. The owner or operator would still be required to comply with the notification and comment-response documentation requirements of the NSPS.

The siting requirements of the NSPS contain no provisions affecting the relative timing of the air permitting process and the completion of the materials separation plan. The NSPS only requires that the final siting analysis and the materials separation plan be submitted with or before the initial application for construction permit. This provision will not present a delay in the permitting process except for those owners or operators that would have otherwise submitted a construction permit application immediately after the effective date of the NSPS.

If a municipality has already had public hearings to decide on an overall MSW management approach, then this approach may be considered at the public meetings, and incorporated into the materials separation plan. The process of making this decision and incorporating an existing plan into the materials separation plan is not a significant burden. In any event, the construction of a MWC would be a significant new component in most areas' MSW management programs. In such a case, existing material separation or recycling programs should be reviewed and updated to accommodate the development of the MWC as a new component in an area's ISWM program.

4.2.5 Legal Authority to Issue Materials Separation Plan Requirements

Comment: The EPA received a number of comments (IV-D-28, IV-D-37, IV-D-38, IV-D-41, IV-D-43, IV-D-44, IV-D-55, IV-D-56, IV-D-67, IV-D-85, IV-D-87, IV-D-97, IV-D-98, VI-B-02, VI-B-04, VI-B-05, VI-B-06) challenging the proposed materials separation ("MS") plan as both being inconsistent with Congressional intent and lacking statutory authority. Some of these commenters argued that a MS program requirement is not a siting requirement, nor has the EPA demonstrated that site specific reductions will be achieved with MS. Some commenters noted that the EPA has consistently concluded that MS programs do not improve MWC emissions and there is no new data to contradict this long-standing conclusion. Some commenters argued that MS is a component of an integrated solid waste management system, and such systems should be promulgated under the Resource Conservation and Recovery Act ("RCRA") and applied to all solid waste facilities, not promulgated under the CAA and applied only to MWC's. Some of the comments further stated that the legislative history of the Act clearly indicates Congress' intent not to include MS and recycling in the CAAA, because the Senate version of the 1990 Amendments containing these provisions subsequently was removed by the Conference Committee based upon the Committee's belief that it would be better to regulate solid waste issues comprehensively under RCRA. Some commenters stated that adding a MS program violates Executive Order 12875, and further, MS is not an emission control technique and section 129 only authorizes performance standards and other requirements, such as numerical emission limits or monitoring requirements.

Response: The EPA disagrees with the commenters who argued that it lacks statutory authority to promulgate materials separation as a procedural requirement that owners and operators of new MWC's must meet as part of the siting analysis. Authority for this action is derived from sections 129(a)(3), 129(a)(2), and 111(a)(1). Section 129(a)(3) provides that MWC standards shall be based upon methods and technologies "for <u>removal</u> or destruction of pollutants <u>before</u>, during, or after combustion . . .." 42 U.S.C. § 7429(a)(3) (emphasis added). Section 129(a)(2) authorizes the Administrator to take into consideration a number of factors, including "any non-air quality health and environmental impacts and <u>energy requirements</u> . . .." 42 U.S.C. § 7429(a)(2) (emphasis added). Section 111(a)(1) similarly requires promulgated standards to reflect "any nonair quality health and environmental impact and energy requirements . . .." 42 U.S.C. § 7411(a)(1).

The Administrator concludes that separating materials before combustion will result in fewer materials containing pollutants being combusted, which means there will a decrease in pollutants emitted, since no emission control system has demonstrated the capability of removing 100% of the HAP's contained in materials that are burned in MWC's. Moreover, recycling of materials conserves natural resources. For example, the more aluminum cans that are recycled, the less bauxite (a mineral from which aluminum is made) is needed, thereby providing a positive environmental impact. Therefore, the Administrator decided to retain the materials separation requirement in essentially the same format proposed. As part of the siting analysis for new units, owners and operators must submit a materials separation plan for public review and comment prior to obtaining a construction permit. The materials separation requirement is procedural in nature only; no specific performance levels, specification of separation system design, or designation of materials to be separated are required in the final rule. The final rule thus allows the materials separation plan to be specifically tailored to the area to be serviced by the MWC as one method to be considered for removing pollutants before combustion.

4.2.6 Overall Agency Strategy to Promote Municipal Solid Waste Reduction and Recycling

Comment: Several commenters (IV-D-18, IV-D-28, IV-D-43, IV-D-44, IV-D-56, IV-D-67, IV-D-120, VI-B-02, VI-B-05, VI-B-06) concluded that a materials separation program is not an appropriate requirement of an air quality regulation. The commenters stated that materials separation would be more effectively instituted if applied to all MSW management activities in a comprehensive program under RCRA, rather than in a piecemeal fashion. One commenter (IV-D-98) added that the proper sizing of an MWC plant must be determined through comprehensive MSW management planning addressed on a State-wide basis under RCRA and that the NSPS would perpetuate piecemeal MSW regulation, which is what Congress sought to avoid.

Response: The materials separation plan provisions of the NSPS are a procedural requirement to evaluate the effect of current and projected material separation and recycling activities on the quantity and character of MSW in the service area of the MWC. The information obtained in the development of the materials separation plan will be used to ensure that the MWC is of the proper size for the service area. Since the size of the MWC will affect the magnitude of the air quality impacts from the MWC, the materials separation plan is an appropriate consideration under the siting requirements required by the Act.

The NSPS does not prescribe what separation or recycling activities should be performed in the service area of the MWC. Therefore, the NSPS does not attempt to accomplish any specific MSW management goals that should be addressed on a State-wide basis under RCRA.

Comment: Two commenters (IV-D-28, IV-D-44) urged the EPA to review the regulatory agenda for other MSW management approaches to enable a "level playing field" to be achieved for all MSW management practices. According to one commenter (IV-D-28), regulating MSW management in a piecemeal fashion by requiring materials separation for MWC's may bias decisions made at the local government level with no assurance for the protection of public health and the environment. Refer to section 3.6.1 for further discussion of the environmental impact of landfills versus MWC's. The other commenter (IV-D-44) noted that the EPA concluded in the preamble to the 1991 NSPS (subpart Ea) that it should not promulgate requirements for material separation programs that discriminate against MWC's and favor landfills (56 FR 5497).

Response: The NSPS does not require any specific materials separation or recycling programs that would discriminate against MWC's in favor of landfills. The NSPS only requires that owners and operators of a proposed MWC consider the effect of present and future material separation or recycling programs on the quantity and character of MSW and, in turn, the projected size of the MWC.

Section 3.6.1 discusses the potential impact of the entire NSPS on the selection of landfills versus MWC's and the potential environmental impacts of the decreased use of MWC's in favor of landfills.

4.2.7 Miscellaneous

Comment: One commenter (IV-D-24) noted that the Court of Appeals decision in New York v. Reilly, 969 F. 2d 1147, 1153 (D.C. Cir. 1992) stated that the EPA has concluded that removal of lead-acid batteries reduces emissions. The commenter urged the Agency to ban the combustion of lead-acid batteries in the final rule. The commenter also noted that because the EPA is under a court order to promulgate the MWC regulations, the EPA must decide the materials separation issues within the deadlines set by the court order.

Response: The EPA's final decision on the issue of separating lead-acid batteries from MSW destined for MWC's will be addressed in a separate EPA action to be published at the same time as the final NSPS and emission guidelines. That action will reflect considerable information on the effect of lead-acid batteries on MWC emissions the recycling of lead-acid batteries that the EPA has collected since the Court of Appeals decision.

Comment: One commenter (IV-D-99) stated that local governments with MWC's already have some of the best recycling programs in the country. The commenter argued that if the EPA wants to require materials separation, materials separation should be added to standards for landfills, instead of to the requirements for MWC's.

Response: The materials separation plan provisions of the NSPS will apply only to new MWC's and not to existing MWC's. Furthermore, the NSPS does not require materials separation, only an evaluation of the effect of materials separation and recycling on the projected quantity and character of MSW generated in the service area of the MWC. Actual MSW recycling and material separation requirements addressed under RCRA.

Existing recycling and materials separation programs in the service area of a proposed MWC can serve as the starting point for the materials separation plan. To comply with the NSPS, the owners or operators of the proposed MWC only need to reassess the existing program in light of the proposed MWC and provide for a public meeting and the opportunity for public comment on the materials separation plan.

Comment: Two commenters (IV-D-75, IV-D-96) argued that materials separation plans are local concerns that are better addressed by local solid waste management plans and regulations than by Federal air pollution control regulations.

Response: Procedural requirements for a materials separation plan were proposed on the Federal level to ensure that all States and municipalities consider materials separation and recycling in the siting of new MWC's. A majority of municipalities have addressed materials separation and recycling at the local level. The NSPS includes materials separation plan provisions so that materials separation and recycling are considered in the siting of all new MWC's. However, local factors affecting materials separation and recycling are variable; therefore, no specific materials separation ore recycling activities were included in the NSPS. The actual details of each plan and the activities to be undertaken will be left to the owners and operators, local governments, and those participating in the public meetings. Under the NSPS program, State and local agencies are delegated the authority to implement and enforce the NSPS. Therefore, State and local agencies, rather than the Federal EPA, will typically be involved in the materials separation plan and siting procedures.

5.0 NEW SOURCE PERFORMANCE STANDARDS - FUGITIVE ASH EMISSIONS

5.1 SELECTION OF FUGITIVE ASH EMISSION LIMITS

Comment: Several commenters (IV-D-02, IV-D-18, IV-D-28, IV-D-30, IV-D-34, IV-D-37, IV-D-38, IV-D-41, IV-D-43, IV-D-44, IV-D-67, IV-D-69, IV-D-82, IV-D-85, IV-D-98, IV-D-99, IV-B-02, IV-B-06) contended that from a practical standpoint, zero emissions is not achievable. Three commenters (IV-D-18, IV-D-82, and IV-D-85) were concerned that any observed emission, regardless of its nature, size, and duration would need to be reported as a violation, and could be subject to penalties and fines. Some commenters (IV-D-18, IV-D-28, IV-D-85, IV-D-98) added that because Method 22 requires records of visible emissions of 0.5 second durations, a zero emission limit will be unachievable. Some commenters (IV-D-18, IV-D-30, IV-D-37, IV-D-38, IV-D-44, IV-D-85) concluded this standard would prevent an operator from ever opening any enclosed ash system where ash could potentially become fugitive, and would prevent necessary maintenance activities. Three commenters (IV-D-18, IV-D-85, IV-D-98) gave examples of fugitive emission generating activities that may violate the zero emission standard or guideline, including routine changing of FF's and other maintenance activities. Three commenters (IV-D-37, IV-D-38, IV-D-44) were concerned that a zero visible emission guideline allows no leeway for emissions from accidental releases, spills, or equipment failure or maintenance, and urged the EPA to provide an exception for such situations.

Several commenters (IV-D-18, IV-D-43, IV-D-44, IV-D-67, IV-D-85) contended that EPA's observation of three MWC plants and Method 22 testing of two MWC plants does not constitute a representative sample and is not sufficient to conclude that a zero emission standard or guideline can be met. One commenter (IV-D-99) said they were not aware of any scientific or technical justification for the zero emissions limit.

Thee commenters (IV-D-47, IV-D-49, IV-D-74) supported the proposed fugitive ash emission limit.

Response: The proposed no visible emissions limit was based on observations of ash handling practices at several MWC's and visible emissions data from two MWC plants. Since proposal, the EPA has reviewed Method 22 visible emissions data from the metallic mineral and nonmetallic mineral processing industries, which use similar transfer systems. The data show visible emissions from conveyor transfer points and transfer points from 0 to 2.5 percent of the time. Based on consideration of the comments received and this additional fugitive emissions data, the EPA revised the no visible emission limit to be a visible emission limit of less than 5 percent of the time from ash conveying and transfer systems and ash storage. This limit provides a reasonable margin to ensure that the level is achievable.

Additionally, the final standards include an exemption from the fugitive ash visible emission limit for maintenance and repair activities, because these necessary activities may require opening of an enclosure that could generate short-term visible emissions.

5.2 FORMAT OF FUGITIVE ASH STANDARDS

Comment: Several commenters (IV-D-18, IV-D-28, IV-D-30, IV-D-43, IV-D-44, IV-D-54, IV-D-56, IV-D-75, IV-D-80, IV-D-85, IV-D-95, IV-D-103) suggested that work practice standards and guidelines should be used to regulate MWC fugitive ash instead of a zero emission limit standard.

Response: Under section 111(h)(1), the EPA only may promulgate a work practice standard if the Administrator determines it is not feasible to prescribe or enforce a standard of performance. The Administrator believes, however, that the final rule's visible ash limitation is both achievable and enforceable. Accordingly, work practice standards are not authorized to control visible ash emissions.

5.3 LEGAL AUTHORITY TO PROMULGATE FUGITIVE ASH STANDARDS

Comment: Two commenters (IV-D-28, IV-D-69) contended that the proposed fly ash/bottom ash rules are outside the purview of the Act. These commenters and others (IV-D-41, VI-B-02, VI-B-06) characterized the proposed fugitive ash limit as arbitrary and outside the EPA's regulatory latitude. One commenter (IV-D-18) contended that the EPA has no authority to regulate indoor emissions, and is exceeding its authority by proposing zero emissions "at the doorway" instead of at the fenceline. Another commenter (IV-D-98) stated that the EPA has no legal authority to regulate ash under section 129; rather, section 129 is intended to control pollutants from MWC combustion processes, not fugitive emissions from post-combustion residues. The commenter further contended that section 129 regulates "MWC units," which the Act defines as a distinct operating unit of any facility which combusts solid waste, and ash collection and storage facilities do not fall within the definition of MWC units.

This commenter (IV-D-98) also argued that the legislative history precludes the EPA from regulating fugitive ash emissions under section 129. The commenter contended that the Conference Committee deleted the provisions that would have authorized regulation of ash fugitives under section 129, believing that ash handling should be regulated under RCRA. The same commenter further contended that unlike section 112(d), section 129 does not expressly authorize the

EPA to require enclosure of systems, collection, capture or treatment of fugitive emissions, or design or work practice standards. The commenter concluded from these omissions in section 129 that the EPA is not authorized to regulate fugitive ash emissions from MWC's.

Another commenter (IV-D-85) stated that section 111, which is referenced in section 129, authorizes the EPA to issue work practice standards in lieu of performance standards where performance standards are not feasible. The commenter suggested that the EPA promulgate such work practice standards to regulate ash emissions. Two commenters (IV-D-37, IV-D-38) further stated that the proposed ash zero-emissions standard was impossible to achieve, and thus, was arbitrary and capricious.

Response: The legal issues raised by these comments are addressed below.

Scope of Coverage

As noted by some commenters, section 129(a)(1) authorizes the EPA to establish standards for solid waste incinerator units, which section 129(g) defines as a "distinct operating unit of any facility which combusts any solid waste material from commercial or industrial establishments . . .." 42 U.S.C. § 7429(g) (emphasis added). This definition of solid waste incinerator unit, however, does not clearly define the boundaries of a solid waste incinerator unit, particularly since the word, "unit," is included in the definition. As a result, the EPA has received requests for clarification regarding the appropriate boundaries of a solid waste incinerator unit. (These questions typically arise in the context of a potential modification/reconstruction, because in determining whether NSPS applies to an existing unit, one of the key factors is the cost to modify or reconstruct the combustor.) To avoid further confusion, the final rule clarifies the boundaries of a solid waste incinerator unit to which these regulations apply.

Under the final rule, a solid waste incinerator unit is defined as the MWC combustor, which includes, but is not limited to, the fuel feed system, grate system, flue gas system, bottom ash system, and the combustor water system. Generally speaking then, the combustor starts at the MSW pit or hopper and extends through (1) the combustor flue gas system, which ends immediately following the heat recovery equipment, or if there is no heat recovery equipment, immediately following the combustion chamber; (2) the combustor bottom ash system -- including all ash handling systems that are interconnected to the bottom ash handling system -- which ends at the truck loading station or similar ash handling equipment that transfers ash to final disposal; and (3) the combustor water system, which starts at the feed water pump and ends at the piping exiting the steam drum. The combustor does <u>not</u> include air pollution control equipment, the stack, water treatment equipment, or the turbine-generator set.

The final fugitive ash emissions rule is thus limited to emissions from the combustor, as defined above. It does not cover emissions from trucks and storage facilities since these are outside the combustor unit.

Additionally, the EPA agrees with the commenters that this rule should not regulate indoor emissions of fugitive ash. It was the EPA's original intent that the fugitive ash emission limit apply to external ash emissions. If ash handling equipment subject to the rule is enclosed inside a building or other enclosure, the fugitive ash emission limit would apply to visible emissions discharged <u>from</u> the building, not visible emissions inside the building. The final rule has been revised to clarify this point.

<u>Legal Authority to Regulate Ash Emissions</u>

The EPA disagrees with those commenters who stated that the EPA does not have the discretion under section 129 to regulate fugitive ash/bottom ash emissions. As stated in the subsection above, the final rule regulates ash emissions from the combustor bottom ash system, as well as any ash emissions from all ash handling systems that are interconnected to the bottom ash handling system prior to the truck loading station or similar ash handling equipment that transfers ash to final ash disposal. The legal authority for this standard is provided in sections 129(a)(3) and 129(a)(4).

Section 129(a)(3) states:

> (3) Control methods and technologies
> Standards under section 7411 of this title and this section applicable to solid waste incineration units shall be based on methods and technologies for removal or destruction of pollutants before, during, or after combustion . . . .

42 U.S.C. § 7429(a)(3) (emphasis added). Section 129(a)(4) further requires the EPA to:

> [S]pecify numerical emissions limitations for the following substances or mixtures: particulate matter (total and fine), opacity (as appropriate), sulfur dioxide, hydrogen chloride, oxides of nitrogen, carbon monoxide, lead, cadmium, mercury, and dioxins and dibenzofurans. The Administrator may promulgate numerical emissions limitations or provide for the monitoring of postcombustion concentrations of surrogate substances, parameters or periods of residence time in excess of stated temperatures with respect to pollutants other than those listed in this paragraph.

42 U.S.C. § 7429(a)(4) (emphasis added).

Fugitive bottom ash emissions are emissions of dust from the combustor bottom ash system that are not contained within a fully enclosed ash handling system. This bottom ash dust consists of PM and various associated pollutants absorbed to the PM, such as Cd, Pb, Hg, and organic compounds, including dioxins and furans. Thus, the EPA properly can regulate fugitive bottom ash emissions because (1) they are emitted by an MWC unit; (2) they consist of a mixture of the pollutants expressly listed in section 129(a)(4) for which the EPA is required to specify numerical emissions standards; and (3) the standards are "based on methods and technologies for removal . . . of [these] pollutants [from the air] . . . after combustion . . .." 42 U.S.C. § 7609(a)(3).

Section 112 Enumerated List of Methods

One commenter (IV-D-98) noted that section 112(d)(2) expressly states that in promulgating section 112 emissions standards, the EPA may apply:

> [M]easures, processes, methods, systems or techniques including, but not limited to, measures which . . .
>
> (A) reduce the volume of, or eliminate emissions, of, such pollutants through process changes, substitution of materials or other modifications,
>
> (B) enclose systems or processes to eliminate emissions,
>
> (C) collect, capture or treat such pollutants when released from a process, stack, storage or fugitive emissions point,
>
> (D) are design, equipment, work practice, or operational standards (including requirements for operator training or certification) as provided in subsection (h) of this section, or
>
> (E) are a combination of the above.

42 U.S.C. § 7412(d)(2). The commenter stated that because section 129(a)(2), which contains language that is similar to the rest of section 112(d)(2), does not contain this enumerated list, Congress did not intend to give the EPA the discretion to consider these methods when developing MWC standards.

The EPA disagrees with the conclusions reached by this commenter. The fact that section 129 does not include a list that is identical to sections 112(d)(2)(A)-(D) does not mean, a fortiori, that the EPA is precluded from promulgating such measures, processes, methods, systems or techniques under section 129. Unlike section 112 standards, MWC standards are promulgated under both section 129 and section 111. See section 129(a)(2) and 129(b)(1). Thus, Congress did not need to include language in section 129 that already was incorporated, either expressly or impliedly, in section 111. For example, section 111(h)(1) states in pertinent part:

> Design, equipment, work practice, or operational standard; alternative emission limitation
>
> (1) For purposes of this section, if in the judgment of the Administrator, it is not feasible to prescribe or enforce a standard of performance, [s]he may instead promulgate a design, equipment, work practice, or operational standard, or combination thereof, which reflects the best technological system of continuous emission reduction which (taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated.

42 U.S.C. § 7411(h)(1) (emphasis added). As this example demonstrates, Congress did not need to include in section 129 a provision that is analogous to section 112(d)(2)(D) [work practice standards] because this authority already exists in section 111(h)(1).

Moreover, section 129(a)(3) expressly gives the EPA the authority to promulgate standards based on "methods and technologies for removal or destruction of pollutants before, during, or after combustion . . .." 42 U.S.C. § 7429(a)(3) (emphasis added). Thus, although Congress did not expressly list examples of methods and technologies that the EPA may consider in promulgating section 129 standards as it did in section 112(d)(2) for section 112 standards, section 129(a)(3) vests the EPA with the discretion to determine upon which methods and technologies it should base MWC standards. It should also be noted that section 112 does not have a provision comparable to section 129(a)(3), but this does not mean that the EPA cannot consider methods and technologies for removal or destruction of section 112 pollutants when it sets section 112 standards. Rather, it appears that Congress gave the EPA discretion in both section 129 and section 112 to promulgate standards based upon methods and technologies for removing pollutants: in section 129(a)(3), it gave this discretion in broad terms; whereas in section 112(d)(2), Congress provided some specific examples of the methods the EPA could consider. Accordingly, the final ash emissions rule promulgated today, which is based on methods and technologies for removal, after combustion, of many of the pollutants that the EPA is required to regulate under section 129, is a proper exercise of the EPA's discretion.

Legislative History

The EPA also does not agree that the legislative history precludes it from promulgating a numerical ash emissions standard. The Senate Bill, as reported, contained recycling and ash management requirements that ultimately were deleted by the Conference Committee. Read in context, however, it appears that Congress was concerned with deleting ash disposal requirements from section 129; the history does not suggest that Congress intended to prevent the EPA from exercising its discretion to remove ash emissions from the air. This point is demonstrated by the Senate Report's comments regarding the proposed title III's ash provisions:

> In addition to new authorities to control emissions of hazardous air pollutants and to prevent catastrophic chemical accidents, title III also provides for the control of air emissions and management of ash disposal from municipal waste incineration units.
>
> Incinerators have come to the forefront in the solid waste disposal industry because the quantity of the waste generated continues to increase while landfill disposal capacity declines. . . . The fly ash which is produced by the emission control systems may or may not be mixed with the bottom ash. But both are ultimately disposed in landfills.

Leg. Hist. at 8484, 8486 (emphasis added).

Further, during the Senate debates on the 1990 CAAA Conference Report, Senator Dole stated that the EPA should be addressing in the new source performance standards for MWC's a number of the critical issues that were eliminated from the conference report:

> Another area of concern to me is the treatment of solid and medical waste incinerators under the bill. . . . Although the bill has been improved, there are still critical issues that were eliminated from the conference agreement and will have to be worked out in the new source performance standards. It is my view that the EPA should look to clean, environmentally sound incineration techniques, recycling and ash management as key components of national waste management policy.

Leg. Hist. at 1974 (Oct. 27, 1990) (statement of Sen. Dole) (emphasis added).

Thus, whatever Congress may have intended with respect to the EPA's discretion to regulate disposal of ash from MWC's, Congress did not eliminate the EPA's discretion to regulate emissions of ash from MWC's to the air. Thus, the proposed and final rules properly limit the amount of fugitive bottom ash that owners and operators of MWC's may emit into the air; it does not regulate how the collected ash is to be disposed of.

Achievability of Standard

The EPA has considered the comments of those who stated the proposed standard is impossible to achieve, and thus, is arbitrary and capricious. As discussed in section 5.1, the final standards allows fugitive ash emissions up to 5-percent of the time that the test is being conducted. The EPA's data demonstrate that commercial MWC's are capable of meeting this standard with an ample margin, thereby demonstrating the achievability of the standard. The final rule also has been revised to apply only during the operation of the combustor unit in order to address the concerns raised that certain maintenance operations, such as changing the baghouse filters, will generate visible ash emissions. The EPA thus believes the final rule is both achievable and a well-reasoned way of controlling emissions of the pollutants designated in section 129(a)(4) after combustion.

5.4 MISCELLANEOUS

Comment: Some commenters (IV-D-18, IV-D-30, IV-D-56, IV-D-80, IV-D-85, IV-D-87, IV-D-95) were concerned that Method 22 is subjective and subject to error. Three commenters (IV-D-18, IV-D-30, IV-D-85) said that Method 22 does not require the observer to be certified (as does Method 9). Other commenters (IV-D-18, IV-D-30, IV-D-56, IV-D-67, IV-D-80, IV-D-95) said that ambient conditions, steam, or fugitive non-ash emissions may interfere with observations and introduce error. One commenter (IV-D-75) said that dust and other PM from surrounding properties can be transported on site during high wind "Santa Anna" conditions and could easily be mistaken for MWC fugitive ash.

Three commenters (IV-D-18, IV-D-28, IV-D-85) said the standard, as written, assumes any dust emitted from an ash area is ash, whereas some MWC plants store hydrated lime or activated carbon in areas also used for conveying ash. The commenters said that a fugitive emission of activated carbon should not constitute a violation of the fugitive ash standard.

Response: A Method 22 observer is required to complete Method 9 training, but is not required to be certified for Method 9. Method 9 is a more difficult method that involves observing opacity and making a judgement about the percent opacity of emissions, whereas Method 22 is an observation of the amount of time any visible emissions are observed. It is for this reason that Method 9 certification is not required. Method 9 training is adequate for Method 22 observers because it trains the observer about the principles of observing visible emissions. Method 9 training includes training for the observer to distinguish between emissions and steam. While the training does not specifically address the interference of non-ash fugitive emissions, observers are trained in considering their location with respect to the source of emissions and it is expected that observers are trained in considering their location with respect to the source of emissions and it is expected that observers will use common sense in distinguishing between the source of emissions.

<u>Comment</u>: One commenter (IV-D-31) suggested that the EPA clarify that their reference to "ash pile usage, mixing of fly ash with bottom ash, and addition of stabilizers of binders" (on p. 48222 of the proposal preamble) is not to be interpreted as sanctioning by the EPA of any of these activities when the ash qualifies as a hazardous waste. The commenter noted that activities used to comply with the fugitive ash provisions of the NSPS or emission guidelines must be in compliance with RCRA regulations.

<u>Response:</u> The commenter is correct in stating that activities used to comply with the fugitive ash provisions of the NSPS or guidelines must also be in compliance with any RCRA regulations that apply to the MWC.

6.0 MISCELLANEOUS COMMENTS ON MUNICIPAL WASTE COMBUSTOR NEW SOURCE PERFORMANCE STANDARDS

6.1 HEALTH EFFECTS OF DIOXINS/FURANS AND MERCURY

Comment: Five commenters (IV-D-17, IV-D-24, IV-D-65, IV-D-122, IV-D-126) discussed the health effects of dioxins/furans and/or mercury. Three commenters (IV-D-17, IV-D-24, IV-D-65) discussed the health effects of metals and their implication on the NSPS and emission guidelines. Two commenters (IV-D-17, IV-D-65) pointed out that metals can be passed through the food chain causing adverse health effects. One commenter (IV-D-17) argued that the strictest possible emission limits for Hg are warranted. The commenter pointed out that Hg can be passed from mother to fetus and infant. The commenter further stated that Hg also bioaccumulates in the aquatic food chain such that fish can carry Hg concentrations in their flesh up to a million times higher than those found in the water, and that therefore families, including Native Americans, and wildlife that feed on fish are at risk. The commenter stated that deposition of airborne Hg from anthropogenic sources is responsible for accumulation of Hg in the aquatic food chain. The commenter cited an EPA study that estimates that MWC's and MWI's account for more than 128.5 tons/yr or more than 38 percent of the total anthropogenic emissions. The commenter claimed that MWI's represent about half of this total.

One commenter (IV-D-65) argued that EPA's proposed standards fail to address food chain implications properly and that ash which is utilized adjacent to soil should be regulated "by content, by dry weight, as compost is regulated, and not by leaching characteristics."

The commenter (IV-D-65) stated that leaching is a relatively minor pathway into the food chain for most metals. The commenter suggested that the "WES-PHix process", patented by Wheelabrator Environmental Systems, which places metal-laden ash near soil, is "another case of the EPA appearing to guided by a vendor."

One commenter (IV-D-24) provided an article regarding Hg contamination in the United States in order to stress the importance of applying the proposed emission guidelines to MWC "units" smaller than the 35 Mg/day size cutoff specified in the proposal. Refer to section 3.2 for further discussion of the comment regarding the smaller size cutoff.

Three commenters (IV-D-65, IV-D-122, IV-D-126) asserted that the dioxin/furan limit is not strict enough and that the EPA should recommend a ban on dioxin-producing incinerators. The commenters claimed that humans are presently exposed to levels which tend to cause unacceptable damage and that there is no threshold of safety. The commenters warned that dioxin is an extremely poisonous, stable compound which can be passed through to a fetus and newborn from the mother. The commenters listed several reproductive, developmental, and cancerous effects, as well as effects on the immune system, of tetra-chlorinated dibenzodioxin.

<u>Response</u>: This rule is a section 129 technology-based standard. Congress abandoned the risk-based approach because it was found to be ineffective. In the 1970's and 1980's numerous technology-based standards were implemented under section 111 as compared to only a few risk-based standards under section 112. It is recognized that there are health concerns associated with dioxins/furans and Hg. The final emission standards and guidelines will significantly reduce dioxin/furan and Hg emissions. Within 5 years of

implementation of these rules, the EPA will conduct a risk-based analysis.

6.2 PROCEDURAL

Comment: Six commenters (IV-D-01, IV-D-78, IV-D-46, IV-D-61, IV-D-79, IV-D-93) requested 30-day extensions to develop adequate and meaningful comments to the NSPS and emission guidelines. Reasons provided by the commenters included the following: (1) The provisions dealing with "applicability" of co-fired combustion units and cement kilns were causing considerable confusion; (2) EPA's three-part proposal is very complex and the proposal requested comment on a variety of issues, including cost analysis; (3) the inability to obtain a copy of the draft regulatory language in a timely manner as it was not published in the Federal Register; and (4) the applicability of the proposed rule is broad enough to have a significant effect on RCRA policy, other regulations, and future rule-makings on medical and industrial waste combustors.

Response: The public comment period officially remained open until November 21, 1994 as originally scheduled. However, the public comment period was effectively longer than 60 days. The MWC regulations were published (proposed) in the Federal Register on September 20, 1994, and the 60-day comment period remained open until November 21, 1994. Prior to proposal, various drafts of the regulations were circulated widely including distribution to MWC owners, MWC operators, State governments, and environmental groups. The last circulated draft was in mid-August 1994 two weeks prior to signature of the proposal. Additionally, the full text of the final regulations (preamble, regulations, and Fact Sheets) were entered into the EPA Technology Transfer Network (TTN) electronic bulletin board on September 2, 1994, the day after signature of the proposal, making the actual proposal available to the public almost 3 weeks before publication in the Federal Register. Although the public comment period ended November 21, 1994, comments continued through April 1995. As noted in chapter 2.0, 35 percent of the public comment letters considered by EPA were received after the November 21 deadline.

Comment: Five commenters (IV-D-35, IV-D-57, IV-D-61, IV-D-93, IV-D-102) complained about the practice of not publishing NSPS and emission guidelines rule language in the Federal Register. One commenter (IV-D-35) stressed that this practice is "disturbing" given the "importance" of the precise rule language, and since the electronic copy cannot be verified. One commenter (IV-D-61) reported that it took them several weeks to obtain the necessary information from the proper sources. This commenter continued that this practice is "unfortunate" because it has increased the burden on the regulated community to access the information necessary to provide comprehensive comments. One commenter (IV-D-102) complained they could not comment on § 60.51b because the section was not in the Federal Register.

Response: The EPA apologizes for any inconvenience caused by its policy to not publish in the Federal Register regulatory text for proposed rules. The regulatory text is being provided on the EPA TTN rather than being published in the Federal Register in order to reduce the costs of proposal printing. The promulgation regulatory text was printed in the Federal Register.

7.0 EMISSION GUIDELINES - MUNICIPAL WASTE COMBUSTOR EMISSIONS

This chapter includes comments made specifically about the proposed emission guidelines. To avoid duplication, when the same comment was made about both the NSPS and emission guidelines and the EPA's response to the comment is the same for both the NSPS and guidelines, the issue is summarized only once for both the NSPS and guidelines in chapter 3.0. If a comment was made specifically regarding the guidelines and not the NSPS, or if the EPA's response to the same comment is different for the NSPS and guidelines, then the comment is summarized and responded to in this section for the guidelines. However, in those cases where the comment summary or parts of the EPA's response are the same, to avoid duplication, the comment summary and response may refer to the summary and response in chapter 3.0 for more detail. This chapter covers the following provisions: source category, designated pollutant, modification and reconstruction, the MACT floor and MACT, impacts, format of the emission limits, performance test methods and monitoring requirements, enforcement provisions, reporting and recordkeeping provisions, malfunction provisions, legal considerations, and wording.

7.1 SELECTION OF SOURCE CATEGORY

Comment: Two commenters (IV-D-19, IV-D-39) contended that waste-fuel power generation facilities burning only clean biomass materials should not be subject to the proposed emission guidelines.

One of the commenters (IV-D-19) defined "clean biomass" as including "bagasse from sugar cane processing operations, tree trunks and limbs from land-clearing activities, limbs and wood waste from yard maintenance activities, wood pallets, untreated lumber that has been removed from construction and demolition debris from agricultural, residential, institutional, and other areas throughout South Florida." The commenter clarified that the term "bagasse" refers to a fibrous, carbonaceous waste product resulting from the milling of sugar cane.

The commenters were specifically concerned with the Osceola and Okeelanta facilities currently under construction in Florida, which will burn 100 percent clean biomass fuels from both agricultural and residential/ institutional sources, and which, as they are being built, will not be capable of meeting the proposed guidelines for MWC metals, SO_2, and CO. The commenters pointed out that the EPA has decided that sources firing agricultural biomass wastes would not be subject to the proposal but that sources firing residential/institutional biomass wastes would be subject to the proposal. The commenters argued that the combustion of those fuels will not be affected by the fuel's place of origin. The commenters also pointed out that the EPA is proposing that air curtain incinerators burning clean dry wood should not be subject to the proposed emission guidelines for solid waste incineration units. The commenters believed that waste-fuel power generation facilities burning only clean biomass materials should similarly not be subject to the emission guidelines.

The commenters pointed out that if Osceola, Okeelanta, and other biomass-fueled facilities were excluded from being subject to the proposed emission guidelines, these types of facilities would not be unregulated, as follows: (1) large wood burning facilities will have to comply with PSD and other air quality regulations, (2) cogeneration facilities will be subject to the NSPS in Subpart Da, and (3) new steam generating units will be subject to subparts Db and Dc.

Response: As discussed in section 3.1, "clean wood" is not included in the definition of MSW in the final rule. This exemption was added to the final MWC rule for two reasons. First, the EPA is developing regulations for combustion of wood-fired boilers and industrial waste under separate rulemakings. Second, test data for wood-fired boilers show that the combustion of clean wood results in low dioxin/furan and mercury emissions. Additionally, the EPA expects that combustion of clean wood results in low emissions of other pollutants such as lead and cadmium. Refer to section 3.1 for more discussion of this rationale.

Clean wood is defined in the final rule as wood or wood products including clean untreated lumber (which is defined in the final rule), tree stumps, and tree limbs. Clean wood does not include yard waste, which is considered to be MSW under the final rule. Yard waste is defined in the final rule as including grass, grass clippings, leaves, bushes, and shrubs. By covering yard waste in the MWC rule, the EPA is encouraging composting rather than the incineration of yard wastes.

One commenter requested that "bagasse" be considered to be "clean biomass" and be exempt from the final rule. Bagasse, as defined by the commenter, is a waste product resulting from the milling of sugar cane. Because bagasse is an agricultural waste from an industrial process, bagasse is not considered a municipal waste, and is not included in the definition of MSW. The EPA is currently considering the regulation of agricultural and industrial wastes under a separate rulemaking (see 59 FR 66850).

As a result of the removal of "clean wood" from the definition of MSW, plants burning clean biomass consisting only of "clean wood", wood pallets, and construction/ demolition wastes, as well as industrial process wastes and agricultural wastes would not be subject to the final MWC rule. If these same plants combust less than 10 Mg/day or less than 30 percent yard waste or other MSW on a unit basis (making them cofired combustors under the final rule), the plants would also not be subject to the final MWC rule, as long as they submit an initial notification of exemption and keep daily records of the amount of MSW combusted.

Comment: One commenter (IV-D-15) argued that the definition of MSW should not include yard waste or other woody debris because covering these materials under the MWC rule will have a negative impact on city programs that sell the material as fuel. The commenter explained that city programs collect yard debris and trees/branches, intermix and shred the material, and stockpile the material for composting or for sell as fuel. The commenter explained that if the fuel is considered MSW, it will not be marketable.

Response: As explained above, clean wood is exempt in the final rule, but yard waste is still covered. The EPA encourages composting rather than incineration of yard waste. However, the material referred to by the commenter may still be marketable as MSW under the final rule. As explained in section 3.1 of this document, the definition of cofired combustor was revised to allow plants that fire smaller amounts of MSW (i.e., less than 30 percent MSW) to calculate on a quarterly basis their usage of MSW to determine their status as a cofired combustor. At proposal, combustion plants were required to calculate MSW usage on a daily basis. See section 3.1 for more discussion on this revision. This provision may encourage buyers of the yard waste/clean wood fuel to continue purchasing the fuel, as long as they qualify as cofired combustors and are, thus, not considered MWC's and not subject to the MWC rule.

7.2 SELECTION OF DESIGNATED FACILITIES

Comment: One commenter (IV-D-76) requested that the definition of MWC plant capacity be modified so that where federally-enforceable permit conditions exist which limit the maximum existing combustor plant capacity to less than 35 Mg/day, the emission reduction requirements of "this section" would not be applicable. The commenter cited an example of a two-unit plant where each unit has a capacity less than 35 Mg/day and it is normal practice not to operate more than one unit at a time. In this case, the commenter argued, the effective capacity is less than the 35 Mg/day threshold as long as there are federally-enforceable conditions. The commenter recommended the third paragraph of 40 CFR 60.31b be modified to read as follows: "Municipal waste combustor plant capacity means the aggregate municipal waste combustor unit capacity to emit of all municipal waste combustor units, taking into account any federally-enforceable limitations on operations of or emissions from unit or units at a facility for which construction, modification,..."

Response: It is appropriate to base NSPS applicability on design capacity. All standards have been done this way under section 111 for years. However, a new applicability criteria has been added to the final NSPS and guidelines such that if a plant is permitted to combust less than 10 Mg/day of MSW or RDF, it is exempt. Federally-enforceable permit conditions limiting the amount of MSW combusted by the whole plant to less than 10 Mg/day must exist to qualify for this exemption. The level of 10 Mg/day is consistent with the proposed exemption for cofired combustors in the proposed rule. Refer to section 3.1 for further discussion of this new 10 Mg/day applicability provision. As a result of this added exemption, some of the plants referred to by the commenter are now exempt from the final MWC NSPS and guidelines.

7.3 MODIFICATION AND RECONSTRUCTION

Comment: One commenter (IV-D-04) stated the proposed NSPS contained some potentially contradictory language relative to the applicability of subparts Cb and Eb to a modified existing source where modification costs exceed 50 percent of the original cost of the plant in current dollars. The commenter cited section II.A of the NSPS preamble, which states that modification of an existing MWC plant to comply with the emission guidelines would not bring an existing MWC under the NSPS. The commenter also cited section IV.C, which defines a modified solid waste incineration unit as one in which the cost of modification exceeds the 50 percent threshold. The commenter then questioned which section would govern if an existing plant were to incur costs above the 50 percent threshold while attempting to comply with subpart Cb.

Three other commenters (IV-D-28, IV-D-37, IV-D-38) said it is unfair that extremely costly retrofits necessary to meet the guidelines for existing sources might ultimately transform an existing source into a new source and trigger NSPS. These commenters requested the EPA exclude these costs from the definition of a modified solid waste incineration unit.

Response: The intent is as specified in § 60.32b(h) of the proposed guidelines, "Physical or operational changes made to an existing municipal waste combustor unit solely for the purpose of complying with emission guidelines under this subpart are not considered modification or reconstruction and do not bring an existing municipal waste combustor unit under the provisions of subpart Eb of this part". If a plant were to incur costs above the 50 percent threshold while attempting to comply with subpart Cb, the plant would remain an existing source and would not trigger NSPS. The citation listed above from the proposed guidelines has been retained in the final guidelines, with one minor exception. In the final rule, the provision cited above (under § 60.32b(c) of the final guidelines and § 60.50b(d) of the final NSPS) was revised, replacing the term "solely" to "primarily", to avoid a situation where an existing facility, which makes physical/operational changes to comply with the guidelines, becomes subject to the NSPS because during the retrofit a change was made (e.g., improving efficiency) that was not directly related to compliance with the guidelines, but had a secondary or associated benefit.

In the final rule, two new terms are defined to incorporate the section 129 definition of "modified solid waste incineration unit." The terms "reconstruction" and "modification" (or "modified municipal waste combustor unit") are defined to incorporate the section 129 definition of "modified solid waste incineration." The definitions are almost equivalent to the definitions of these two terms in § 60.14 and 60.15 of 40 CFR 60 subpart A.

7.4 SELECTION OF MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY FLOOR FOR MUNICIPAL WASTE COMBUSTOR EMISSIONS

7.4.1 General Comments on MACT Floor Selection

Comment: Several commenters (IV-D-18, IV-D-20, IV-D-30, IV-D-44, IV-D-75, IV-D-68, IV-D-85, IV-D-90, IV-D-98, IV-D-104, VI-B-11) criticized the EPA's approach of choosing the average of the top 12 percent for existing sources separately for each pollutant when determining the MACT floor (this approach is referred to by the commenters as "cherry picking"). The commenters asserted that no single plant can achieve the best control level for all regulated pollutants as determined by the EPA. Three commenters (IV-D-18, IV-V-85, IV-D-98) said that "cherry picking" inevitably results in a set of standards unachievable by any unit. One commenter (IV-D-20) urged the EPA to re-evaluate the data to assure that compliance is achievable simultaneously for all pollutants.

Several commenters (IV-D-30, IV-D-68, IV-D-85, IV-D-90, IV-D-98) pointed out that many pollutants are interrelated, including the following: CO and NO_x; PM, Cd, and Pb; SO_2 and HCl; PM and dioxins/furans; and CO and dioxins/furans. One commenter (IV-D-30) said that an example is that higher combustion temperatures reduce CO and dioxin/furan emissions while increasing NO_x emissions. Two commenters (IV-D-20, IV-D-75) said that this approach does not account for site-specific trade-offs in performance for multiple pollutants from the same source. One commenter (IV-D-98) said that permit limits take these trade-offs into account, but "cherry picking" excludes from the MACT floor any consideration of these factors.

Four commenters (IV-D-20, IV-D-90, IV-D-85, IV-D-98) said that the EPA's approach is unlawful and that the Act commands the EPA to look at the <u>same</u> 'best' existing source, or the same best 12 percent of existing sources, to derive the <u>entire</u> set of emission limitations that constitute the MACT floor. The commenters cited Congressional record text in support of this interpretation. Refer to section 3.11 for a discussion of legal issues.

<u>Response</u>: The EPA agrees that many pollutants are interrelated. The EPA considered these relationships in selecting the MACT floor emission levels and MACT emission limits for the regulated pollutants. The EPA determined what APC technologies would generally be required to achieve the MACT floor pollutant emission levels (i.e., SD/FF/ SNCR or SD/ESP/SNCR for large plants; DSI/ESP for small plants). The EPA then defined the performance capabilities of these technologies in selecting the MACT emission levels. Individual units with the same APC technologies will achieve different emission rates, which is indicative of variability within APC technologies. The EPA recognized this variability within APC technology performance in establishing the MACT

emission limits. The MACT floor pollutant emission levels for existing units represent the upper bound of performance (i.e., the highest emission level) consistently achievable by the specific APCD's determined to represent the MACT floor.

While there are limited data on SD/FF and SD/ESP used in conjunction with SNCR, and there is some question as to whether SNCR or carbon injection would affect the pollutant emission levels for certain pollutants, data received by the EPA after proposal indicate that the promulgated levels are achievable. Data were received from units that recently initiated operation with SD/FF/SNCR/carbon injection control systems, and the data indicate that SNCR and carbon injection do not interfere with the levels of control achieved by SD/FF. Refer to the section 3.11 of this BID for the EPA's response to legal issues raised by the commenters.

Comment: Two commenters (IV-D-68, IV-D-98) said that, instead of "cherry picking", a better way to determine achievable levels is to choose the best sources by adding the weighted average of the rankings of the permitted emission level of each individual pollutant from each source and selecting the sources with the highest overall ranking.

Response: With regard to the suggested ranking approach, the EPA does not think it is appropriate to distinguish between similarly designed and operated APCD's (e.g., SD/FF's). This would be required if the actual emission estimates were ranked as suggested by the commenters. It would also be impossible to determine the single best source, or the best group of sources, without assuming priority for certain pollutants (one plant may have lower NO_X emissions but higher dioxin/furans). The lack of permit limits for some individual pollutants at any given MWC and the problems with how to prioritize or weigh permit limits for different pollutants would make an overall ranking of existing sources based on permit data infeasible. Instead, emissions data were used to examine the technical achievability of the MACT floor and MACT emission levels for existing MWC's after the floor was determined from the permit limits.

Comment: One commenter (IV-D-104) said that the EPA has previously argued that "achieved by" does not require that all sources in the top 12 percent meet the floor limits (59 FR 29199, June 6, 1994). The commenter contended that even under this interpretation, it must mean that at least some of the best-performing sources must be able to meet the MACT floors. The commenter said a review of table 2 of docket item number II-B-37 from docket No. A-90-45 suggests that no unit included in the EPA's data base can simultaneously meet the floor developed for existing units for the individual pollutants. One example is the Kent County MWC, which is in the top 12 percent for Cd (at proposal, 12 percent of the large plants included 29 units), but ranks fortieth for Pb, thirty-seventh for HCl, one hundred and second for NO_X, thirtieth for SO_X, and has no dioxin/furan limit.

Response: The MACT floor pollutant emission levels for existing units were determined by the average emission limitation of the top 12 percent of permitted units. Although the permits were used to determine the MACT floor, the EPA analyzed performance data to assess achievability. While a plant may currently have a permit limit for a particular pollutant that is less restrictive than the MACT floor or emission limit for that pollutant in the final guidelines, this does not mean that the plant cannot achieve lower levels. For example, the commenter cited permit data from the Kent County MWC. Although this MWC is ranked fortieth in terms of permitted Pb emissions, performance data from both units at this MWC indicate actual Pb levels of 0.007 mg/dscm at 7 percent O_2 (see docket item number II-B-34 from docket No. A-90-45). Such performance indicates that this plant would not have difficulty in achieving the proposed Pb MACT floor level of 0.53 mg/dscm or the final Pb emission limit of 0.49 mg/dscm. Another example is the MWC located in Long Beach, CA, which has achieved the MACT floor levels for all pollutants (except Cd, for which no data were available).

Comment: Several commenters (IV-D-24, IV-D-49, IV-D-51, IV-D-73, IV-D-74, IV-D-103, IV-D-104, IV-D-120, VI-B-11) criticized the use of permit limitations for determining the MACT floor. Three commenters (IV-D-51, IV-D-74, IV-D-103) contended that the wording "emissions limitation achieved" in section 129 of the Act refers to measured performance data rather than permitted emissions.

Several commenters (IV-D-24, IV-D-49, IV-D-51, IV-D-73, IV-D-74, IV-D-103, IV-D-104) criticized the MACT floor as insufficiently stringent because "EPA derived its limitations from permitted emission limitations only" and ignored actual emission levels achieved in practice by the best performers. These commenters challenged the EPA's interpretation of the language of the Act and Congress's intent. One commenter (IV-D-74) questioned the use of both permits and section 114 information requests as the basis for the proposed guidelines. The commenter said the floor and guidelines should be based on optimum control technology performance data, not permit limitations or data from uncontrolled units. The commenter recommended that the EPA use the same approach as was used in establishing MACT floors and standards for new combustors because they all have similar emissions and impacts on health and the environment.

Several commenters (IV-D-18, IV-D-28, IV-D-30, IV-D-37, IV-D-38, IV-D-44, IV-D-54, IV-D-56, IV-D-69, IV-D-80, IV-D-85, IV-D-95, IV-D-98, IV-D-99) strongly supported the EPA's use of permit limitations in setting the MACT floors for existing plants. Several commenters (IV-D-13, IV-D-41, IV-D-43, IV-D-67, IV-D-82, IV-D-96, VI-B-02, VI-B-03, VI-B-05, VI-B-06) made the general statement that they considered EPA's "approach" to setting MACT floors for each pollutant to be reasonable. Various commenters (IV-D-18, IV-D-28, IV-D-37, IV-D-38, IV-D-44, IV-D-54, IV-D-56, IV-D-69, IV-D-80, IV-D-85, IV-D-95,) asserted that the phrase "average emissions limitation" in the Act clearly requires the EPA to use permit limitations, not technology or emissions data.

Response: The EPA believes that permit limitations data is appropriate to use in determining the MACT floors for existing sources. See section 7.9 for discussion of the legal issues raised by the commenters on this subject.

The EPA assures the commenters that although the MACT floor emission levels are based on permit data, actual emissions test data are considered for all pollutants in determining the MACT level of control. For existing MWC units at large MWC plants, the EPA is promulgating MACT emission levels more stringent than the MACT floor emission levels for Cd, Hg, and dioxins/furans. For existing MWC units at small MWC plants, the EPA selected MACT emission levels more stringent than the MACT floor emission levels for all pollutants except PM and NO_X. As such, MWC performance was considered in establishing the emission guideline emission limits, as had been done under previous regulatory efforts.

Comment: Six commenters (IV-D-18, IV-D-54, IV-D-74, IV-D-80, IV-D-85, IV-D-104, IV-D-120) raised issues regarding the quality of the permit data used. Two commenters (IV-D-18, IV-D-85) pointed out that if a unit fails to meet its permit limits on even a single occasion while being well-operated, the limits cannot be considered in determining the MACT floor because such limits are not demonstrated in practice to be continuously achievable. Another commenter (IV-D-120) questioned whether each plant is in compliance with its permit limit, and if so, how close the limit is to the plant's actual performance. One commenter (IV-D-104) warned that relying on permitted emission rates precludes any real assessment of the compliance probability and may not even reflect reality if the permit limits are not being met. One commenter (IV-D-85) said the EPA should clarify the analysis it conducted of performance against the permit limit by each unit for inclusion of that unit in the MACT floor calculation. One commenter (IV-D-74) criticized the EPA's approach of using uncontrolled emission levels to fill in some of the data gaps when determining the average top 12 percent, arguing that using emissions data from uncontrolled units to determine MACT limits is contrary to the objectives of the Act, which requires continuous reduction of emissions based on MACT.

Response: The EPA agrees that it is important to consider whether the units included in the top 12 percent have met their permit limits. When evaluating the permit limitation data, the EPA considered only those permit limits that had been achieved by the respective plants. This was determined by reviewing available test data for each plant and contacting the State agencies issuing the permits.

Since proposal, the MACT floors for large and small existing plants have been recalculated. The revisions incorporate permit information received since proposal and an updated inventory of MWC plants. The revised MACT floors for existing MWC units at small MWC plants are 98 ppm SO_2, 560 ppm HCl, 67 mg/dscm PM, 1.1 mg/dscm Cd, 16 mg/dscm Pb, 1.2 mg/dscm Hg, 1,500 ng/dscm dioxins/furans, and uncontrolled for NO_x. The revised MACT floors for existing MWC units at large MWC plants are 31 ppm SO_2, 31 ppm HCl, 24 mg/dscm PM, 0.097 mg/dscm Cd, 0.49 mg/dscm Pb, 0.27 mg/dscm Hg, and 126 ng/dscm dioxins/furans. The MACT floors for NO_x were revised based on subcategorization by combustor type: 200 ppmv for mass burn waterwall combustors; 250 ppmv for refuse-derived fuel combustors; 250 ppmv for mass burn rotary waterwall combustors; 240 ppmv for fluidized bed combustors;

uncontrolled for mass burn refractory combustors; and 200 ppmv for other combustors not listed above.

When necessary, the EPA did use typical uncontrolled emission levels for MWC's in calculating the MACT floor in instances where there were not enough data from units with permit limitations to comprise the top 12 percent. For large plants, this only occurred for Cd; however, the emission limit in the final guidelines for Cd was based on performance data that represented lower Cd emission levels than the MACT floor, so using the uncontrolled Cd value as part of the MACT floor analysis did not significantly impact the final emission limit. For small plants, it was necessary to use typical uncontrolled emission values in selecting the MACT floor for Cd, Pb, Hg, NO_X, and dioxins/furans because there were not enough units with permit limitations to comprise the top 12 percent for these pollutants. As with Cd for large plants, the EPA is promulgating a MACT level of control more stringent than the floor for each of these pollutants except NO_X; therefore, the MACT floor and the approach taken to establish the MACT floor did not significantly impact the pollutant emission limits in the final guidelines.

Comment: One commenter (IV-D-54) stated that consistency in applying permit levels is essential. The commenter reviewed the permit data for the MWC units included in the data base used by the EPA to establish the floor. Based on this review, the commenter reported that they identified discrepancies. As an example, the commenter claimed that the Barron County MWC unit that the EPA included in its floor data base for SO_2 does not have an SO_2 limit in its permit.

Response: Regarding the Barron County MWC, a review of this plant's section 114 response indicates that a limit of 5.21 lb/hr for SO_2 was reported by this plant. This limit was therefore included in the floor calculation. Since proposal, the EPA has recalculated the MACT floors for all pollutants based on the updated inventory of existing MWC's and the addition of several operating permits received since proposal for units which began operation in 1990 or later. The inventory identified 100 units at existing small MWC plants. Of these 100 units, 68 were documented as having permits for at least one pollutant. The number of units comprising the top 12 percent of the population of small units is 12. The revised MACT floors for small existing plants are 98 ppm SO_2, 560 ppm HCl, 67 mg/dscm PM, 1.1 mg/dscm Cd, 16 mg/dscm Pb, 1.2 mg/dscm Hg, 1,500 ng/dscm dioxins/furans, and uncontrolled for NO_x.

Comment: One commenter (IV-D-90) stated that the EPA's exclusion from its calculation of the MACT floor and the guidelines of small MWC plants that did not have permit limits was unsupportable under the Act. The commenter stated that the only units that may be excluded from the floor calculation are those that are demonstrated to achieve LAER within a specified time period. By excluding the small MWC plants noted, the commenter contended that the EPA is biased against existing sources, setting standards that most existing sources could not meet. The commenter also claimed that federal enforceability has nothing to do with whether permit limits may be used to set MACT standards. The commenter said that at the standard-setting stage, the EPA's obligation is to characterize the universe of permit limits for a category.

Response: As stated in the proposal preamble section IV.F.4 (59 FR 48244), the EPA utilized emission limitations included in Federal and State permits to determine the MACT floors for units at small existing plants. Section 129 of the Act states that standards for existing units "shall not be less stringent than the average emissions limitation achieved by the best performing 12 percent of units in the category". Therefore, the EPA considered all units at small plants known to have emissions limitations (that have been achieved) in the population of units for the purpose of determining the number of units that comprise the top 12 percent. Since proposal, the EPA has reconsidered this interpretation and has revised the MACT floors such that the top 12 percent of the entire population of small units was used.

Prior to proposal, the EPA identified 137 units at existing small plants, and 88 of these units were determined to have permit limitations. After proposal, the EPA updated its MWC inventory of existing plants, identifying 100 units at existing small MWC plants. The averages of the top 12 percent of these 100 units (i.e., 12 units) were used to establish the floor for small plants.

7.4.2 Municipal Waste Combustor Metals (Mercury)

Comment: One commenter (IV-D-98) said that it does not make sense that the MACT floor emission level for Hg in the guidelines is more stringent than the MACT floor emission level for Hg in the NSPS, since the guideline floor is based on SD/ESP technology and the NSPS floor is based on SD/FF technology. The commenter said it makes no sense for the EPA to set the MACT floor for existing plants at 0.36 mg/dscm, or 40-percent reduction, when the EPA admits that Hg removal will vary from 0 to 50 percent for SD/FF's. The commenter (IV-D-98) concluded that the Hg floor for the guidelines must be set at the uncontrolled emission level of 0.65 mg/dscm which was considered MACT floor for new units at proposal.

Response: The floors for the existing units and the new units were calculated by different methods, so it is possible for the floors for existing units to be more stringent than for new units. As explained in previous responses, the existing unit floors were based on permit limits, while the NSPS floors were based on performance of SD/FF controls without the benefit of carbon injection. Since proposal, the floor for the NSPS Hg standards was revised to SD/FF/CI based on recent data from plants operating with carbon injection, with a control level of 0.080 mg/dscm. The resulting emission limitations for new and existing, large and small units remain the same as proposed (0.080 mg/dscm).

Comment: One commenter (IV-D-55) asserted that the EPA should subcategorize large plants by technology because the existing data base confirms, for example, that RDF plants equipped with SD/FF technology generally can meet the proposed Hg limit without carbon injection.

Response: If a plant can meet the limits without a specific technology, the plant is free to do so. As the commenter stated, RDF plants can generally meet the proposed Hg emission limit for existing large plants without the use of carbon injection. The available data indicate that RDF plants will also be able the meet the proposed dioxin/furan emission limit without carbon injection. Just because RDF plants can meet the same emission levels as other MWC's without carbon injection does not mean there is a need to subcategorize plants by combustor type.

7.4.3 Nitrogen Oxides

Comment: Five commenters (IV-D-44, IV-D-55, IV-D-56, IV-D-66, IV-D-85) said the EPA should reconsider the proposed floor for NO_X for existing units at large plants. One commenter (IV-D-56) said the proposed NO_X floor does not represent a level that can be considered "demonstrated." This commenter suggested that a NO_X level of 235 ppm is a more appropriate MACT floor. Three commenters (IV-D-44, IV-D-55, IV-D-85) said that EPA's approach to determining the NO_X floor is flawed because it leads the EPA to conclude that some level of NO_X control is necessary to achieve the floor. Two commenters (IV-D-44, IV-D-55) claimed that the EPA has already conceded that the floor for MB/WW combustors could be 230 ppm and the floor for RDF combustors could be 275 ppm. Two commenters (IV-D-55, IV-D-98) also asserted that the exemption of MB/REF MWC's from meeting the NO_X guidelines justifies further subcategorization of other combustor types.

One commenter (IV-D-55) asserted that because RDF units emit high uncontrolled levels of NO_X, the cost to retrofit SNCR would not be insignificant, and RDF plants should not be forced to retrofit with SNCR to meet an artificially low floor and standard that does not take into account the combustor type. The commenter provided a table of the NO_X permit limits for 43 RDF units, most of which were derived from EPA's MACT floor data base, and said the most stringent permit limitation for RDF units is currently 247 ppmv.

Response: After considering commenter input, the EPA agrees that NO_X emissions vary between combustor types. The EPA determined that the difference in NO_X emissions between combustor types is significant enough to warrant subcategorizing the large plant population of existing MWC units by combustor type in calculating the MACT floor for NO_X. Under this approach, the subcategories and NO_X MACT floors are as follows: 200 ppmv for mass burn waterwall combustors; 250 ppmv for mass burn rotary waterwall combustors; 250 ppmv for refuse-derived fuel combustors; 240 ppmv for fluidized bed combustors; no limit (uncontrolled) for mass burn refractory combustors; and 200 ppmv for other combustors not listed above.

Comment: One commenter (IV-D-55) contended that, according to the statute, the EPA must exclude units that achieved LAER 18 months prior to September 20, 1994. The commenter argued that the EPA must recalculate the MACT floor for NO_X because there is no evidence in the record (i.e., the June 30, 1994 memorandum regarding the floor calculation) that this exclusion was made. Two other commenters (IV-D-55, IV-D-66) suggested that the MACT floor may be biased by permit limitations from plants in ozone nonattainment areas that must meet more stringent requirements.

Response: At proposal, the MACT floor for NO_X was calculated using the average of the top 12 percent of permit limitations for existing units located at large plants. Permits were reviewed and checked against the BACT/LAER Clearinghouse to determine if SNCR was installed as a result of a LAER decision within 18 months of proposal or 30 months of the projected date of promulgation. Any NO_X limitations found to be the result of LAER were not used to calculate the MACT floor.

7.5 SELECTION OF MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY FOR MUNICIPAL WASTE COMBUSTOR EMISSIONS

7.5.1 General Comments on Emission Levels

Comment: Several commenters (IV-D-28, IV-D-34, IV-D-41, IV-D-43, IV-D-44, IV-D-54, IV-D-56, IV-D-59, IV-D-63, IV-D-64, IV-D-66, IV-D-70, IV-D-80, IV-D-85, IV-D-86, IV-D-92, IV-D-95, IV-D-96, IV-D-99, IV-D-106, IV-D-114, VI-B-03) expressed dissatisfaction with the proposed guidelines that are more stringent than the MACT floor. Several commenters (IV-D-34, IV-D-43, IV-D-44, IV-D-56, IV-D-66, IV-D-85, IV-D-86, IV-D-95, IV-D-96, VI-B-03) indicated that in certain cases, the EPA considers available technology in addition to existing permit limitations in setting an emission limit more stringent than the MACT floor, and that the EPA has not adequately presented the basis and justification for this approach. Six commenters (IV-D-59, IV-D-63, IV-D-66, IV-D-92, IV-D-96, IV-D-106) further stated that the proposed standards impose an unjustified economic burden on local governments and, ultimately, the public. One commenter (IV-D-44) disagreed with the EPA's contention that the costs for additional control more stringent than the floor are minimal. Refer to section 7.6.2 for further discussion of the economic issue.

Response: The Act directs the Administrator to promulgate guidelines that reflect the maximum degree of reduction in emissions of air pollutants, taking cost into consideration. Once the MACT floor (i.e., the minimum control level for evaluation) has been determined, the EPA must evaluate available technologies to determine MACT (i.e., the maximum degree of reduction with consideration for cost). The final guidelines are based on technologies determined to be MACT.

Standards promulgated for several pollutants (PM, NO_X, and SO_2 for small plants; PM, HCl, NO_X, Pb, and SO_2 for large plants) are set at the floor levels because it was considered to be too costly to require control more stringent than the floor. For the remaining pollutants, standards more stringent than the floor were determined to be achievable at a reasonable cost.

Comment: Several commenters (IV-D-28, IV-D-34, IV-D-41, IV-D-43, IV-D-54, IV-D-63, IV-D-80, IV-D-85, IV-D-92, IV-D-95, IV-D-96, IV-D-98, IV-D-106, IV-B-03) raised the concern that the proposed limits would not be achievable. Four commenters (IV-D-28, IV-D-34, IV-D-41, IV-D-43) contended that the proposed MACT emission limits are not commercially achievable, and cannot be guaranteed by the vendor community. Three commenters (IV-D-43, IV-D-80, IV-D-85) said that in certain cases the addition of the technology basis is not sound because it is based on extremely limited pilot test data or temporary control installations. Five commenters (IV-D-59, IV-D-63, IV-D-92, IV-D-96, IV-D-106) said the guidelines are based on limited pilot tests and technology that has questionable commercial application, and that this is not what Congress intended. Two commenters (IV-D-54, IV-D-95) said the proposed guidelines are only theoretically justified, not demonstrated on actual units in operation.

Response: The technology basis for the final guidelines is SD/ESP (or FF)/carbon injection/SNCR for large plants and DSI/ESP/carbon injection for small plants. These technologies have all been commercially demonstrated on MWC's to support the final guideline emission limits. The EPA disagrees with the commenter's conclusion that the guidelines, as promulgated are unachievable. Refer to section 7.5.2 for further discussion of this revision.

Comment: One commenter (IV-D-65) said the EPA's rationale for "avoiding" standards that would require wet scrubbers is weak. The commenter maintained that in addition to better capturing airborne metals, wet scrubbing allows acid washing to be more easily incorporated into the system. The commenter said all MWC's should be required to employ wet scrubbers, FF's, and activated carbon beds, and some should require SCR. The commenter provided no data.

Response: These are technology-based standards. The EPA is required to set emission limits based on the performance of the technology determined to be MACT. MACT was determined to be SD or DSI with particulate control and carbon injection for existing plants. As stated in the proposal preamble, wet scrubbing technology was examined; however, there are little data from domestic plants using this technology. Any controls, including activated carbon beds, SCR, or wet scrubbing, may be used to meet the standards promulgated.

7.5.2 Municipal Waste Combustor Organics

Comment: Several commenters (IV-D-02, IV-D-18, IV-D-28, IV-D-37, IV-D-38, IV-D-41, IV-D-43, IV-D-44, IV-D-55, IV-D-56, IV-D-67, IV-D-68, IV-D-82, IV-D-85, IV-D-96, IV-D-98, IV-D-104, VI-B-02, VI-B-04, VI-B-05, VI-B-06) protested the MACT standard for dioxin/furans being more stringent than the floor. Several commenters (IV-D-43, IV-D-44, IV-D-56, IV-D-68, IV-D-82, IV-D-85, IV-D-104, VI-B-03, VI-B-04) maintained that the results of limited pilot or experimental testing for dioxins/furans are not sufficient justification for establishing more stringent standards. The commenters said the dioxin/furan standard is not based on emission levels at a specific plant and, therefore, has not been demonstrated to be achievable in practice as required by the Act. Seven commenters (IV-D-18, IV-D-28, IV-D-85, VI-B-02, VI-B-03, VI-B-05, VI-B-06) stated that it is inappropriate for the EPA to base standards on carbon injection results from one test program instead of on a full-scale commercial operation whose limits are guaranteed by an equipment supplier. The commenters urged the EPA to provide further data to support the assertion that the standard can be achieved in commercial application.

Two commenters (IV-D-56, IV-D-82) claimed the EPA lacks the information necessary to assume that the standard is generally achievable on a continual basis. One commenter (IV-D-56) said the 50 percent reduction due to carbon injection is only a theory, not a fact, and using a theory to set a standard borders on arbitrary and capricious. Four other commenters (IV-D-28, IV-D-37, IV-D-38, IV-D-44) also disagreed with the EPA's assumption of 50 percent reduction for carbon injection. Three commenters (IV-D-18, IV-D-56, IV-D-85) maintained that the EPA has not demonstrated that 50-percent additional control on a unit equipped with an SD/FF, SD/ESP, or DSI/ESP will consistently result in performance below the proposed standards.

Another point of contention raised by the two commenters (IV-D-18, IV-D-85) was that the Camden MWC testing program may have achieved its performance due to some factor other than carbon injection (e.g., higher PM concentrations for baseline runs than for the test runs). Several commenters (IV-D-18, IV-D-28, IV-D-85, VI-B-02, VI-B-05, VI-B-06) suggested that the EPA should collect more operating data from systems now coming on line with carbon injection before establishing limits for new and existing facilities.

Two commenters (IV-D-32, IV-D-75) stated that the proposed dioxin/furan standards are achievable using current technology with or without carbon injection. One commenter

(IV-D-32) stated that in many cases the use of a dry scrubber (spray dryer or dry sorbent injection system) without carbon injection will be sufficient to meet the standards. This commenter said one supplier has guaranteed emissions of 30 ng/dscm using a retrofit dry scrubber. One commenter (IV-D-75) stated that multiple tests since 1987 at the Commerce MWC (a MB/WW plant) show that the proposed dioxin/furan guidelines can be met with SD/FF alone and do not require carbon injection. The commenter interpreted the proposal to mean that even though the standards were based on carbon injection, it is not required as long as the standard is met.

Response: The carbon injection data upon which the proposed dioxin/furan emission limits were based are from short-term full-scale MWC tests at commercial MWC's, not experimental or pilot tests. The Camden MWC test was the primary test used to assess carbon injection performance prior to proposal. Data from several MWI's, an HWI, and several European MWC's were also reviewed. This information is available in docket No. A-90-45, item number II-B-39. These multiple tests indicate that a 50-percent supplemental reduction of dioxin/furan emissions can be achieved with carbon injection.

After considering commenter input, the EPA agrees with the commenters that commercial operational data from carbon injection systems retrofitted to existing MWC's, especially those equipped with ESP-based control systems, are limited. Therefore, the EPA has concluded that the MACT level of control for existing units at small and large plants should be based on the use of GCP in combination with SD/ESP or SD/FF for large plants and DSI/ESP for small plants without credit for carbon injection. Based on available data for these control systems [previously documented in the preambles to the promulgated subpart Ca guidelines (56 FR 5514, February 11,

1991) and proposed subpart Cb guidelines (59 FR 48228, September 20, 1994)], the EPA concluded that for large plants, units equipped with SD/ESP can achieve dioxin/furan total mass emissions of 60 ng/dscm and units equipped with SD/FF systems can achieve dioxin/furan total mass emissions of 30 ng/dscm. Similarly for small plants, the EPA determined that units equipped with DSI/ESP systems can achieve dioxin/furan total mass emissions of 125 ng/dscm. Therefore, the MACT floor emission levels of 126 ng/dscm for large plants and 1,500 ng/dscm for small plants can be achieved with SD/ESP or SD/FF systems in the case of large plants and DSI/ESP systems in the case of small plants.

When determining the final MACT standard (which may be more stringent than the MACT floor), section 129(a)(2) requires the Administrator to consider certain factors, including the cost of achieving the emission reduction. In the Administrator's judgement, it would be prohibitively expensive and unreasonable to require existing MWC's at large plants with ESP's that can meet a limit of 60 ng/dscm to retrofit an SD/FF in order to achieve an additional 30 ng/dscm reduction in emissions more stringent than the MACT floor (see the proposal preamble, 50 FR 48228, September 20, 1994, for a more detailed discussion). For the final rule, the Administrator considered several regulatory options more stringent than the MACT floor; however, because of this high pollution control device retrofit cost, the Administrator decided to get separate MACT limits for MWC's with ESP-based control systems and MWC's with nonESP-based control systems. For MWC's with ESP-based APCD systems, the EPA selected a MACT level of 60 ng/dscm total mass, based on the performance of SD/ESP systems. For MWC's using or retrofitting nonESP-based APCD systems, the EPA selected a MACT level of 30 ng/dscm total mass, based on the performance of SD/FF systems. Additionally, for small MWC plants, a MACT level of

125 ng/dscm total mass was selected, based on performance of DSI/ESP systems.

As discussed in section 7.5.7, the final MACT limit for Hg is based on the use of activated carbon injection. Activated carbon injection technology used in combination with DSI/ESP, SD/ESP, or SD/FF technology is expected to result in supplemental dioxin/furan control, reducing dioxin/furan emissions from these control systems by more than 50 percent.

Comment: One commenter (IV-D-55) said the EPA has failed to take into account that a source is free to demonstrate compliance with the Hg emission limitation without installing activated carbon injection. The commenter claimed that such a source would be at a tremendous disadvantage if it could not also demonstrate compliance with the proposed dioxin/furan emission limit. The commenter further asserted that the EPA should subcategorize large plants by technology because the existing data base confirms, for example, that RDF plants equipped with SD/FF technology generally can meet the proposed Hg limit without carbon injection. The commenter noted that these plants have already implemented costly APC measures by installing the more effective FF control and that they should not be penalized by a dioxin/furan limitation that is overly stringent because it is based on carbon injection and doesn't take into account combustor characteristics. One commenter (IV-D-41) said that another RDF plant, the Nashville MWC, will not likely achieve the standard.

Response: The final dioxin/furan limits for large plants have been revised, as discussed in section 7.5.2. The selected MACT limits are based on APCD as follows: 30 ng/dscm for units with nonESP-based APCD's and 60 ng/dscm for units with ESP-based APCD's. These limits were developed based on units equipped with SD/ESP and SD/FF systems, and not utilizing carbon injection. Data from RDF plants (8 units) show that large RDF plants equipped with SD/FF or SD/ESP technology can achieve the proposed dioxin/furan emission limit of 30 ng/dscm without the use of carbon injection. The RDF dioxin/furan emissions data ranged from 1 to 12 ng/dscm. Based on these data and the revised dioxin/furan emission limits, the EPA expects that most RDF units will not be required to retrofit with carbon injection to meet the final MWC guidelines.

Comment: Two commenters (IV-D-37, IV-D-38) argued that the EPA's characterization of uncontrolled dioxin/furan emissions as 1,000 ng/dscm is incorrect, at least for the combustor types at the Pinellas and Tampa MWC's. One commenter (IV-D-38) claimed the Tampa units' rotary design limits its ability to regulate combustion air, and the limited boiler surface restricts the plant's ability to reduce ESP inlet temperatures. These commenters (IV-D-37, IV-D-38) cited as evidence the recent tests performed at Pinellas and Tampa in cooperation with the EPA which show much higher emission levels on a consistent basis, without any clear correlation to any parameter under control of the operator. Excerpts from two Pinellas and one Tampa (McKay Bay) test reports are included.

Response: There are data showing that some combustors with ESP controls alone could have emissions higher than 1,000 ng/dscm. Data show that secondary formation of dioxins/furans occurs more rapidly at ESP inlet temperatures above 440 ^{o}F than at lower temperatures. The EPA determined that 1,000 ng/dscm was a typical value (midpoint). Some plants will be higher; some plants will be lower. The EPA expects that large combustors with ESP controls alone will need to retrofit SD equipment to meet the acid gas levels. The addition of SD equipment is expected to reduce the ESP inlet temperatures sufficiently to prevent dioxin/furan formation in the ESP. With the addition of carbon injection, which the EPA expects will be needed for these plants for Hg control, the dioxin/furan emissions will be further reduced.

7.5.3 Municipal Waste Combustor Metals (other than Mercury) and Particulate Matter

Comment: Five commenters (IV-D-18, IV-D-28, IV-D-85, IV-D-98, IV-D-137) stated that the NSPS and emission guideline emission limits for PM are very tight and will push FF's to the limits of their control capabilities. Two commenters (IV-D-18, IV-D-85) indicated that even well-run units may at times have excursions above the limit. The commenters (IV-D-18, IV-D-85, IV-D-98) maintained that, compounding the difficulty in meeting the tight limit, there is a possibility of interference by activated carbon with particulate control, particularly on ESP performance. Two commenters (IV-D-18, IV-D-98) indicated that tighter acid gas control and carbon injection will result in increased grain loading.

The commenters warned that it is inappropriate to establish a MACT standard for PM for existing units when data are not available to prove they can be achieved on a continuous basis when activated carbon is being injected. One commenter (IV-D-98) said that although the tests at Camden did not indicate direct interference from carbon injection, literature reports that a significant reduction occurred in ESP PM efficiency following a carbon injection test at an SD/ESP-equipped plant. The commenter said the EPA should investigate this issue at the three plants that the EPA said were going into commercial operation in 1994. Two commenters (IV-D-18, IV-D-85) recommended that a limit of 0.01 gr/dscf (21 mg/dscm) can be reliably met, and noted that this would still be less than two-thirds of the 1991 NSPS limit.

Response: The EPA has considered the commenter's concern and agrees that use of carbon injection could result in increased grain loading, resulting in slightly elevated PM emissions from ESP's. The EPA recognizes that carbon injection has not been retrofitted on many existing MWC's. The EPA made adjustments to account for increased gain loading from use of carbon injection in selecting the final MACT PM limits for existing MWC's of 27 mg/dscm for large plants and 70 mg/dscm for small plants.

Comment: Several commenters (IV-D-18, IV-D-28, IV-D-44, IV-D-56, IV-D-68, IV-D-85, IV-D-98) disagreed with the Cd and Pb guidelines for large plants and recommended that they be set at the MACT floor level of control. Four commenters (IV-D-18, IV-D-28, IV-D-85, IV-D-98) stated that Cd and Pb emissions should be considered as a percentage of total particulate, and should be directly linked to the PM guideline. Three commenters (IV-D-44, IV-D-68, IV-D-85) said that the proposal of guidelines more stringent than the MACT floor has not been justified. The commenters stated that the EPA has argued in the preamble that removal would be accomplished through the PM control device. The commenters contended that, although the PM guideline for large plants is 0.012 gr/dscf, the operators will have to continuously achieve 0.002 to 0.005 gr/dscf to meet the Cd guideline. The commenters (IV-D-18, IV-D-28, IV-D-85) pointed out that for large plants the Cd guideline (0.04 mg/dscm) is orders of magnitude below the floor (0.25 mg/dscm), yet the EPA has not provided data in the docket to prove that MWC's can achieve the lower guideline through controlling PM to a level of 0.012 gr/dscf. Two commenters (IV-D-18, IV-D-85) acknowledged that the EPA has presented stack test data showing low Cd emissions, but claimed this does not explain how such low emissions can be achieved when the PM guideline is 0.012 gr/dscf. One commenter (IV-D-98) said that the EPA did not explain how it concluded that 80-percent control of Cd and 98-percent control of Pb are achievable through 99-percent control of total PM.

One commenter (IV-D-32) agreed that the proposed PM emission limits can be met with current ESP and FF technology for a reasonable cost. The commenter cited data from the Commerce, Marion County, Spokane, Warren County, Indianapolis, and Huntington MWC's along with data from the docket as evidence that the proposed limits are achievable. One commenter (IV-D-56) agreed with the EPA's reasoning that high-efficiency PM and metals control can be achieved with either ESP or FF technology, and applauded the EPA's decision not to require costly replacement of ESP's with FF's for marginal pollutant removal gains. The commenter supported EPA's technical and economic reasoning on this issue.

Response: The emission limits being promulgated for large plants are 0.49 mg/dscm for Pb and 0.040 mg/dscm for Cd. To arrive at the emission limits for Cd and Pb, the EPA reviewed available MWC emissions test data from MWC's equipped with SD/ESP's, including data submitted by commenters. The emission limits were established independently for each pollutant (PM, Cd, and Pb) at the upper bound (i.e., least stringent level) of the emissions data, representing a level achievable by well-operated existing MWC's equipped with SD/ESP's or SD/FF's. For both Cd and Pb, the permit limits used at proposal to determine the MACT floor did not reflect the performance achievable with SD/ESP's and SD/FF's. The MACT floor for Cd would have required an 80-percent reduction in the average uncontrolled value, while emissions data indicated that over 98-percent reduction was achievable with SD/ESP's and SD/FF's. The MACT floor for Pb would have required a 98-percent reduction in the uncontrolled value, while emissions data indicated that over 99-percent reduction was achievable with SD/ESP's or SD/FF's. After proposal, additional permits were received and the floors were revised as described in section 7.4.1. The revised floor for Pb is

0.49 mg/dscm and for Cd is 0.097 mg/dscm. Because the revised floor for Pb is now lower than the proposed guideline of 0.50 mg/dscm, the guideline is being promulgated at the floor level of 0.49 mg/dscm. Although the revised floor for Cd is more stringent, it does not reflect the higher level of control achievable by SD/ESP-equipped units as demonstrated by available emissions data (see items II-B-34 and II-A-45 in docket A-90-45). Therefore, the EPA is selecting MACT for Cd at the proposed level of 0.040 mg/dscm.

7.5.4 Municipal Waste Combustor Acid Gases

Comment: One commenter (IV-D-32) agreed that the proposed HCl and SO_2 guidelines can be met easily. The commenter also claimed that the required removal percentages for small plants could be increased to 70 percent for SO_2 and 85 percent for HCl, without making scrubber costs exorbitant. One commenter (IV-D-56) supported the SO_2 and HCl standards as long as there remains a percent removal efficiency option as proposed.

Response: The EPA acknowledges these commenters' support for the proposed guidelines. However, the EPA does not believe that DSI/ESP systems, the basis for the emission guidelines for small MWC's, can continuously achieve reduction efficiencies as high as suggested by the commenter. The EPA determined that a 50-percent reduction was achievable. The 50-percent removal efficiency option will remain as proposed.

Comment: Four commenters (IV-D-54, IV-D-64, IV-D-80, IV-D-120) contended that the SO_2 emission limit for small MWC plants is unreasonable. Three of these commenters (IV-D-54, IV-D-64, IV-D-80) recommended that the SO_2 limit be set at the MACT floor level. The commenters indicated that the EPA assumed that plants would require emission controls such as DSI/FF's in order to reduce SO_2 emissions from an uncontrolled value of 160 ppm to the floor of 120 ppm. The commenters pointed out that, based on this assumption, the EPA concluded that since small plants already required acid gas control to meet the floor, they could just as easily meet a limit of 80 ppm without significant cost. The commenters said the analysis is in error because it is based on an incorrect uncontrolled value.

One commenter (IV-D-80) said CEM data at the Olmstead MWC indicate that 120 ppm is a more accurate estimate of uncontrolled data. The commenters (IV-D-54, IV-D-64) said data from Minnesota and Wisconsin indicate that small plants have an uncontrolled level of less that 120 ppm and would require no control to meet the floor. The commenter said that since many small MWC plants can meet the floor without controls, the cost impact of achieving a more stringent control level of 80 ppm would be significant and must be taken into account.

Response: The EPA has considered the commenters' concerns regarding whether small plants actually require acid gas control to achieve the floor. Assuming the commenters' assertions that 120 ppm is a more reasonable value for uncontrolled emissions are correct, the EPA would not conclude that acid gas is required to meet the proposed floor of 118 ppm. However, data submitted by the commenters to support their assertion that 120 ppm is a more representative level of uncontrolled SO_2 emissions indicate that 120 ppm is not continuously achieved on a 24-hour basis over a period of several months. The data indicate that 120 ppm is frequently achieved for shorter time periods. In addition, the MACT floors were revised after proposal as described in section 7.4.1, and the revised SO_2 floor for small plants was determined to be 98 ppmv. The EPA believes acid gas controls will be needed by these plants to achieve the revised floor, and there will be little additional cost to achieve a level somewhat lower than the floor. As at proposal, the final SO_2 emission limit selected as MACT is 80 ppmv on a 24-hour basis.

The 50-percent removal efficiency option will also remain in the final rule as proposed.

7.5.5 Nitrogen Oxides

Comment: One commenter (IV-D-05) requested clarification of the definition of "mass burn/refractory" units which fall under the exemption from additional NO_X control. The commenter stated that the facility in question has "a multi-pass mass burn waterwall system with refractory in the furnace and first pass of the boiler", and has uncontrolled emissions of 203 ppm which are below the proposed MACT floor and would be exempt if the definition does not exclude waterwall systems that employ refractory.

Response: Mass burn/refractory MWC's are defined as having no heat recovery (i.e., no waterwalls) in the furnace (i.e., radiant heat transfer section). However, heat recovery may occur in a convective pass waste heat boiler. Based on the commenter's description, the commenter's MWC is a mass burn/waterwall unit and would be subject to the NO_X emission limit promulgated for mass burn waterwall units at large plants. Since proposal, the NO_X emission limits were revised based on subcategorization by combustor type and the mass burn waterwall limit is 200 ppmv. See another comment in this section for further discussion of the final NO_X emission limits.

Comment: One commenter (IV-D-24) declared that the EPA ignored beneficial impacts of the following combustion design/operating strategies and add-on controls and said these should be given consideration for NO_X control for both large and small plants: grate/furnace design for staging combustion; waterwall cooling of the grate area; automatic combustion controls; bubbling and circulating fluidized bed boilers; overall design to permit flue gas recirculation; NO_XOUT; KRC Two-Stage $DeNO_X$ Process; SCR; and wet scrubbing. The commenter claimed that a combination of one or more of these can achieve 100 ppm and cited the following paper to support this argument: "Technologies for Minimizing the Emission of NO_x from MSW Incineration", published in the Proceedings of the International Conference on Municipal Waste Combustion, April 11-14, 1989. A second commenter (IV-D-74) suggested that the EPA analyze the use of the flue gas recirculation in further reducing NO_x emissions, particularly for small plants since the proposal allows small plants to remain uncontrolled.

Response: An individual owner or operator of an MWC is free to select any approach or technology that can meet the limits. Although the EPA recognizes the merit of the technologies/techniques noted by the commenters, SNCR is the best technology demonstrated in the United States as applicable to designated MWC's. The EPA has some reservations regarding the use of SNCR on modular units and mass burn/refractory units, as discussed in the proposal preamble. Other control technologies have been examined (refer to document Nos. EPA-600/R-94-208 and EPA-450/3-89-27d); however, the percent reductions attainable with many of these technologies are low and data are limited. As stated above, an individual owner or operator of an MWC is free to select any approach or technology that can meet the promulgated limits.

Comment: Several commenters (IV-D-28, IV-D-37, IV-D-38, IV-D-41, IV-D-44, IV-D-54, IV-D-55, IV-D-56, IV-D-66, IV-D-67, IV-D-69, IV-D-82, IV-D-85, IV-D-86, IV-D-87, IV-D-88, IV-D-98, IV-D-136, VI-B-02, VI-B-03, VI-B-04, VI-B-05, VI-B-06) said that the proposed emission guideline of 180 ppm for large existing MWC's is too stringent and should be revised. The commenters raised various points in support of the arguments, as follows.

Some of the commenters (IV-D-28, IV-D-37, IV-D-38, IV-D-41, IV-D-54, IV-D-55, IV-D-85, VI-B-02, VI-B-03, VI-B-04, VI-B-05, VI-B-06) said that while the 180 ppm level may theoretically be achievable for newer units designed with SNCR, such as Stanislaus, it is not achievable or commercially demonstrated for existing MWC's whose boilers were typically designed ten or more years ago. Several commenters (IV-D-28, IV-D-41, IV-D-54, IV-D-82, IV-D-85, IV-D-87, VI-B-02, VI-B-05, VI-B-06) contended that the EPA, relying solely on data generated at one MWC (Stanislaus), has not exhibited in the docket a sufficient data base with long-term CEM data showing that 180 ppm can be achieved by retrofitted MWC's. Several commenters (IV-D-37, IV-D-38, IV-D-44, IV-D-66, IV-D-85, IV-D-86) claimed no MWC's have been retrofitted for NO_x controls and, therefore, SNCR is not demonstrated in this application. These commenters questioned whether the injectors can be properly located and whether existing plants are capable of maintaining the required temperature window in a predictable location. One commenter (IV-D-44) said that test results from one plant, Stanislaus, are not representative of the best performing 12 percent of units and cannot be expected to apply to all retrofit situations.

Several commenters (IV-D-28, IV-D-41, VI-B-02, VI-B-03, VI-B-05, VI-B-06) indicated that the vendors will not guarantee 180 ppm. Two commenters (IV-D-28, IV-D-85) stated that the standard should be revised to 235 ppmv (dry) at 7 percent O_2 based on a 24-hour average. One commenter (IV-D-85) said 235 ppm would represent a 33-percent reduction for some of the old units, which the EPA's data have shown can emit NO_x to levels as high as 350 ppm.

Four commenters (IV-D-37, IV-D-38, IV-D-85, IV-D-98) recommended that the NO_x limit be set at the floor, after recalculating the floor with additional subcategorization by combustor type. Two commenters (IV-D-55, IV-D-136) contended that there are no data to suggest that an RDF plant retrofitted with SNCR could attain 180 ppmv. One commenter

(IV-D-139) said that SNCR can be retrofitted successfully on RDF units and there is at least one RDF facility with a retrofit with 132 ppm guaranteed.

One commenter (IV-D-87) noted that the Mid-Connecticut MWC, which was studied by the EPA in 1989, would be able to meet the MACT floor of 215 ppm with no additional controls.

Response: Fourteen MWC's in the U.S., including five plants that have recently come online, have applied SNCR. Additionally, this technology has been applied to MWC's overseas. The EPA believes this technology can be successfully retrofitted on existing MWC's. According to vendors of this technology, existing plants, including RDF units, have an advantage over new plants in that the temperature profiles are already known, which will allow optimization of the system to be completed in a short amount of time. As discussed in the proposal preamble, the EPA has reservations regarding retrofit of SNCR to existing mass burn/refractory units (described in 40 CFR 60 IV.F.2.c) and, therefore, NO_X control is not required for this type of MWC. The EPA also discussed reservations regarding retrofit to modular units, and is not promulgating a NO_X limit for small MWC's.

After considering the commenters' concerns about the difference in performance between combustor types, the EPA revised the MACT floors for NO_X by subcategorizing the existing large MWC plant population by combustor type. The EPA has determined MACT to be at the MACT floor levels for each combustor type because it would not be cost effective to require control beyond the MACT floor. Refer to section 7.4.1 for more description of the MACT floor revisions. The MACT limits being promulgated for NO_X at large plants are as follows: 200 ppmv for mass burn waterwall combustors; 250 ppmv for mass burn rotary waterwall combustors; 250 ppmv for refuse-derived fuel combustors; 240 ppmv for fluidized bed combustors; no limit for mass burn refractory combustors; and 200 ppmv for other combustors not listed above.

Comment: Two commenters (IV-D-28, IV-D-87) requested that the EPA allow MWC's the flexibility to use ERC's to meet the NO_x emissions standards in States where ERC's are part of the State regulations and SIP's. The commenters pointed out that the EPA already allows plants to use ERC's to meet SO_2 limits, and that the trading program appears to be working well. One commenter (ID-D-87) warned that compliance without ERC's will create a "regulatory nightmare" with a nearly impossible compliance schedule for plants in non-attainment States such as Connecticut. The commenter (IV-D-87) said that by May 31, 1995, these States will have to meet Phase I NO_x emission limits; next, these States will have to meet the proposed MWC emission guidelines; then, by May 31, 1999, these States will have to meet Phase II NO_x emission limits; and finally, if attainment is not achieved in Phase II, there will be a Phase III default plan. The commenter (IV-D-87) said these schedules mean that plants will either have to change their control systems three times to meet the changing emission limits, or "will have to buy the third system first (if such systems are now available) in order to achieve compliance at the later dates." The commenter (IV-D-87) stated that without the availability of an ERC program for NO_x credits, the plants are doomed to waste massive amounts of money or risk non-compliance.

Both commenters (IV-D-28, IV-D-87) strongly asserted that it would be discriminatory and scientifically insupportable for the EPA to deny a specific type of plant, such as MWC's, the right to use ERC's, while allowing other sources to utilize the "credit market."

One commenter (VI-B-03) expressed serious reservations about the ultimate level of NO_x control that plants such as the Alexandria/Arlington MWC may face. The commenter explained that this MWC is in an ozone nonattainment area, and that, according to EPA's Oxidant Modeling project, the entire Northeast corridor may require a 70-percent reduction in NO_X to achieve compliance with the NAAQS for ozone.

Response: The EPA acknowledges the commenters' concerns and has added a provision to the emission guidelines under which States may choose to allow emissions averaging of NO_X emissions between units at an MWC plant and emissions trading of NO_X emissions between plants as part of their State plans, if they so desire.

Emissions averaging allows plants flexibility in the level of control applied to each individual MWC unit, as long as greater plant-wide NO_X reduction is achieved than if every individual unit had met the limit. This may allow some plants to control only some of their units and achieve the required emission reduction at less cost. The combination of units included in an emissions averaging plan at an MWC plant must meet emission limits approximately 10 percent more stringent than the single unit emission requirements. The emission limits under the emissions averaging plan are: 180 ppmv for mass burn waterwall combustors; 220 ppmv for mass burn rotary waterwall combustors; 230 ppmv for refuse-derived fuel combustors; 220 ppmv for fluidized bed combustors; no limit for mass burn refractory combustors; and 180 ppmv for other combustors not listed above. The average emissions must be determined on a 24-hour daily basis.

If a unit included in the emissions averaging plan is offline on a particular day, resulting in difficulty for the plant in meeting its daily emissions averaging limit, the owner or operator of the plant may opt to determine compliance for that day by an alternative method. The owner or operator must demonstrate that each of the units included in the emissions averaging plan and online that day is operating at or below the maximum daily 24-hour average emission level measured for that unit from all days during which the emissions averaging plan was achieved with all units online during the last calendar quarter. If this alternative method of compliance is chosen, the owner or operator must also demonstrate that the average kilograms per day of NO_X emitted over the days using the alternate method is less than the average kilograms per day emitted over the days the emissions averaging plan was achieved with all units online. These average kilograms per day values are to be determined on a calendar year basis. The annual provisions ensure that on an annual basis the emissions average (considering shutdowns) achieves as much reduction as if the emissions average had been met on a daily basis throughout the year.

For plants that participate in NO_X trading programs, these programs must be consistent with the Open Market Trading Rules for Ozone Smog Precursors (proposed on August 3, 1995 at 60 FR 39668) as finally promulgated. Until the Open Market trading rule is finalized, it is not possible to reference the rule in the guidelines text. In the interim, the guidelines text indicates NO_X emissions trading must be approved by the Administrator prior to implementation. After the Open Market Trading Rule is finalized, it is preapproved for use under the guidelines. These options are designed to allow owners or operators flexibility while at the same time ensuring that the amount of NO_X emitted into the air is controlled.

7.5.6 Good Combustion Practices

Comment: Two commenters (IV-D-71, IV-D-72) were concerned that there are no startup, shutdown, or upset provisions in the CO guideline. One commenter (IV-D-71) recommended a revision of the CO limit for modular starved-air units to 250 ppmv, 24-hour average, during startup and shutdown. The commenter agrees that the 50 ppm, 4-hour average, guideline is achievable during normal operations; however, the normal stoichiometric balance is upset during periods of startup, shutdown, or emergencies, resulting in CO spikes that auxiliary burners have limited ability to correct. One commenter (IV-D-72) said that while the proposed 100 ppm, 4-hour average, guideline for FBC's is reasonable under steady-state conditions, it is impossible to meet under startup, shutdown, or upset conditions. Neither commenter provided specific data in support.

Response: The regulations specify that a 3-hour period is allowed for startup, shutdown, and malfunctions during which the standards do not apply. If a longer period is needed, however, compliance with CO emission limits during startup and shutdown can be achieved by the use of an auxiliary fuel. The startup of a unit begins when operators begin feeding waste to the unit. Shutdown ends when all waste and ash has been cleared from a combustor's grates/furnace. By appropriate use of an auxiliary fuel such as natural gas, a unit can use the following or a similar sequence of operation to avoid a violation of the CO emission limit during startup:

1. Begin heating up the unit with auxiliary fuel (it is the responsibility of the operator to establish the time and temperature to which the unit is to be heated before waste is introduced to the unit).
2. Begin feeding of waste to the unit and continue to fire auxiliary fuel.
3. Continue to fire auxiliary fuel as the unit is brought up to full operating load. Reduce the amount of auxiliary fuel firing as needed to comply with the load limitation by firing at a sufficient rate to maintain adequate furnace temperatures and low CO emission concentrations.
4. When waste combustion conditions reach steady-state conditions where adequate furnace temperatures and steam flow rates can be maintained by waste combustion alone, the firing of auxiliary fuel may be terminated.

A similar sequence could be used during shutdown:

1. Begin firing auxiliary fuel when feeding of waste to the unit is terminated.

2. Continue to burn auxiliary fuel in the unit until all waste has been cleared from the grates/furnace. The rate at which auxiliary fuel is fired must be sufficient to maintain high furnace temperatures which promote complete furnace destruction of organics and maintain low CO emission concentrations. The burning of auxiliary fuel may be terminated when all waste has been cleared from the grates/furnace. The requirement for complying with the Federal CO emission limit for MWC's ends when the firing of MSW ends.

Comment: Two commenters (IV-D-25, IV-D-38) strongly requested that the CO limit for rotary refractory combustors be specified as 250 ppm corrected to 7 percent O_2 based on a 24-hour average. The current proposal is 100 ppm based on a 24-hour average.

The first commenter (IV-D-25) pointed out that, while the 1991 guidelines specifically exclude rotary combustors without waterwalls from both the mass burn rotary waterwall class and the mass burn refractory class, the current proposal does not address unit classification and a clarification is needed.

One commenter (IV-D-25) submitted an attachment describing data and rationale previously submitted in support of such a limit. The commenter stated that these issues were reviewed in a March 22, 1994, EPA memorandum from James Kilgroe to Walt Stevenson, and that Mr. Kilgroe did not agree that rotary waterwall combustors and rotary refractory combustors should be subject to the same limit. The other commenter (IV-D-38) also referred to the previous correspondence. Both commenters questioned the basis of the decision. One commenter (IV-D-38) claimed that without this reclassification, Tampa will be forced to close or to install an entirely new combustor in addition to the expected APCD retrofits.

One commenter (IV-D-25) stated that the primary data appeared to be from tests at the Dayton South MWC and the McKay Bay MWC. This commenter indicated that although some of the Dayton South data were below 100 ppm without lime injection, other data were 150 to 400 ppm when lime injection was being used. This commenter questioned whether the McKay Bay data were corrected for O_2, and criticized the use of some of the data that were obtained through an Orsat analysis (Method 3) instead of a performance test.

This commenter (IV-D-25) also asserted that CEM data instead of stack tests should be considered in setting the CO limit, as was done for other types of combustors such as rotary waterwall and RDF units. This commenter provided CEM data from Units 1 and 2 at Dayton North, which both use limestone injection for SO_2 control by permit condition.

Both commenters (IV-D-25, IV-D-38) asserted that the technology of the rotary refractory combustors is sufficiently similar to the rotary waterwall combustors to justify similar treatment under the emission guidelines.

One commenter (IV-D-25) cited "Good Combustion Practices of MWC Facilities: CO Emission Limit Requirement," prepared by Agrawal and von Alten, Energy and Environmental Research Corporation, for the EPA, November 1990, and provided a discussion of the similarities in the combustors. This commenter contended that EPA's proposed modifications, which are already starting to be implemented at the Montgomery plants, address the major differences between the technologies. This commenter cited the August 1989 BID as saying that the proposed modifications would reduce CO levels to 150 ppmv for Volund units, and stated that with normal fluctuations and without the proposed modifications, an emission limit of 250 ppm is justified.

One commenter (IV-D-38) provided a detailed discussion supporting the change, and included as a attachment a letter with arguments specifically responding to Mr. Kilgroe's March 22, 1994 letter.

Response: The Montgomery County Solid Waste Management Department submitted comments to the EPA on the proposed regulations for existing MWC's. They indicated that EPA had failed to set separate emission limits for rotary refractory combustors. They claimed that the rotary refractory units are similar to rotary waterwall combustors and requested that the CO emission limits for rotary refractory mass burn combustors be set at 250 ppm at 7 percent O_2 on a 24-hour average. Similar comments were submitted on behalf of the rotary refractory combustor facility in Tampa, Florida (McKay Bay).

The CO emission limits for mass burn refractory combustors which were proposed in 1989 and promulgated in 1991 were intended to cover all types of mass burn refractory combustors including rotary refractory combustors. The CO emission limits for both new and existing mass burn refractory units were 100 ppm at 7 percent O_2 on a 4-hour average. The results of EPA tests on Unit 3 at the Montgomery South Plant were considered when establishing the CO initial emission limits for mass burn combustors.

In early 1994, the owners of the McKay Bay and Montgomery County MWC's petitioned the EPA to set separate CO emission limits for mass burn rotary refractory combustors. They cited the separate emission limits for waterwall refractory units and contended that similar separate emission limits should be established for mass burn rotary refractory units. The EPA responded by establishing CO emission limits of 100 ppm on a 24-hour averaging time for existing mass burn rotary refractory combustors. These same emission limits were proposed in the September 20, 1994 rules for MWC's.

Rotary refractory combustors of the Volund type are considered by EPA to be a different type of combustor than the Westinghouse O'Connor rotary waterwall combustor. The Volund is basically a refractory combustor while the Westinghouse combustor is a waterwall combustor. Primary and secondary air is added through the rotating waterwalls of the Westinghouse combustor. Tertiary combustion air is also added into a secondary waterwall combustion chamber above the rotary kiln exit.

The Volund style combustors contain a primary refractory combustion chamber called an ignition chamber, followed by a rotary refractory kiln, an ash pit, and a mixing chamber. Combustion gases from the ignition chamber enter a refractory-lined bypass duct at the top of the ignition chamber where they flow over the top of the kiln and into the mixing chamber over the ash pit. Combustion air is provided to the Volund type units as under and overfire air in the ignition chamber.

The Volund style unit at the Montgomery County North and South Facilities are of an earlier generation of designs than the Tampa Facility. The Tampa units contained zoned underfire air and the Montgomery County units do not. Neither the Montgomery County nor the Tampa Facilities contain modern computer operated distributed combustion control systems.

The refractory kiln Volund style units and waterwall kiln Westinghouse style units are sufficiently different in design and operation to warrant separate CO emission limits.

The Montgomery County Department of Solid Waste Management provided CO emission data from the Montgomery County North and South Plants to support their request for a higher emission limit for mass burn rotary refractory MWC's. Data were provided on a hourly and 24-hour basis. Most of the data were from Unit 1 and Unit 2 of the North Plant. As expected, the averages and variability of the 24-hour data were much lower than for the hourly averages. Data on 24-hour averages on Unit 1 and Unit 2 of the North Plant were presented for January 12, 1992 through January 31, 1993.

No information on operating conditions [temperatures, O_2 concentrations, waste feed rates, or waste conditions (dry, normal, or wet)] was provided with the CO emission data.

Also, no data were available for significant periods of time, especially for Unit 2. For 4 months, when similar amounts of data were available for both units (January 1992 though April 1992), average CO emissions from Unit 2 were approximately 2 to 3 times higher than CO emissions from Unit 1. No information was provided on design or operating conditions which may have caused this difference.

Although not noted by Montgomery County, there appeared to be a seasonal effect on CO emissions. The lowest average CO emissions were recorded for Unit 1 during March and early April when 16 of the 30 days of available data exhibited average CO emissions of less than 100 ppm. The highest CO emissions occurred during the months of July, August, and September. During one 4 day period in July, average daily CO emissions from Unit 1 ranged from 952 to 1,357 ppm. It is possible that seasonal and monthly periods of high CO emissions corresponded to periods when large amounts of yard wastes or wet wastes (rain or snow) were being burned.

It is probable that the high CO emissions at the Montgomery County Plants were the result of the design and operating features of the combustors. The major design deficiencies include poor provisions for the distribution of combustion air and the lack of modern computer operated combustion control systems. Operating conditions which probably contributed to high CO emissions were a lack of operating training, lack of a requirement for low CO emissions, and the injection of limestone into the ignition chamber for SO_2 control.

During EPA testing at Montgomery County and other facilities it has been found the CO emissions are highly dependent on the skills of the operator, and the attention paid to maintaining good combustion conditions. This is especially true of MWC's which do not have distributed combustion control systems, but have manually operated controls such as those used at the Montgomery County North and South plants.

During the EPA sponsored tests on Unit 3 of the Montgomery County South plant, the plant operators were instructed to maintain good combustion conditions by maintaining adequate O_2 concentrations in the combustor, and temperatures of approximately 980 ^oC (1,800 ^oF) and 925 ^oC (1,700 ^oF), respectively in the ignition and mixing chambers. During six tests with good combustion conditions, CO concentrations in the stack ranged from 16.5 to 51.6 ppm. During three tests with poor combustion conditions with the ignition chamber operated at a temperature of 1,040 ^oC (1,900 ^oF) and the mixing chamber at 800 ^oC (1,475 ^oF), average stack concentrations of CO ranged from 118 to 412 ppm. When limestone was injected into the ignition chamber at 500 lb/hr through the overfire air port in the side of the ignition chamber, average CO emissions increased to 108 to 303 ppm even though the combustion temperature was maintained at the good combustion levels. When limestone ($CaCO_3$) is injected into the high temperature region in the injection chamber it decomposes via an endothermic reaction to form lime (CaO) and CO_2. The higher levels of CO during the injection of limestone probably result from the quenching of combustion reactions by the endothermic limestone decomposition reactions, or by the dissociation of CO_2 into CO and O_2.

When wet wastes are combusted it is often necessary to modify operation of the combustor to control CO emissions. Corrective actions include the use of preheated air, a reduction in waste firing rates, and changes in the combustion air distribution. These changes in operation are used in state-of-the-art MWC's that employ GCP.

It is EPA's understanding that the Montgomery County Facilities continue to inject limestone into the furnace, a factor which contributes to elevated CO emissions. The

Montgomery County Department of Solid Waste Management Department has not provided documentation that they have taken corrective actions to control CO emissions and it is assumed that the emission data submitted to the EPA do not represent good operating practices.

To comply with the proposed emission guidelines (and an Ohio Consent Decree) the Montgomery County MWC's must install spray dryers, employ GCP, and implement operator training procedures intended to insure good operating practices. Based on available evidence from the EPA's field test program at Montgomery County and a knowledge of combustion practices in MWC's, it is concluded that existing mass burn rotary kiln combustors can achieve CO emission limits of 100 ppm on a 24-hour average.

Comment: Several commenters (IV-D-18, IV-D-28, IV-D-29, IV-D-30, IV-D-43, IV-D-44, IV-D-51, IV-D-73, IV-D-74, IV-D-85, IV-D-98, IV-D-103) agreed that operator certification and training are appropriate requirements, but disagreed with the timing, saying that the 6-month period is not adequate to fully train and schedule testing and certification. Five commenters (IV-D-51, IV-D-73, IV-D-74, IV-D-85, IV-D-103) pointed out that certification could be required before the end of 1995. The five commenters suggested that training and testing sites in numerous locations in every State will be required in order to offer all personnel sufficient opportunity to obtain training and certification. Given the number of operators that will now require training nationwide, the commenters (IV-D-28, IV-D-29, IV-D-30, IV-D-43, IV-D-85) urged the EPA to begin discussions with ASME to fully develop the training program, and indicated that a phase-in period may be needed. One commenter (IV-D-28) said the EPA should consider whether other training organizations should also be allowed to provide training for operation.

One commenter (IV-D-29) informed the EPA that applicants are required to document 6 months of satisfactory employment in the capacity of chief facility operator or shift supervisor as a prerequisite for full ASME operator certification. This commenter said the proposed rule is not clear whether an operator would be permitted to work as a chief facility operator or shift supervisor during the period prior to becoming eligible for full certification. This commenter also pointed out that the site specific examination is conducted by a three-member ASME board of examiners, including one technical representative from the resource recovery industry and one representative from the regulatory authority. The commenter indicated that lead times of 6 months are often necessary for the scheduling of exams.

Two commenters (IV-D-43, IV-D-44) suggested that a 2-year period for certification is more reasonable given the current state of the ASME certification program. One commenter (IV-D-85) said that 3 years is more appropriate, and an extension provision should be provided if delays result from the hazards of developing a new certification process.

Response: The EPA has discussed the issue of certification with ASME and agrees that the proposed schedule is unrealistic given the limited resources for testing all those who require full certification. Because provisional certification is required by ASME as the first step in attaining full certification, time is being allowed for both the provisional and full certification requirements to be met. Most of the large plants have already been provisionally certified in accordance with the 1991 MWC rule. The proposed regulations are revised such that all chief facility operators and shift supervisors at large plants have 1 year from promulgation or 6 months from startup to become provisionally certified by ASME (or State-approved equivalent). In addition, within 1 year after promulgation or 6 months after startup, all chief facility operators and shift supervisors at large plants must complete or become registered for the ASME (or State-approved equivalent) full certification exam. For small plants, the proposed regulations are revised such that all chief facility operators and shift supervisors have 18 months from promulgation or 6 months from startup to become provisionally certified by ASME (or State-approved equivalent). In addition, within the first 18 months after promulgation or 6 months after startup, all chief facility operators and shift supervisors at small plants must complete or become registered for the ASME (or State-approved equivalent) full certification exam. These changes will ensure that all operators are, at a minimum, provisionally certified and are scheduled to be fully certified as soon as can be accommodated by ASME (or State-approved equivalent).

7.5.7 Municipal Waste Combustor Metals (Mercury)

Comment: Several commenters (IV-D-37, IV-D-44, IV-D-55, IV-D-56, VI-B-03, VI-B-04) asserted that the Hg emission limit should be revised due to lack of demonstrated data. One commenter (IV-D-18) maintained that commercial application of technology often isolates problems not observed during short-term test runs. One commenter (IV-D-56) urged the EPA to revise the guideline to 0.10 mg/dscm or 80-percent removal, whichever is less stringent. While it was acknowledged that carbon injection is efficacious and can be used to meet a standard more stringent than the floor, the commenter said the proposed guideline is not technically justified. The commenter provided no data or other discussion in support of the suggested change.

One commenter (IV-D-55) suggested a limitation of 0.15 mg/dscm with and alternate percent reduction of 75 percent for existing plants because MWC plants on a nationwide basis have not demonstrated an ability to meet the proposed Hg emission limitation continuously. The commenter conceded that fourteen data points taken at the Stanislaus MWC show the limit is capable of being achieved; however, those data were collected during a high carbon feet rate of 0.72 lb carbon/ton MSW and the commenter claimed that the EPA has ignored data indicating that the proposed limit may not be easily achieved at a slightly lower carbon feed rate. In support, the commenter provided a table of Hg removal rates versus carbon injection rates during multiple tests at four plants (Burnaby; Zurich, Switzerland; Stanislaus; and Camden). Referring to these data, the commenter pointed out that the Burnaby plant, at an injection rate of 0.55 lb carbon/ton MSW, achieved only 53-percent reduction. The commenter stated that the average outlet Hg concentration and average removal rate for the 0.36 lb carbon/ton MSW correspond to the proposed emission guidelines but allow no margin between the emission limitation and the achieved emission level.

Three commenters (IV-D-37, IV-D-44, VI-B-04) stated that pilot or demonstration projects are not an appropriate basis on which to set the emission guidelines, and performance based on these projects cannot be broadly expected to apply to all retrofit situations. Two commenters (IV-D-37, IV-D-44) said "the results are not representative of the permit limitations of the best performing 12 percent of all units". These commenters recommended that the limit be set at the floor level.

Two commenters (IV-D-32, IV-D-108) agreed that the proposed Hg limits are achievable using current technology, including carbon injection. One commenter (IV-D-32) cited one report showing 99-percent Hg control efficiency by an SD/FF alone, and another showing greater than 98-percent reduction to a level below 0.050 mg/dscm using carbon injection with an SD/FF. The commenter cited yet another paper which presented results of 0.070 mg/dscm using Sorbalit technology as an alternative to carbon injection. One commenter (IV-D-108) noted that the 85-percent reduction standard based on the Stanislaus and Camden County tests is reasonable since more recent data show actual efficiencies to be well above 95 percent.

Response: Activated carbon injection has been used commercially on MWC's in Europe and Canada, where the performance capabilities of this control technology have been demonstrated. It is not possible to directly translate data gathered in Europe and Canada due to differences in test methods and other procedures. For these reasons, the EPA conducted testing at two U.S. MWC's (Stanislaus County and Camden County) to assess the capabilities of this control technology. Also, 5 U.S. MWC's that began using activated carbon injection technology since 1994 (Union County, Lee County, Onondaga County, Falls/Bucks County, and Hennepin County MWC's) are meeting the proposed limits. In addition, the Alexandria/Arlington MWC, equipped with flue sorbent injection and ESP's, was retrofitted in 1993 with carbon injection for mercury control, and data indicate that the proposed limits are being achieved.

Regarding the commenter's discussion of the Stanislaus data, the EPA's initial analysis of the data showed that 80-percent reduction was achievable. However, subsequent analyses based on the combined knowledge gained from the Stanislaus County, Camden County, and other tests concluded that higher Hg reductions could be continuously achieved by increasing the carbon feed rate. This analysis concluded that at a carbon injection rate of approximately 100 mg/dscm (0.8 lb carbon/ton MSW) the proposed limit of 80 mg/dscm or 85 percent reduction would be achieved. This analysis also examined the impact of further increasing carbon feed rates to achieve even lower Hg emissions and the impact of variability in the Hg content of MSW. The EPA did an economic analysis (refer to docket No. A-90-45, item number II-A-13) and determined the costs of carbon injection to be reasonable.

Based on the testing done by the EPA, activated carbon injection can be retrofitted to existing plants. The MACT floors for existing plants represent Hg emission levels higher than levels that can be achieved using carbon injection. The EPA has selected MACT for Hg at an emission level more stringent than the floor since the technology can control better than the emission level currently represented by the permits, and the cost of the technology is reasonable. Refer to section 7.6.2 for discussion of the cost of requiring carbon injection.

7.6 IMPACTS OF MUNICIPAL WASTE COMBUSTOR EMISSION GUIDELINES

7.6.1 Energy

Commenter: Several commenters (IV-D-37, IV-D-38, IV-D-44, IV-D-54, IV-D-64, IV-D-69, IV-D-80) urged the EPA to consider the energy impact that will result from implementation of the proposed rule. One commenter (IV-D-44) argued that the EPA has not adequately considered the energy impacts of proposing guidelines more stringent than the MACT floor. The commenters explained that where plants close either temporarily or permanently because of the high cost of the retrofit, localities will need to find alternative energy options. One commenter (IV-D-44) claimed that EPA's energy impacts analysis is very general and should address this specific type of energy impact. One commenter (IV-D-80) pointed out that the National Energy Strategy states the need to "...encourage the conversion of MSW to energy...".

Response: The EPA's modeling of the economic impacts of the proposed regulation on existing plants does take into account the potential losses of energy revenue due to downtime during retrofit (temporary closings), although these costs are not explicitly broken out from the total capital costs reported in the EIA. The national capital costs estimates include the cost of equipment as well as downtime costs attributable to lost energy revenue and to increased waste disposal costs, which were calculated for each model plant. Furthermore, the electricity impacts estimated on a TJ/year basis for the guidelines represent a very small portion of the electricity generated at MWC's (i.e., less than 10 percent), and the natural gas impacts are negligible.

The EPA does not expect any permanent plant closings resulting from implementation of the emission guidelines to cause significant energy impact. The MWC plants most likely to close are older MWC plants that do not generate electricity. Additionally, MWC plants are not major power producers. Large MWC plants produce only around 70 MW of electricity. If a county does close an MWC plant due implementation of the guidelines, the county may choose to purchase electricity from the national electricity grid system.

7.6.2 Cost and Economic

Comment: Several commenters (IV-D-28, IV-D-37, IV-D-38, IV-D-43, IV-D-44, IV-D-54, IV-D-80) contended that the EPA has underestimated the cost of the proposed guidelines. Several commenters (IV-D-28, IV-D-37, IV-D-38, IV-D-43, IV-D-54, VI-B-04) provided examples of the cost of the proposal for specific MWC plants. The commenters indicated that the proposed emission guidelines would cost from $4 million to $136 million for specific existing MWC plants that would be subject to the guidelines.

Response: The cost estimates developed prior to proposal are representative for typical plants. The cost estimates for 17 model plants chosen to represent different sizes, types, and ages of existing facilities are contained in the document entitled "Economic Impact Analysis for Proposed Emission Standards and Guidelines for Municipal Waste Combustors" (EPA-450/3-91-029, March 1994). Capital costs of controls were developed from information provided by vendors for control equipment designed to be applicable to MWC's. Installation costs were included. Retrofit factors were used to account for increased costs due to site access constraints and congestion. For most model plants, a factor of 1.25 was used, representing a "medium" difficulty case. For some models, a factor of 1.42 was used to represent a very limited space and access. "Scope adder" costs for modifying ducts and stacks, demolition, and replacement were also included where appropriate.

The capital costs cited by some of the commenters are consistent with EPA's estimated capital costs to comply with the guidelines. The EPA's estimate of capital costs for retrofitting acid gas/PM control for achieving the guideline emission levels for acid gases and PM for three large model MWC plants (i.e., each of the model plants is mass burn and has three units, from 300 to 750 tons/day unit capacity) range from $14 million to $31 million, depending on the difficulty of the retrofit. The $14 million capital cost value represents the cost for a plant that already has an ESP achieving the guideline PM level, but requiring an SD. The EPA estimates $21 million for a plant with an existing ESP not achieving the guidelines level for PM to upgrade its system to meet the PM level, and retrofit with an SD. The $31 million value is the EPA's estimate of the cost to add an SD and replace an existing ESP with an FF. These costs are provided in the memorandum "Analysis of Acid Gas Control System Cost-Effectiveness for Existing MWC's," August 24, 1990. The EPA expects these estimated capital costs to be mid-range and accurate within a factor of 3. The EPA expects the cost to comply with the proposal to vary depending on site-specific factors at individual facilities. The EPA contacted commenter IV-D-28 to see if a cost breakdown was available for some of the higher retrofit cost examples provided, in order to compare the commenter's cost estimates (which were provided only as a total retrofit cost value) to the EPA's cost estimates. The commenter indicated that a cost breakdown was not likely available and did not provide any breakdown of total retrofit costs. In any case, the EPA expects that its capital cost estimates are mid-range, and that the retrofit cost for some individual facilities will vary.

Comment: Several commenters (IV-D-28, IV-D-34, IV-D-37, IV-D-43, IV-D-44, IV-D-54, IV-D-55, IV-D-67, IV-D-88, IV-D-87, IV-D-98) argued that the EPA had underestimated the cost of NO_X control for existing MWC plants. One commenter (IV-D-87) reported estimates of capital expenditures for retrofits that range from $1 million to $1.5 million per boiler, with associated operating expenses of approximately $200,000/year. One commenter (IV-D-37) indicated that Pinellas County has estimated the capital costs of a NO_X control system to be $4 million. The commenter added that the modifications to boilers will add about $1 million to the capital costs and that annual operating costs are estimated at $2.2 to $3.1 million. One commenter (IV-D-88) stated that it would cost in excess of $1 million to control NO_X to the MACT floor level of 215 ppmv or to the selected MACT level of 180 ppmv. One commenter (IV-D-87) indicated that vendor quotes for the capital and operating costs for NO_X control vary from $2,521 to $7,000 per ton of NO_X removed. Another commenter (IV-D-55) indicated that vendors provided cost estimates indicating an average cost increase of an SNCR retrofit of $3.40/Mg of MSW combusted. Four commenters (IV-D-34, IV-D-43, IV-D-44, IV-D-67) argued that EPA's costing data for applying NO_X controls to existing facilities are based on data for application of a system to a facility that incorporated this system into its original design. The commenters urged the EPA to perform further tests and research to determine whether there are major economic impediments to applying the NO_X guideline to existing plants.

Two commenters (IV-D-28, IV-D-87) pointed out that the EPA considered the cost to purchase and install SNCR equipment but that the EPA did not consider the cost to properly store and manage the storage of a chemical such as ammonia, the "potential environmental costs" of the control equipment, and the increased operating costs associated with the proper operation of the SNCR system. One commenter (IV-D-98) stated that the EPA did not consider the added costs of mitigating ammonia slip hazards, or of complying with other regulations [e.g., SARA title III; section 112(r)] triggered by the presence of substantial amounts of ammonia stored and used onsite.

One commenter (IV-D-98) criticized the EPA's costing analysis for NO_X control because it has not been significantly updated since the 1989 subpart Ea proposal notice, and because the only memorandum providing updated information is not well-founded. The commenter criticized the September 24, 1991 memorandum "NO_X Control on Existing MWC's" because it concludes, without any analysis, the following: "To account for additional costs associated with [SNCR] retrofit difficulty, equipment costs were multiplied by a retrofit factor of 1.25." The commenter points out that the only source for this conclusion is a November 30, 1990 telephone conversation with one major SNCR vendor.

<u>Response</u>: For the most part, the costs for NO_X control provided by the commenters are not different from the EPA's NO_X control cost estimates for the proposal. Refer to the memorandum entitled "NO_X Control on Existing MWC's," dated August 23, 1991, for the EPA's costing analysis for NO_X control. As shown in table 5 of that memorandum, the EPA's capital cost estimates for NO_X control using SNCR using the Thermal DeNOx™ process with aqueous ammonia range from

$1.8 million for a 450 Mg/day plant with 2 units to $4.8 million for a 2,050 Mg/day plant with 3 units. The annualized costs for these two plants are estimated to be about $470,000 and $1.4 million, respectively. The estimates for the Pinellas MWC provided by one commenter are not significantly higher than would be estimated by the EPA for a plant such as Pinellas with capacity of 2,700 Mg/day and 3 units. Additionally, the EPA's estimate of the cost per ton of MSW ranged from $1.82/ton of MSW to $3.40/ton of MSW for plants all of the model plants identified by the EPA with capacities greater than 380 Mg/day. The $/ton of NO_X removed and $/ton MSW values provided by the commenters are within the range of values estimated by the EPA prior to proposal.

In estimating the cost of SNCR for application to existing plants, the EPA did investigate the possibility of there being difficulty in retrofitting an SNCR system to an existing plant. The EPA found that, in general, facilities should face no difficulty in retrofitting SNCR systems. Prior to proposal, the EPA included in its cost estimates for NO_X a retrofit factor of 1.25 to account for the additional cost to add SNCR to an existing facility (e.g., the cost of installing ports and tube bending). After proposal, the EPA contacted an additional vendor of SNCR systems to further investigate the use of this retrofit factor, and found that the vendor indicated that there is very little difference in the difficulty of installing an SNCR system into an existing plant versus a new plant. The vendor indicated that the cost of installing ports and tube bending would average $120,000 (refer to memorandum entitled Telephone Conference Between Denise Bevington and David White, Radian Corporation and Rich Pickens, Nalco Fuel Tech, April 27, 1995.) This estimate is less than the EPA's cost estimate at proposal, using a retrofit factor of 1.25 applied to the equipment costs to calculate capital cost for existing plants. In fact, because the EPA's retrofit cost estimate may be high, it may reflect retrofit conditions that are more difficult and costly than are average.

The EPA's analysis of NO_X control costs are based on use of the Thermal DeNOx process with aqueous ammonia injection. Both aqueous ammonia and urea (used with the NOxOUT™ process) may be stored and used safely, and do not have the safety hazards and costs associated with the use of anhydrous ammonia (i.e., the regulatory costs associated with SARA title III and section 112(r) of the Act.) Additionally, at the level of NO_X control required by the final guidelines, ammonia concentration in the ash and ammonia slip have not been demonstrated to be a problem.

The EPA prepared its pre-proposal costing analysis for NO_X in August of 1991 and considers the analysis to be representative of NO_X control costs at proposal. Since the EPA prepared that memorandum, the Office of Research and Development of the U.S. EPA and the U.S. Department of Energy funded a study in 1994 of NO_X control technologies, entitled "NO_X Control Technologies Applicable to Municipal Waste Combustors," EPA-600/R-94-August 1994. The study assessed the cost of a conventional SNCR system based on injection of aqueous ammonia as a liquid. The study indicated that the costs of a urea-based system are similar. The study estimates capital costs of $800,000 for a 400 tons/day unit. Using a retrofit factor of 1.25, and applying it to the total process capital cost included within the $800,000 capital cost, the total capital cost for retrofiring this system on an existing plant would be estimated to be $900,000. For a facility with two units, the cost would be $1.8 million. In EPA's 1991 study of NO_X control costs, the estimated capital cost for a 600 tons/day plant with two units is $2.3 million, which is $0.5 million higher than the more recent estimate of the cost for a larger plant. Therefore, the EPA considers its cost estimates for NO_X to be representative of the cost at proposal.

Comment: One commenter (IV-D-87) said the entire cost analysis is faulty because it assumes that SNCR will be needed to meet the floor, which is not accurate. The commenter noted that the Mid-Connecticut MWC, which was studied by the EPA in 1989, would be able to meet the MACT floor of 215 ppm with no additional controls. The commenter argued that it would be necessary for MWC's to add SNCR to meet a guideline of 180 ppm. The commenter argued that this requirement would represent a large cost that the EPA must include in the incremental cost analysis.

Response: The EPA agrees with the commenter that some MWC facilities may be able to achieve the proposed floor level of NO_X control without utilizing SNCR. As further discussed in section 7.5.5 of this document, the NO_X limit for large facilities was revised based on subcategorization by combustor type. The revised MACT limits being promulgated for NO_X at large plants are as follows: 200 ppmv for mass burn waterwall combustors; 250 ppmv for mass burn rotary waterwall combustors; 250 ppmv for refuse-derived fuel combustors; 240 ppmv for fluidized bed combustors; uncontrolled for mass burn refractory combustors; and 200 ppmv for other combustors not listed above. These limits are equivalent to the MACT floor for each combustor type and require no additional control technology other than that needed to achieve the MACT floor. As a result of this change in the NO_X guidelines, the cost of the NO_X guidelines is considered to be reasonable.

Comment: Three commenters (IV-D-44, IV-D-54, IV-D-80) argued that the EPA must consider certain specific costs of the proposal that are not included in the EPA's economic impact analysis. One commenter (IV-D-44) contended that the EPA's discussion of cost impacts must address increased operating costs, such as the cost of additional reagents and costs for risks assumed by the vendors to meet higher performance levels, and hidden costs, such as changing technologies for which debt service continues to be owed. Two commenters (IV-D-54, IV-D-80) contended that the EPA must consider additional operational expenses related to labor, repairs, and reduced equipment life. The commenter asserted that these operational expenses are significant concerns due to the low gas temperatures and accelerated corrosion rates that would accompany the proposed pollution control technology.

Response: Regarding reagent costs, the EPA's costing analysis included the cost of reagents required to meet the guidelines (i.e., carbon, lime, and aqueous ammonia.) There will be no cost for vendors taking "risks" to support the guidelines because vendors have reviewed the guideline pollutant emission levels and have indicated that their technologies can achieve those levels. Regarding debt owed on equipment replaced to meet the guidelines, the EPA considered this problem in establishing the guidelines emission levels; however, the cost of paying the debt on equipment replaced as a result of the guidelines is not a cost that the EPA includes in its analysis of capital and incremental costs. The final guidelines are based on use of ESP's or FF's, such that many existing ESP's will not need to be replaced in order to comply with the MWC guidelines. It has not been demonstrated that the guideline emission levels will result in accelerated corrosion rates due to the low gas temperatures required to achieve the guidelines, especially in light of the reduced acid gas emission levels that will accompany the low gas temperatures to achieve the guidelines emission levels for acid gases.

Comment: Several commenters (IV-D-18, IV-D-37, IV-D-38, IV-D-44, IV-D-54, VI-B-03, VI-B-04) argued that the EPA must consider the direct and indirect costs of the guidelines on communities due to closing MWC plants either temporarily for retrofits or permanently. One commenter (IV-D-18) stated that some plants will not have the space necessary to avoid significant downtime. One commenter (VI-B-04) indicated that their facility would be down for 6 months to perform the required retrofit. The commenter (VI-B-04) estimated that the cost to landfill approximately 175,000 tons of waste during an estimated 6-month downtime would cost $2.625 million.

Three commenters (IV-D-44, VI-B-03, VI-B-04) argued that municipalities in which the MWC closes as a result of the emission guidelines would face the costs of alternative waste disposal and lost investment in the closed MWC plant. One commenter (VI-B-03) explained that, in their case, landfill space is limited and their community does not have access to municipal transfer station facilities, such that they would need to contract for disposal services, which would represent a significant added cost for long distance transportation of MSW.

Several commenters (IV-D-37, IV-D-38, IV-D-54, VI-B-03, VI-B-04) mentioned the lost energy revenues for WTE plants as an added cost. Three commenters (IV-D-37, IV-D-38, VI-B-04) provided an example of the cost impact for specific MWC plants. One commenter (IV-D-37) stated that the county that owns the Pinellas, Florida MWC plant will lose $18.1 million annually from energy sales ($8.5 million) and "capacity sales" ($9.6 million) to Florida Power Corporation. Another commenter (IV-D-38) stated that the county that owns the Tampa, Florida MWC plant will lose $4.2 million annually from energy sales. One commenter (VI-B-04) indicated that the Tulsa, Oklahoma plant would lose $3.2 million in steam and recovered materials sales during an estimated 6-month downtime. One commenter (IV-D-54) stated that many MWC plants in Minnesota have long-term electric and steam contracts, the requirements for which would have to be met in another more costly way.

Response: Regulatory costs due to downtime (temporary closure) of existing plants for retrofit will have cost impacts, and EPA addressed these cost impacts as part of the total capital costs of the regulation. The national capital cost estimates include the cost of equipment as well as downtime costs attributable to both lost energy revenue and increased waste disposal costs (offsite disposal), which were calculated for each model plant. Downtime costs were estimated based on downtime estimates which ranged from 0 to 6 months depending on the model plant and control option. The actual downtimes or costs associated with them may vary; however, this is only one of many costs which were factored into the impact analysis. The cost used for the diversion of waste to other disposal alternatives (i.e., $60/Mg) may now be considered high, and actual costs for the diversion of MSW may be closer to $50/Mg, given changes in tipping fees. This would reduce the retrofit cost assumed by the EPA in its impacts analysis.

The EPA did not consider the cost of the proposal due to permanent closings of MWC's. The EPA expects that most of the MWC's that will close are older plants that do not produce electricity, such that there would be no significant loss in revenues for energy production. Refer to section 3.6.2 for further discussion on this issue.

Comment: Two commenters (IV-D-13, IV-D-44) contended that EPA's cost-benefit analysis for requiring carbon injection on MWC units at small MWC plants significantly underestimates the cost to these plants. One of the commenters (IV-D-13) explained that during the 1980's, the Hampton/NASA MWC plant spent $1 million to reduce its dioxin/furan emissions by 99 percent (using good operating practices), to a level of 2.19 ng/dscm TEQ. Both commenters contended that capital costs and annual operating costs to implement dry sorbent injection and carbon injection to achieve the dioxin guideline would be unreasonably high. One of the commenters (IV-D-44) stated that the high cost for dioxin control contradicts the EPA's contention that costs for additional control beyond the floor are minimal.

Response: The high cost referred to by the commenters is due primarily to the cost of retrofitting a DSI for acid gas scrubbing. Acid gas scrubbing using a DSI system is required to meet the floor level of control for SO_2; therefore, the cost to retrofit an acid gas scrubbing system is mandated by section 129 of the Act. Additionally, since proposal, the dioxin/furan limit for small MWC plants has been revised to 125 ng/dscm total mass, so the facility referred to by the commenter may be able to meet the final guideline without carbon injection. Refer to section 7.5.2 for further discussion of the revised dioxin/furan limit.

Comment: Several commenters (IV-D-06, IV-D-08, IV-D-11, IV-D-37, IV-D-38, IV-D-40, IV-D-43, IV-D-44, IV-D-58, IV-D-62, IV-D-62, IV-D-68, IV-D-95, IV-D-99, IV-D-104, IV-D-114, IV-D-127, IV-D-128, IV-D-129, IV-D-130, IV-D-131, IV-D-132) expressed concern that the EPA has not taken into account the cost of achieving the proposed emission reductions where the guidelines have been set at a level more stringent than the MACT floor. Three commenters (IV-D-43, IV-D-44, IV-D-104) argued that the EPA did not provide cost justification for selecting guideline levels more stringent than the MACT floor.

Response: For both small and large MWC plants, acid gas/PM control using DSI/ESP for small plants and SD/ESP or SD/FF for large plants will be required to achieve the floor and MACT levels of control for SO_2 and PM. Refer to sections 7.4 and 7.5 of this document for further discussion of the final MACT floor levels and final MACT levels for each pollutant. Therefore, the cost for acid gas/PM control to achieve the final guideline emission limits for SO_2, HCl, PM, Cd, Pb, and dioxins/furans is required by the MACT floor, which is the least stringent emission level mandated by section 129 of the Act. At proposal, the EPA determined that the incremental cost to add activated carbon to the acid gas/PM control device to reduce Hg to the proposed and final guideline emission levels of 0.080 mg/dscm would be less than $1.00 per Mg of MSW combusted for large plants and $1.40 per Mg of MSW combusted for small plants. The EPA concluded that this cost is reasonable given the concerns over the toxicity and bioaccumulation of Hg in the environment.

Comment: Several commenters (IV-D-06, IV-D-08, IV-D-11, IV-D-40, IV-D-58, IV-D-59, IV-D-62, IV-D-63, IV-D-86, IV-D-92, IV-D-95, IV-F-99, IV-D-100, IV-D-106, IV-D-110, IV-D-114, IV-D-116, IV-D-117, IV-D-127, IV-D-128, IV-D-129, IV-D-130, IV-D-131, IV-D-132) expressed concern about the cost impact that the proposed guidelines will have on city/county budgets. In contrast, one commenter (IV-D-32) indicated that the guidelines will not be unduly burdensome or costly for MWC plants because they are well within the capabilities of existing control technologies. Some of the commenters questioned whether the EPA understands the price that will be paid by local governments. The commenters explained that the proposed guidelines will cause money to be removed from other essential city-funded services and would dismantle States' integrated solid waste management approaches. Several commenters emphasized this point with regards to the economic impact on small combustors serving small communities and stated that the proposal is "pro-big business" The commenters questioned whether the benefit of implementing the guidelines would outweigh the resulting cost to cities, through cutbacks in other city programs, such as health and safety. Two commenters pointed out that the WTE industry is already one of the cleanest power producing groups in the country, such that the proposal will provide only a marginal benefit in emissions reduction.

Response: The EPA recognizes that the emissions guidelines will impact city/count budgets; however, section 129 of the Act requires that MACT standards be established for small plants, with the minimum level of control to be established at the MACT floor. For all pollutants except Hg and dioxins/furans, the final guidelines are set at the minimum level required by section 129 (i.e., at the MACT floor level.) As discussed above in this section, the final emission guidelines for small plants would require acid gas/PM control to achieve the MACT floor for SO_2 and PM. The only pollutant emission level established at a level more stringent than the floor that will result in additional cost to small plants is Hg. As discussed above in this section, the incremental cost of $1.40 per Mg of MSW combusted is considered to be reasonable in light of the emission reduction benefit.

In preparing the guidelines for small plants, the EPA was particularly concerned about the impacts on small entities. To address these concerns, several measures designed to mitigate the impacts on small entities were considered. The emission guidelines consist of emission limits, as opposed to design, equipment, work practice, or operational standards, giving the MWC owners and operators the freedom to select the most successful economic means of reducing emissions. The emission guidelines will apply only to MWC plants with capacity of greater than 35 Mg/day. This cutoff eliminates from the purview of the guidelines the overwhelming majority of existing very small MWC plants. The guidelines are "tiered" so that the stringency (and therefore potential economic burden) of the emission guidelines increases as the size of the MWC plant increases. Small plants would be required to perform performance testing, but the guidelines and performance testing requirements would not be as stringent as those for large plants (e.g., performance testing is required less frequently.) Additionally, small plants are not required to control NO_x.

Overall, the emission guidelines will not apply directly to any MWC's, but will be used as a guide by individual State air pollution control agencies in developing site-specific regulations for MWC's. States are allowed some flexibility in implementing the guidelines.

7.7 PERFORMANCE TEST METHODS AND MONITORING PROVISIONS FOR MUNICIPAL WASTE COMBUSTOR EMISSIONS

7.7.1 Continuous Monitoring

Comment: One commenter (IV-D-69) said the requirement for 75 percent availability each day should be eliminated. The commenter said 90 percent availability per quarter is achievable, but 75 percent per day is not because of periodic problems with probes, filters, sample lines, and conditioning systems that cannot be prevented. The commenter said sometimes parts not on the manufacturer's recommended spare parts list must be sent to a plant via overnight mail.

Response: The EPA's data indicate that for 90 percent of the days in a quarter, 75 percent availability per day is achievable. In other words, up to a total of 10 percent of the days per quarter (approximately 9 days) may be used if necessary to order, ship, and install parts to repair a CEMS. This should be adequate time.

Comment: One commenter (IV-D-109) recommended that a 95 percent data availability is reasonable and necessary to ensure compliance on a continuous basis. The commenter informed the EPA that the Ohio EPA has a CEMS program that includes approval, certification, computer tracking of data, and independent audits of systems on a statewide basis. The Ohio EPA has tracked data availability for over ten years and currently has over 125 plants monitoring continuously across the State. The commenter said plants must maintain 95 percent or better data availability, and approved routine maintenance (e.g., daily calibration checks, quarterly linearity checks, cylinder gas audits, relative accuracy tests, etc.) do not count as monitor downtime. The commenter asserted that the data indicate that opacity monitoring systems can actually achieve 98 percent or better availability. The commenter noted that if a site experiences a lightening strike, the major reason for CEMS downtime in Ohio, it may take a week to get the parts delivered, installed, and operating again.

Response: The EPA agrees that greater than 90 percent data availability may be achievable per quarter; however, the EPA's data indicate that 90 percent data availability per quarter is a more consistently achievable and reasonable requirement which ensures a properly operating CEMS. States are free to impose more stringent requirements if they so choose.

Comment: Two commenters (IV-D-18, IV-D-85) did not want to have to replace currently certified CEM systems for the purpose of changing span values. One commenter (IV-D-18) said the span values should not be arbitrarily set at two times the emission limit. One commenter (IV-D-85) said that some plants have been constructed under State regulations more stringent than the existing or proposed federal standards, and it would be a waste of time and money to require these plants to change out the CEMS for the sole purpose of changing the span value. The commenter suggested that the following wording be added to the NSPS rule for NO_x analyzers which is referenced by the guidelines: "The span value of the CEM system shall be two times the level of the emission limit provided in this section, unless a CEM system has been previously installed, certified, and operated in accordance with 40 CFR 60, appendix B." The commenter suggested that similar changes be made to the SO_2 and the CO requirements in the NSPS which are referenced by the emission guidelines.

Response: At proposal, the span values for NO_X and CO CEMS were set at twice the level of the applicable emission limits, and the span values for SO_2 CEMS were set at 125 percent of the expected maximum uncontrolled concentration at the inlet to the control device and 50 percent of the expected maximum uncontrolled concentration at the outlet of the control device. In order to ensure that CEMS have span values appropriate to each individual MWC unit, the NO_X and CO CEMS span values have been revised to 125 percent of the maximum expected concentration at the point of measurement. The EPA believes this change assures that the source will be able to demonstrate compliance with the emission limits, while providing flexibility to the operator in monitor selection. There is no change to the SO_2 CEMS span values. If previously installed CEMS meet these requirements, there should be no need for replacement.

7.7.2 Comments on Proposed Test Methods

Comment: One commenter (IV-D-109) asserted that the unavailability of audit samples for Method 29 needs to be addressed by the EPA. The commenter has found that audit samples are only available a few months out of the year and, without an audit sample, cannot ensure that the metals analyses were done properly and that the data generated is representative.

In addition, the commenter said, the EPA has failed to establish pass/fail criteria that can be used by the Ohio EPA to accept or reject the results of metals testing. A detailed letter describing the problems this has caused is attached to the comment (attachment G). The commenter was told that with certain control technologies the amount of PM collected does not meet the PQL and, therefore, cannot be held to a pass/fail criteria. The commenter stated that clarification regarding

PQL's for both the Method 29 collection and the analyses of samples would be appreciated. The commenter asked the following question: If a company fails one or more of the multiple metals being tested, but not all of them, does the EPA recommend redoing only those metals that did not pass the audit, or redoing all of them?

Response: Proposed Method 29 has many required internal Quality Assurance and Quality Control (QA/QC) procedures which may be used to establish the quality of the data. Additionally, the specific analytical procedures described by proposed Method 29 have internal QA/QC of their own. Therefore, sufficient quality of the data can normally be established without the requirement of the use of audit samples. The use of an audit sample, if commercially available, would be an optional procedure.

In response to the second general comment, proposed Method 29 describes in detail in section 2.3 a mechanism for determining in-stack detection limits based on total volume of gas sampled and analytical procedures, and should be applied for test planning and evaluation purposes.

Comment: One commenter (IV-D-55) questioned the EPA's conclusions regarding the superiority of Method 29. The commenter said that the EPA concluded in a 1991 comparison study by OAQPS that Method 101A might miss measuring small amounts (3 percent) of mercury based on the fact that some Method 29 results reported higher values. The commenter asserted, however, that the 1991 comparison study failed to account for the data points where Method 101A reported higher average concentrations of mercury than Method 29.

Response: The selection of Method 29 over Method 101A was based on recognized statistical evaluation techniques, as reported in the subject document, which can be found in the docket. Correction factors reported in that study for the Method 101A comparative data ranged from 1.14 to 1.49, depending on source operation. Method imprecision in methods that are statistically shown to be different can cause an overlay of the data sets.

Comment: One commenter (IV-D-09) questioned whether current performance testing technology is sufficient to measure dioxin/furan emissions at the low levels proposed.

Response: Both the proposed dioxin/furan limits (30 ng/dscm for large plants and 60 ng/dscm for small plants) and the final dioxin/furan limits (30 ng/dscm for non-ESP equipped units at large plants, 60 ng/dscm for ESP-equipped units at large plants, and 125 ng/dscm for small plants) are at levels that are well within the measurement capabilities of Method 23.

7.8 ENFORCEMENT, REPORTING, AND RECORDKEEPING PROVISIONS FOR MUNICIPAL WASTE COMBUSTOR EMISSIONS

7.8.1 Enforcement

Comment: One commenter (IV-D-120), noting that States have differing responses to documented noncompliance, offered three suggestions for the EPA to consider to help clarify the purpose of the requirement that facilities with compliance schedules longer than 1 year from the date of approval of the State plan must submit dioxin test results. The commenter recommended any one of the following suggestions: (1) Delete this requirement; (2) give specific instructions to States about what to do with this information; or (3) start the routine dioxin performance testing sooner than the currently proposed schedule in 40 CFR 60.58b(g)(3)-(4).

Response: The purpose of the emission guidelines to require the facilities with compliance schedules longer than one year from the date of approval of the State plan to submit dioxin test results is to help States manage and prioritize retrofits. Additionally, the schedule and emission reports will allow States to balance emission levels with the economic impacts of requiring retrofitting.

7.8.2 Reporting and Recordkeeping

Comment: One commenter (IV-D-103) recommended that the requirements pertaining to compliance recordkeeping contained in § 60.39b(c)(1)(i) through (ix) should be made consistent with the requirements listed in 40 CFR 60.21(h). Another commenter (IV-D-120) preferred to see this list of "suggestions" removed from the proposed emission guidelines because the general public often misinterprets suggestions as "musts." The commenter added that if they are kept, the EPA should stress that they are only suggestions.

Response: The intent of the increments of progress listed under subpart B - Adoption and Submittal of State Plans for Designated Facilities (proposed § 60.21(h)), which are required steps that owners or operators must take to achieve compliance, and the intent of the measurable and enforceable activities specified in proposed § 60.39b(c)(1)(i) through (ix), which are suggested steps to achieve compliance that owners or operators may take, are the same. Both lists are consistent with each other. The latter is a list of suggestions, as clearly stated in the final rule. No significant change has been made to the final rule with regard to this comment.

7.9 LEGAL CONSIDERATIONS

Comment: Two commenters (IV-D-85, IV-D-98) argued that EPA's approach of choosing the average of the top 12 percent of the units separately for each pollutant when determining the MACT Floor has resulted in MACT guidelines that are too stringent. The commenter claimed that available data indicate that several of the guidelines calculated using this method, including some set at the MACT Floor level, are not continuously achievable. Refer to sections 3.5.1 and 7.5.1 for further discussion of the technical issues related to the comment. Both commenters argued that it is established beyond question that to satisfy the legal "achievability" criteria of sections 111 and 129, the EPA must show that all affected units will be able to continuously meet the promulgated limits through proper use of reference control technology under foreseeable worst-case operating conditions. Refer to section 3.11 for further discussion of the legal issues associated with this comment.

Response: This same issues was raised for the NSPS. Refer to section 3.11 for EPA's response to this comment.

Comment: Two commenters (IV-D-24, IV-D-49) argued that the EPA has no legal basis for establishing the MACT floor for existing units based upon permit data, but instead, the commenters believed that section 129(a)(2) clearly requires the EPA to derive floors from lower actual emissions data, when the data are available. One commenter (IV-D-24) further argued that Congress intended the phrase, "average emission limitation achieved" in section 129(d)(3) to mean actual emission rates, and that Congress could not have intended to refer to permitted emission levels when actual emissions are lower than permitted levels. The commenter further stated that the EPA's improper use of regulatory and permit limitations resulted in MACT floors that were not as stringent as they should be. The same commenter noted that although section 302(k) defines emission limitation, that section was adopted to clarify that emission standards may include work practice standards in response to a 1978 Supreme Court decision, and the EPA has never interpreted the phrase to require it to use permit data when actual emission data are available. Moreover, the commenter argued that nothing in the 1990 Amendments indicates that Congress intended such a result.

One commenter (IV-D-44) conversely argued that the EPA legally is required to establish the MACT floor and MACT for existing plants based upon permit limits. The commenter contended that the phrase "emission limitation" in section 129 is defined in section 302(k) of the Act, and specifically refers to a regulatory limitation on the quantity, rate, or concentration of emissions of air pollutants, such as a permit limitation. Thus, the commenter stated that contrary to EPA's comments in the preamble to the proposed rule, the EPA does not have the discretion to set MACT floors based upon permit data, but is required to do so.

Response: The starting point for analyzing whether the EPA must apply the section 302(k) definition of emission limitation in determining MACT floors or actual emissions data is the "test" set forth in Chevron v. NRDC, 467 U.S. 837 (1984). Under the Chevron test, the reviewing court will first ask whether Congress has "directly spoken to the precise question at issue." Chevron, 467 U.S. at 842. If Congress has not "directly spoken to the precise question at issue," the court will proceed to the second prong of the Chevron analysis, in which it must uphold the Agency's interpretation if it is a "permissible construction" of the statute. Id. at 843.

The EPA concludes from its analysis of the statutory language that Congress has not clearly indicated which interpretation it intended. The EPA therefore does not agree with either position taken by the commenters -- i.e., the EPA does not agree that the language of section 129 clearly requires it to use regulatory and permit data to set the MACT floor, or clearly requires it to use actual data.

For example, although the EPA could interpret the statute as requiring it to apply the definition of emission limitation in section 302(k) to section 129(a)(2) as suggested by some commenters, that application would result in a conflict with the language of section 111(h). Section 302(k) provides:

> The terms "emission limitation" and "emission standard" mean a requirement established by the State or the Administrator which limits the quantity, rate, or concentration of emissions of air

> pollutants on a continuous basis, including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction, <u>and</u> any design, equipment, work practice or operational standard promulgated under this chapter.

42 U.S.C. § 7602(k) (emphasis added). Section 111(h), however, provides:

> For purposes of this section, if it is not feasible . . . to prescribe or enforce <u>a standard of performance</u>, . . . [the Administrator] may <u>instead</u> promulgate <u>a design, equipment, work practice, or operational standard</u>, or combination thereof, which reflects the best technological system of continuous emission reduction which (taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated.

42 U.S.C. § 7411(h)(1) (emphasis added). Since 1970, section 111(a)(1) has incorporated the following language in its definition of "standard of performance":

> [A] standard for emissions of air pollutants which reflects the degree of <u>emission limitation achievable</u> through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any non-air quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated.

<u>See</u> 42 U.S.C. § 7411(a)(1) (emphasis added). The 1977 Amendments of the Act amended the definition of standard of performance to include a requirement that the Administrator also must take into account "any nonair quality health and environmental impact and energy requirements . . .." 42 U.S.C. § 7411(a)(1). Thus, since section 111(h) authorizes the EPA to promulgate "a design, equipment, work practice, or operational standard" <u>instead</u> of a performance standard, and section 111(a)(1) defines a performance standard in terms of emission limitation achievable, one cannot unequivocally conclude that Congress intended for the definition of emission limitation provided in section 302(k) to apply to section 111.

And since MWC standards are promulgated under both sections 129 and 111, one cannot unequivocally conclude that Congress intended for section 302(k) to apply to section 129.

Moreover, such an interpretation is contrary to the interpretation that the EPA consistently has given to a phrase in section 111(a)(1) that uses similar terminology. That section states, "The term 'standard of performance' means a standard for emissions of air pollutants which reflects the <u>degree of emission limitation achievable</u> through the application of the best system of emission reduction . . .." 42 U.S.C. § 7411(a)(1) (emphasis added). Accordingly, the EPA does not agree with those commenters who stated that the EPA is <u>required</u> to apply section 302(k) to section 129(a)(2).

The EPA also does not agree with the commenters who stated that Congress intended for the EPA <u>always</u> to use actual emissions data to set the MACT floors when the data are available. For some emission standards, using actual data to set the MACT floors may be inappropriate based on the facts applicable to the standard being set. For example, in the MWC rulemaking, use of actual data resulted in MACT floors that no MWC unit, nor any technology, could continuously meet. Section 129(a)(2) requires MACT standards to be at least as stringent as the MACT floor. 42 U.S.C. § 7429(a)(2). Not only does the definition of "MACT" emphasize achievable -- i.e., maximum <u>achievable</u> control technology -- but case law also requires standards promulgated under section 111 to be achievable "under the range of relevant conditions which may affect the emissions to be regulated . . .." <u>National Lime Ass'n v. EPA</u>, 627 F.2d 416, 433 (D.C.C. 1980). An achievable standard does not have to be one that is already routinely achieved in industry, but it must be one that is capable of being met under most adverse conditions which reasonably can be expected to recur and which are not or cannot be taken into account in determining the 'costs' of compliance." _Id._ at 431 n.46.

When OAQPS ranked the emissions test data from the large MWC's in order from lowest emissions to highest emissions, and then averaged the results from the best performing 12-percent of units in the category (i.e., the top 29 entries on the list), the resulting MACT floor is unachievable continuously by any unit or any technology. This is because a ranking and averaging of the test data does not account for the variability in emissions data exhibited by the _same_ unit -- i.e., if five performance tests are conducted on a particular MWC in 5 years, it is not unusual for one or more of the annual tests to produce emissions that fall within the best 12-percent of the data, while the remaining annual test data fall outside this range, even though operating and maintenance conditions remain the same. Thus, the EPA concludes that Congress did not intend for the EPA to _always_ use actual emissions data to set MACT standards, because Congress would not have intended for the EPA to promulgate standards that are at least as stringent as the MACT floor, when the MACT floor itself is not achievable continuously.

As the above discussion establishes, Congress has not "directly spoken to the precise question at issue" [_Chevron_, 467 U.S. 837 (1984)] -- namely, whether it intended for the EPA to apply the definition of section 302(k) to section 129 when setting the MACT floors as one commenter has asserted, or actual emissions data when the data are available as other commenters have asserted. In the MWC rulemaking, however, only one of the two interpretations resulted in MACT floors that are achievable continuously under the range of relevant conditions that may affect the emissions the rule regulates. The EPA thus determined MACT floors for MWC's using regulatory and permit limitations that actually have been achieved in practice.

7.10 COMPLIANCE TIMES FOR MUNICIPAL WASTE COMBUSTOR EMISSIONS

NOTE: The issue of compliance schedules for completing retrofits (or closure) to comply with the guidelines is discussed in the promulgation preamble.

Comment: Five commenters (IV-D-43, IV-D-44, IV-D-66, IV-D-67, IV-D-86) disagreed with an accelerated compliance schedule for Hg and dioxins/furans, while two commenters (IV-D-74, IV-D-103) argued that all large MWC plants which already have SD/ESP or SD/FF control systems should be required to comply with the accelerated compliance schedule regardless of commencement of construction dates. For MWC plants constructed after June 26, 1987, two of the commenters (IV-D-43, IV-D-44) suggested an 18-month timeframe, and one other commenter (IV-D-67) suggested a 24-month timeframe, would be more reasonable to meet the emission guidelines for Hg and dioxins/furans than the proposed 1 year timeframe. Two commenters (IV-D-66, IV-D-86) recommended compliance within 3 years following approval of the SIP. These commenters disagreed with an accelerated compliance schedule for Hg and dioxins/furans by arguing that: (1) An accelerated schedule does not allow for consideration of integrated systems or new technologies which may offer cost savings to municipalities, (2) compliance schedules should not be based on public perception (the commenter cited recent public concern with potential emissions of dioxins/furans from MWC's - refer to section 6.1 for more discussion on this issue) but rather on a realistic appraisal of the implementation time required, and (3) the different compliance schedules proposed create "regulatory uncertainty."

Response: An accelerated compliance schedule will be retained in the final rule for MWC units for which construction, modification, or reconstruction commenced after June 26, 1987 and that are located at existing large MWC plants. However, the proposed 1-year accelerated compliance schedule has been extended to 18 months in the final rule. The rationale for an accelerated compliance schedule is as discussed in section IV.I of the proposal preamble to the emissions guidelines. Since all MWC units at large MWC plants permitted since June 26, 1987 have been subject to NSR and are, therefore, already equipped with the appropriate acid gas/PM control devices for dioxin/furan and Hg control (i.e., SD/ESP or SD/FF), it was concluded that it would be reasonable to require that the Hg and dioxin/furan limits be complied with according to an accelerated schedule (i.e., many plants will need to retrofit carbon injection) in order to achieve additional dioxin/furan and Hg emission reductions as soon as possible. In response to public comment, the proposed 1-year accelerated compliance schedule has been extended to 18 months. Additionally, to allow more flexibility, the scheduling provisions were revised to allow for compliance with Hg and dioxin/furan limits by 18 months after either approval of the State plan or issuance of a revised construction operating permit (if a permit modification is required), whichever is later. The wording of the final rule has been revised to reflect these changes.

8.0 EMISSION GUIDELINES - MATERIALS SEPARATION PLAN

Comment: Of the 25 comments received discussing the EPA's proposal to include a materials separation plan in the emission guidelines, 7 commenters (IV-D-24, IV-D-49, IV-D-65, IV-D-73, IV-D-74, IV-D-103, IV-D-109) supported the proposal and 18 commenters (IV-D-28, IV-D-37, IV-D-38, IV-D-41, IV-D-44, IV-D-55, IV-D-56, IV-D-66, IV-D-67, IV-D-71, IV-D-85, IV-D-86, IV-D-87, IV-D-96, VI-B-02, VI-B-04, VI-B-05, VI-B-06) were not in favor of the proposal. Reasons commenters supported the proposal included the following: (1) it may result in emission reductions at little cost; (2) materials separation is necessary for proper operation of MWC's; (3) the proposed plan would be the only way to reduce MSW; and (4) materials separation could save society money. Reasons commenters objected to the proposal included the following: (1) It was not specific enough in its requirements; (2) materials separation plans could disrupt the flow of MSW to MWC's; (3) it would be economically prohibitive; (4) there is no technical basis to demonstrate that materials separation would reduce MWC emissions or the risk to the public; (5) the EPA does not have statutory authority under the Act to establish materials separation plan requirements for existing MWC's; (6) materials separation would be more effectively institute if applied to all MSW management activities in an integrated program under RCRA; and (7) material separation requirements are better addressed by local solid waste management plans.

Response: Material separation requirements will not be part of the final emission guidelines. The EPA requested comments on the possibility of including material separation requirements in the final guidelines. Based on public comment and further consideration of requiring material separation for existing plants, the EPA concluded that this type of requirement would be overly burdensome for existing plants.

9.0 EMISSION GUIDELINES - FUGITIVE ASH EMISSIONS

Refer to chapter 5.0 for a discussion of all significant legal and technical issues raised by commenters on the subject of fugitive ash emissions.

10.0 MISCELLANEOUS COMMENTS ON MUNICIPAL WASTE COMBUSTOR EMISSIONS GUIDELINES

This chapter includes miscellaneous comments made specifically about the proposed emission guidelines. Comments that were made about both the NSPS and emission guidelines regarding the health effect of dioxins/furans and Hg, procedural issues, and other miscellaneous issues are not duplicated in this chapter. The reader is referred to chapter 6.0 for additional comments on these issues.

10.1 PROCEDURAL

Comment: One commenter (IV-D-101) claimed that the July 1, 1993 40 CFR 60 already contained a subpart Cb (Emission Guidelines and Compliance Times for Sulfuric Acid Production Units) and questioned the Cb designation for this proposed rule.

Response: The emission guidelines and compliance times for Sulfuric Acid Production Units have been moved to subpart Cd of 40 CFR 60 to allow placement of this rule under subpart Cb. This redesignation of subpart Cb to Cd is specified in the same Federal Register notice in which the final NSPS and emission guidelines are published.

10.2 MISCELLANEOUS

Comment: One commenter (IV-D-80) recommended that product formulation controls be considered as a potential method of pollution control in lieu of the more costly means proposed. The commenter argued that it would be most prudent to control certain metals such as Pb, Cd, and Hg at the source, where control is efficient and cost effective. The commenter claimed there has been no national effort to control toxic materials in consumer products.

Response: Other efforts are underway to minimize the use of these metals; however, these guidelines are complying with section 129 which addresses MWC's and not product and material manufacturers.

11.0 WITHDRAWAL OF THE 1991 MUNICIPAL WASTE COMBUSTOR EMISSION GUIDELINES (SUBPART Ca)

Comment: Several commenters (IV-D-28, IV-D-37, IV-D-38, IV-D-41, IV-D-56, IV-D-99, VI-B-02, VI-B-05, VI-B-06, VI-B-07, VI-B-08, VI-B-09, VI-B-10, VI-B-12, VI-B-13) expressed support for the proposed withdrawal of the 1991 emission guidelines under subpart Ca. Several commenters (VI-B-08, VI-B-09, VI-B-10, VI-B-12, VI-B-13) stated that this withdrawal will be consistent with section 129 of the Act, which requires that certain pollutants be added to the guidelines and that the guidelines be based on MACT rather than BDT. One commenter (VI-B-13) stated that it was Congress' intent in writing section 129 that the proposed guidelines would supersede the 1991 guidelines. One commenter (VI-B-13) stated that the EPA is making a necessary "policy decision" in making a tradeoff between timing and stringency. Two commenters (IV-D-28, VI-B-13) explained that this withdrawal will avoid a situation where there are two separate retrofit schedules for subparts Ca and Cb. Several commenters (IV-D-99, VI-B-08, VI-B-09, VI-B-10, VI-B-12, VI-B-13) supported the withdrawal to avoid a situation where local governments must "double-retrofit" facilities to comply with two different requirements, which would be prohibitively costly. One commenter (IV-D-56) indicated that since most States have not adopted SIP's to implement the 1991 rule, the compliance schedule would not have been met by most operating facilities anyway. The commenter supported the withdrawal of the 1991 guidelines to circumvent noncompliance issues associated with the 1991 schedule. One commenter (VI-B-07) requested that the

EPA promptly proceed with the final withdrawal, since States are in an awkward position of defending why their State rules were not completed.

Response: The EPA agrees with the commenters that the 1991 subpart Ca emission guidelines should be withdrawn at the same time that these final subpart Cb guidelines are implemented. The withdrawal of subpart Ca is accomplished in the same Federal Register notice as the promulgated subpart Cb guidelines.

12.0 UNFUNDED MANDATES REFORM ACT AND EXECUTIVE ORDER 12875

Comment: Several commenters (IV-D-06, IV-D-08, IV-D-09, IV-D-10, IV-D-11, IV-D-13, IV-D-28, IV-D-34, IV-D-37, IV-D-38, IV-D-40, IV-D-41, IV-D-43, IV-D-44, IV-D-54, IV-D-55, IV-D-58, IV-D-62, IV-D-67, IV-D-80, IV-D-82, IV-D-87, IV-D-88, IV-D-95, IV-D-96, IV-D-99, IV-D-104, IV-D-117, VI-B-02, VI-B-03, VI-B-04, VI-B-05, VI-B-06) pointed out that the proposed emission guidelines is an unfunded mandate and that the EPA violated this mandate with its proposal. One commenter (IV-D-87) contended that the EPA violated the executive order by proposing limits more stringent than the MACT floor. Several commenters (IV-D-67, IV-D-87, IV-D-88, IV-D-96) explained that the purpose of the executive order is to reduce the imposition of unfunded mandates upon State, local, and tribal governments. Several of the commenters (IV-D-06, IV-D-08, IV-D-11, IV-D-40, IV-D-58, IV-D-62, IV-D-80) contended that the EPA should address the "checks and balances detailed in Executive Order 12875" before setting standards more stringent than the MACT floor.

Several commenters (IV-D-28, IV-D-34, IV-D-43, IV-D-44, IV-D-67, IV-D-95, VI-B-03) cited or referred to the contents of Section 1 of Executive Order 12875 as the following: "no Agency shall promulgate any regulation that is not required by statute and that creates a mandate on local government unless: (1) the funds necessary to implement the mandate are provided by the Federal government; or (2) the Agency consults with the effected governments, addresses their concerns and documents the Agency's position supporting the need to issue the regulation containing the mandate." Several commenters criticized the EPA for not complying with the latter requirement, as discussed below.

Two commenters (IV-D-28, VI-B-04) pointed out that various associations (e.g., SWANA and NLC) have been consulted by the EPA in drafting the proposal, and that throughout these consultations, these associations have urged the EPA to promulgate final regulations that are both (1) protective of human health and the environment and (2) cost effective, given the level of proven commercially available control technology. Three commenters (IV-D-28, IV-D-41, IV-D-69) implied that the EPA did not address the effected government's concerns. Three commenters (IV-D-28, IV-D-41, IV-D-69) contended that the proposed emission guidelines are based on costs that are clearly excessive and that have not been justified by the EPA, and two commenters (IV-D-28, IV-D-69) contended that the proposed emission guidelines do not protect human health and the environment.

Several commenters (IV-D-09, IV-D-28, IV-D-34, IV-D-37, IV-D-38, IV-D-41, IV-D-43, IV-D-44, IV-D-54, IV-D-55, IV-D-67, IV-D-80, IV-D-95, IV-D-99, VI-B-02, VI-B-03, VI-B-04, VI-B-05, VI-B-06) urged the EPA to justify the additional cost of selecting control levels more stringent than the MACT floor (IV-D-28, IV-D-54, IV-D-67, IV-D-80, VI-B-02, VI-B-03, VI-B-04, VI-B-05, VI-B-06 only) or provide the required funding to local governments. Two commenters (IV-D-96, VI-B-02) stated that EPA's failure to make this justification would represent a violation of the executive order. One commenter (IV-D-99) contended that the EPA must establish MACT at the MACT floor or provide the necessary funding to local governments. Three commenters (IV-D-43, IV-D-67, IV-D-95) recommended that the EPA adhere to the MACT floor to comply with the administrative procedures required by Executive Order 12875.

Response: Executive Order 12875, "Enhancing the Intergovernmental Partnership," which President Clinton signed on October 28, 1993, is directed at reducing the imposition of unfunded mandates upon State, local, and tribal governments. The Order precludes the EPA to the extent feasible and permitted by law from promulgating any regulation that is not required by statute and that creates a mandate upon a State, local, or tribal government, unless:

> (1) Funds necessary to pay the direct costs incurred by the State, local, or tribal government in complying with the mandate are provided by the Federal Government; or
> (2) The Agency, prior to the formal promulgation of regulations containing the proposed mandate, provides to the Director of the Office of Management and Budget a description of the extent of the Agency's prior consultation with representatives of affected State, local, and tribal governments, the nature of their concerns, any written communications submitted to the Agency by such units of government, and the Agency's position supporting the need to issue the regulation containing the mandate.

E.O. 12875, § 1(a) (Oct. 25, 1993). The EPA has reviewed the requirements of Executive Order 12875, and disagrees with the commenters who stated that the emission guidelines violate its terms.

The emission guidelines promulgated today are the most cost-effective and least burdensome alternative for regulating existing MWC's that satisfy the statutory requirements of sections 111 and 129 of the Act. Section 129(a)(2) of the Clean Air Act requires that the guidelines for existing MWC's reflect the maximum degree of reduction in emissions of the air pollutants designated in section 129(a)(4), taking into consideration the cost of achieving such emission reduction, and any non-air-quality health and environmental impacts and energy requirements that the Administrator determines are achievable for a particular category of sources (this standard is commonly referred to as "maximum achievable control technology, or "MACT"). Section 129 also provides that the emission limitations in the guidelines for existing MWC's may not be less stringent than the average emission limitations achieved by the best performing 12 percent of units in the category. This is referred to as the "MACT floor" for existing MWC units. Emission control options less stringent than the MACT floor can not be considered in developing section 129 guidelines.

The guidelines for existing sources have been set at the MACT level of control. For some pollutants, control levels more stringent than the floor have been required and are achieved at minimal costs. For large plants, the MACT standards are at the floor for all pollutants except three: dioxins/furans, Cd, and Hg. There is no unfunded mandate associated with the MACT standards that are set at the respective MACT floors because these levels are required by statute.

There also is no unfunded mandate associated with the final emission limits for dioxins/furans and Cd, even though the guidelines for these pollutants are more stringent than their respective MACT floors. This is because levels more stringent than the floors can be achieved by requiring optimal performance of the same acid gas/PM control systems that MWC owners and operators need to meet the MACT floor levels (and final emission guidelines) for SO_2 and PM. Therefore, setting the dioxin/furan and Cd emission limits at a lower emission rate (more stringent) than the MACT floors does not result in any additional control costs.

To achieve the Hg guidelines, additional control (i.e., carbon injection) may be required. Because of the toxicity and bioaccumulation potential of Hg, the small incremental cost of adding Hg control ($1.00 to $1.40/Mg of MSW combusted) is reasonable. Further, a consideration of the factors specified in section 129(a)(2) -- cost, emissions reductions, and non-air quality health and environmental factors) led the Administrator to conclude that MACT for Hg control includes carbon injection. The final Hg emission limit is a level that is achievable by acid gas/PM control systems combined with carbon injection.

The EPA notes that Federal funds are not available to pay the nominal direct costs that State or local governments that own MWC's may incur in order to comply with the mercury emission guidelines promulgated today. (Since no tribal governments own MWC's, no tribal governments are affected by the emission guidelines.) However, prior to the formal promulgation of these emission guidelines, the EPA satisfied the requirements of section 1(a)(2) of Executive Order 12875.

The analysis for the guidelines promulgated today for small MWC's is analogous. The final emission guidelines are more stringent than the floor for six designated pollutants. However, of the six emission limits that are more stringent than their respective MACT floor emission levels, five are limits that represent optimal performance of the acid gas/PM control system and which can be achieved with no additional control costs. The only limit that may require additional control is the limit for Hg, which may require the addition of carbon injection to achieve. After considering the same factors as were considered above for existing MWC's at large MWC plants, the Administrator concluded that MACT for Hg control includes carbon injection. Thus, the final Hg MACT emission limit for existing MWC's at small MWC plants are the levels that are achievable by acid gas/PM control systems combined with carbon injection.

Accordingly, the EPA has met the requirements of Executive Order 12875 by (1) Promulgating standards that are either statutorily required or, where more stringent than the floor, are standards that can be achieved at a cost that is reasonable in light of the environmental hazards posed; and

(2) consulting with affected State and local officials to hear any concerns they may have with the proposed emission guidelines.