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Subject: Baseline Emissions and Emissions Reductions for Existing and New HMIWI
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I. Background

The U.S. Environmental Protection Agency (EPA) is re-developing the regulation for hospital/medical/infectious waste incinerators (HMIWI) to respond to concerns raised by the U.S. Court of Appeals for the D.C. Circuit regarding the methodology originally used to develop the regulation. The EPA, under sections 111 and 129 of the Clean Air Act (CAA), is required to regulate emissions of nine pollutants from HMIWI. These nine pollutants are hydrogen chloride (HCl), carbon monoxide (CO), lead (Pb), cadmium (Cd), mercury (Hg), particulate matter (PM), dioxins/furans (CDD/CDF), nitrogen oxides (NO_x), and sulfur dioxide (SO₂). The EPA has developed a series of control options to reduce the emissions of these pollutants from the 57 HMIWI currently operating in the U.S. and from the three HMIWI projected to start up in the next few years. These control options are discussed in separate memoranda.^{1,2}

The purpose of this memorandum is to present baseline emissions estimates for these nine pollutants for existing and new HMIWI for each of the HMIWI size subcategories (large, medium, small non-rural [also called “small”], and small rural) and to determine for these HMIWI the reduction in emissions that are expected to result from compliance using the aforementioned control options. (Note: Small rural HMIWI are not included as a subcategory for new sources.) An estimated 57 HMIWI are currently in operation, and an additional 3 new HMIWI are projected.

II. Existing Sources

A. Baseline Emissions

Annual baseline emissions were estimated for each of the 57 existing HMIWI using site-specific emissions concentrations, stack gas flow rates, operating hours, and stack gas temperatures from the HMIWI inventory database and test data database.^{3,4} The baseline emissions for each HMIWI are presented in Table 1 at the end of this memorandum. The equations used to estimate the baseline emissions are as follows:

PM (pounds per year [lb/yr]) = [concentration (grains per dry standard cubic foot [gr/dscf])] x [stack gas flow rate (dry standard cubic feet per minute [dscfm])] x [1 lb/7000 gr] x [60 min/hr] x [operating hours per year (hr/yr)]

Pb, Cd, Hg (lb/yr) = [concentration (milligrams per dry standard cubic meter [mg/dscm])] x [1 cubic meter (m³)/35.31467 cubic feet (ft³)] x [stack gas flow rate (dscfm)] x [1 lb/453.59237 grams (g)] x [1 g/1000 mg] x [60 minutes per hour (min/hr)] x [operating hours per year (hr/yr)]

CDD/CDF (grams per year [g/yr]) = [concentration (nanograms per dry standard cubic meter [ng/dscm])] x [1 m³/35.31467 ft³] x [stack gas flow rate (dscfm)] x [1 g/10⁹ ng] x [60 min/hr] x [operating hours per year (hr/yr)]

HCl, CO, NO_x, SO₂ (lb/yr) = [concentration (parts per million by volume, dry basis [ppmvd])] x [molecular weight (g/g-mole)] x [gas constant (1 g-mole-°K/0.08206 liter-atmosphere [L-atm])] x [pressure (1 atm)] x [1/temperature in °K (°C + 273°)] x [1,000 L-micrograms (µg)/g-m³] x [1 m³/35.31467 ft³] x [1 g/10⁶ µg] x [1 lb/453.59237 g] x [stack gas flow rate (dscfm)] x [60 min/hr] x [operating hours per year (hr/yr)]

In a few cases, emissions data were unavailable, and average concentrations were assigned to those HMIWI in order to estimate baseline emissions. (The average concentrations used, and the baseline emissions estimated from them, are highlighted in Table 1 at the end of this memorandum.) Average concentrations were developed for the particular pollutant, HMIWI size, and emission control type for which data were missing, using the emissions data in the HMIWI test data database.³ The average concentrations that were developed are presented in Table 2 at the end of this memorandum.

Baseline emissions were estimated by summing the baseline emission estimates for the HMIWI and pollutants. To avoid double counting with total CDD/CDF, the CDD/CDF toxic equivalents (TEQ) were not included in the sum. Baseline emissions (in pounds per year [lb/yr] and grams per year [g/yr]) were estimated to be:

<u>Pollutant</u>	<u>Large</u>	<u>Medium</u>	<u>Small</u>	<u>Small rural</u>	<u>Total</u>
HCl, lb/yr	196,000	1,580	43.6	581	198,000
CO, lb/yr	18,800	1,250	146	12.7	20,200
Pb, lb/yr	343	71.6	3.88	1.56	420
Cd, lb/yr	26.9	7.77	0.0954	0.263	35.1
Hg, lb/yr	675	6.74	0.259	0.302	682
PM, lb/yr	78,000	10,900	781	228	89,900
Total CDD/CDF, g/yr	39.8	4.66	0.0372	0.234	44.7
CDD/CDF TEQ, g/yr	0.762	0.0619	0.000599	0.00475	0.830
NO _x , lb/yr	1,030,000	46,900	5,280	320	1,080,000
SO ₂ , lb/yr	122,000	3,380	245	62.1	126,000
Total, lb/yr	1,450,000	64,100	6,500	1,210	1,520,000

Note that the emission estimates presented above have been rounded to three significant digits, so there may be some rounding error in the calculation of total nationwide baseline emissions.

B. Emission Reductions

The emission limits that were developed for each pollutant and HMIWI size under the maximum achievable control technology (MACT) floor options and beyond-the-floor (BTF)

options were assigned to each HMIWI, as applicable. The same equations presented above were used to estimate the control level emissions at the MACT floor and beyond the MACT floor. If the HMIWI is already meeting the emission limit (i.e., the baseline concentration is less than the emission limit), then the control level emissions were assumed equal to the baseline emissions, with one exception. In those cases where the BTF option includes NO_x control (i.e., selective noncatalytic reduction, or SNCR), and the HMIWI is already meeting the NO_x BTF limit, the NO_x control level emissions were estimated as shown in the following equation, assuming 45 percent NO_x control with SNCR:⁵

$$\text{NO}_x \text{ BTF control level (lb/yr)} = [\text{NO}_x \text{ baseline (lb/yr)}] \times (100\% - 45\%)$$

Emission reductions from baseline were estimated as the difference between the baseline emissions and the control level emissions (MACT floor or BTF). The incremental emission reductions expected by going from the MACT floor to the more stringent BTF level were estimated as the difference between the MACT floor emissions and BTF emissions.

Total nationwide emission reductions were estimated by summing the emission reduction estimates for the 57 HMIWI and 9 pollutants. Tables 3 and 4 at the end of this memorandum present the emissions and emission reductions associated with the MACT floor and BTF control options for each HMIWI. Relative to baseline, the emission reductions obtained at the MACT floor (in lb/yr, g/yr, and % reduction) were estimated to be:

<u>Pollutant</u>	<u>Large</u>	<u>Medium</u>	<u>Small</u>	<u>Small rural</u>	<u>Total</u>	<u>% red.</u>
HCl, lb/yr	183,000	897	0	0	184,000	93%
CO, lb/yr	6,250	574	30.4	0	6,860	34%
Pb, lb/yr	293	67.4	0	0	361	86%
Cd, lb/yr	15.7	6.31	0	0	22.0	63%
Hg, lb/yr	631	5.36	0.0813	0.283	637	93%
PM, lb/yr	23,100	4,260	0	0	27,300	30%
Total CDD/CDF, g/yr	36.6	4.59	0	0	41.2	92%
CDD/CDF TEQ, g/yr	0.705	0.0607	0.000508	0	0.767	92%
NO _x , lb/yr	148,000	0	0	0	148,000	14%
SO ₂ , lb/yr	98,200	1,840	50.0	0	100,000	79%
Total, lb/yr	460,000	7,650	80.5	0.283	468,000	31%

The incremental emission reductions obtained by going from the MACT floor to the more stringent BTF level were estimated to be:

<u>Pollutant</u>	<u>Large</u>	<u>Medium</u>	<u>Small</u>	<u>Small rural</u>	<u>Total</u>	<u>% red.</u>
HCl, lb/yr	7,970	115	0	569	8,660	64%
CO, lb/yr	1,910	157	57.4	0	2,130	16%
Pb, lb/yr	46.9	0.230	3.42	0.318	50.9	86%
Cd, lb/yr	10.7	0	0	0.180	10.8	83%
Hg, lb/yr	38.9	0.846	0.120	0	39.9	88%
PM, lb/yr	5,450	1,060	178	0	6,690	11%
Total CDD/CDF, g/yr	1.89	0.0323	0.0327	0.208	2.16	61%
CDD/CDF TEQ, g/yr	0.0271	0	0	0.00473	0.0318	51%

<u>Pollutant</u>	<u>Large</u>	<u>Medium</u>	<u>Small</u>	<u>Small rural</u>	<u>Total</u>	<u>% red.</u>
NO _x , lb/yr	278,000	29,600	3,370	192	311,000	33%
SO ₂ , lb/yr	6,750	1,040	141	58.4	7,980	31%
Total, lb/yr	300,000	32,000	3,750	820	336,000	32%

Relative to baseline, the emission reductions obtained beyond the floor (in lb/yr, g/yr, and % reduction) were estimated to be:

<u>Pollutant</u>	<u>Large</u>	<u>Medium</u>	<u>Small</u>	<u>Small rural</u>	<u>Total</u>	<u>% red.</u>
HCl, lb/yr	191,000	1,010	0	569	193,000	98%
CO, lb/yr	8,160	731	87.8	0	8,980	44%
Pb, lb/yr	340	67.7	3.42	0.318	412	98%
Cd, lb/yr	26.3	6.31	0	0.180	32.8	94%
Hg, lb/yr	670	6.20	0.202	0.283	677	99%
PM, lb/yr	28,500	5,320	178	0	34,000	38%
Total CDD/CDF, g/yr	38.5	4.62	0.0327	0.208	43.3	97%
CDD/CDF TEQ, g/yr	0.733	0.0607	0.000508	0.00473	0.798	96%
NO _x , lb/yr	426,000	29,600	3,370	192	459,000	42%
SO ₂ , lb/yr	105,000	2,880	191	58.4	108,000	86%
Total, lb/yr	760,000	39,600	3,830	820	804,000	53%

Note that the emission reduction estimates presented above have been rounded to three significant digits, so there may be some rounding error in the calculation of total nationwide emission reductions.

III. New Sources

A. Baseline Emissions

Annual baseline emissions were estimated for the three projected new HMIWI using model emissions concentrations, stack gas flow rates, operating hours, and stack gas temperatures patterned after HMIWI that have been installed over the last 10 years.^{3,4} The model parameters and baseline emissions for these three HMIWI are presented in Table 5 at the end of this memorandum. The baseline emissions for these three HMIWI were estimated using the same equations presented above.

In a few cases, emissions data were unavailable for the HMIWI that were used as the basis for the three projected new HMIWI. Consequently, average concentrations were assigned to those HMIWI in order to estimate baseline emissions. (The average concentrations used, and the baseline emissions estimated from them, are highlighted in Table 5 at the end of this memorandum.) Average concentrations were developed for the particular pollutant, HMIWI size, and emission control type for which data were missing, using the emissions data in the HMIWI test data database.³ The average concentrations that were developed are presented in Table 2 at the end of this memorandum.

Total nationwide baseline emissions were estimated by summing the baseline emission estimates for the three projected new HMIWI and nine pollutants (after converting total CDD/CDF emissions from grams to pounds). As before, total CDD/CDF was included in the sum instead of CDD/CDF TEQ. Total nationwide baseline emissions (in lb/yr and g/yr) were estimated to be:

<u>Pollutant</u>	<u>Large</u>	<u>Medium</u>	<u>Small</u>	<u>Total</u>
HCl, lb/yr	2,580	328	13.2	2,920
CO, lb/yr	827	58.7	94.5	980
Pb, lb/yr	3.96	0.137	0.572	4.67
Cd, lb/yr	0.332	0.0358	0.0429	0.410
Hg, lb/yr	2.79	0.312	0.0230	3.12
PM, lb/yr	5,660	308	137	6,100
Total CDD/CDF, g/yr	0.0442	0.249	0.0103	0.304
CDD/CDF TEQ, g/yr	0.000805	0.00294	0.0000162	0.00376
NO _x , lb/yr	32,000	4,880	1,350	38,200
SO ₂ , lb/yr	465	122	62.8	650
Total, lb/yr	41,500	5,700	1,660	48,900

Note that the emission estimates presented above have been rounded to three significant digits, so there may be some rounding error in the calculation of total nationwide baseline emissions.

B. Emission Reductions

The emission limits that were developed for each pollutant and HMIWI size under the MACT floor and BTF options were assigned to each HMIWI, as applicable. The same equations presented above were used to estimate the control level emissions at the MACT floor and beyond the MACT floor. If the HMIWI is already meeting the emission limit (i.e., the baseline concentration is less than the emission limit), then the control level emissions were assumed equal to the baseline emissions.

As before, emission reductions from baseline were estimated as the difference between the baseline emissions and the control level emissions (MACT floor or BTF). The incremental emission reductions expected by going from the MACT floor to the more stringent BTF level were estimated as the difference between the MACT floor emissions and BTF emissions.

Total nationwide emission reductions were estimated by summing the emission reduction estimates for the three projected new HMIWI and nine pollutants. Tables 6 and 7 at the end of this memorandum present the emissions and emission reductions associated with the MACT floor and BTF control options for each new HMIWI. Relative to baseline, the total nationwide emission reductions obtained at the MACT floor (in lb/yr, g/yr, and % reduction) were estimated to be:

<u>Pollutant</u>	<u>Large</u>	<u>Medium</u>	<u>Small</u>	<u>Total</u>	<u>% red.</u>
HCl, lb/yr	2,340	262	0	2,600	89%
CO, lb/yr	124	5.15	30.5	159	16%

<u>Pollutant</u>	<u>Large</u>	<u>Medium</u>	<u>Small</u>	<u>Total</u>	<u>% red.</u>
Pb, lb/yr	3.82	0	0	3.82	82%
Cd, lb/yr	0.296	0	0	0.296	72%
Hg, lb/yr	2.51	0.245	0	2.75	88%
PM, lb/yr	2,360	0	0	2,360	39%
Total CDD/CDF, g/yr	0	0.244	0	0.244	80%
CDD/CDF TEQ, g/yr	0	0.00280	0	0.00280	74%
NO _x , lb/yr	0	3,120	863	3,980	10%
SO ₂ , lb/yr	0	71.9	48.8	121	19%
Total, lb/yr	4,840	3,460	942	9,240	19%

The incremental emission reductions obtained by going from the MACT floor to the more stringent BTF level were estimated to be:

<u>Pollutant</u>	<u>Large</u>	<u>Medium</u>	<u>Small</u>	<u>Total</u>	<u>% red.</u>
HCl, lb/yr	0	0	0	0	0%
CO, lb/yr	0	0	0	0	0%
Pb, lb/yr	0	0	0.446	0.446	52%
Cd, lb/yr	0	0	0	0	0%
Hg, lb/yr	0	0	0.00726	0.00726	2%
PM, lb/yr	0	0	0	0	0%
Total CDD/CDF, g/yr	0	0	0.00905	0.00905	15%
CDD/CDF TEQ, g/yr	0	0	0	0	0.2%
NO _x , lb/yr	7,910	0	0	7,910	23%
SO ₂ , lb/yr	0	0	0	0	0%
Total, lb/yr	7,910	0	0.453	7,910	20%

Relative to baseline, emission reductions obtained beyond the floor (in lb/yr, g/yr, and % reduction) were estimated to be:

<u>Pollutant</u>	<u>Large</u>	<u>Medium</u>	<u>Small</u>	<u>Total</u>	<u>% red.</u>
HCl, lb/yr	2,340	262	0	2,600	89%
CO, lb/yr	124	5.15	30.5	159	16%
Pb, lb/yr	3.82	0	0.446	4.27	91%
Cd, lb/yr	0.296	0	0	0.296	72%
Hg, lb/yr	2.51	0.245	0.00726	2.76	88%
PM, lb/yr	2,360	0	0	2,360	39%
Total CDD/CDF, g/yr	0	0.244	0.00905	0.253	83%
CDD/CDF TEQ, g/yr	0	0.00280	0	0.00280	74%
NO _x , lb/yr	7,910	3,120	863	11,900	31%
SO ₂ , lb/yr	0	71.9	48.8	121	19%
Total, lb/yr	12,700	3,460	943	17,100	35%

Note that the emission reduction estimates presented above have been rounded to three significant digits, so there may be some rounding error in the calculation of total nationwide emission reductions.

IV. References

1. Memorandum from Thomas Holloway, RTI, to Mary Johnson, EPA. October 24, 2008. *MACT Floors, Data Variability Analysis, and Emission Limits for Existing and New HMIWI.*
2. Memorandum from Thomas Holloway, RTI, to Mary Johnson, EPA. October 24, 2008. *Analysis of Beyond-the-Floor Options.*
3. Memorandum from Thomas Holloway, RTI, to Mary Johnson, EPA. October 24, 2008. *Documentation of HMIWI Test Data Database.*
4. Memorandum from Thomas Holloway, RTI, to project file. October 24, 2008. *Updated Hospital/Medical/Infectious Waste Incinerator (HMIWI) Inventory Database.*
5. U.S. Environmental Protection Agency. November 1999. *EPA Technical Bulletin: Nitrogen Oxides (NO_x)--Why and How They Are Controlled.* Clean Air Technology Center. Publication Number EPA/456/F-99-006R.

Table 1. Baseline Emissions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD code	APCD type	APCD description
1	1	1	Bristol-Myers Squibb Co.		Wallingford	CT	L	E	FF	Dry	Secondary chamber (1800F) and baghouse
2	5	5	Merck & Company, Inc.		Rahway	NJ	L	E	DIFF	Dry	Secondary chamber (1500F, 1 sec), partial quench, dry acid gas scrubber with dry lime injection, and baghouse
3	15	15--1	Curtis Bay Energy	Unit 1	Baltimore	MD	L	E	DIFF	Dry	Secondary chamber, dry scrubber, and baghouse
4	15	15--2	Curtis Bay Energy	Unit 2	Baltimore	MD	L	E	DIFF	Dry	Secondary chamber, dry scrubber, and baghouse
5	20	20--1	Fort Detrick	Unit 5	Fort Detrick	MD	L	E	WS	Wet	Secondary chamber and rotary atomizing wet scrubber
6	20	20--2	Fort Detrick	Unit 6	Fort Detrick	MD	L	E	WS	Wet	Secondary chamber and rotary atomizing wet scrubber
7	29	29	Hamot Medical Center		Erie	PA	L	E	DIFF/WS	Dry/wet	Secondary chamber (2000F, 2 sec), lime injection system, powdered activated carbon injection system, baghouse, and vertical upflow two-stage multi-microventuri scrubber system
8	36	36--1	Merck & Company, Inc.	Unit 2	West Point (Upper Gwynedd Township)	PA	L	E	DIFF	Dry	Secondary/tertiary chamber (2000F, 2 sec), water quench followed by sodium bicarbonate injection system with dry reaction chamber and pulse-jet baghouse
9	36	36--2	Merck & Company, Inc.	Unit 5	West Point (Upper Gwynedd Township)	PA	L	E	DIFF	Dry	Secondary chamber (1800F, 2.2 sec), water quench followed by sodium bicarbonate injection system and pulse-jet baghouse
10	40	40	Charleston Area Medical Center, General Hospital		Charleston	WV	L	E	DIFF	Dry	Secondary chamber (1800F, 2 sec), dry injection/baghouse scrubber system with activated carbon
11	42	42	Stericycle, Inc.		Apopka	FL	L	E	DIFF	Dry	Secondary chamber (1800, 1 sec), dry scrubbing system with quench chamber, passive absorber, lime and carbon injection, and baghouse.
12	43	43	Boca Raton Community Hospital		Boca Raton	FL	L	E	WS	Wet	Secondary chamber (1800F, 1 sec) and rotary atomizing wet scrubber system with caustic soda injection
13	44	44	Bethesda Memorial Hospital		Boynton Beach	FL	L	E	WS	Wet	Secondary chamber (1800F, 2 sec) and rotary atomizing scrubber with mist eliminator
14	46	46	Holy Cross Hospital		Fort Lauderdale	FL	L	E	WS	Wet	Secondary chamber (1800F, 1 sec) and venturi scrubber with packed bed absorption unit using dilute NaOH
15	48	48	Memorial Regional Hospital		Hollywood	FL	L	E	WS	Wet	Secondary chamber (1800F, 1 sec), packed column gas scrubber, and wet ESP
16	51	51	Lakeland Regional Medical Center		Lakeland	FL	L	E	DIFF	Dry	Secondary chamber (1800F, 1 sec), lime injection system, and baghouse
17	54	54	Bayfront Medical Center		St. Petersburg	FL	L	E	WS	Wet	Secondary chamber (1800F, 1 sec) and flux force/condensation collision scrubber system using dilute NaOH
18	55	55	St. Joseph's Hospital		Tampa	FL	L	E	DIFF/WS	Dry/wet	Secondary chamber (1800F, 1 sec), lime injection, baghouse, and venturi scrubber
19	59	59--1	Stericycle, Inc.	Unit 1	Haw River	NC	L	E	WS	Wet	Secondary chamber (1800F, 1 sec), rapid gas quench system, wet scrubber system consisting of a packed bed absorber and venturi scrubber, and demister.

Table 1. Baseline Emissions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD code	APCD type	APCD description
20	59	59--2	Stericycle, Inc.	Unit 2	Haw River	NC	L	E	WS	Wet	Secondary chamber (1800F, 1 sec), rapid gas quench system, wet scrubber system consisting of a packed bed absorber and venturi scrubber, and demister.
21	60	60--1	BMWNC, Inc.	Unit 1	Matthews	NC	L	E	DIFF	Dry	Secondary chamber (1641F), dry scrubber with lime and activated carbon injection, and baghouse
22	65	65--1	Stericycle, Inc.	Unit 1	Clinton	IL	L	E	WS	Wet	Secondary chamber (1800F), venturi scrubber, and condensing absorber
23	65	65--2	Stericycle, Inc.	Unit 2	Clinton	IL	L	E	WS	Wet	Secondary chamber (1800F), venturi scrubber, and condensing absorber
24	71	71	Loyola University Medical Center		Maywood	IL	L	E	WS	Wet	Two secondary chambers (1600F), twin rotary atomizer scrubber using 50% caustic solution, and two demister pads
25	77	77	Parkview Hospital		Fort Wayne	IN	L	E	WS	Wet	Secondary chamber and wet scrubber
26	84	84	Mayo Clinic, Waste Management Facility		Rochester	MN	L	E	DIFF	Dry	Secondary chamber (1800F, 1 sec) and baghouse with lime and carbon injection
27	87	87	MedCentral Health System, Mansfield Hospital		Mansfield	OH	L	E	DIFF	Dry	Secondary chamber (1800F, 2 sec) and baghouse with lime and carbon injection system
28	94	94	Stericycle, Inc.		Warren	OH	L	E	WS	Wet	Secondary chamber (1800F, 2 sec), wet scrubber
29	98	98--1	University of Texas Medical Branch		Galveston	TX	L	E	WS	Wet	Secondary chamber, packed tower, and venturi scrubber with activated carbon injection
30	106	106	Stericycle, Inc.		Kansas City	KS	L	E	WS	Wet	Secondary chamber (1800F, 2 sec), wet scrubber
31	109	109	Healthcare Environmental Services Inc.		Fargo	ND	L	E	DIFF	Dry	Secondary chamber (1800F) and dry scrubber/baghouse system with lime and carbon injection
32	110	110	Stericycle, Inc.		North Salt Lake	UT	L	E	DI-ESP/WS	Dry/wet	Secondary chamber (1834F), carbon injection system, ESP, dry scrubber, and wet gas absorber
33	120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	Anahuac	TX	L	N	DIFF	Dry	Secondary chamber, baghouse with virgin lime injection, urea injection, and activated carbon injection
34	120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	Anahuac	TX	L	N	DIFF	Dry	Secondary chamber, baghouse with virgin lime injection, urea injection, and activated carbon injection
35	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		Greenville	NC	L	N	CA/WS	Dry/wet	Secondary chamber (1985F), rotary atomizing wet scrubber (with NaOH scrubbing medium), carbon bed adsorber, HEPA filtering system, and heat recovery system
36	130	130	Department of Veterans Affairs Medical Center		Miami	FL	L	E	WS	Wet	Secondary chamber (1800F, 1 sec), venturi scrubber, and packed tower absorber
37	13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		Baltimore	MD	M	E	WS	Wet	Secondary chamber (1832F) and venturi caustic scrubber with packed-bed scrubber
38	16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		Baltimore	MD	M	E	WS	Wet	Secondary chamber (1800F) and venturi wet scrubber followed by saturation chamber and mist eliminator
39	18	18	Franklin Square Hospital Center		Baltimore	MD	M	E	WS	Wet	Secondary chamber (1800F) and venturi scrubber followed by quench chamber and mist eliminator
40	21	21	Washington County Hospital		Hagerstown	MD	M	E	WS	Wet	Secondary chamber and venturi caustic scrubber

Table 1. Baseline Emissions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD code	APCD type	APCD description
41	25	25	Holy Spirit Hospital		Camp Hill	PA	M	E	WS	Wet	Secondary chamber (1800F) and venturi scrubber with prequench and NaOH injection
42	30	30	Riddle Memorial Hospital		Media	PA	M	E	WS	Wet	Secondary chamber (1800F, 2 sec), caustic packed tower scrubber, and high pressure venturi, with activated carbon injection
43	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		State College	PA	M	E	WS	Wet	Secondary chamber (1900F) and rotary atomizing wet scrubber with demister
44	38	38	Wilkes-Barre General Hospital		Wilkes-Barre	PA	M	N	DIFF	Dry	Secondary/tertiary chambers (1800F, 2.85 sec) and dry scrubber/baghouse with lime and activated carbon injection
45	41	41	Thomas Memorial Hospital		South Charleston	WV	M	E	WS	Wet	Secondary chamber (1800F) and venturi packed tower wet scrubber with caustic injection
46	47	47	Malcolm Randall Veterans Affairs Medical Center		Gainesville	FL	M	E	WS	Wet	Secondary chamber (1800F, 1 sec) and wet scrubber with caustic soda injection
47	63	63	St. Jude Children's Research Hospital		Memphis	TN	M	E	DIFF	Dry	Secondary chamber (1528F) and baghouse with sodium bicarbonate and carbon injection
48	81	81	South Bend Medical Foundation		South Bend	IN	M	E	WS	Wet	Secondary chamber and wet scrubber
49	82	82	Good Samaritan Hospital		Vincennes	IN	M	E	WS	Wet	Secondary chamber and multi-chamber spray scrubber
50	88	88	Medina General Hospital		Medina	OH	M	E	WS	Wet	Secondary chamber (1800F, 1 sec) and wet scrubber
51	95	95	St. Joseph's Hospital		Marshfield	WI	M	E	DIFF	Dry	Secondary chamber (1800F), quench tower, and baghouse with lime/carbon injection
52	108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	Hamilton	MT	M	E	WS	Wet	Secondary chamber and wet scrubber
53	111	111	Wyoming Medical Center		Casper	WY	M	E	WS	Wet	Secondary chamber and wet scrubber
54	86	86	Fairfield Medical Center		Lancaster	OH	S	E	WS	Wet	Secondary chamber (1800F, 1 sec) and wet scrubber
55	129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	Atlanta	GA	S	N	WS	Wet	Secondary chamber (1800F, 1.68 sec) and rotary atomizing wet scrubber
56	115	115	Kona Community Hospital		Kealahou	HI	SR	E	CC	Comb ctrl	Secondary chamber (1900F, 2 sec), no APCD
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		Bethel	AK	SR	E	CC	Comb ctrl	Secondary chamber, no APCD
Large total											
Medium total											
Small total											
Small rural total											
Nationwide total											

Notes:

1. HCl, CO, NO_x, SO₂ baseline emissions (lb/yr) = concentration (ppmvd) x molecular weight (g/g-mol) x g-mol⁻¹K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-μg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ μg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
2. Pb, Cd, Hg baseline emissions (lb/yr) = concentration (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
3. PM baseline emissions (lb/yr) = concentration (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
4. CDD/CDF, TEQ baseline emissions (g/yr) = concentration

Table 1. Baseline Emissions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD code	APCD type	APCD description
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(ng/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x

g/10⁹ ng x 60 min/hr x operating hours (hr/yr)

5. Baseline emissions estimated from average emissions data were calculated using the same equations above.

6. Total baseline emissions (lb/yr) = $\sum(\text{HCl, CO, Pb, Cd, Hg, PM, NO}_x,$

SO₂ lb/yr) + (total CDD/CDF g/yr x lb/453.59237 g)

7. Molecular weights:

HCl g/g-mol = 36

CO g/g-mol = 28

NO_x g/g-mol = 46

SO₂ g/g-mol = 64

Sources:

1. Inventory database

2. Test data database

Key:

 Emissions data unavailable; used average emissions data from Table 2 to estimate emissions

- CA = Carbon adsorber
- CC = Combustion control
- Cd = Cadmium
- CDD/CDF = Dioxins/furans
- CO = Carbon monoxide
- DI = Dry sorbent injection
- DIFF = Dry injection fabric filter
- dscf = Dry standard cubic feet
- dscm = Dry standard cubic meter
- E = Existing HMIWI
- ESP = Electrostatic precipitator
- FF = Fabric filter
- gr = Grains
- HCl = Hydrogen chloride
- Hg = Mercury
- HMIWI = Hospital/medical/infectious waste incinerator(s)
- L = Large HMIWI
- M = Medium HMIWI
- mg = Milligrams
- N = New HMIWI
- ng = Nanograms
- NO_x = Nitrogen oxides
- Pb = Lead
- PM = Particulate matter
- ppmvd = Parts per million by volume, dry
- S = Small HMIWI
- SO₂ = Sulfur dioxide
- SR = Small rural HMIWI
- TEQ = 2,3,7,8-TCDD toxic equivalent
- WESP = Wet ESP
- WS = Wet scrubber

Table 1. Baseline Emissions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	Design capacity (lb/hr)	Design capacity (lb/batch)	Maximum charge rate (lb/hr)	Stack gas flow rate (dscfm)	Stack gas temperature (°F)	Stack gas temperature (°C)	Operating hours (hr/yr)	HCl unit average (ppmvd)	CO unit average (ppmvd)
1	1	1	Bristol-Myers Squibb Co.		1,000		1,000	1,648	217	103	2,072	65.7	0.983
2	5	5	Merck & Company, Inc.		799		799	7,346	246	119	4,321	0.780	1.41
3	15	15--1	Curtis Bay Energy	Unit 1	8,333		7,083	27,698	296	147	8,736	85.2	1.26
4	15	15--2	Curtis Bay Energy	Unit 2	8,333		7,083	30,578	303	151	8,736	76.9	2.91
5	20	20--1	Fort Detrick	Unit 5	1,000		1,000	2,424	87	31	1,300	0.190	0.871
6	20	20--2	Fort Detrick	Unit 6	1,000		1,000	2,308	92	33	1,300	0.353	1.17
7	29	29	Hamot Medical Center		1,060		1,060	3,701	122	50	2,080	16.6	2.60
8	36	36--1	Merck & Company, Inc.	Unit 2	2,000		2,000	5,235	358	181	865	4.22	2.46
9	36	36--2	Merck & Company, Inc.	Unit 5	3,045		3,045	8,119	304	151	5,753	3.75	1.07
10	40	40	Charleston Area Medical Center, General Hospital		1,000		1,000	4,323	312	156	1,248	26.6	11.3
11	42	42	Stericycle, Inc.		1,900		1,900	7,008	327	164	7,951	27.1	10.7
12	43	43	Boca Raton Community Hospital		730		730	2,078	91	33	8,736	0.986	6.46
13	44	44	Bethesda Memorial Hospital		1,000		1,000	4,537	106	41	3,024	0.608	2.74
14	46	46	Holy Cross Hospital		1,300		1,300	3,378	124	51	2,964	1.18	4.91
15	48	48	Memorial Regional Hospital		1,800		1,800	4,568	143	62	4,992	1.02	1.17
16	51	51	Lakeland Regional Medical Center		750		750	3,323	212	100	6,247	2.68	6.35
17	54	54	Bayfront Medical Center		1,500		1,500	2,898	133	56	3,352	0.947	9.36
18	55	55	St. Joseph's Hospital		1,500		1,500	3,347	400	204	8,008	12.5	5.85
19	59	59--1	Stericycle, Inc.	Unit 1	1,911		1,911	4,002	135	57	8,400	4.24	3.95

Table 1. Baseline Emissions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	Design capacity (lb/hr)	Design capacity (lb/batch)	Maximum charge rate (lb/hr)	Stack gas flow rate (dscfm)	Stack gas temperature (°F)	Stack gas temperature (°C)	Operating hours (hr/yr)	HCl unit average (ppmvd)	CO unit average (ppmvd)
20	59	59--2	Stericycle, Inc.	Unit 2	1,911		1,911	3,917	138	59	8,400	3.88	4.61
21	60	60--1	BMWNC, Inc.	Unit 1	1,500		1,500	6,763	343	173	7,456	38.8	15.1
22	65	65--1	Stericycle, Inc.	Unit 1	1,500		1,500	3,304	143	62	7,665	1.12	12.9
23	65	65--2	Stericycle, Inc.	Unit 2	1,500		1,500	3,125	141	61	7,558	1.43	5.77
24	71	71	Loyola University Medical Center		1,650		1,650	3,526	156	69	4,800	2.22	7.07
25	77	77	Parkview Hospital		1,200		1,200	2,766	114	46	8,395	2.68	5.90
26	84	84	Mayo Clinic, Waste Management Facility		2,000		2,000	6,516	294	146	6,240	15.2	2.24
27	87	87	MedCentral Health System, Mansfield Hospital		600		600	2,351	260	127	3,120	24.8	4.81
28	94	94	Stericycle, Inc.		1,400		1,400	2,737	138	59	7,904	0.661	4.45
29	98	98--1	University of Texas Medical Branch		1,500		1,500	4,534	111	44	5,328	2.12	1.73
30	106	106	Stericycle, Inc.		1,500		1,500	3,590	152	67	8,760	0.567	4.62
31	109	109	Healthcare Environmental Services Inc.		1,686		1,686	4,478	302	150	1,872	72.5	14.7
32	110	110	Stericycle, Inc.		2,500		1,935	6,291	126	52	7,309	3.93	7.39
33	120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	4,167		4,167	10,031	296	147	7,896	11.0	3.96
34	120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	4,167		4,167	9,028	291	144	7,896	5.30	2.86
35	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		1,000		1,000	3,124	125	52	625	1.58	10.7
36	130	130	Department of Veterans Affairs Medical Center		1,000		1,000	6,422	155	68	4,160	8.32	1.00
37	13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		500		500	1,972	189	87	1,440	0.708	1.50
38	16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		320		320	1,890	179	82	1,350	1.39	11.8
39	18	18	Franklin Square Hospital Center		1,000		500	2,999	54	12	5,408	1.48	5.363
40	21	21	Washington County Hospital		573		500	1,834	112	44	2,496	6.26	6.62

Table 1. Baseline Emissions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	Design capacity (lb/hr)	Design capacity (lb/batch)	Maximum charge rate (lb/hr)	Stack gas flow rate (dscfm)	Stack gas temperature (°F)	Stack gas temperature (°C)	Operating hours (hr/yr)	HCl unit average (ppmvd)	CO unit average (ppmvd)
41	25	25	Holy Spirit Hospital		570		500	1,702	99	37	3,944	0.736	1.88
42	30	30	Riddle Memorial Hospital		500		500	1,730	239	115	2,920	2.10	1.41
43	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		600		500	2,117	175	79	1,022	1.27	2.11
44	38	38	Wilkes-Barre General Hospital		400		400	2,063	274	134	4,472	8.95	2.08
45	41	41	Thomas Memorial Hospital		470		470	1,526	146	63	2,080	2.62	0.946
46	47	47	Malcolm Randall Veterans Affairs Medical Center		495		495	1,645	115	46	1,664	4.69	11.6
47	63	63	St. Jude Children's Research Hospital		500		500	2,333	276	136	1,050	27.5	0.679
48	81	81	South Bend Medical Foundation		470		470	2,325	121	49	2,028	12.3	2.06
49	82	82	Good Samaritan Hospital		565		500	1,352	128	53	2,574	1.58	1.91
50	88	88	Medina General Hospital		300		300	1,153	100	38	3,016	3.29	14.1
51	95	95	St. Joseph's Hospital		940		500	1,634	223	106	1,404	5.27	2.15
52	108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	825		500	1,790	112	44	1,248	0.455	1.97
53	111	111	Wyoming Medical Center		400		400	1,505	130	54	989	1.17	3.28
54	86	86	Fairfield Medical Center		95		95	1,095	97	36	5,018	1.03	2.27
55	129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	120		120	717	161	72	2,920	1.30	12.11
56	115	115	Kona Community Hospital		250		200	684	1,787	975	1,430	135	7.00
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		50	200	50	559	1,457	792	1,560	298	5.41
Large total													
Medium total													
Small total													
Small rural total													
Nationwide total													

Notes:

1. HCl, CO, NO_x, SO₂ baseline emissions (lb/yr) = concentration (ppmvd) x molecular weight (g/g-mol) x g-mol-°K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-µg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ µg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
2. Pb, Cd, Hg baseline emissions (lb/yr) = concentration (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
3. PM baseline emissions (lb/yr) = concentration (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
4. CDD/CDF, TEQ baseline emissions (g/yr) = concentration

Table 1. Baseline Emissions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	Design capacity (lb/hr)	Design capacity (lb/batch)	Maximum charge rate (lb/hr)	Stack gas flow rate (dscfm)	Stack gas temperature (°F)	Stack gas temperature (°C)	Operating hours (hr/yr)	HCl unit average (ppmvd)	CO unit average (ppmvd)
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$(\text{ng/dscm}) \times \text{dscm}/35.31467 \text{ dscf} \times \text{stack gas flow rate (dscfm)} \times$

$\text{g}/10^9 \text{ ng} \times 60 \text{ min/hr} \times \text{operating hours (hr/yr)}$

5. Baseline emissions estimated from average emissions data were calculated using the same equations above.

6. Total baseline emissions (lb/yr) = $\sum(\text{HCl, CO, Pb, Cd, Hg, PM, NO}_x,$

$\text{SO}_2 \text{ lb/yr}) + (\text{total CDD/CDF g/yr} \times \text{lb}/453.59237 \text{ g})$

7. Molecular weights:

HCl g/g-mol = 36

CO g/g-mol = 28

NO_x g/g-mol = 46

SO₂ g/g-mol = 64

Sources:

1. Inventory database
2. Test data database

Key:

 Emissions data unavailable; used average emissions data from Table 2 to estimate emissions

- CA = Carbon adsorber
- CC = Combustion control
- Cd = Cadmium
- CDD/CDF = Dioxins/furans
- CO = Carbon monoxide
- DI = Dry sorbent injection
- DIFF = Dry injection fabric filter
- dscf = Dry standard cubic feet
- dscm = Dry standard cubic meter
- E = Existing HMIWI
- ESP = Electrostatic precipitator
- FF = Fabric filter
- gr = Grains
- HCl = Hydrogen chloride
- Hg = Mercury
- HMIWI = Hospital/medical/infectious waste incinerator(s)
- L = Large HMIWI
- M = Medium HMIWI
- mg = Milligrams
- N = New HMIWI
- ng = Nanograms
- NO_x = Nitrogen oxides
- Pb = Lead
- PM = Particulate matter
- ppmvd = Parts per million by volume, dry
- S = Small HMIWI
- SO₂ = Sulfur dioxide
- SR = Small rural HMIWI
- TEQ = 2,3,7,8-TCDD toxic equivalent
- WESP = Wet ESP
- WS = Wet scrubber

Table 1. Baseline Emissions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	Pb unit average (mg/dscm)	Cd unit average (mg/dscm)	Hg unit average (mg/dscm)	PM unit average (gr/dscf)	CDD/CDF unit average (ng/dscm)	TEQ unit average (ng/dscm)	NO _x unit average (ppmvd)	SO ₂ unit average (ppmvd)	HCl baseline (lb/yr)	CO baseline (lb/yr)
1	1	1	Bristol-Myers Squibb Co.		0.319	0.00364	0.000695	0.00180	36.9	0.659	119	29.9	993	11
2	5	5	Merck & Company, Inc.		0.0155	0.00265	0.00353	0.00330	12.8	0.110	112	2.72	105	146
3	15	15--1	Curtis Bay Energy	Unit 1	0.00504	0.000887	0.174	0.00823	27.7	0.451	187	23.0	81,759	930
4	15	15--2	Curtis Bay Energy	Unit 2	0.00769	0.00130	0.300	0.00407	5.47	0.115	180	34.7	80,705	2,349
5	20	20--1	Fort Detrick	Unit 5	0.126	0.00992	0.00324	0.00721	85.2	0.762	121	2.85	3	12
6	20	20--2	Fort Detrick	Unit 6	0.182	0.00867	0.00771	0.00775	97.3	1.26	121	2.85	6	15
7	29	29	Hamot Medical Center		0.00675	0.00119	0.00400	0.00174	7.72	0.0879	131	2.78	659	79
8	36	36--1	Merck & Company, Inc.	Unit 2	0.00115	0.000853	0.00305	0.00156	3.71	0.0442	99.8	1.13	70	31
9	36	36--2	Merck & Company, Inc.	Unit 5	0.0109	0.00242	0.0141	0.00255	6.78	0.308	94.4	2.35	688	150
10	40	40	Charleston Area Medical Center, General Hospital		0.00468	0.00186	0.00418	0.00106	1.31	0.0153	92.7	2.07	558	182
11	42	42	Stericycle, Inc.		0.0434	0.00886	0.0132	0.00203	24.3	0.748	149	1.50	5,763	1,749
12	43	43	Boca Raton Community Hospital		0.0883	0.00537	0.0119	0.0104	67.7	0.852	121	2.85	97	490
13	44	44	Bethesda Memorial Hospital		0.0774	0.00929	0.0739	0.00960	54.3	1.21	88.3	4.62	44	153
14	46	46	Holy Cross Hospital		0.0618	0.0168	0.0504	0.0103	37.5	2.23	67.9	1.16	61	194
15	48	48	Memorial Regional Hospital		0.0928	0.00560	0.00374	0.00973	48.3	1.29	142	3.41	116	102
16	51	51	Lakeland Regional Medical Center		0.0348	0.00365	0.00244	0.00254	68.2	1.29	77.1	2.13	249	452
17	54	54	Bayfront Medical Center		0.0976	0.00379	0.00128	0.00543	46.6	0.819	140	1.25	47	353
18	55	55	St. Joseph's Hospital		0.0740	0.00205	0.00730	0.00111	66.2	1.35	123	2.52	1,171	420
19	59	59--1	Stericycle, Inc.	Unit 1	0.206	0.0233	0.0389	0.00714	2.82	0.0664	121	2.85	717	513

Table 1. Baseline Emissions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	Pb unit average (mg/dscm)	Cd unit average (mg/dscm)	Hg unit average (mg/dscm)	PM unit average (gr/dscf)	CDD/CDF unit average (ng/dscm)	TEQ unit average (ng/dscm)	NO _x unit average (ppmvd)	SO ₂ unit average (ppmvd)	HCl baseline (lb/yr)	CO baseline (lb/yr)
20	59	59--2	Stericycle, Inc.	Unit 2	0.206	0.0188	0.118	0.0102	5.48	0.0845	121	2.85	640	584
21	60	60--1	BMWNC, Inc.	Unit 1	0.00335	0.000532	0.0598	0.00504	6.10	0.149	104	7.03	7,302	2,182
22	65	65--1	Stericycle, Inc.	Unit 1	0.200	0.00572	0.415	0.00921	1.24	0.0105	121	2.85	142	1,249
23	65	65--2	Stericycle, Inc.	Unit 2	0.134	0.0123	0.377	0.00878	0.837	0.0126	121	2.85	168	522
24	71	71	Loyola University Medical Center		0.178	0.0152	0.0183	0.0105	67.9	0.630	107	0.819	183	448
25	77	77	Parkview Hospital		0.177	0.0802	0.00623	0.0109	7.10	0.0898	121	2.85	326	550
26	84	84	Mayo Clinic, Waste Management Facility		0.291	0.0101	0.0445	0.0137	0.357	0.0117	176	1.45	2,465	279
27	87	87	MedCentral Health System, Mansfield Hospital		0.0415	0.00113	0.00898	0.00357	29.8	0.560	121	9.27	758	113
28	94	94	Stericycle, Inc.		0.244	0.00524	0.239	0.00617	14.7	0.341	121	2.85	72	371
29	98	98--1	University of Texas Medical Branch		0.756	0.00298	0.0482	0.0147	98.1	1.06	78.9	1.12	270	169
30	106	106	Stericycle, Inc.		0.127	0.00396	0.375	0.00828	2.40	0.0176	121	2.85	87	547
31	109	109	Healthcare Environmental Services Inc.		0.0171	0.00296	0.129	0.00611	16.0	1.95	207	20.2	2,390	374
32	110	110	Stericycle, Inc.		0.0309	0.00214	0.0746	0.00449	3.37	0.0824	228	3.35	924	1,335
33	120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	0.0187	0.00132	0.0130	0.00702	0.498	0.00807	72.4	1.21	3,466	956
34	120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	0.00778	0.000889	0.00559	0.00947	0.152	0.00378	88.4	0.462	1,509	625
35	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		0.000296	0.000106	0.00164	0.00323	0.380	0.00532	66.9	1.45	16	82
36	130	130	Department of Veterans Affairs Medical Center		0.0435	0.00564	0.00542	0.0111	0.665	0.0160	81.5	7.58	1,083	100
37	13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		0.973	0.122	0.0405	0.0126	1.06	0.0509	99.8	0.469	9	15
38	16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		0.331	0.0472	0.00395	0.0294	6.98	0.151	87.9	2.88	17	109
39	18	18	Franklin Square Hospital Center		0.262	0.0474	0.00270	0.0256	91.4	0.996	84.7	10.9	140	390
40	21	21	Washington County Hospital		0.164	0.0139	0.000836	0.0197	76.2	1.32	105	3.52	150	122

Table 1. Baseline Emissions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	Pb unit average (mg/dscm)	Cd unit average (mg/dscm)	Hg unit average (mg/dscm)	PM unit average (gr/dscf)	CDD/CDF unit average (ng/dscm)	TEQ unit average (ng/dscm)	NO _x unit average (ppmvd)	SO ₂ unit average (ppmvd)	HCl baseline (lb/yr)	CO baseline (lb/yr)
41	25	25	Holy Spirit Hospital		0.155	0.0439	0.00346	0.0164	3.47	0.0299	105	3.52	27	52
42	30	30	Riddle Memorial Hospital		0.178	0.00366	0.0108	0.0124	78.2	1.42	124	0.336	46	24
43	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		0.151	0.00408	0.00124	0.0239	0.0973	0.00291	105	1.22	13	17
44	38	38	Wilkes-Barre General Hospital		0.00406	0.00106	0.00927	0.00399	16.3	0.193	105	1.90	337	60
45	41	41	Thomas Memorial Hospital		0.723	0.0297	0.109	0.0261	0.175	0.00424	94.4	2.46	41	11
46	47	47	Malcolm Randall Veterans Affairs Medical Center		0.227	0.0877	0.0195	0.0173	4.48	0.111	148	2.54	67	127
47	63	63	St. Jude Children's Research Hospital		0.00485	0.00152	0.00361	0.00505	9.11	0.160	131	2.02	275	5
48	81	81	South Bend Medical Foundation		0.539	0.00176	0.206	0.01159	4.10	0.0409	15.0	11.7	299	39
49	82	82	Good Samaritan Hospital		0.0261	0.00336	0.00251	0.0137	27.9	0.0967	105	3.52	28	26
50	88	88	Medina General Hospital		0.669	0.0109	0.00716	0.0267	17.2	0.458	105	3.52	61	201
51	95	95	St. Joseph's Hospital		0.00397	0.00128	0.00254	0.00294	1.28	0.0457	105	1.96	53	17
52	108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	0.0996	0.00773	0.00312	0.0216	0.206	0.00300	128	0.932	5	18
53	111	111	Wyoming Medical Center		0.0496	0.0182	0.0237	0.00336	74.0	1.12	141	1.80	9	19
54	86	86	Fairfield Medical Center		0.161	0.00256	0.0114	0.0137	2.89	0.0624	105	3.52	30	52
55	129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	0.0727	0.00545	0.00292	0.00760	2.89	0.00453	105	3.52	13	94
56	115	115	Kona Community Hospital		0.226	0.0380	0.00158	0.0128	29.6	0.618	95	3.52	175	7
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		0.226	0.0380	0.0906	0.0162	125	2.52	95.1	22.6	406	6
Large total													195,610	18,815
Medium total													1,577	1,251
Small total													43.6	146
Small rural total													581	12.7
Nationwide total													197,812	20,225

Notes:

1. HCl, CO, NO_x, SO₂ baseline emissions (lb/yr) = concentration (ppmvd) x molecular weight (g/g-mol) x g-mol-°K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-µg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ µg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
2. Pb, Cd, Hg baseline emissions (lb/yr) = concentration (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
3. PM baseline emissions (lb/yr) = concentration (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
4. CDD/CDF, TEQ baseline emissions (g/yr) = concentration

Table 1. Baseline Emissions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	Pb unit average (mg/dscm)	Cd unit average (mg/dscm)	Hg unit average (mg/dscm)	PM unit average (gr/dscf)	CDD/CDF unit average (ng/dscm)	TEQ unit average (ng/dscm)	NO _x unit average (ppmvd)	SO ₂ unit average (ppmvd)	HCl baseline (lb/yr)	CO baseline (lb/yr)
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$(\text{ng/dscm}) \times \text{dscfm} / 35.31467 \text{ dscf} \times \text{stack gas flow rate (dscfm)} \times$
 $\text{g}/10^9 \text{ ng} \times 60 \text{ min/hr} \times \text{operating hours (hr/yr)}$
 5. Baseline emissions estimated from average emissions data were calculated using the same equations above.
 6. Total baseline emissions (lb/yr) = $\sum(\text{HCl, CO, Pb, Cd, Hg, PM, NO}_x, \text{SO}_2 \text{ lb/yr}) + (\text{total CDD/CDF g/yr} \times \text{lb}/453.59237 \text{ g})$
 7. Molecular weights:
 HCl g/g-mol = 36
 CO g/g-mol = 28
 NO_x g/g-mol = 46
 SO₂ g/g-mol = 64

Sources:

1. Inventory database
2. Test data database

Key:

Emissions data unavailable; used average emissions data from Table 2 to estimate emissions

- CA = Carbon adsorber
- CC = Combustion control
- Cd = Cadmium
- CDD/CDF = Dioxins/furans
- CO = Carbon monoxide
- DI = Dry sorbent injection
- DIFF = Dry injection fabric filter
- dscf = Dry standard cubic feet
- dscm = Dry standard cubic meter
- E = Existing HMIWI
- ESP = Electrostatic precipitator
- FF = Fabric filter
- gr = Grains
- HCl = Hydrogen chloride
- Hg = Mercury
- HMIWI = Hospital/medical/infectious waste incinerator(s)
- L = Large HMIWI
- M = Medium HMIWI
- mg = Milligrams
- N = New HMIWI
- ng = Nanograms
- NO_x = Nitrogen oxides
- Pb = Lead
- PM = Particulate matter
- ppmvd = Parts per million by volume, dry
- S = Small HMIWI
- SO₂ = Sulfur dioxide
- SR = Small rural HMIWI
- TEQ = 2,3,7,8-TCDD toxic equivalent
- WESP = Wet ESP
- WS = Wet scrubber

Table 1. Baseline Emissions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	Pb baseline (lb/yr)	Cd baseline (lb/yr)	Hg baseline (lb/yr)	PM baseline (lb/yr)	CDD/CDF baseline (g/yr)	TEQ baseline (g/yr)	NO _x baseline (lb/yr)	SO ₂ baseline (lb/yr)	Total baseline (lb/yr)
1	1	1	Bristol-Myers Squibb Co.		4.08	0.05	0.009	53	0.214	0.004	2,273	795	4,130
2	5	5	Merck & Company, Inc.		1.84	0.32	0.42	899	0.692	0.006	19,121	643	20,917
3	15	15--1	Curtis Bay Energy	Unit 1	4.56	0.80	157.98	17,068	11.376	0.185	226,518	38,738	365,176
4	15	15--2	Curtis Bay Energy	Unit 2	7.70	1.30	300.24	9,324	2.484	0.052	237,734	64,069	394,491
5	20	20--1	Fort Detrick	Unit 5	1.49	0.12	0.04	195	0.456	0.004	2,627	86	2,924
6	20	20--2	Fort Detrick	Unit 6	2.05	0.10	0.09	199	0.496	0.006	2,479	82	2,782
7	29	29	Hamot Medical Center		0.19	0.03	0.12	115	0.101	0.001	6,563	193	7,609
8	36	36--1	Merck & Company, Inc.	Unit 2	0.02	0.01	0.05	61	0.029	0.0003	2,090	33	2,285
9	36	36--2	Merck & Company, Inc.	Unit 5	1.91	0.42	2.47	1,023	0.538	0.024	21,826	757	24,448
10	40	40	Charleston Area Medical Center, General Hospital		0.09	0.04	0.08	49	0.012	0.0001	2,452	76	3,318
11	42	42	Stericycle, Inc.		9.05	1.85	2.76	972	2.297	0.071	39,974	560	49,031
12	43	43	Boca Raton Community Hospital		6.00	0.37	0.81	1,619	2.089	0.026	15,024	495	17,732
13	44	44	Bethesda Memorial Hospital		3.98	0.48	3.80	1,129	1.265	0.028	8,102	590	10,026
14	46	46	Holy Cross Hospital		2.32	0.63	1.89	883	0.639	0.038	4,403	105	5,651
15	48	48	Memorial Regional Hospital		7.93	0.48	0.32	1,902	1.873	0.050	20,301	679	23,108
16	51	51	Lakeland Regional Medical Center		2.71	0.28	0.19	452	2.406	0.045	9,015	347	10,518
17	54	54	Bayfront Medical Center		3.55	0.14	0.05	452	0.768	0.014	8,694	108	9,658
18	55	55	St. Joseph's Hospital		7.43	0.21	0.73	255	3.013	0.062	14,483	414	16,751
19	59	59--1	Stericycle, Inc.	Unit 1	25.89	2.93	4.89	2,056	0.161	0.004	25,765	848	29,933

Table 1. Baseline Emissions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	Pb baseline (lb/yr)	Cd baseline (lb/yr)	Hg baseline (lb/yr)	PM baseline (lb/yr)	CDD/CDF baseline (g/yr)	TEQ baseline (g/yr)	NO _x baseline (lb/yr)	SO ₂ baseline (lb/yr)	Total baseline (lb/yr)
20	59	59--2	Stericycle, Inc.	Unit 2	25.36	2.32	14.53	2,873	0.307	0.005	25,094	826	30,060
21	60	60--1	BMWNC, Inc.	Unit 1	0.63	0.10	11.29	2,178	0.522	0.013	24,601	2,324	38,599
22	65	65--1	Stericycle, Inc.	Unit 1	19.02	0.54	39.34	2,000	0.053	0.0005	19,156	631	23,237
23	65	65--2	Stericycle, Inc.	Unit 2	11.89	1.09	33.33	1,777	0.034	0.0005	17,920	590	21,024
24	71	71	Loyola University Medical Center		11.26	0.97	1.16	1,517	1.953	0.018	11,087	119	13,367
25	77	77	Parkview Hospital		15.43	6.97	0.54	2,168	0.280	0.004	18,452	608	22,126
26	84	84	Mayo Clinic, Waste Management Facility		44.29	1.53	6.77	4,764	0.025	0.001	35,973	412	43,945
27	87	87	MedCentral Health System, Mansfield Hospital		1.14	0.03	0.25	224	0.371	0.007	4,645	498	6,240
28	94	94	Stericycle, Inc.		19.76	0.42	19.39	1,144	0.542	0.013	16,497	543	18,666
29	98	98--1	University of Texas Medical Branch		68.40	0.27	4.36	3,046	4.028	0.043	12,637	249	16,443
30	106	106	Stericycle, Inc.		14.94	0.47	44.23	2,233	0.128	0.001	23,436	772	27,134
31	109	109	Healthcare Environmental Services Inc.		0.54	0.09	4.04	439	0.228	0.028	8,612	1,168	12,987
32	110	110	Stericycle, Inc.		5.32	0.37	12.85	1,770	0.263	0.006	67,691	1,384	73,123
33	120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	5.54	0.39	3.86	4,767	0.067	0.001	28,677	670	38,545
34	120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	2.08	0.24	1.49	5,789	0.018	0.0005	31,733	231	39,890
35	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		0.002	0.0008	0.01	54	0.001	0.00002	845	25	1,022
36	130	130	Department of Veterans Affairs Medical Center		4.35	0.564	0.543	2,542	0.030	0.001	13,396	1,734	18,860
37	13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		10.35	1.30	0.43	307	0.005	0.0002	1,652	11	2,006
38	16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		3.16	0.45	0.04	643	0.030	0.001	1,328	61	2,160
39	18	18	Franklin Square Hospital Center		15.92	2.88	0.16	3,555	2.518	0.027	10,116	1,808	16,028
40	21	21	Washington County Hospital		2.81	0.24	0.01	771	0.592	0.010	3,189	148	4,383

Table 1. Baseline Emissions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	Pb baseline (lb/yr)	Cd baseline (lb/yr)	Hg baseline (lb/yr)	PM baseline (lb/yr)	CDD/CDF baseline (g/yr)	TEQ baseline (g/yr)	NO _x baseline (lb/yr)	SO ₂ baseline (lb/yr)	Total baseline (lb/yr)
41	25	25	Holy Spirit Hospital		3.90	1.10	0.09	946	0.040	0.0003	4,785	222	6,036
42	30	30	Riddle Memorial Hospital		3.37	0.07	0.20	537	0.671	0.012	3,398	13	4,021
43	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		1.22	0.03	0.01	443	0.0004	0.00001	1,358	22	1,854
44	38	38	Wilkes-Barre General Hospital		0.14	0.04	0.32	315	0.255	0.003	5,009	125	5,848
45	41	41	Thomas Memorial Hospital		8.60	0.35	1.29	711	0.001	0.00002	1,870	68	2,712
46	47	47	Malcolm Randall Veterans Affairs Medical Center		2.33	0.90	0.20	405	0.021	0.001	2,670	64	3,336
47	63	63	St. Jude Children's Research Hospital		0.04	0.01	0.03	106	0.038	0.001	1,648	35	2,069
48	81	81	South Bend Medical Foundation		9.51	0.03	3.64	468	0.033	0.0003	460	499	1,778
49	82	82	Good Samaritan Hospital		0.34	0.04	0.03	408	0.165	0.001	2,359	110	2,930
50	88	88	Medina General Hospital		8.72	0.14	0.09	796	0.102	0.003	2,477	115	3,661
51	95	95	St. Joseph's Hospital		0.03	0.01	0.02	58	0.005	0.0002	1,339	35	1,501
52	108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	0.83	0.06	0.03	414	0.001	0.00001	1,884	19	2,342
53	111	111	Wyoming Medical Center		0.28	0.10	0.13	43	0.187	0.003	1,343	24	1,438
54	86	86	Fairfield Medical Center		3.31	0.05	0.24	645	0.027	0.001	3,933	183	4,846
55	129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	0.57	0.04	0.02	136	0.010	0.00002	1,344	62	1,651
56	115	115	Kona Community Hospital		0.83	0.14	0.006	108	0.049	0.001	156	8	455
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		0.74	0.12	0.30	121	0.185	0.004	163	54	751
Large total					343	26.9	675	77,991	39.8	0.762	1,029,894	122,400	1,445,755
Medium total					71.6	7.77	6.74	10,926	4.66	0.0619	46,886	3,378	64,104
Small total					3.88	0.0954	0.259	781	0.0372	0.000599	5,277	245	6,497
Small rural total					1.56	0.263	0.302	228	0.234	0.00475	320	62.1	1,206
Nationwide total					420	35.1	682	89,927	44.7	0.830	1,082,377	126,085	1,517,563

Notes:

1. HCl, CO, NO_x, SO₂ baseline emissions (lb/yr) = concentration (ppmvd) x molecular weight (g/g-mol) x g-mol⁻¹K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-μg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ μg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
2. Pb, Cd, Hg baseline emissions (lb/yr) = concentration (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
3. PM baseline emissions (lb/yr) = concentration (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
4. CDD/CDF, TEQ baseline emissions (g/yr) = concentration

Table 1. Baseline Emissions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	Pb baseline (lb/yr)	Cd baseline (lb/yr)	Hg baseline (lb/yr)	PM baseline (lb/yr)	CDD/CDF baseline (g/yr)	TEQ baseline (g/yr)	NO _x baseline (lb/yr)	SO ₂ baseline (lb/yr)	Total baseline (lb/yr)
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$(\text{ng/dscm}) \times \text{dscm}/35.31467 \text{ dscf} \times \text{stack gas flow rate (dscfm)} \times$

$\text{g}/10^9 \text{ ng} \times 60 \text{ min/hr} \times \text{operating hours (hr/yr)}$

5. Baseline emissions estimated from average emissions data were calculated using the same equations above.

6. Total baseline emissions (lb/yr) = $\sum(\text{HCl, CO, Pb, Cd, Hg, PM, NO}_x,$

$\text{SO}_2 \text{ lb/yr}) + (\text{total CDD/CDF g/yr} \times \text{lb}/453.59237 \text{ g})$

7. Molecular weights:

HCl g/g-mol = 36

CO g/g-mol = 28

NO_x g/g-mol = 46

SO₂ g/g-mol = 64

Sources:

1. Inventory database
2. Test data database

Key:

 Emissions data unavailable; used average emissions data from Table 2 to estimate emissions

- CA = Carbon adsorber
- CC = Combustion control
- Cd = Cadmium
- CDD/CDF = Dioxins/furans
- CO = Carbon monoxide
- DI = Dry sorbent injection
- DIFF = Dry injection fabric filter
- dscf = Dry standard cubic feet
- dscm = Dry standard cubic meter
- E = Existing HMIWI
- ESP = Electrostatic precipitator
- FF = Fabric filter
- gr = Grains
- HCl = Hydrogen chloride
- Hg = Mercury
- HMIWI = Hospital/medical/infectious waste incinerator(s)
- L = Large HMIWI
- M = Medium HMIWI
- mg = Milligrams
- N = New HMIWI
- ng = Nanograms
- NO_x = Nitrogen oxides
- Pb = Lead
- PM = Particulate matter
- ppmvd = Parts per million by volume, dry
- S = Small HMIWI
- SO₂ = Sulfur dioxide
- SR = Small rural HMIWI
- TEQ = 2,3,7,8-TCDD toxic equivalent
- WESP = Wet ESP
- WS = Wet scrubber

Table 2. Average HMIWI Emissions Data Used to Fill Data Gaps in Baseline Emissions

No.	FACID	UNITID	Facility name	Unit number	City	State	Category	APCD type	Pb unit average (mg/dscm)	Cd unit average (mg/dscm)	CDD/CDF unit average (ng/dscm)	NO _x unit average (ppmvd)	SO ₂ unit average (ppmvd)
1	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		Greenville	NC	L	Dry/wet	0.000296	0.000106	0.380	66.9	1.45
2	29	29	Hamot Medical Center		Erie	PA	L	Dry/wet	0.00675	0.00119	7.72	131	2.78
3	110	110	Stericycle, Inc.		North Salt Lake	UT	L	Dry/wet	0.0309	0.00214	3.37	228	3.35
4	55	55	St. Joseph's Hospital		Tampa	FL	L	Dry/wet	0.0740	0.00205	66.2	123	
5	120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	Anahuac	TX	L	Dry	0.0187	0.00132	0.498	72.4	1.21
6	120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	Anahuac	TX	L	Dry	0.00778	0.000889	0.152	88.4	0.462
7	1	1	Bristol-Myers Squibb Co.		Wallingford	CT	L	Dry	0.319	0.00364	36.9	119	29.9
8	5	5	Merck & Company, Inc.		Rahway	NJ	L	Dry	0.0155	0.00265	12.8	112	2.72
9	15	15--1	Curtis Bay Energy	Unit 1	Baltimore	MD	L	Dry	0.00504	0.000887	27.7	187	23.0
10	15	15--2	Curtis Bay Energy	Unit 2	Baltimore	MD	L	Dry	0.00769	0.00130	5.47	180	34.7
11	36	36--1	Merck & Company, Inc.	Unit 2	West Point (Upper Gwynedd Township)	PA	L	Dry	0.00115	0.000853	3.71	99.8	1.13
12	36	36--2	Merck & Company, Inc.	Unit 5	West Point (Upper Gwynedd Township)	PA	L	Dry	0.0109	0.00242	6.78	94.4	2.35
13	40	40	Charleston Area Medical Center, General Hospital		Charleston	WV	L	Dry	0.00468	0.00186	1.31	92.7	2.07
14	42	42	Stericycle, Inc.		Apopka	FL	L	Dry	0.0434	0.00886	24.3	149	1.50
15	51	51	Lakeland Regional Medical Center		Lakeland	FL	L	Dry	0.0348	0.00365	68.2	77.1	2.13
16	60	60--1	BMWNC, Inc.	Unit 1	Matthews	NC	L	Dry	0.00335	0.000532	6.10	104	7.03
17	84	84	Mayo Clinic, Waste Management Facility		Rochester	MN	L	Dry	0.291	0.0101	0.357	176	1.45
18	87	87	MedCentral Health System, Mansfield Hospital		Mansfield	OH	L	Dry	0.0415	0.00113	29.8		
19	109	109	Healthcare Environmental Services Inc.		Fargo	ND	L	Dry	0.0171	0.00296		207	20.2
20	38	38	Wilkes-Barre General Hospital		Wilkes-Barre	PA	M	Dry	0.00406	0.00106	16.3		1.90
21	63	63	St. Jude Children's Research Hospital		Memphis	TN	M	Dry	0.00485	0.00152	9.11	131	2.02
22	95	95	St. Joseph's Hospital		Marshfield	WI	M	Dry	0.00397	0.00128	1.28		
23	20	20--1	Fort Detrick	Unit 5	Fort Detrick	MD	L	Wet	0.126	0.00992	85.2		
24	20	20--2	Fort Detrick	Unit 6	Fort Detrick	MD	L	Wet	0.182	0.00867	97.3		
25	43	43	Boca Raton Community Hospital		Boca Raton	FL	L	Wet	0.0883	0.00537	67.7		
26	44	44	Bethesda Memorial Hospital		Boynton Beach	FL	L	Wet	0.0774	0.00929	54.3	88.3	4.62
27	46	46	Holy Cross Hospital		Fort Lauderdale	FL	L	Wet	0.0618	0.0168		67.9	1.16
28	48	48	Memorial Regional Hospital		Hollywood	FL	L	Wet	0.0928	0.00560	48.3	142	3.41
29	54	54	Bayfront Medical Center		St. Petersburg	FL	L	Wet	0.0976	0.00379	46.6	140	1.25
30	59	59--1	Stericycle, Inc.	Unit 1	Haw River	NC	L	Wet	0.206	0.0233	2.82		
31	59	59--2	Stericycle, Inc.	Unit 2	Haw River	NC	L	Wet	0.206	0.0188	5.48		
32	65	65--1	Stericycle, Inc.	Unit 1	Clinton	IL	L	Wet	0.200	0.00572	1.24		
33	65	65--2	Stericycle, Inc.	Unit 2	Clinton	IL	L	Wet	0.134	0.0123	0.837		
34	71	71	Loyola University Medical Center		Maywood	IL	L	Wet	0.178	0.0152	67.9	107	0.819
35	77	77	Parkview Hospital		Fort Wayne	IN	L	Wet	0.177	0.0802	7.10		
36	94	94	Stericycle, Inc.		Warren	OH	L	Wet	0.244	0.00524	14.7		
37	98	98--1	University of Texas Medical Branch		Galveston	TX	L	Wet	0.756	0.00298	98.1	78.9	1.12
38	106	106	Stericycle, Inc.		Kansas City	KS	L	Wet	0.127	0.00396	2.40		
39	130	130	Department of Veterans Affairs Medical Center		Miami	FL	L	Wet	0.0435	0.00564	0.665	81.5	7.58
40	18	18	Franklin Square Hospital Center		Baltimore	MD	M	Wet	0.262	0.0474	91.4	84.7	10.9
41	16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		Baltimore	MD	M	Wet	0.331	0.0472	6.98	87.9	2.88
42	13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		Baltimore	MD	M	Wet	0.973	0.122	1.06	99.8	0.469
43	21	21	Washington County Hospital		Hagerstown	MD	M	Wet	0.164	0.0139	76.2		

Table 2. Average HMIWI Emissions Data Used to Fill Data Gaps in Baseline Emissions

No.	FACID	UNITID	Facility name	Unit number	City	State	Category	APCD type	Pb unit average (mg/dscm)	Cd unit average (mg/dscm)	CDD/CDF unit average (ng/dscm)	NO _x unit average (ppmvd)	SO ₂ unit average (ppmvd)
44	25	25	Holy Spirit Hospital		Camp Hill	PA	M	Wet	0.155	0.0439	3.47		
45	30	30	Riddle Memorial Hospital		Media	PA	M	Wet	0.178	0.00366	78.2	124	0.336
46	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		State College	PA	M	Wet	0.151	0.00408	0.0973		1.22
47	41	41	Thomas Memorial Hospital		South Charleston	WV	M	Wet	0.723	0.0297	0.175	94.4	2.46
48	47	47	Malcolm Randall Veterans Affairs Medical Center		Gainesville	FL	M	Wet	0.227	0.0877	4.48	148	2.54
49	81	81	South Bend Medical Foundation		South Bend	IN	M	Wet	0.539	0.00176	4.10	15.0	11.7
50	82	82	Good Samaritan Hospital		Vincennes	IN	M	Wet	0.0261	0.00336	27.9		
51	88	88	Medina General Hospital		Medina	OH	M	Wet	0.669	0.0109	17.2		
52	108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	Hamilton	MT	M	Wet	0.0996	0.00773	0.206	128	0.932
53	111	111	Wyoming Medical Center		Casper	WY	M	Wet	0.0496	0.0182	74.0	141	1.80
54	129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	Atlanta	GA	S	Wet	0.0727	0.00545			
55	86	86	Fairfield Medical Center		Lancaster	OH	S	Wet	0.161	0.00256	2.89		
56	115	115	Kona Community Hospital		Kealahou	HI	SR	Comb ctrl			29.6		
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		Bethel	AK	SR	Comb ctrl	0.226	0.0380	125	95.1	22.6
							All	All	0.160	0.0138	27.3	116	5.92
							L	All				121	
							L	Dry	0.0547	0.00287	16.0		9.27
							L	Wet	0.176	0.014	37.5		2.85
							L	Dry/wet	0.0280	0.00137	19.4		2.52
							M	All				105	
							M	Dry	0.00429	0.00129	8.89		1.96
							M	Wet	0.325	0.0316	27.5		3.52
							S	Wet	0.117	0.004	2.89		
							SR	Comb ctrl	0.226	0.0380	77.3	95	22.6

Key:  Emissions data unavailable

Table 3. MACT Floor Emission Reductions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD code	APCD type	MACT floor controls	HCI MACT floor limit (ppmvd)
1	1	1	Bristol-Myers Squibb Co.		Wallingford	CT	L	E	FF	Dry	replace FF with DIFF; add packed-bed scrubber and ACI	2.4
2	5	5	Merck & Company, Inc.		Rahway	NJ	L	E	DIFF	Dry	improve FF performance, add ACI	2.4
3	15	15--1	Curtis Bay Energy	Unit 1	Baltimore	MD	L	E	DIFF	Dry	improve FF performance; add packed-bed scrubber, ACI, and SNCR	2.4
4	15	15--2	Curtis Bay Energy	Unit 2	Baltimore	MD	L	E	DIFF	Dry	add packed-bed scrubber, ACI, and SNCR	2.4
5	20	20--1	Fort Detrick	Unit 5	Fort Detrick	MD	L	E	WS	Wet	add DIFF, caustic, and ACI	2.4
6	20	20--2	Fort Detrick	Unit 6	Fort Detrick	MD	L	E	WS	Wet	add DIFF, caustic, and ACI	2.4
7	29	29	Hamot Medical Center		Erie	PA	L	E	DIFF/WS	Dry/wet	add packed-bed scrubber; increase activated carbon	2.4
8	36	36--1	Merck & Company, Inc.	Unit 2	West Point (Upper Gwynedd Township)	PA	L	E	DIFF	Dry	add packed-bed scrubber and ACI	2.4
9	36	36--2	Merck & Company, Inc.	Unit 5	West Point (Upper Gwynedd Township)	PA	L	E	DIFF	Dry	add packed-bed scrubber and ACI	2.4
10	40	40	Charleston Area Medical Center, General Hospital		Charleston	WV	L	E	DIFF	Dry	increase natural gas; add packed-bed scrubber	2.4
11	42	42	Stericycle, Inc.		Apopka	FL	L	E	DIFF	Dry	secondary chamber retrofit; replace DIFF; add packed-bed scrubber; increase activated carbon; only minor adjustment of system to obtain additional NO _x control (marginal difference in NO _x)	2.4
12	43	43	Boca Raton Community Hospital		Boca Raton	FL	L	E	WS	Wet	secondary chamber retrofit; add DIFF, caustic, and ACI	2.4
13	44	44	Bethesda Memorial Hospital		Boynton Beach	FL	L	E	WS	Wet	add DIFF, caustic, and ACI	2.4
14	46	46	Holy Cross Hospital		Fort Lauderdale	FL	L	E	WS	Wet	increase natural gas; add DIFF and ACI	2.4
15	48	48	Memorial Regional Hospital		Hollywood	FL	L	E	WS	Wet	add DIFF, caustic, and ACI; only minor adjustment of system to obtain additional NO _x control (marginal difference in NO _x)	2.4
16	51	51	Lakeland Regional Medical Center		Lakeland	FL	L	E	DIFF	Dry	secondary chamber retrofit; replace DIFF; increase lime; add ACI	2.4
17	54	54	Bayfront Medical Center		St. Petersburg	FL	L	E	WS	Wet	secondary chamber retrofit; add DIFF and ACI; only minor adjustment of system needed to obtain additional NO _x control (marginal difference in NO _x)	2.4
18	55	55	St. Joseph's Hospital		Tampa	FL	L	E	DIFF/WS	Dry/wet	increase natural gas, replace DIFF; add packed-bed scrubber and ACI	2.4
19	59	59--1	Stericycle, Inc.	Unit 1	Haw River	NC	L	E	WS	Wet	increase natural gas; add DIFF, caustic, and ACI	2.4
20	59	59--2	Stericycle, Inc.	Unit 2	Haw River	NC	L	E	WS	Wet	increase natural gas; add DIFF, caustic, and ACI	2.4
21	60	60--1	BMWNC, Inc.	Unit 1	Matthews	NC	L	E	DIFF	Dry	secondary chamber retrofit; add packed-bed scrubber; increase activated carbon	2.4

Table 3. MACT Floor Emission Reductions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD code	APCD type	MACT floor controls	HCI MACT floor limit (ppmvd)
22	65	65--1	Stericycle, Inc.	Unit 1	Clinton	IL	L	E	WS	Wet	secondary chamber retrofit; add DIFF, caustic, and ACI	2.4
23	65	65--2	Stericycle, Inc.	Unit 2	Clinton	IL	L	E	WS	Wet	increase natural gas; add DIFF, caustic, and ACI	2.4
24	71	71	Loyola University Medical Center		Maywood	IL	L	E	WS	Wet	secondary chamber retrofit; add DIFF and ACI	2.4
25	77	77	Parkview Hospital		Fort Wayne	IN	L	E	WS	Wet	increase natural gas; add DIFF, caustic, and ACI	2.4
26	84	84	Mayo Clinic, Waste Management Facility		Rochester	MN	L	E	DIFF	Dry	replace DIFF; add packed-bed scrubber; increase activated carbon; add SNCR	2.4
27	87	87	MedCentral Health System, Mansfield Hospital		Mansfield	OH	L	E	DIFF	Dry	increase natural gas; replace DIFF; add packed-bed scrubber; increase activated carbon	2.4
28	94	94	Stericycle, Inc.		Warren	OH	L	E	WS	Wet	increase natural gas; add DIFF, caustic, and ACI	2.4
29	98	98--1	University of Texas Medical Branch		Galveston	TX	L	E	WS	Wet	add DIFF and ACI	2.4
30	106	106	Stericycle, Inc.		Kansas City	KS	L	E	WS	Wet	increase natural gas; add DIFF, caustic, and ACI	2.4
31	109	109	Healthcare Environmental Services Inc.		Fargo	ND	L	E	DIFF	Dry	secondary chamber retrofit; replace DIFF; add packed-bed scrubber and SNCR; increase activated carbon	2.4
32	110	110	Stericycle, Inc.		North Salt Lake	UT	L	E	DI-ESP/WS	Dry/wet	secondary chamber retrofit; add FF; increase sodium bicarbonate and activated carbon; add SNCR	2.4
33	120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	Anahuac	TX	L	N	DIFF	Dry	increase natural gas; replace DIFF; add packed-bed scrubber; increase activated carbon	2.4
34	120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	Anahuac	TX	L	N	DIFF	Dry	replace DIFF; add packed-bed scrubber	2.4
35	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		Greenville	NC	L	N	CA/WS	Dry/wet	secondary chamber retrofit	2.4
36	130	130	Department of Veterans Affairs Medical Center		Miami	FL	L	E	WS	Wet	add DIFF and caustic	2.4
37	13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		Baltimore	MD	M	E	WS	Wet	add DIFF and ACI	2.5
38	16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		Baltimore	MD	M	E	WS	Wet	secondary chamber retrofit; add DIFF, caustic, and ACI	2.5
39	18	18	Franklin Square Hospital Center		Baltimore	MD	M	E	WS	Wet	secondary chamber retrofit; add DIFF, packed-bed scrubber, and ACI	2.5
40	21	21	Washington County Hospital		Hagerstown	MD	M	E	WS	Wet	secondary chamber retrofit; add DIFF, packed-bed scrubber, and ACI	2.5
41	25	25	Holy Spirit Hospital		Camp Hill	PA	M	E	WS	Wet	add DIFF, caustic, and ACI	2.5
42	30	30	Riddle Memorial Hospital		Media	PA	M	E	WS	Wet	add DIFF and ACI	2.5
43	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		State College	PA	M	E	WS	Wet	add FF	2.5

Table 3. MACT Floor Emission Reductions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD code	APCD type	MACT floor controls	HCI MACT floor limit (ppmvd)
44	38	38	Wilkes-Barre General Hospital		Wilkes-Barre	PA	M	N	DIFF	Dry	add packed-bed scrubber; increase activated carbon	2.5
45	41	41	Thomas Memorial Hospital		South Charleston	WV	M	E	WS	Wet	add DIFF, caustic, and ACI	2.5
46	47	47	Malcolm Randall Veterans Affairs Medical Center		Gainesville	FL	M	E	WS	Wet	secondary chamber retrofit; add DIFF, packed-bed scrubber, and ACI	2.5
47	63	63	St. Jude Children's Research Hospital		Memphis	TN	M	E	DIFF	Dry	add packed-bed scrubber; increase activated carbon	2.5
48	81	81	South Bend Medical Foundation		South Bend	IN	M	E	WS	Wet	add DIFF, packed-bed scrubber, and ACI	2.5
49	82	82	Good Samaritan Hospital		Vincennes	IN	M	E	WS	Wet	add DIFF, caustic, and ACI	2.5
50	88	88	Medina General Hospital		Medina	OH	M	E	WS	Wet	secondary chamber retrofit; add DIFF, caustic, and ACI	2.5
51	95	95	St. Joseph's Hospital		Marshfield	WI	M	E	DIFF	Dry	add packed-bed scrubber; increase activated carbon	2.5
52	108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	Hamilton	MT	M	E	WS	Wet	add FF	2.5
53	111	111	Wyoming Medical Center		Casper	WY	M	E	WS	Wet	increase natural gas; add DIFF and ACI	2.5
54	86	86	Fairfield Medical Center		Lancaster	OH	S	E	WS	Wet	add caustic and ACI	4.5
55	129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	Atlanta	GA	S	N	WS	Wet	secondary chamber retrofit, add caustic	4.5
56	115	115	Kona Community Hospital		Kealahou	HI	SR	E	CC	Comb ctrl	none	440
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		Bethel	AK	SR	E	CC	Comb ctrl	add DIFF and ACI	440
Large total												
Medium total												
Small total												
Small rural total												
Nationwide total												
Nationwide % reduction												

Notes:

- HCl, CO, NO_x, SO₂ control level emissions (lb/yr) = emission limit (ppmvd) x molecular weight (g/g-mol) x g-mol-°K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-µg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ µg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
- Pb, Cd, Hg control level emissions (lb/yr) = emission limit (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
- PM control level emissions (lb/yr) = emission limit (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
- CDD/CDF, TEQ control level emissions (g/yr) = emission limit (ng/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x g/10⁹ ng x 60 min/hr x operating hours (hr/yr)
- If baseline concentration < emission limit, then control level emissions = baseline emissions.
- Emission reduction (lb/yr) = baseline emissions (lb/yr) - control level emissions (lb/yr)

Table 3. MACT Floor Emission Reductions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	City	State	Category	New/existing	APCD code	APCD type	MACT floor controls	HCl MACT floor limit (ppmvd)
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7. Total emission reduction (lb/yr) = $\sum(\text{HCl, CO, Pb, Cd, Hg, PM, NO}_x,$

$\text{SO}_2 \text{ lb/yr}) + (\text{total CDD/CDF g/yr} \times \text{lb}/453.59237 \text{ g})$

8. Molecular weights:

HCl g/g-mol = 36

CO g/g-mol = 28

NO_x g/g-mol = 46

SO₂ g/g-mol = 64

Sources:

1. Inventory database

2. MACT floor memo

Key:

- CA = Carbon adsorber
- CC = Combustion control
- Cd = Cadmium
- CDD/CDF = Dioxins/furans
- CO = Carbon monoxide
- DI = Dry sorbent injection
- DIFF = Dry injection fabric filter
- dscf = Dry standard cubic feet
- dscm = Dry standard cubic meter
- E = Existing HMIWI
- ESP = Electrostatic precipitator
- FF = Fabric filter
- gr = Grains
- HCl = Hydrogen chloride
- Hg = Mercury
- HMIWI = Hospital/medical/infectious waste incinerator(s)
- L = Large HMIWI
- M = Medium HMIWI
- mg = Milligrams
- N = New HMIWI
- ng = Nanograms
- NO_x = Nitrogen oxides
- Pb = Lead
- PM = Particulate matter
- ppmvd = Parts per million by volume, dry
- S = Small HMIWI
- SO₂ = Sulfur dioxide
- SR = Small rural HMIWI
- TEQ = 2,3,7,8-TCDD toxic equivalent
- WESP = Wet ESP
- WS = Wet scrubber

Table 3. MACT Floor Emission Reductions for Existing HI

No.	FACID	UNITID	Facility name	Unit number	CO MACT floor limit (ppmvd)	Pb MACT floor limit (mg/dscm)	Cd MACT floor limit (mg/dscm)	Hg MACT floor limit (mg/dscm)	PM MACT floor limit (gr/dscf)	CDD/CDF MACT floor limit (ng/dscm)	TEQ MACT floor limit (ng/dscm)	NO _x MACT floor limit (ppmvd)	SO ₂ MACT floor limit (ppmvd)
1	1	1	Bristol-Myers Squibb Co.		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
2	5	5	Merck & Company, Inc.		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
3	15	15--1	Curtis Bay Energy	Unit 1	3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
4	15	15--2	Curtis Bay Energy	Unit 2	3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
5	20	20--1	Fort Detrick	Unit 5	3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
6	20	20--2	Fort Detrick	Unit 6	3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
7	29	29	Hamot Medical Center		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
8	36	36--1	Merck & Company, Inc.	Unit 2	3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
9	36	36--2	Merck & Company, Inc.	Unit 5	3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
10	40	40	Charleston Area Medical Center, General Hospital		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
11	42	42	Stericycle, Inc.		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
12	43	43	Boca Raton Community Hospital		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
13	44	44	Bethesda Memorial Hospital		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
14	46	46	Holy Cross Hospital		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
15	48	48	Memorial Regional Hospital		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
16	51	51	Lakeland Regional Medical Center		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
17	54	54	Bayfront Medical Center		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
18	55	55	St. Joseph's Hospital		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
19	59	59--1	Stericycle, Inc.	Unit 1	3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
20	59	59--2	Stericycle, Inc.	Unit 2	3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
21	60	60--1	BMWNC, Inc.	Unit 1	3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8

Table 3. MACT Floor Emission Reductions for Existing HI

No.	FACID	UNITID	Facility name	Unit number	CO MACT floor limit (ppmvd)	Pb MACT floor limit (mg/dscm)	Cd MACT floor limit (mg/dscm)	Hg MACT floor limit (mg/dscm)	PM MACT floor limit (gr/dscf)	CDD/CDF MACT floor limit (ng/dscm)	TEQ MACT floor limit (ng/dscm)	NO _x MACT floor limit (ppmvd)	SO ₂ MACT floor limit (ppmvd)
22	65	65--1	Stericycle, Inc.	Unit 1	3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
23	65	65--2	Stericycle, Inc.	Unit 2	3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
24	71	71	Loyola University Medical Center		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
25	77	77	Parkview Hospital		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
26	84	84	Mayo Clinic, Waste Management Facility		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
27	87	87	MedCentral Health System, Mansfield Hospital		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
28	94	94	Stericycle, Inc.		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
29	98	98--1	University of Texas Medical Branch		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
30	106	106	Stericycle, Inc.		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
31	109	109	Healthcare Environmental Services Inc.		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
32	110	110	Stericycle, Inc.		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
33	120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
34	120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
35	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
36	130	130	Department of Veterans Affairs Medical Center		3.9	0.013	0.0041	0.0095	0.0056	1.6	0.029	140	2.8
37	13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		3.0	0.017	0.0071	0.0079	0.012	0.63	0.0097	200	2.8
38	16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		3.0	0.017	0.0071	0.0079	0.012	0.63	0.0097	200	2.8
39	18	18	Franklin Square Hospital Center		3.0	0.017	0.0071	0.0079	0.012	0.63	0.0097	200	2.8
40	21	21	Washington County Hospital		3.0	0.017	0.0071	0.0079	0.012	0.63	0.0097	200	2.8
41	25	25	Holy Spirit Hospital		3.0	0.017	0.0071	0.0079	0.012	0.63	0.0097	200	2.8
42	30	30	Riddle Memorial Hospital		3.0	0.017	0.0071	0.0079	0.012	0.63	0.0097	200	2.8
43	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		3.0	0.017	0.0071	0.0079	0.012	0.63	0.0097	200	2.8

Table 3. MACT Floor Emission Reductions for Existing HI

No.	FACID	UNITID	Facility name	Unit number	CO MACT floor limit (ppmvd)	Pb MACT floor limit (mg/dscm)	Cd MACT floor limit (mg/dscm)	Hg MACT floor limit (mg/dscm)	PM MACT floor limit (gr/dscf)	CDD/CDF MACT floor limit (ng/dscm)	TEQ MACT floor limit (ng/dscm)	NO _x MACT floor limit (ppmvd)	SO ₂ MACT floor limit (ppmvd)
44	38	38	Wilkes-Barre General Hospital		3.0	0.017	0.0071	0.0079	0.012	0.63	0.0097	200	2.8
45	41	41	Thomas Memorial Hospital		3.0	0.017	0.0071	0.0079	0.012	0.63	0.0097	200	2.8
46	47	47	Malcolm Randall Veterans Affairs Medical Center		3.0	0.017	0.0071	0.0079	0.012	0.63	0.0097	200	2.8
47	63	63	St. Jude Children's Research Hospital		3.0	0.017	0.0071	0.0079	0.012	0.63	0.0097	200	2.8
48	81	81	South Bend Medical Foundation		3.0	0.017	0.0071	0.0079	0.012	0.63	0.0097	200	2.8
49	82	82	Good Samaritan Hospital		3.0	0.017	0.0071	0.0079	0.012	0.63	0.0097	200	2.8
50	88	88	Medina General Hospital		3.0	0.017	0.0071	0.0079	0.012	0.63	0.0097	200	2.8
51	95	95	St. Joseph's Hospital		3.0	0.017	0.0071	0.0079	0.012	0.63	0.0097	200	2.8
52	108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	3.0	0.017	0.0071	0.0079	0.012	0.63	0.0097	200	2.8
53	111	111	Wyoming Medical Center		3.0	0.017	0.0071	0.0079	0.012	0.63	0.0097	200	2.8
54	86	86	Fairfield Medical Center		8.2	0.18	0.012	0.0075	0.017	8.3	0.008	200	2.8
55	129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	8.2	0.18	0.012	0.0075	0.017	8.3	0.008	200	2.8
56	115	115	Kona Community Hospital		12	0.35	0.068	0.0040	0.030	130	2.6	110	43
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		12	0.35	0.068	0.0040	0.030	130	2.6	110	43
Large total													
Medium total													
Small total													
Small rural total													
Nationwide total													
Nationwide % reduction													

Notes:

1. HCl, CO, NO_x, SO₂ control level emissions (lb/yr) = emission limit (ppmvd) x molecular weight (g/g-mol) x g-mol-°K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-µg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ µg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
2. Pb, Cd, Hg control level emissions (lb/yr) = emission limit (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
3. PM control level emissions (lb/yr) = emission limit (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
4. CDD/CDF, TEQ control level emissions (g/yr) = emission limit (ng/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x g/10⁹ ng x 60 min/hr x operating hours (hr/yr)
5. If baseline concentration < emission limit, then control level emissions = baseline emissions.
6. Emission reduction (lb/yr) = baseline emissions (lb/yr) - control level emissions (lb/yr)

Table 3. MACT Floor Emission Reductions for Existing HI

No.	FACID	UNITID	Facility name	Unit number	CO MACT floor limit (ppmvd)	Pb MACT floor limit (mg/dscm)	Cd MACT floor limit (mg/dscm)	Hg MACT floor limit (mg/dscm)	PM MACT floor limit (gr/dscf)	CDD/CDF MACT floor limit (ng/dscm)	TEQ MACT floor limit (ng/dscm)	NO _x MACT floor limit (ppmvd)	SO ₂ MACT floor limit (ppmvd)
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7. Total emission reduction (lb/yr) = $\sum(\text{HCl, CO, Pb, Cd, Hg, PM, NO}_x, \text{SO}_2 \text{ lb/yr}) + (\text{total CDD/CDF g/yr} \times \text{lb}/453.59237 \text{ g})$

8. Molecular weights:

HCl g/g-mol = 36

CO g/g-mol = 28

NO_x g/g-mol = 46

SO₂ g/g-mol = 64

Sources:

1. Inventory database

2. MACT floor memo

Key:

- CA = Carbon adsorber
- CC = Combustion control
- Cd = Cadmium
- CDD/CDF = Dioxins/furans
- CO = Carbon monoxide
- DI = Dry sorbent injection
- DIFF = Dry injection fabric filter
- dscf = Dry standard cubic feet
- dscm = Dry standard cubic meter
- E = Existing HMIWI
- ESP = Electrostatic precipitator
- FF = Fabric filter
- gr = Grains
- HCl = Hydrogen chloride
- Hg = Mercury
- HMIWI = Hospital/medical/infectious waste incinerator(s)
- L = Large HMIWI
- M = Medium HMIWI
- mg = Milligrams
- N = New HMIWI
- ng = Nanograms
- NO_x = Nitrogen oxides
- Pb = Lead
- PM = Particulate matter
- ppmvd = Parts per million by volume, dry
- S = Small HMIWI
- SO₂ = Sulfur dioxide
- SR = Small rural HMIWI
- TEQ = 2,3,7,8-TCDD toxic equivalent
- WESP = Wet ESP
- WS = Wet scrubber

Table 3. MACT Floor Emission Reductions for Existing HI

No.	FACID	UNITID	Facility name	Unit number	HCl MACT floor control level (lb/yr)	CO MACT floor control level (lb/yr)	Pb MACT floor control level (lb/yr)	Cd MACT floor control level (lb/yr)	Hg MACT floor control level (lb/yr)	PM MACT floor control level (lb/yr)	CDD/CDF MACT floor control level (g/yr)	TEQ MACT floor control level (g/yr)	NO _x MACT floor control level (lb/yr)
1	1	1	Bristol-Myers Squibb Co.		36	11	0.17	0.05	0.009	53	0.009	0.0002	2,273
2	5	5	Merck & Company, Inc.		105	146	1.55	0.32	0.42	899	0.086	0.002	19,121
3	15	15--1	Curtis Bay Energy	Unit 1	2,303	930	4.56	0.80	8.61	11,615	0.658	0.012	169,511
4	15	15--2	Curtis Bay Energy	Unit 2	2,519	2,349	7.70	1.30	9.51	9,324	0.726	0.013	185,419
5	20	20--1	Fort Detrick	Unit 5	3	12	0.15	0.05	0.04	151	0.009	0.0002	2,627
6	20	20--2	Fort Detrick	Unit 6	6	15	0.15	0.05	0.09	144	0.008	0.0001	2,479
7	29	29	Hamot Medical Center		95	79	0.19	0.03	0.12	115	0.021	0.0004	6,563
8	36	36--1	Merck & Company, Inc.	Unit 2	40	31	0.02	0.01	0.05	61	0.012	0.0002	2,090
9	36	36--2	Merck & Company, Inc.	Unit 5	440	150	1.91	0.42	1.66	1,023	0.127	0.002	21,826
10	40	40	Charleston Area Medical Center, General Hospital		50	63	0.09	0.04	0.08	49	0.012	0.0001	2,452
11	42	42	Stericycle, Inc.		509	636	2.71	0.86	1.98	972	0.151	0.003	37,494
12	43	43	Boca Raton Community Hospital		97	296	0.88	0.28	0.65	871	0.049	0.0009	15,024
13	44	44	Bethesda Memorial Hospital		44	153	0.67	0.21	0.49	659	0.037	0.0007	8,102
14	46	46	Holy Cross Hospital		61	154	0.49	0.15	0.36	481	0.027	0.0005	4,403
15	48	48	Memorial Regional Hospital		116	102	1.11	0.35	0.32	1,095	0.062	0.001	20,031
16	51	51	Lakeland Regional Medical Center		222	278	1.01	0.28	0.19	452	0.056	0.001	9,015
17	54	54	Bayfront Medical Center		47	147	0.47	0.14	0.05	452	0.026	0.0005	8,676
18	55	55	St. Joseph's Hospital		224	280	1.31	0.21	0.73	255	0.073	0.001	14,483
19	59	59--1	Stericycle, Inc.	Unit 1	407	508	1.64	0.52	1.20	1,613	0.091	0.002	25,765
20	59	59--2	Stericycle, Inc.	Unit 2	396	494	1.60	0.51	1.17	1,579	0.089	0.002	25,094
21	60	60--1	BMWNC, Inc.	Unit 1	452	564	0.63	0.10	1.79	2,178	0.137	0.002	24,601

Table 3. MACT Floor Emission Reductions for Existing HI

No.	FACID	UNITID	Facility name	Unit number	HCl MACT floor control level (lb/yr)	CO MACT floor control level (lb/yr)	Pb MACT floor control level (lb/yr)	Cd MACT floor control level (lb/yr)	Hg MACT floor control level (lb/yr)	PM MACT floor control level (lb/yr)	CDD/CDF MACT floor control level (g/yr)	TEQ MACT floor control level (g/yr)	NO _x MACT floor control level (lb/yr)
22	65	65--1	Stericycle, Inc.	Unit 1	142	377	1.23	0.39	0.90	1,216	0.053	0.0005	19,156
23	65	65--2	Stericycle, Inc.	Unit 2	168	353	1.15	0.36	0.84	1,134	0.034	0.0005	17,920
24	71	71	Loyola University Medical Center		183	247	0.82	0.26	0.60	812	0.046	0.0008	11,087
25	77	77	Parkview Hospital		291	363	1.13	0.36	0.54	1,115	0.063	0.001	18,452
26	84	84	Mayo Clinic, Waste Management Facility		388	279	1.98	0.62	1.45	1,952	0.025	0.0008	28,558
27	87	87	MedCentral Health System, Mansfield Hospital		73	92	0.36	0.03	0.25	224	0.020	0.0004	4,645
28	94	94	Stericycle, Inc.		72	325	1.05	0.33	0.77	1,038	0.059	0.001	16,497
29	98	98--1	University of Texas Medical Branch		270	169	1.18	0.27	0.86	1,160	0.066	0.001	12,637
30	106	106	Stericycle, Inc.		87	462	1.53	0.47	1.12	1,510	0.085	0.0009	23,436
31	109	109	Healthcare Environmental Services Inc.		79	99	0.41	0.09	0.30	402	0.023	0.0004	5,826
32	110	110	Stericycle, Inc.		565	705	2.24	0.37	1.64	1,770	0.125	0.002	41,566
33	120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	754	941	3.86	0.39	2.82	3,802	0.067	0.001	28,677
34	120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	683	625	2.08	0.24	1.49	3,422	0.018	0.0005	31,733
35	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		16	30	0.002	0.0008	0.01	54	0.001	0.00002	845
36	130	130	Department of Veterans Affairs Medical Center		313	100	1.30	0.41	0.54	1,282	0.030	0.0007	13,396
37	13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		9	15	0.18	0.08	0.08	292	0.003	0.00005	1,652
38	16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		17	28	0.16	0.07	0.04	262	0.003	0.00004	1,328
39	18	18	Franklin Square Hospital Center		140	218	1.03	0.43	0.16	1,668	0.017	0.0003	10,116
40	21	21	Washington County Hospital		60	55	0.29	0.12	0.01	471	0.005	0.00008	3,189
41	25	25	Holy Spirit Hospital		27	52	0.43	0.18	0.09	691	0.007	0.0001	4,785
42	30	30	Riddle Memorial Hospital		46	24	0.32	0.07	0.15	519	0.005	0.00008	3,398
43	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		13	17	0.14	0.03	0.01	223	0.0004	0.00001	1,358

Table 3. MACT Floor Emission Reductions for Existing HI

No.	FACID	UNITID	Facility name	Unit number	HCl MACT floor control level (lb/yr)	CO MACT floor control level (lb/yr)	Pb MACT floor control level (lb/yr)	Cd MACT floor control level (lb/yr)	Hg MACT floor control level (lb/yr)	PM MACT floor control level (lb/yr)	CDD/CDF MACT floor control level (g/yr)	TEQ MACT floor control level (g/yr)	NO _x MACT floor control level (lb/yr)
44	38	38	Wilkes-Barre General Hospital		94	60	0.14	0.04	0.27	315	0.010	0.0002	5,009
45	41	41	Thomas Memorial Hospital		39	11	0.20	0.08	0.09	327	0.0009	0.00002	1,870
46	47	47	Malcolm Randall Veterans Affairs Medical Center		36	33	0.17	0.07	0.08	282	0.003	0.00005	2,670
47	63	63	St. Jude Children's Research Hospital		25	5	0.04	0.01	0.03	106	0.003	0.00004	1,648
48	81	81	South Bend Medical Foundation		61	39	0.30	0.03	0.14	468	0.005	0.00008	460
49	82	82	Good Samaritan Hospital		28	26	0.22	0.04	0.03	358	0.004	0.00006	2,359
50	88	88	Medina General Hospital		47	43	0.22	0.09	0.09	358	0.004	0.00006	2,477
51	95	95	St. Joseph's Hospital		25	17	0.03	0.01	0.02	58	0.002	0.00004	1,339
52	108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	5	18	0.14	0.06	0.03	230	0.0008	0.00001	1,884
53	111	111	Wyoming Medical Center		9	17	0.09	0.04	0.04	43	0.002	0.00002	1,343
54	86	86	Fairfield Medical Center		30	52	3.31	0.05	0.15	645	0.027	0.00007	3,933
55	129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	13	64	0.57	0.04	0.02	136	0.010	0.00002	1,344
56	115	115	Kona Community Hospital		175	7	0.83	0.14	0.006	108	0.049	0.001	156
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		406	6	0.74	0.12	0.01	121	0.185	0.004	163
Large total					12,256	12,565	49.3	11.3	43.6	54,932	3.18	0.0569	881,478
Medium total					680	677	4.13	1.46	1.39	6,670	0.0747	0.00116	46,886
Small total					43.6	115	3.88	0.095	0.177	781	0.0372	0.0000908	5,277
Small rural total					581	12.7	1.56	0.263	0.0188	228	0.234	0.00475	320
Nationwide total					13,560	13,370	58.9	13.1	45.2	62,612	3.53	0.0630	933,961
Nationwide % reduction													

Notes:

- HCl, CO, NO_x, SO₂ control level emissions (lb/yr) = emission limit (ppmvd) x molecular weight (g/g-mol) x g-mol-°K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-µg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ µg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
- Pb, Cd, Hg control level emissions (lb/yr) = emission limit (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
- PM control level emissions (lb/yr) = emission limit (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
- CDD/CDF, TEQ control level emissions (g/yr) = emission limit (ng/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x g/10⁹ ng x 60 min/hr x operating hours (hr/yr)
- If baseline concentration < emission limit, then control level emissions = baseline emissions.
- Emission reduction (lb/yr) = baseline emissions (lb/yr) - control level emissions (lb/yr)

Table 3. MACT Floor Emission Reductions for Existing HI

No.	FACID	UNITID	Facility name	Unit number	HCl MACT floor control level (lb/yr)	CO MACT floor control level (lb/yr)	Pb MACT floor control level (lb/yr)	Cd MACT floor control level (lb/yr)	Hg MACT floor control level (lb/yr)	PM MACT floor control level (lb/yr)	CDD/CDF MACT floor control level (g/yr)	TEQ MACT floor control level (g/yr)	NO _x MACT floor control level (lb/yr)
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7. Total emission reduction (lb/yr) = $\sum(\text{HCl, CO, Pb, Cd, Hg, PM, NO}_x, \text{SO}_2 \text{ lb/yr}) + (\text{total CDD/CDF g/yr} \times \text{lb}/453.59237 \text{ g})$

8. Molecular weights:

HCl g/g-mol = 36
 CO g/g-mol = 28
 NO_x g/g-mol = 46
 SO₂ g/g-mol = 64

Sources:

1. Inventory database
2. MACT floor memo

Key:

CA = Carbon adsorber
 CC = Combustion control
 Cd = Cadmium
 CDD/CDF = Dioxins/furans
 CO = Carbon monoxide
 DI = Dry sorbent injection
 DIFF = Dry injection fabric filter
 dscf = Dry standard cubic feet
 dscm = Dry standard cubic meter
 E = Existing HMIWI
 ESP = Electrostatic precipitator
 FF = Fabric filter
 gr = Grains
 HCl = Hydrogen chloride
 Hg = Mercury
 HMIWI = Hospital/medical/infectious waste incinerator(s)
 L = Large HMIWI
 M = Medium HMIWI
 mg = Milligrams
 N = New HMIWI
 ng = Nanograms
 NO_x = Nitrogen oxides
 Pb = Lead
 PM = Particulate matter
 ppmvd = Parts per million by volume, dry
 S = Small HMIWI
 SO₂ = Sulfur dioxide
 SR = Small rural HMIWI
 TEQ = 2,3,7,8-TCDD toxic equivalent
 WESP = Wet ESP
 WS = Wet scrubber

Table 3. MACT Floor Emission Reductions for Existing HI

No.	FACID	UNITID	Facility name	Unit number	SO ₂ MACT floor control level (lb/yr)	Total MACT floor control level (lb/yr)	HCl MACT floor emission reduction (lb/yr)	CO MACT floor emission reduction (lb/yr)	Pb MACT floor emission reduction (lb/yr)	Cd MACT floor emission reduction (lb/yr)	Hg MACT floor emission reduction (lb/yr)	PM MACT floor emission reduction (lb/yr)
1	1	1	Bristol-Myers Squibb Co.		74	2,448	957	0	3.91	0	0	0
2	5	5	Merck & Company, Inc.		643	20,917	0	0	0.30	0	0	0
3	15	15--1	Curtis Bay Energy	Unit 1	4,721	189,093	79,456	0	0	0	149.37	5,454
4	15	15--2	Curtis Bay Energy	Unit 2	5,164	204,794	78,186	0	0	0	290.73	0
5	20	20--1	Fort Detrick	Unit 5	85	2,878	0	0	1.34	0.07	0	44
6	20	20--2	Fort Detrick	Unit 6	80	2,723	0	0	1.90	0.05	0	55
7	29	29	Hamot Medical Center		193	7,046	563	0	0	0	0	0
8	36	36--1	Merck & Company, Inc.	Unit 2	33	2,255	30	0	0	0	0	0
9	36	36--2	Merck & Company, Inc.	Unit 5	757	24,200	248	0	0	0	0.81	0
10	40	40	Charleston Area Medical Center, General Hospital		76	2,691	508	119	0	0	0	0
11	42	42	Stericycle, Inc.		560	40,176	5,253	1,113	6.34	0.99	0.77	0
12	43	43	Boca Raton Community Hospital		486	16,776	0	194	5.12	0.09	0.16	748
13	44	44	Bethesda Memorial Hospital		358	9,317	0	0	3.31	0.27	3.31	470
14	46	46	Holy Cross Hospital		105	5,204	0	40	1.83	0.48	1.53	403
15	48	48	Memorial Regional Hospital		558	21,903	0	0	6.81	0.13	0	807
16	51	51	Lakeland Regional Medical Center		347	10,315	26	174	1.70	0	0	0
17	54	54	Bayfront Medical Center		108	9,431	0	206	3.08	0	0	0
18	55	55	St. Joseph's Hospital		414	15,658	947	140	6.12	0	0	0
19	59	59--1	Stericycle, Inc.	Unit 1	833	29,129	311	6	24.25	2.42	3.70	442
20	59	59--2	Stericycle, Inc.	Unit 2	812	28,379	244	90	23.76	1.81	13.36	1,294
21	60	60--1	BMWNC, Inc.	Unit 1	926	28,724	6,850	1,617	0	0	9.49	0

Table 3. MACT Floor Emission Reductions for Existing HI

No.	FACID	UNITID	Facility name	Unit number	SO ₂ MACT floor control level (lb/yr)	Total MACT floor control level (lb/yr)	HCl MACT floor emission reduction (lb/yr)	CO MACT floor emission reduction (lb/yr)	Pb MACT floor emission reduction (lb/yr)	Cd MACT floor emission reduction (lb/yr)	Hg MACT floor emission reduction (lb/yr)	PM MACT floor emission reduction (lb/yr)
22	65	65--1	Stericycle, Inc.	Unit 1	620	21,513	0	871	17.78	0.15	38.44	785
23	65	65--2	Stericycle, Inc.	Unit 2	580	20,157	0	169	10.74	0.73	32.49	643
24	71	71	Loyola University Medical Center		119	12,449	0	201	10.44	0.71	0.56	705
25	77	77	Parkview Hospital		597	20,820	35	186	14.30	6.62	0	1,054
26	84	84	Mayo Clinic, Waste Management Facility		412	31,592	2,077	0	42.31	0.91	5.32	2,812
27	87	87	MedCentral Health System, Mansfield Hospital		150	5,185	685	21	0.78	0	0	0
28	94	94	Stericycle, Inc.		534	18,468	0	46	18.71	0.09	18.62	106
29	98	98--1	University of Texas Medical Branch		249	14,486	0	0	67.22	0	3.50	1,886
30	106	106	Stericycle, Inc.		758	26,256	0	85	13.41	0	43.11	723
31	109	109	Healthcare Environmental Services Inc.		162	6,570	2,310	275	0.13	0	3.74	37
32	110	110	Stericycle, Inc.		1,158	45,768	359	630	3.08	0	11.22	0
33	120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	670	34,851	2,712	15	1.68	0	1.04	965
34	120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	231	36,697	826	0	0	0	0	2,367
35	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		25	970	0	52	0	0	0	0
36	130	130	Department of Veterans Affairs Medical Center		641	15,734	771	0	3.05	0.15	0	1,259
37	13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		11	1,979	0	0	10.16	1.22	0.35	15
38	16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		59	1,694	0	81	3.00	0.38	0	380
39	18	18	Franklin Square Hospital Center		466	12,610	0	172	14.89	2.45	0	1,887
40	21	21	Washington County Hospital		118	3,894	90	67	2.52	0.12	0	300
41	25	25	Holy Spirit Hospital		177	5,732	0	0	3.47	0.92	0	255
42	30	30	Riddle Memorial Hospital		13	4,000	0	0	3.05	0	0.05	18
43	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		22	1,632	0	0	1.08	0	0	221

Table 3. MACT Floor Emission Reductions for Existing HI

No.	FACID	UNITID	Facility name	Unit number	SO ₂ MACT floor control level (lb/yr)	Total MACT floor control level (lb/yr)	HCl MACT floor emission reduction (lb/yr)	CO MACT floor emission reduction (lb/yr)	Pb MACT floor emission reduction (lb/yr)	Cd MACT floor emission reduction (lb/yr)	Hg MACT floor emission reduction (lb/yr)	PM MACT floor emission reduction (lb/yr)
44	38	38	Wilkes-Barre General Hospital		125	5,605	243	0	0	0	0.05	0
45	41	41	Thomas Memorial Hospital		68	2,316	2	0	8.40	0.27	1.20	384
46	47	47	Malcolm Randall Veterans Affairs Medical Center		64	3,084	31	94	2.16	0.83	0.12	123
47	63	63	St. Jude Children's Research Hospital		35	1,819	250	0	0	0	0	0
48	81	81	South Bend Medical Foundation		120	1,148	239	0	9.21	0	3.50	0
49	82	82	Good Samaritan Hospital		87	2,858	0	0	0.12	0	0	50
50	88	88	Medina General Hospital		92	3,017	15	158	8.50	0.05	0	439
51	95	95	St. Joseph's Hospital		35	1,473	28	0	0	0	0	0
52	108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	19	2,157	0	0	0.69	0.005	0	184
53	111	111	Wyoming Medical Center		24	1,436	0	2	0.18	0.06	0.09	0
54	86	86	Fairfield Medical Center		146	4,809	0	0	0	0	0.08	0
55	129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	50	1,608	0	30	0	0	0	0
56	115	115	Kona Community Hospital		8	455	0	0	0.00	0.00	0	0
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		54	751	0	0	0	0	0.28	0
Large total					24,237	985,572	183,354	6,251	293	15.7	631	23,059
Medium total					1,534	56,454	897	574	67.4	6.31	5.36	4,256
Small total					195	6,417	0	30.4	0	0	0.0813	0
Small rural total					62.1	1,206	0	0	0	0	0.283	0
Nationwide total					26,028	1,049,649	184,251	6,855	361	22.0	637	27,315
Nationwide % reduction							93%	34%	86%	63%	93%	30%

Notes:

1. HCl, CO, NO_x, SO₂ control level emissions (lb/yr) = emission limit (ppmvd) x molecular weight (g/g-mol) x g-mol-°K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-µg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ µg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
2. Pb, Cd, Hg control level emissions (lb/yr) = emission limit (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
3. PM control level emissions (lb/yr) = emission limit (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
4. CDD/CDF, TEQ control level emissions (g/yr) = emission limit (ng/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x g/10⁹ ng x 60 min/hr x operating hours (hr/yr)
5. If baseline concentration < emission limit, then control level emissions = baseline emissions.
6. Emission reduction (lb/yr) = baseline emissions (lb/yr) - control level emissions (lb/yr)

Table 3. MACT Floor Emission Reductions for Existing HI

No.	FACID	UNITID	Facility name	Unit number	SO ₂ MACT floor control level (lb/yr)	Total MACT floor control level (lb/yr)	HCl MACT floor emission reduction (lb/yr)	CO MACT floor emission reduction (lb/yr)	Pb MACT floor emission reduction (lb/yr)	Cd MACT floor emission reduction (lb/yr)	Hg MACT floor emission reduction (lb/yr)	PM MACT floor emission reduction (lb/yr)
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7. Total emission reduction (lb/yr) = $\sum(\text{HCl, CO, Pb, Cd, Hg, PM, NO}_x, \text{SO}_2 \text{ lb/yr}) + (\text{total CDD/CDF g/yr} \times \text{lb}/453.59237 \text{ g})$

8. Molecular weights:

HCl g/g-mol = 36

CO g/g-mol = 28

NO_x g/g-mol = 46

SO₂ g/g-mol = 64

Sources:

1. Inventory database

2. MACT floor memo

Key:

CA = Carbon adsorber

CC = Combustion control

Cd = Cadmium

CDD/CDF = Dioxins/furans

CO = Carbon monoxide

DI = Dry sorbent injection

DIFF = Dry injection fabric filter

dscf = Dry standard cubic feet

dscm = Dry standard cubic meter

E = Existing HMIWI

ESP = Electrostatic precipitator

FF = Fabric filter

gr = Grains

HCl = Hydrogen chloride

Hg = Mercury

HMIWI = Hospital/medical/infectious waste incinerator(s)

L = Large HMIWI

M = Medium HMIWI

mg = Milligrams

N = New HMIWI

ng = Nanograms

NO_x = Nitrogen oxides

Pb = Lead

PM = Particulate matter

ppmvd = Parts per million by volume, dry

S = Small HMIWI

SO₂ = Sulfur dioxide

SR = Small rural HMIWI

TEQ = 2,3,7,8-TCDD toxic equivalent

WESP = Wet ESP

WS = Wet scrubber

Table 3. MACT Floor Emission Reductions for Existing HI

No.	FACID	UNITID	Facility name	Unit number	CDD/CDF MACT floor emission reduction (g/yr)	TEQ MACT floor emission reduction (g/yr)	NO _x MACT floor emission reduction (lb/yr)	SO ₂ MACT floor emission reduction (lb/yr)	Total MACT floor emission reduction (lb/yr)
1	1	1	Bristol-Myers Squibb Co.		0.205	0.004	0	721	1,681
2	5	5	Merck & Company, Inc.		0.605	0.004	0	0	0
3	15	15--1	Curtis Bay Energy	Unit 1	10.718	0.173	57,007	34,017	176,084
4	15	15--2	Curtis Bay Energy	Unit 2	1.758	0.039	52,315	58,905	189,697
5	20	20--1	Fort Detrick	Unit 5	0.447	0.004	0	2	47
6	20	20--2	Fort Detrick	Unit 6	0.488	0.006	0	1	59
7	29	29	Hamot Medical Center		0.080	0.0008	0	0	563
8	36	36--1	Merck & Company, Inc.	Unit 2	0.016	0.0001	0	0	30
9	36	36--2	Merck & Company, Inc.	Unit 5	0.411	0.022	0	0	249
10	40	40	Charleston Area Medical Center, General Hospital		0	0	0	0	627
11	42	42	Stericycle, Inc.		2.146	0.068	2,480	0	8,854
12	43	43	Boca Raton Community Hospital		2.039	0.025	0	9	956
13	44	44	Bethesda Memorial Hospital		1.228	0.027	0	232	709
14	46	46	Holy Cross Hospital		0.611	0.037	0	0	446
15	48	48	Memorial Regional Hospital		1.811	0.049	270	121	1,205
16	51	51	Lakeland Regional Medical Center		2.349	0.044	0	0	202
17	54	54	Bayfront Medical Center		0.742	0.013	18	0	227
18	55	55	St. Joseph's Hospital		2.940	0.060	0	0	1,093
19	59	59--1	Stericycle, Inc.	Unit 1	0.069	0.002	0	15	805
20	59	59--2	Stericycle, Inc.	Unit 2	0.217	0.003	0	15	1,681
21	60	60--1	BMWNC, Inc.	Unit 1	0.385	0.010	0	1,398	9,875

Table 3. MACT Floor Emission Reductions for Existing HI

No.	FACID	UNITID	Facility name	Unit number	CDD/CDF MACT floor emission reduction (g/yr)	TEQ MACT floor emission reduction (g/yr)	NO _x MACT floor emission reduction (lb/yr)	SO ₂ MACT floor emission reduction (lb/yr)	Total MACT floor emission reduction (lb/yr)
22	65	65--1	Stericycle, Inc.	Unit 1	0	0	0	11	1,723
23	65	65--2	Stericycle, Inc.	Unit 2	0	0	0	10	867
24	71	71	Loyola University Medical Center		1.907	0.017	0	0	917
25	77	77	Parkview Hospital		0.217	0.002	0	11	1,306
26	84	84	Mayo Clinic, Waste Management Facility		0	0	7,415	0	12,353
27	87	87	MedCentral Health System, Mansfield Hospital		0.352	0.007	0	347	1,055
28	94	94	Stericycle, Inc.		0.483	0.011	0	10	199
29	98	98--1	University of Texas Medical Branch		3.962	0.042	0	0	1,957
30	106	106	Stericycle, Inc.		0.043	0	0	14	878
31	109	109	Healthcare Environmental Services Inc.		0.205	0.027	2,785	1,006	6,417
32	110	110	Stericycle, Inc.		0.138	0.004	26,125	226	27,355
33	120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	0	0	0	0	3,695
34	120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	0	0	0	0	3,192
35	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		0	0	0	0	52
36	130	130	Department of Veterans Affairs Medical Center		0	0	0	1,093	3,127
37	13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		0.002	0.0002	0	0	27
38	16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		0.028	0.0006	0	2	466
39	18	18	Franklin Square Hospital Center		2.500	0.027	0	1,342	3,418
40	21	21	Washington County Hospital		0.588	0.010	0	30	490
41	25	25	Holy Spirit Hospital		0.032	0.0002	0	45	305
42	30	30	Riddle Memorial Hospital		0.666	0.012	0	0	21
43	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		0	0	0	0	222

Table 3. MACT Floor Emission Reductions for Existing HI

No.	FACID	UNITID	Facility name	Unit number	CDD/CDF MACT floor emission reduction (g/yr)	TEQ MACT floor emission reduction (g/yr)	NO _x MACT floor emission reduction (lb/yr)	SO ₂ MACT floor emission reduction (lb/yr)	Total MACT floor emission reduction (lb/yr)
44	38	38	Wilkes-Barre General Hospital		0.246	0.003	0	0	243
45	41	41	Thomas Memorial Hospital		0	0	0	0	396
46	47	47	Malcolm Randall Veterans Affairs Medical Center		0.018	0.0005	0	0	252
47	63	63	St. Jude Children's Research Hospital		0.035	0.0006	0	0	250
48	81	81	South Bend Medical Foundation		0.028	0.0003	0	379	630
49	82	82	Good Samaritan Hospital		0.161	0.0005	0	22	72
50	88	88	Medina General Hospital		0.098	0.003	0	23	644
51	95	95	St. Joseph's Hospital		0.003	0.0001	0	0	28
52	108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	0	0	0	0	185
53	111	111	Wyoming Medical Center		0.186	0.003	0	0	2
54	86	86	Fairfield Medical Center		0	0.0005	0	37	37
55	129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	0.000	0	0	13	43
56	115	115	Kona Community Hospital		0	0	0	0	0
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		0	0	0	0	0
Large total					36.6	0.705	148,416	98,163	460,183
Medium total					4.59	0.0607	0	1,844	7,650
Small total					0	0.000508	0	50.0	80.5
Small rural total					0	0	0	0	0.283
Nationwide total					41.2	0.767	148,416	100,057	467,914
Nationwide % reduction					92%	92%	14%	79%	31%

Notes:

- HCl, CO, NO_x, SO₂ control level emissions (lb/yr) = emission limit (ppmvd) x molecular weight (g/g-mol) x g-mol-°K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-µg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ µg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
- Pb, Cd, Hg control level emissions (lb/yr) = emission limit (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
- PM control level emissions (lb/yr) = emission limit (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
- CDD/CDF, TEQ control level emissions (g/yr) = emission limit (ng/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x g/10⁹ ng x 60 min/hr x operating hours (hr/yr)
- If baseline concentration < emission limit, then control level emissions = baseline emissions.
- Emission reduction (lb/yr) = baseline emissions (lb/yr) - control level emissions (lb/yr)

Table 3. MACT Floor Emission Reductions for Existing HI

No.	FACID	UNITID	Facility name	Unit number	CDD/CDF MACT floor emission reduction (g/yr)	TEQ MACT floor emission reduction (g/yr)	NO _x MACT floor emission reduction (lb/yr)	SO ₂ MACT floor emission reduction (lb/yr)	Total MACT floor emission reduction (lb/yr)
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7. Total emission reduction (lb/yr) = $\sum(\text{HCl, CO, Pb, Cd, Hg, PM, NO}_x, \text{SO}_2 \text{ lb/yr}) + (\text{total CDD/CDF g/yr} \times \text{lb}/453.59237 \text{ g})$

8. Molecular weights:

HCl g/g-mol = 36

CO g/g-mol = 28

NO_x g/g-mol = 46

SO₂ g/g-mol = 64

Sources:

1. Inventory database
2. MACT floor memo

Key:

- CA = Carbon adsorber
- CC = Combustion control
- Cd = Cadmium
- CDD/CDF = Dioxins/furans
- CO = Carbon monoxide
- DI = Dry sorbent injection
- DIFF = Dry injection fabric filter
- dscf = Dry standard cubic feet
- dscm = Dry standard cubic meter
- E = Existing HMIWI
- ESP = Electrostatic precipitator
- FF = Fabric filter
- gr = Grains
- HCl = Hydrogen chloride
- Hg = Mercury
- HMIWI = Hospital/medical/infectious waste incinerator(s)
- L = Large HMIWI
- M = Medium HMIWI
- mg = Milligrams
- N = New HMIWI
- ng = Nanograms
- NO_x = Nitrogen oxides
- Pb = Lead
- PM = Particulate matter
- ppmvd = Parts per million by volume, dry
- S = Small HMIWI
- SO₂ = Sulfur dioxide
- SR = Small rural HMIWI
- TEQ = 2,3,7,8-TCDD toxic equivalent
- WESP = Wet ESP
- WS = Wet scrubber

Table 4. Beyond-the-Floor Emission Reductions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD code	APCD type	Consolidated beyond-the-floor controls
1	1	1	Bristol-Myers Squibb Co.		Wallingford	CT	L	E	FF	Dry	improve FF performance; add caustic; increase activated carbon; add SNCR
2	5	5	Merck & Company, Inc.		Rahway	NJ	L	E	DIFF	Dry	replace DIFF (in place of improving FF performance); add packed-bed scrubber; increase activated carbon; add SNCR
3	15	15--1	Curtis Bay Energy	Unit 1	Baltimore	MD	L	E	DIFF	Dry	replace DIFF (in place of improving FF performance); add caustic; increase activated carbon and NO _x reagent
4	15	15--2	Curtis Bay Energy	Unit 2	Baltimore	MD	L	E	DIFF	Dry	minor adjustment of system to obtain additional CO control (marginal difference in CO); replace DIFF; add caustic; increase activated carbon and NO _x reagent
5	20	20--1	Fort Detrick	Unit 5	Fort Detrick	MD	L	E	WS	Wet	improve FF performance; add more caustic; increase activated carbon; add SNCR
6	20	20--2	Fort Detrick	Unit 6	Fort Detrick	MD	L	E	WS	Wet	improve FF performance; add more caustic; increase activated carbon; add SNCR
7	29	29	Hamot Medical Center		Erie	PA	L	E	DIFF/WS	Dry/wet	replace DIFF; add caustic; further increase activated carbon; add SNCR
8	36	36--1	Merck & Company, Inc.	Unit 2	West Point (Upper Gwynedd Township)	PA	L	E	DIFF	Dry	replace DIFF; add caustic; increase activated carbon; add SNCR
9	36	36--2	Merck & Company, Inc.	Unit 5	West Point (Upper Gwynedd Township)	PA	L	E	DIFF	Dry	replace DIFF; add caustic; increase activated carbon; add SNCR
10	40	40	Charleston Area Medical Center, General Hospital		Charleston	WV	L	E	DIFF	Dry	add more natural gas; replace DIFF; add caustic; increase activated carbon; add SNCR
11	42	42	Stericycle, Inc.		Apopka	FL	L	E	DIFF	Dry	add natural gas; improve FF performance; add caustic; further increase activated carbon; add SNCR (in place of minor adjustment of system)
12	43	43	Boca Raton Community Hospital		Boca Raton	FL	L	E	WS	Wet	add natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR
13	44	44	Bethesda Memorial Hospital		Boynton Beach	FL	L	E	WS	Wet	improve FF performance; add more caustic; increase activated carbon; add SNCR
14	46	46	Holy Cross Hospital		Fort Lauderdale	FL	L	E	WS	Wet	secondary chamber retrofit (in place of increasing natural gas); improve FF performance; add caustic; increase activated carbon; add SNCR
15	48	48	Memorial Regional Hospital		Hollywood	FL	L	E	WS	Wet	improve FF performance; add more caustic; increase activated carbon; add SNCR (in place of minor adjustment of system)
16	51	51	Lakeland Regional Medical Center		Lakeland	FL	L	E	DIFF	Dry	add natural gas; improve FF performance; add packed-bed scrubber (in place of increasing lime); increase activated carbon; add SNCR
17	54	54	Bayfront Medical Center		St. Petersburg	FL	L	E	WS	Wet	add natural gas; improve FF performance; add caustic; increase activated carbon; add SNCR

Table 4. Beyond-the-Floor Emission Reductions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD code	APCD type	Consolidated beyond-the-floor controls
18	55	55	St. Joseph's Hospital		Tampa	FL	L	E	DIFF/WS	Dry/wet	secondary chamber retrofit (in place of increasing natural gas); improve FF performance; add caustic; increase activated carbon; add SNCR
19	59	59--1	Stericycle, Inc.	Unit 1	Haw River	NC	L	E	WS	Wet	add more natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR
20	59	59--2	Stericycle, Inc.	Unit 2	Haw River	NC	L	E	WS	Wet	add more natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR
21	60	60--1	BMWNC, Inc.	Unit 1	Matthews	NC	L	E	DIFF	Dry	add natural gas; replace DIFF; add caustic; further increase activated carbon; add SNCR
22	65	65--1	Stericycle, Inc.	Unit 1	Clinton	IL	L	E	WS	Wet	add natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR
23	65	65--2	Stericycle, Inc.	Unit 2	Clinton	IL	L	E	WS	Wet	secondary chamber retrofit (in place of increasing natural gas); improve FF performance; add more caustic; increase activated carbon; add SNCR
24	71	71	Loyola University Medical Center		Maywood	IL	L	E	WS	Wet	add natural gas; improve FF performance; add packed-bed scrubber; increase activated carbon; add SNCR
25	77	77	Parkview Hospital		Fort Wayne	IN	L	E	WS	Wet	secondary chamber retrofit (in place of increasing natural gas); improve FF performance; add packed-bed scrubber (in place of adding caustic); increase activated carbon; add SNCR
26	84	84	Mayo Clinic, Waste Management Facility		Rochester	MN	L	E	DIFF	Dry	improve FF performance; add caustic; further increase activated carbon; increase NO _x reagent
27	87	87	MedCentral Health System, Mansfield Hospital		Mansfield	OH	L	E	DIFF	Dry	add more natural gas; improve FF performance; add caustic; further increase activated carbon; add SNCR
28	94	94	Stericycle, Inc.		Warren	OH	L	E	WS	Wet	add more natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR
29	98	98--1	University of Texas Medical Branch		Galveston	TX	L	E	WS	Wet	improve FF performance; add caustic; further increase activated carbon; add SNCR
30	106	106	Stericycle, Inc.		Kansas City	KS	L	E	WS	Wet	add more natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR
31	109	109	Healthcare Environmental Services Inc.		Fargo	ND	L	E	DIFF	Dry	add natural gas; improve FF performance; add caustic; further increase activated carbon; increase NO _x reagent
32	110	110	Stericycle, Inc.		North Salt Lake	UT	L	E	DI-ESP/WS	Dry/wet	add natural gas; improve FF performance; add more sodium bicarbonate; further increase activated carbon; increase NO _x reagent

Table 4. Beyond-the-Floor Emission Reductions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD code	APCD type	Consolidated beyond-the-floor controls
33	120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	Anahuac	TX	L	N	DIFF	Dry	add more natural gas; improve FF performance; add caustic; further increase activated carbon; add SNCR
34	120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	Anahuac	TX	L	N	DIFF	Dry	improve FF performance; add caustic; increase activated carbon; add SNCR
35	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		Greenville	NC	L	N	CA/WS	Dry/wet	add natural gas and caustic; increase activated carbon; add SNCR
36	130	130	Department of Veterans Affairs Medical Center		Miami	FL	L	E	WS	Wet	improve FF performance; add more caustic; add ACI and SNCR
37	13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		Baltimore	MD	M	E	WS	Wet	improve FF performance; increase activated carbon; add SNCR
38	16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		Baltimore	MD	M	E	WS	Wet	add natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR
39	18	18	Franklin Square Hospital Center		Baltimore	MD	M	E	WS	Wet	add natural gas; improve FF performance; add caustic; increase activated carbon; add SNCR
40	21	21	Washington County Hospital		Hagerstown	MD	M	E	WS	Wet	add natural gas; improve FF performance; add caustic; increase activated carbon; add SNCR
41	25	25	Holy Spirit Hospital		Camp Hill	PA	M	E	WS	Wet	improve FF performance; add more caustic; increase activated carbon; add SNCR
42	30	30	Riddle Memorial Hospital		Media	PA	M	E	WS	Wet	improve FF performance; add caustic; further increase activated carbon; add SNCR
43	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		State College	PA	M	E	WS	Wet	increase natural gas; improve FF performance; add packed-bed scrubber; add SNCR
44	38	38	Wilkes-Barre General Hospital		Wilkes-Barre	PA	M	N	DIFF	Dry	increase natural gas; add caustic; further increase activated carbon; add SNCR
45	41	41	Thomas Memorial Hospital		South Charleston	WV	M	E	WS	Wet	improve FF performance; add more caustic; increase activated carbon; add SNCR
46	47	47	Malcolm Randall Veterans Affairs Medical Center		Gainesville	FL	M	E	WS	Wet	add natural gas; improve FF performance; add caustic; increase activated carbon; add SNCR
47	63	63	St. Jude Children's Research Hospital		Memphis	TN	M	E	DIFF	Dry	add caustic; further increase activated carbon; add SNCR
48	81	81	South Bend Medical Foundation		South Bend	IN	M	E	WS	Wet	increase natural gas; improve FF performance; add caustic; increase activated carbon; add SNCR
49	82	82	Good Samaritan Hospital		Vincennes	IN	M	E	WS	Wet	minor adjustment of system to obtain additional CO control (marginal difference in CO); improve FF performance; add more caustic; increase activated carbon; add SNCR
50	88	88	Medina General Hospital		Medina	OH	M	E	WS	Wet	add natural gas; improve FF performance; add more caustic; increase activated carbon; add SNCR

Table 4. Beyond-the-Floor Emission Reductions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD code	APCD type	Consolidated beyond-the-floor controls
51	95	95	St. Joseph's Hospital		Marshfield	WI	M	E	DIFF	Dry	increase natural gas; add caustic; further increase activated carbon; add SNCR
52	108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	Hamilton	MT	M	E	WS	Wet	increase natural gas; add DIFF (in place of FF); improve FF performance; add caustic, ACI, and SNCR
53	111	111	Wyoming Medical Center		Casper	WY	M	E	WS	Wet	add more natural gas; improve FF performance; add caustic; increase activated carbon; add SNCR
54	86	86	Fairfield Medical Center		Lancaster	OH	S	E	WS	Wet	increase natural gas; add DIFF; add more caustic; increase activated carbon; add SNCR
55	129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	Atlanta	GA	S	N	WS	Wet	increase natural gas; add DIFF; add more caustic; add ACI and SNCR
56	115	115	Kona Community Hospital		Kealahou	HI	SR	E	CC	Comb ctrl	add DIFF, packed-bed scrubber, ACI, and SNCR
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		Bethel	AK	SR	E	CC	Comb ctrl	improve FF performance; add packed-bed scrubber; increase activated carbon; add SNCR
Large total											
Medium total											
Small total											
Small rural total											
Nationwide total											
Nationwide % reduction											

Notes:

- HCl, CO, NO_x, SO₂ control level emissions (lb/yr) = emission limit (ppmvd) x molecular weight (g/g-mol) x g-mol-°K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-µg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ µg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
- Pb, Cd, Hg control level emissions (lb/yr) = emission limit (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
- PM control level emissions (lb/yr) = emission limit (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
- CDD/CDF, TEQ control level emissions (g/yr) = emission limit (ng/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x g/10⁹ ng x 60 min/hr x operating hours (hr/yr)
- If baseline concentration < emission limit, then control level emissions = baseline emissions, except when beyond-the-floor option includes NO_x control (SNCR) and unit meets beyond-the-floor limit, then control level emissions = baseline emissions x (100% - 45% control with SNCR).
- Emission reduction (lb/yr) = baseline emissions (lb/yr) - control level emissions (lb/yr)
- Total emission reduction (lb/yr) = Σ(HCl, CO, Pb, Cd, Hg, PM, NO_x, SO₂ lb/yr) + (total CDD/CDF g/yr x lb/453.59237 g)

Table 4. Beyond-the-Floor Emission Reductions for Existing HMIWI

No.	FACID	UNITID	Facility name	Unit number	City	State	Category	New/ existing	APCD code	APCD type	Consolidated beyond-the-floor controls
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8. Molecular weights:

HCl g/g-mol = 36
 CO g/g-mol = 28
 NO_x g/g-mol = 46
 SO₂ g/g-mol = 64

Sources:

1. Inventory database
2. Beyond-the-floor memo
3. NO_x removal efficiency: Clean Air Technology Center. EPA Technical Bulletin: Nitrogen Oxides (NO_x)--Why and How They Are Controlled. 456/F-99-006R. November 1999.

Key:

CA = Carbon adsorber
 CC = Combustion control
 Cd = Cadmium
 CDD/CDF = Dioxins/furans
 CO = Carbon monoxide
 DI = Dry sorbent injection
 DIFF = Dry injection fabric filter
 dscf = Dry standard cubic feet
 dscm = Dry standard cubic meter
 E = Existing HMIWI
 ESP = Electrostatic precipitator
 FF = Fabric filter
 gr = Grains
 HCl = Hydrogen chloride
 Hg = Mercury
 HMIWI = Hospital/medical/infectious waste incinerator(s)
 L = Large HMIWI
 M = Medium HMIWI
 mg = Milligrams
 N = New HMIWI
 ng = Nanograms
 NO_x = Nitrogen oxides
 Pb = Lead
 PM = Particulate matter
 ppmvd = Parts per million by volume, dry
 S = Small HMIWI
 SO₂ = Sulfur dioxide
 SR = Small rural HMIWI
 TEQ = 2,3,7,8-TCDD toxic equivalent
 WESP = Wet ESP
 WS = Wet scrubber

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	HCl BTF limit (ppmvd)	CO BTF limit (ppmvd)	Pb BTF limit (mg/dscm)	Cd BTF limit (mg/dscm)	Hg BTF limit (mg/dscm)	PM BTF limit (gr/dscf)	CDD/CDF BTF limit (ng/dscm)	TEQ BTF limit (ng/dscm)	NO _x BTF limit (ppmvd)	SO ₂ BTF limit (ppmvd)
1	1	1	Bristol-Myers Squibb Co.		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
2	5	5	Merck & Company, Inc.		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
3	15	15--1	Curtis Bay Energy	Unit 1	0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
4	15	15--2	Curtis Bay Energy	Unit 2	0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
5	20	20--1	Fort Detrick	Unit 5	0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
6	20	20--2	Fort Detrick	Unit 6	0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
7	29	29	Hamot Medical Center		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
8	36	36--1	Merck & Company, Inc.	Unit 2	0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
9	36	36--2	Merck & Company, Inc.	Unit 5	0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
10	40	40	Charleston Area Medical Center, General Hospital		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
11	42	42	Stericycle, Inc.		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
12	43	43	Boca Raton Community Hospital		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
13	44	44	Bethesda Memorial Hospital		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
14	46	46	Holy Cross Hospital		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
15	48	48	Memorial Regional Hospital		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
16	51	51	Lakeland Regional Medical Center		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
17	54	54	Bayfront Medical Center		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	HCl BTF limit (ppmvd)	CO BTF limit (ppmvd)	Pb BTF limit (mg/dscm)	Cd BTF limit (mg/dscm)	Hg BTF limit (mg/dscm)	PM BTF limit (gr/dscf)	CDD/CDF BTF limit (ng/dscm)	TEQ BTF limit (ng/dscm)	NO _x BTF limit (ppmvd)	SO ₂ BTF limit (ppmvd)
18	55	55	St. Joseph's Hospital		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
19	59	59--1	Stericycle, Inc.	Unit 1	0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
20	59	59--2	Stericycle, Inc.	Unit 2	0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
21	60	60--1	BMWNC, Inc.	Unit 1	0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
22	65	65--1	Stericycle, Inc.	Unit 1	0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
23	65	65--2	Stericycle, Inc.	Unit 2	0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
24	71	71	Loyola University Medical Center		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
25	77	77	Parkview Hospital		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
26	84	84	Mayo Clinic, Waste Management Facility		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
27	87	87	MedCentral Health System, Mansfield Hospital		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
28	94	94	Stericycle, Inc.		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
29	98	98--1	University of Texas Medical Branch		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
30	106	106	Stericycle, Inc.		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
31	109	109	Healthcare Environmental Services Inc.		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
32	110	110	Stericycle, Inc.		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	HCl BTF limit (ppmvd)	CO BTF limit (ppmvd)	Pb BTF limit (mg/dscm)	Cd BTF limit (mg/dscm)	Hg BTF limit (mg/dscm)	PM BTF limit (gr/dscf)	CDD/CDF BTF limit (ng/dscm)	TEQ BTF limit (ng/dscm)	NO _x BTF limit (ppmvd)	SO ₂ BTF limit (ppmvd)
33	120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
34	120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
35	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
36	130	130	Department of Veterans Affairs Medical Center		0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.6	0.014	110	1.9
37	13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		1.8	1.9	0.016	0.0071	0.002	0.0099	0.35	0.0097	38	0.78
38	16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		1.8	1.9	0.016	0.0071	0.002	0.0099	0.35	0.0097	38	0.78
39	18	18	Franklin Square Hospital Center		1.8	1.9	0.016	0.0071	0.002	0.0099	0.35	0.0097	38	0.78
40	21	21	Washington County Hospital		1.8	1.9	0.016	0.0071	0.002	0.0099	0.35	0.0097	38	0.78
41	25	25	Holy Spirit Hospital		1.8	1.9	0.016	0.0071	0.002	0.0099	0.35	0.0097	38	0.78
42	30	30	Riddle Memorial Hospital		1.8	1.9	0.016	0.0071	0.002	0.0099	0.35	0.0097	38	0.78
43	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		1.8	1.9	0.016	0.0071	0.002	0.0099	0.35	0.0097	38	0.78
44	38	38	Wilkes-Barre General Hospital		1.8	1.9	0.016	0.0071	0.002	0.0099	0.35	0.0097	38	0.78
45	41	41	Thomas Memorial Hospital		1.8	1.9	0.016	0.0071	0.002	0.0099	0.35	0.0097	38	0.78
46	47	47	Malcolm Randall Veterans Affairs Medical Center		1.8	1.9	0.016	0.0071	0.002	0.0099	0.35	0.0097	38	0.78
47	63	63	St. Jude Children's Research Hospital		1.8	1.9	0.016	0.0071	0.002	0.0099	0.35	0.0097	38	0.78
48	81	81	South Bend Medical Foundation		1.8	1.9	0.016	0.0071	0.002	0.0099	0.35	0.0097	38	0.78
49	82	82	Good Samaritan Hospital		1.8	1.9	0.016	0.0071	0.002	0.0099	0.35	0.0097	38	0.78
50	88	88	Medina General Hospital		1.8	1.9	0.016	0.0071	0.002	0.0099	0.35	0.0097	38	0.78

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	HCl BTF limit (ppmvd)	CO BTF limit (ppmvd)	Pb BTF limit (mg/dscm)	Cd BTF limit (mg/dscm)	Hg BTF limit (mg/dscm)	PM BTF limit (gr/dscf)	CDD/CDF BTF limit (ng/dscm)	TEQ BTF limit (ng/dscm)	NO _x BTF limit (ppmvd)	SO ₂ BTF limit (ppmvd)
51	95	95	St. Joseph's Hospital		1.8	1.9	0.016	0.0071	0.002	0.0099	0.35	0.0097	38	0.78
52	108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	1.8	1.9	0.016	0.0071	0.002	0.0099	0.35	0.0097	38	0.78
53	111	111	Wyoming Medical Center		1.8	1.9	0.016	0.0071	0.002	0.0099	0.35	0.0097	38	0.78
54	86	86	Fairfield Medical Center		1.8	1.9	0.016	0.0071	0.002	0.0099	0.35	0.008	38	0.78
55	129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	1.8	1.9	0.016	0.0071	0.002	0.0099	0.35	0.008	38	0.78
56	115	115	Kona Community Hospital		4.5	8.2	0.18	0.012	0.0040	0.017	8.3	0.008	38	0.78
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		4.5	8.2	0.18	0.012	0.0040	0.017	8.3	0.008	38	0.78
Large total														
Medium total														
Small total														
Small rural total														
Nationwide total														
Nationwide % reduction														

Notes:

- HCl, CO, NO_x, SO₂ control level emissions (lb/yr) = emission limit (ppmvd) x molecular weight (g/g-mol) x g-mol-°K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-µg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ µg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
- Pb, Cd, Hg control level emissions (lb/yr) = emission limit (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
- PM control level emissions (lb/yr) = emission limit (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
- CDD/CDF, TEQ control level emissions (g/yr) = emission limit (ng/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x g/10⁹ ng x 60 min/hr x operating hours (hr/yr)
- If baseline concentration < emission limit, then control level emissions = baseline emissions, except when beyond-the-floor option includes NO_x control (SNCR) and unit meets beyond-the-floor limit, then control level emissions = baseline emissions x (100% - 45% control with SNCR).
- Emission reduction (lb/yr) = baseline emissions (lb/yr) - control level emissions (lb/yr)
- Total emission reduction (lb/yr) = ∑(HCl, CO, Pb, Cd, Hg, PM, NO_x, SO₂ lb/yr) + (total CDD/CDF g/yr x lb/453.59237 g)

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	HCl BTF limit (ppmvd)	CO BTF limit (ppmvd)	Pb BTF limit (mg/dscm)	Cd BTF limit (mg/dscm)	Hg BTF limit (mg/dscm)	PM BTF limit (gr/dscf)	CDD/CDF BTF limit (ng/dscm)	TEQ BTF limit (ng/dscm)	NO _x BTF limit (ppmvd)	SO ₂ BTF limit (ppmvd)
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8. Molecular weights:

HCl g/g-mol = 36
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 NO_x g/g-mol = 46
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Sources:

1. Inventory database
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Key:

- CA = Carbon adsorber
- CC = Combustion control
- Cd = Cadmium
- CDD/CDF = Dioxins/furans
- CO = Carbon monoxide
- DI = Dry sorbent injection
- DIFF = Dry injection fabric filter
- dscf = Dry standard cubic feet
- dscm = Dry standard cubic meter
- E = Existing HMIWI
- ESP = Electrostatic precipitator
- FF = Fabric filter
- gr = Grains
- HCl = Hydrogen chloride
- Hg = Mercury
- HMIWI = Hospital/medical/infectious waste incinerator(s)
- L = Large HMIWI
- M = Medium HMIWI
- mg = Milligrams
- N = New HMIWI
- ng = Nanograms
- NO_x = Nitrogen oxides
- Pb = Lead
- PM = Particulate matter
- ppmvd = Parts per million by volume, dry
- S = Small HMIWI
- SO₂ = Sulfur dioxide
- SR = Small rural HMIWI
- TEQ = 2,3,7,8-TCDD toxic equivalent
- WESP = Wet ESP
- WS = Wet scrubber

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	HCl BTF control level (lb/yr)	CO BTF control level (lb/yr)	Pb BTF control level (lb/yr)	Cd BTF control level (lb/yr)	Hg BTF control level (lb/yr)	PM BTF control level (lb/yr)	CDD/CDF BTF control level (g/yr)	TEQ BTF control level (g/yr)	NO _x BTF control level (lb/yr)	SO ₂ BTF control level (lb/yr)
1	1	1	Bristol-Myers Squibb Co.		11	11	0.006	0.002	0.009	53	0.003	0.00008	1,250	50
2	5	5	Merck & Company, Inc.		101	146	0.06	0.01	0.11	899	0.032	0.0008	10,517	450
3	15	15--1	Curtis Bay Energy	Unit 1	720	930	0.43	0.11	0.84	9,955	0.247	0.006	133,187	3,203
4	15	15--2	Curtis Bay Energy	Unit 2	787	2,338	0.47	0.12	0.93	9,324	0.272	0.006	145,686	3,504
5	20	20--1	Fort Detrick	Unit 5	3	12	0.006	0.001	0.01	130	0.003	0.00007	1,445	58
6	20	20--2	Fort Detrick	Unit 6	6	15	0.005	0.001	0.01	123	0.003	0.00007	1,363	54
7	29	29	Hamot Medical Center		30	79	0.01	0.003	0.03	115	0.008	0.0002	5,505	132
8	36	36--1	Merck & Company, Inc.	Unit 2	12	31	0.008	0.002	0.02	61	0.005	0.0001	1,150	33
9	36	36--2	Merck & Company, Inc.	Unit 5	137	150	0.08	0.02	0.16	1,023	0.048	0.001	12,004	612
10	40	40	Charleston Area Medical Center, General Hospital		16	47	0.009	0.002	0.02	49	0.006	0.0001	1,349	70
11	42	42	Stericycle, Inc.		159	473	0.10	0.03	0.19	972	0.057	0.001	29,459	560
12	43	43	Boca Raton Community Hospital		74	220	0.03	0.008	0.06	747	0.019	0.0004	8,263	330
13	44	44	Bethesda Memorial Hospital		44	153	0.02	0.006	0.05	564	0.014	0.0003	4,456	243
14	46	46	Holy Cross Hospital		39	115	0.02	0.005	0.03	412	0.010	0.0002	2,422	105
15	48	48	Memorial Regional Hospital		85	102	0.04	0.01	0.08	938	0.023	0.0005	15,739	379
16	51	51	Lakeland Regional Medical Center		69	206	0.04	0.01	0.07	452	0.021	0.0005	4,958	309
17	54	54	Bayfront Medical Center		37	109	0.02	0.004	0.03	400	0.010	0.0002	6,817	108

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	HCl BTF control level (lb/yr)	CO BTF control level (lb/yr)	Pb BTF control level (lb/yr)	Cd BTF control level (lb/yr)	Hg BTF control level (lb/yr)	PM BTF control level (lb/yr)	CDD/CDF BTF control level (g/yr)	TEQ BTF control level (g/yr)	NO _x BTF control level (lb/yr)	SO ₂ BTF control level (lb/yr)
18	55	55	St. Joseph's Hospital		70	208	0.05	0.01	0.09	255	0.027	0.0006	7,966	312
19	59	59--1	Stericycle, Inc.	Unit 1	127	377	0.06	0.02	0.12	1,383	0.034	0.0008	14,171	565
20	59	59--2	Stericycle, Inc.	Unit 2	124	368	0.06	0.01	0.11	1,354	0.034	0.0008	13,802	551
21	60	60--1	BMWNC, Inc.	Unit 1	141	419	0.09	0.02	0.18	2,075	0.051	0.001	13,530	628
22	65	65--1	Stericycle, Inc.	Unit 1	94	281	0.04	0.01	0.09	1,042	0.026	0.0005	10,536	420
23	65	65--2	Stericycle, Inc.	Unit 2	88	263	0.04	0.01	0.08	972	0.024	0.0005	9,856	393
24	71	71	Loyola University Medical Center		62	184	0.03	0.008	0.06	696	0.017	0.0004	6,098	119
25	77	77	Parkview Hospital		91	270	0.04	0.01	0.08	955	0.024	0.0006	10,148	405
26	84	84	Mayo Clinic, Waste Management Facility		121	279	0.07	0.02	0.14	1,673	0.025	0.0008	22,438	412
27	87	87	MedCentral Health System, Mansfield Hospital		23	68	0.01	0.00	0.03	224	0.007	0.0002	2,555	102
28	94	94	Stericycle, Inc.		72	242	0.04	0.01	0.08	890	0.022	0.0005	9,073	362
29	98	98--1	University of Texas Medical Branch		95	169	0.04	0.01	0.08	994	0.025	0.0006	6,950	249
30	106	106	Stericycle, Inc.		87	343	0.06	0.01	0.11	1,294	0.032	0.0007	12,890	514
31	109	109	Healthcare Environmental Services Inc.		25	73	0.01	0.00	0.03	345	0.009	0.0002	4,578	110
32	110	110	Stericycle, Inc.		176	524	0.08	0.02	0.16	1,770	0.047	0.001	32,659	785

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	HCl BTF control level (lb/yr)	CO BTF control level (lb/yr)	Pb BTF control level (lb/yr)	Cd BTF control level (lb/yr)	Hg BTF control level (lb/yr)	PM BTF control level (lb/yr)	CDD/CDF BTF control level (g/yr)	TEQ BTF control level (g/yr)	NO _x BTF control level (lb/yr)	SO ₂ BTF control level (lb/yr)
33	120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	236	700	0.14	0.04	0.28	3,259	0.067	0.001	15,772	670
34	120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	213	625	0.13	0.03	0.25	2,933	0.018	0.0005	17,453	231
35	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		8	22	0.002	0.0008	0.007	54	0.001	0.00002	465	25
36	130	130	Department of Veterans Affairs Medical Center		98	100	0.05	0.01	0.09	1,099	0.027	0.0006	7,368	435
37	13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		9	15	0.17	0.08	0.02	241	0.002	0.00005	629	11
38	16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		17	17	0.15	0.07	0.02	216	0.002	0.00004	574	16
39	18	18	Franklin Square Hospital Center		140	138	0.97	0.43	0.12	1,376	0.010	0.0003	4,538	130
40	21	21	Washington County Hospital		43	35	0.27	0.12	0.01	388	0.003	0.00008	1,150	33
41	25	25	Holy Spirit Hospital		27	52	0.40	0.18	0.05	570	0.004	0.0001	1,726	49
42	30	30	Riddle Memorial Hospital		39	24	0.30	0.07	0.04	429	0.003	0.00008	1,039	13
43	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		13	15	0.13	0.03	0.01	184	0.0004	0.00001	490	14
44	38	38	Wilkes-Barre General Hospital		68	55	0.14	0.04	0.07	315	0.005	0.0002	1,807	52
45	41	41	Thomas Memorial Hospital		28	11	0.19	0.08	0.02	269	0.0009	0.00002	753	22
46	47	47	Malcolm Randall Veterans Affairs Medical Center		26	21	0.16	0.07	0.02	232	0.002	0.00005	684	20
47	63	63	St. Jude Children's Research Hospital		18	5	0.04	0.01	0.02	106	0.001	0.00004	478	14
48	81	81	South Bend Medical Foundation		44	36	0.28	0.03	0.04	400	0.003	0.00008	253	33
49	82	82	Good Samaritan Hospital		28	26	0.21	0.04	0.03	295	0.002	0.00006	851	24
50	88	88	Medina General Hospital		34	27	0.21	0.09	0.03	295	0.002	0.00006	894	26

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	HCl BTF control level (lb/yr)	CO BTF control level (lb/yr)	Pb BTF control level (lb/yr)	Cd BTF control level (lb/yr)	Hg BTF control level (lb/yr)	PM BTF control level (lb/yr)	CDD/CDF BTF control level (g/yr)	TEQ BTF control level (g/yr)	NO _x BTF control level (lb/yr)	SO ₂ BTF control level (lb/yr)
51	95	95	St. Joseph's Hospital		18	15	0.03	0.01	0.02	58	0.001	0.00004	483	14
52	108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	5	17	0.13	0.06	0.02	190	0.0008	0.00001	562	16
53	111	111	Wyoming Medical Center		9	11	0.09	0.04	0.01	43	0.0009	0.00002	363	10
54	86	86	Fairfield Medical Center		30	43	0.33	0.05	0.04	466	0.003	0.00007	1,419	41
55	129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	13	15	0.13	0.04	0.02	136	0.001	0.00002	485	14
56	115	115	Kona Community Hospital		6	7	0.66	0.04	0.006	108	0.014	0.00001	63	2
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		6	6	0.59	0.04	0.01	121	0.012	0.00001	65	2
Large total					4,283	10,653	2.39	0.610	4.72	49,482	1.30	0.0298	603,878	17,490
Medium total					565	520	3.90	1.46	0.539	5,608	0.0424	0.00116	17,274	496
Small total					43.6	58.0	0.455	0.0954	0.0569	603	0.00451	0.0000908	1,904	54.4
Small rural total					12.0	12.7	1.25	0.0831	0.0188	228	0.0261	0.0000251	128	3.65
Nationwide total					4,903	11,244	7.99	2.25	5.34	55,922	1.37	0.0311	623,183	18,044
Nationwide % reduction														

Notes:

- HCl, CO, NO_x, SO₂ control level emissions (lb/yr) = emission limit (ppmv) x molecular weight (g/g-mol) x g-mol⁻¹/K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-μg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ μg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
- Pb, Cd, Hg control level emissions (lb/yr) = emission limit (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
- PM control level emissions (lb/yr) = emission limit (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
- CDD/CDF, TEQ control level emissions (g/yr) = emission limit (ng/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x g/10⁹ ng x 60 min/hr x operating hours (hr/yr)
- If baseline concentration < emission limit, then control level emissions = baseline emissions, except when beyond-the-floor option includes NO_x control (SNCR) and unit meets beyond-the-floor limit, then control level emissions = baseline emissions x (100% - 45% control with SNCR).
- Emission reduction (lb/yr) = baseline emissions (lb/yr) - control level emissions (lb/yr)
- Total emission reduction (lb/yr) = Σ(HCl, CO, Pb, Cd, Hg, PM, NO_x, SO₂ lb/yr) + (total CDD/CDF g/yr x lb/453.59237 g)

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	HCl BTF control level (lb/yr)	CO BTF control level (lb/yr)	Pb BTF control level (lb/yr)	Cd BTF control level (lb/yr)	Hg BTF control level (lb/yr)	PM BTF control level (lb/yr)	CDD/CDF BTF control level (g/yr)	TEQ BTF control level (g/yr)	NO _x BTF control level (lb/yr)	SO ₂ BTF control level (lb/yr)
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8. Molecular weights:

HCl g/g-mol = 36

CO g/g-mol = 28

NO_x g/g-mol = 46

SO₂ g/g-mol = 64

Sources:

1. Inventory database

2. Beyond-the-floor memo

3. NO_x removal efficiency: Clean Air Technology Center. EPA

Technical Bulletin: Nitrogen Oxides (NO_x)--Why and How They Are

Controlled. 456/F-99-006R. November 1999.

Key:

CA = Carbon adsorber

CC = Combustion control

Cd = Cadmium

CDD/CDF = Dioxins/furans

CO = Carbon monoxide

DI = Dry sorbent injection

DIFF = Dry injection fabric filter

dscf = Dry standard cubic feet

dscm = Dry standard cubic meter

E = Existing HMIWI

ESP = Electrostatic precipitator

FF = Fabric filter

gr = Grains

HCl = Hydrogen chloride

Hg = Mercury

HMIWI = Hospital/medical/infectious waste incinerator(s)

L = Large HMIWI

M = Medium HMIWI

mg = Milligrams

N = New HMIWI

ng = Nanograms

NO_x = Nitrogen oxides

Pb = Lead

PM = Particulate matter

ppmvd = Parts per million by volume, dry

S = Small HMIWI

SO₂ = Sulfur dioxide

SR = Small rural HMIWI

TEQ = 2,3,7,8-TCDD toxic equivalent

WESP = Wet ESP

WS = Wet scrubber

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	Total BTF control level (lb/yr)	HCl BTF emission reduction (lb/yr)	CO BTF emission reduction (lb/yr)	Pb BTF emission reduction (lb/yr)	Cd BTF emission reduction (lb/yr)	Hg BTF emission reduction (lb/yr)	PM BTF emission reduction (lb/yr)	CDD/CDF BTF emission reduction (lb/yr)	TEQ BTF emission reduction (lb/yr)	NO _x BTF emission reduction (lb/yr)
1	1	1	Bristol-Myers Squibb Co.		1,376	25	0	0.16	0.05	0	0	0.006	0.00009	1,023
2	5	5	Merck & Company, Inc.		12,113	4	0	1.49	0.30	0.31	0	0.054	0.0008	8,604
3	15	15--1	Curtis Bay Energy	Unit 1	147,997	1,583	0	4.14	0.69	7.77	1,659	0.411	0.006	36,324
4	15	15--2	Curtis Bay Energy	Unit 2	161,641	1,732	11	7.23	1.18	8.58	0	0.454	0.007	39,733
5	20	20--1	Fort Detrick	Unit 5	1,647	0	0	0.15	0.05	0.03	22	0.005	0.00008	1,182
6	20	20--2	Fort Detrick	Unit 6	1,561	0	0	0.14	0.04	0.08	21	0.005	0.00008	1,115
7	29	29	Hamot Medical Center		5,861	65	0	0.18	0.03	0.09	0	0.013	0.0002	1,058
8	36	36--1	Merck & Company, Inc.	Unit 2	1,287	27	0	0.01	0.01	0.04	0	0.008	0.0001	941
9	36	36--2	Merck & Company, Inc.	Unit 5	13,927	302	0	1.83	0.40	1.50	0	0.079	0.001	9,822
10	40	40	Charleston Area Medical Center, General Hospital		1,530	35	16	0.09	0.04	0.07	0	0.007	0.00001	1,103
11	42	42	Stericycle, Inc.		31,624	350	163	2.62	0.83	1.79	0	0.095	0.001	8,034
12	43	43	Boca Raton Community Hospital		9,634	23	76	0.85	0.27	0.58	124	0.031	0.0005	6,761
13	44	44	Bethesda Memorial Hospital		5,461	0	0	0.64	0.20	0.44	94	0.023	0.0003	3,646
14	46	46	Holy Cross Hospital		3,092	22	40	0.47	0.15	0.32	69	0.017	0.0003	1,981
15	48	48	Memorial Regional Hospital		17,243	30	0	1.07	0.34	0.24	156	0.039	0.0006	4,292
16	51	51	Lakeland Regional Medical Center		5,996	153	71	0.97	0.27	0.12	0	0.035	0.0005	4,057
17	54	54	Bayfront Medical Center		7,471	10	38	0.46	0.13	0.01	52	0.017	0.0002	1,859

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	Total BTF control level (lb/yr)	HCl BTF emission reduction (lb/yr)	CO BTF emission reduction (lb/yr)	Pb BTF emission reduction (lb/yr)	Cd BTF emission reduction (lb/yr)	Hg BTF emission reduction (lb/yr)	PM BTF emission reduction (lb/yr)	CDD/CDF BTF emission reduction (lb/yr)	TEQ BTF emission reduction (lb/yr)	NO _x BTF emission reduction (lb/yr)
18	55	55	St. Joseph's Hospital		8,811	154	72	1.26	0.19	0.64	0	0.046	0.0007	6,517
19	59	59--1	Stericycle, Inc.	Unit 1	16,624	280	130	1.58	0.50	1.08	230	0.057	0.0009	11,594
20	59	59--2	Stericycle, Inc.	Unit 2	16,198	272	127	1.54	0.49	1.06	226	0.056	0.0008	11,292
21	60	60--1	BMWNC, Inc.	Unit 1	16,794	311	145	0.54	0.08	1.62	104	0.086	0.001	11,070
22	65	65--1	Stericycle, Inc.	Unit 1	12,374	47	97	1.19	0.38	0.81	174	0.027	0	8,620
23	65	65--2	Stericycle, Inc.	Unit 2	11,572	80	91	1.11	0.35	0.76	162	0.010	0	8,064
24	71	71	Loyola University Medical Center		7,158	121	63	0.79	0.25	0.54	116	0.029	0.0004	4,989
25	77	77	Parkview Hospital		11,870	200	93	1.09	0.35	0.46	159	0.039	0.0006	8,303
26	84	84	Mayo Clinic, Waste Management Facility		24,923	267	0	1.91	0.61	1.31	279	0	0	6,120
27	87	87	MedCentral Health System, Mansfield Hospital		2,972	50	23	0.34	0.03	0.22	0	0.012	0.0002	2,090
28	94	94	Stericycle, Inc.		10,639	0	83	1.02	0.32	0.69	148	0.037	0.0006	7,424
29	98	98--1	University of Texas Medical Branch		8,457	174	0	1.13	0.26	0.78	166	0.041	0.0006	5,687
30	106	106	Stericycle, Inc.		15,129	0	118	1.48	0.45	1.01	216	0.053	0.0002	10,546
31	109	109	Healthcare Environmental Services Inc.		5,131	54	25	0.39	0.09	0.27	57	0.014	0.0002	1,248
32	110	110	Stericycle, Inc.		35,916	388	181	2.16	0.35	1.48	0	0.078	0.001	8,907

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	Total BTF control level (lb/yr)	HCl BTF emission reduction (lb/yr)	CO BTF emission reduction (lb/yr)	Pb BTF emission reduction (lb/yr)	Cd BTF emission reduction (lb/yr)	Hg BTF emission reduction (lb/yr)	PM BTF emission reduction (lb/yr)	CDD/CDF BTF emission reduction (lb/yr)	TEQ BTF emission reduction (lb/yr)	NO _x BTF emission reduction (lb/yr)
33	120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	20,637	518	241	3.72	0.36	2.54	543	0	0	12,905
34	120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	21,456	470	0	1.95	0.21	1.25	489	0	0	14,280
35	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		574	8	8	0	0	0.005	0	0	0	380
36	130	130	Department of Veterans Affairs Medical Center		9,100	215	0	1.25	0.40	0.45	183	0.003	0.00009	6,028
37	13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		905	0	0	0.01	0	0.06	51	0.001	0	1,023
38	16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		841	0	10	0.01	0	0.02	46	0.001	0	754
39	18	18	Franklin Square Hospital Center		6,324	0	80	0.06	0	0.04	292	0.008	0	5,578
40	21	21	Washington County Hospital		1,650	17	20	0.02	0	0	82	0.002	0	2,039
41	25	25	Holy Spirit Hospital		2,424	0	0	0.03	0	0.04	121	0.003	0	3,059
42	30	30	Riddle Memorial Hospital		1,543	7	0	0.02	0	0.11	91	0.002	0	2,360
43	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		716	0	2	0.008	0	0	39	0	0	868
44	38	38	Wilkes-Barre General Hospital		2,297	26	5	0	0	0.20	0	0.004	0	3,202
45	41	41	Thomas Memorial Hospital		1,084	11	0	0.01	0	0.07	57	0	0	1,117
46	47	47	Malcolm Randall Veterans Affairs Medical Center		983	10	12	0.01	0	0.06	49	0.001	0	1,986
47	63	63	St. Jude Children's Research Hospital		621	7	0	0	0	0.01	0	0.001	0	1,169
48	81	81	South Bend Medical Foundation		766	17	3	0.02	0	0.10	68	0.002	0	207
49	82	82	Good Samaritan Hospital		1,225	0	0.1	0.01	0	0.007	63	0.002	0	1,508
50	88	88	Medina General Hospital		1,276	13	16	0.01	0	0.07	63	0.002	0	1,584

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	Total BTF control level (lb/yr)	HCl BTF emission reduction (lb/yr)	CO BTF emission reduction (lb/yr)	Pb BTF emission reduction (lb/yr)	Cd BTF emission reduction (lb/yr)	Hg BTF emission reduction (lb/yr)	PM BTF emission reduction (lb/yr)	CDD/CDF BTF emission reduction (lb/yr)	TEQ BTF emission reduction (lb/yr)	NO _x BTF emission reduction (lb/yr)
51	95	95	St. Joseph's Hospital		587	7	2	0	0	0.005	0	0.001	0	856
52	108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	790	0	0.6	0.008	0	0.009	40	0	0	1,323
53	111	111	Wyoming Medical Center		436	0	6	0.006	0	0.03	0	0.0007	0	980
54	86	86	Fairfield Medical Center		2,000	0	8	2.98	0	0.11	178	0.024	0	2,514
55	129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	663	0	49	0.44	0	0.007	0	0.009	0	859
56	115	115	Kona Community Hospital		185	170	0	0.17	0.10	0	0	0.035	0.001	94
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		200	400	0	0.15	0.08	0	0	0.173	0.004	98
Large total					685,794	7,973	1,912	46.9	10.7	38.9	5,449	1.89	0.0271	277,601
Medium total					24,469	114.8	157	0.230	0	0.846	1,062	0.0323	0	29,612
Small total					2,663	0	57.4	3.42	0	0.120	178	0.0327	0	3,373
Small rural total					386	569	0	0.318	0.180	0	0	0.208	0.00473	192
Nationwide total					713,312	8,657	2,126	50.9	10.8	39.9	6,690	2.16	0.0318	310,778
Nationwide % reduction						64%	16%	86%	83%	88%	11%	61%	51%	33%

Notes:

- HCl, CO, NO_x, SO₂ control level emissions (lb/yr) = emission limit (ppmvd) x molecular weight (g/g-mol) x g-mol-°K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-µg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ µg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
- Pb, Cd, Hg control level emissions (lb/yr) = emission limit (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
- PM control level emissions (lb/yr) = emission limit (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
- CDD/CDF, TEQ control level emissions (g/yr) = emission limit (ng/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x g/10⁹ ng x 60 min/hr x operating hours (hr/yr)
- If baseline concentration < emission limit, then control level emissions = baseline emissions, except when beyond-the-floor option includes NO_x control (SNCR) and unit meets beyond-the-floor limit, then control level emissions = baseline emissions x (100% - 45% control with SNCR).
- Emission reduction (lb/yr) = baseline emissions (lb/yr) - control level emissions (lb/yr)
- Total emission reduction (lb/yr) = ∑(HCl, CO, Pb, Cd, Hg, PM, NO_x, SO₂ lb/yr) + (total CDD/CDF g/yr x lb/453.59237 g)

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	Total BTF control level (lb/yr)	HCl BTF emission reduction (lb/yr)	CO BTF emission reduction (lb/yr)	Pb BTF emission reduction (lb/yr)	Cd BTF emission reduction (lb/yr)	Hg BTF emission reduction (lb/yr)	PM BTF emission reduction (lb/yr)	CDD/CDF BTF emission reduction (lb/yr)	TEQ BTF emission reduction (lb/yr)	NO _x BTF emission reduction (lb/yr)
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8. Molecular weights:

HCl g/g-mol = 36

CO g/g-mol = 28

NO_x g/g-mol = 46

SO₂ g/g-mol = 64

Sources:

1. Inventory database

2. Beyond-the-floor memo

3. NO_x removal efficiency: Clean Air Technology Center. EPA

Technical Bulletin: Nitrogen Oxides (NO_x)--Why and How They Are

Controlled. 456/F-99-006R. November 1999.

Key:

CA = Carbon adsorber

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DI = Dry sorbent injection

DIFF = Dry injection fabric filter

dscf = Dry standard cubic feet

dscm = Dry standard cubic meter

E = Existing HMIWI

ESP = Electrostatic precipitator

FF = Fabric filter

gr = Grains

HCl = Hydrogen chloride

Hg = Mercury

HMIWI = Hospital/medical/infectious waste incinerator(s)

L = Large HMIWI

M = Medium HMIWI

mg = Milligrams

N = New HMIWI

ng = Nanograms

NO_x = Nitrogen oxides

Pb = Lead

PM = Particulate matter

ppmvd = Parts per million by volume, dry

S = Small HMIWI

SO₂ = Sulfur dioxide

SR = Small rural HMIWI

TEQ = 2,3,7,8-TCDD toxic equivalent

WESP = Wet ESP

WS = Wet scrubber

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	SO ₂ BTF emission reduction (lb/yr)	Total BTF emission reduction (lb/yr)	HCl MACT floor + BTF emission reduction (lb/yr)	CO MACT floor + BTF emission reduction (lb/yr)	Pb MACT floor + BTF emission reduction (lb/yr)	Cd MACT floor + BTF emission reduction (lb/yr)	Hg MACT floor + BTF emission reduction (lb/yr)	PM MACT floor + BTF emission reduction (lb/yr)	CDD/CDF MACT floor + BTF emission reduction (lb/yr)
1	1	1	Bristol-Myers Squibb Co.		24	1,072	982	0	4.07	0.05	0	0	0.210
2	5	5	Merck & Company, Inc.		193	8,804	4	0	1.79	0.30	0.31	0	0.659
3	15	15--1	Curtis Bay Energy	Unit 1	1,517	41,096	81,040	0	4.14	0.69	157.14	7,113	11.130
4	15	15--2	Curtis Bay Energy	Unit 2	1,660	43,152	79,918	11	7.23	1.18	299.31	0	2.212
5	20	20--1	Fort Detrick	Unit 5	27	1,231	0	0	1.49	0.12	0.03	65	0.453
6	20	20--2	Fort Detrick	Unit 6	26	1,162	0	0	2.04	0.10	0.08	76	0.493
7	29	29	Hamot Medical Center		61	1,185	629	0	0.18	0.03	0.09	0	0.093
8	36	36--1	Merck & Company, Inc.	Unit 2	0	968	58	0	0.01	0.01	0.04	0	0.024
9	36	36--2	Merck & Company, Inc.	Unit 5	145	10,273	550	0	1.83	0.40	2.31	0	0.490
10	40	40	Charleston Area Medical Center, General Hospital		6	1,161	542	135	0.09	0.04	0.07	0	0.007
11	42	42	Stericycle, Inc.		0	8,553	5,603	1,276	8.96	1.82	2.56	0	2.241
12	43	43	Boca Raton Community Hospital		156	7,142	23	270	5.97	0.36	0.74	872	2.070
13	44	44	Bethesda Memorial Hospital		115	3,856	0	0	3.95	0.47	3.75	565	1.251
14	46	46	Holy Cross Hospital		0	2,112	22	79	2.30	0.63	1.85	471	0.628
15	48	48	Memorial Regional Hospital		179	4,660	30	0	7.88	0.47	0.24	964	1.850
16	51	51	Lakeland Regional Medical Center		37	4,320	179	246	2.67	0.27	0.12	0	2.385
17	54	54	Bayfront Medical Center		0	1,960	10	244	3.53	0.13	0.01	52	0.758

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	SO ₂ BTF emission reduction (lb/yr)	Total BTF emission reduction (lb/yr)	HCl MACT floor + BTF emission reduction (lb/yr)	CO MACT floor + BTF emission reduction (lb/yr)	Pb MACT floor + BTF emission reduction (lb/yr)	Cd MACT floor + BTF emission reduction (lb/yr)	Hg MACT floor + BTF emission reduction (lb/yr)	PM MACT floor + BTF emission reduction (lb/yr)	CDD/CDF MACT floor + BTF emission reduction (lb/yr)
18	55	55	St. Joseph's Hospital		102	6,848	1,101	212	7.38	0.19	0.64	0	2.986
19	59	59--1	Stericycle, Inc.	Unit 1	268	12,505	590	136	25.83	2.92	4.78	673	0.127
20	59	59--2	Stericycle, Inc.	Unit 2	261	12,181	516	217	25.30	2.30	14.41	1,519	0.273
21	60	60--1	BMWNC, Inc.	Unit 1	298	11,929	7,161	1,762	0.54	0.08	11.11	104	0.471
22	65	65--1	Stericycle, Inc.	Unit 1	199	9,140	47	968	18.97	0.53	39.25	958	0.027
23	65	65--2	Stericycle, Inc.	Unit 2	186	8,585	80	260	11.85	1.08	33.25	805	0.010
24	71	71	Loyola University Medical Center		0	5,291	121	264	11.23	0.96	1.10	821	1.936
25	77	77	Parkview Hospital		192	8,950	235	280	15.38	6.96	0.46	1,213	0.256
26	84	84	Mayo Clinic, Waste Management Facility		0	6,669	2,344	0	44.22	1.52	6.63	3,091	0
27	87	87	MedCentral Health System, Mansfield Hospital		48	2,213	735	45	1.13	0.03	0.22	0	0.364
28	94	94	Stericycle, Inc.		172	7,829	0	129	19.73	0.42	19.32	254	0.520
29	98	98--1	University of Texas Medical Branch		0	6,029	174	0	68.36	0.26	4.28	2,052	4.004
30	106	106	Stericycle, Inc.		244	11,127	0	204	14.88	0.45	44.12	939	0.096
31	109	109	Healthcare Environmental Services Inc.		52	1,439	2,365	300	0.52	0.09	4.01	94	0.219
32	110	110	Stericycle, Inc.		372	9,852	747	811	5.24	0.35	12.69	0	0.216

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	SO ₂ BTF emission reduction (lb/yr)	Total BTF emission reduction (lb/yr)	HCl MACT floor + BTF emission reduction (lb/yr)	CO MACT floor + BTF emission reduction (lb/yr)	Pb MACT floor + BTF emission reduction (lb/yr)	Cd MACT floor + BTF emission reduction (lb/yr)	Hg MACT floor + BTF emission reduction (lb/yr)	PM MACT floor + BTF emission reduction (lb/yr)	CDD/CDF MACT floor + BTF emission reduction (lb/yr)
33	120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	0	14,214	3,230	256	5.40	0.36	3.58	1,508	0
34	120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	0	15,241	1,295	0	1.95	0.21	1.25	2,856	0
35	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		0	396	8	60	0	0	0.005	0	0
36	130	130	Department of Veterans Affairs Medical Center		206	6,634	986	0	4.30	0.55	0.45	1,443	0.003
37	13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		0	1,074	0	0	10.18	1.22	0.41	66	0.003
38	16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		42	853	0	91	3.01	0.38	0.02	426	0.029
39	18	18	Franklin Square Hospital Center		336	6,286	0	252	14.95	2.45	0.04	2,179	2.508
40	21	21	Washington County Hospital		85	2,243	107	87	2.53	0.12	0	383	0.590
41	25	25	Holy Spirit Hospital		128	3,307	0	0	3.50	0.92	0.04	376	0.036
42	30	30	Riddle Memorial Hospital		0	2,457	7	0	3.07	0	0.17	109	0.668
43	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		8	917	0	2	1.09	0	0	260	0
44	38	38	Wilkes-Barre General Hospital		74	3,308	269	5	0	0	0.25	0	0.250
45	41	41	Thomas Memorial Hospital		46	1,232	13	0	8.41	0.27	1.27	442	0
46	47	47	Malcolm Randall Veterans Affairs Medical Center		44	2,101	41	106	2.17	0.83	0.18	173	0.019
47	63	63	St. Jude Children's Research Hospital		22	1,198	257	0	0	0	0.01	0	0.036
48	81	81	South Bend Medical Foundation		86	382	256	3	9.23	0	3.61	68	0.030
49	82	82	Good Samaritan Hospital		63	1,634	0	0.1	0.13	0	0.007	112	0.163
50	88	88	Medina General Hospital		66	1,741	28	174	8.51	0.05	0.07	501	0.100

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	SO ₂ BTF emission reduction (lb/yr)	Total BTF emission reduction (lb/yr)	HCl MACT floor + BTF emission reduction (lb/yr)	CO MACT floor + BTF emission reduction (lb/yr)	Pb MACT floor + BTF emission reduction (lb/yr)	Cd MACT floor + BTF emission reduction (lb/yr)	Hg MACT floor + BTF emission reduction (lb/yr)	PM MACT floor + BTF emission reduction (lb/yr)	CDD/CDF MACT floor + BTF emission reduction (lb/yr)
51	95	95	St. Joseph's Hospital		21	885	35	2	0	0	0.005	0	0.004
52	108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	3	1,367	0	0.6	0.70	0.005	0.009	224	0
53	111	111	Wyoming Medical Center		14	1,000	0	8	0.19	0.06	0.12	0	0.186
54	86	86	Fairfield Medical Center		105	2,809	0	8	2.98	0	0.19	178	0.024
55	129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	36	945	0	79	0.44	0	0.007	0	0.009
56	115	115	Kona Community Hospital		6	270	170	0	0.17	0.10	0	0	0.035
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		52	550	400	0	0.15	0.08	0.28	0	0.173
Large total					6,747	299,778	191,327	8,163	340	26.3	670	28,508	38.5
Medium total					1,038	31,985	1,012	731	67.7	6.31	6.20	5,318	4.62
Small total					141	3,754	0	87.8	3.42	0	0.202	178	0.0327
Small rural total					58.4	820	569	0	0.318	0.180	0.283	0	0.208
Nationwide total					7,985	336,337	192,908	8,981	412	32.8	677	34,005	43.3
Nationwide % reduction					31%	32%	98%	44%	98%	94%	99%	38%	97%

Notes:

- HCl, CO, NO_x, SO₂ control level emissions (lb/yr) = emission limit (ppmvd) x molecular weight (g/g-mol) x g-mol-°K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-µg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ µg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
- Pb, Cd, Hg control level emissions (lb/yr) = emission limit (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
- PM control level emissions (lb/yr) = emission limit (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
- CDD/CDF, TEQ control level emissions (g/yr) = emission limit (ng/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x g/10⁹ ng x 60 min/hr x operating hours (hr/yr)
- If baseline concentration < emission limit, then control level emissions = baseline emissions, except when beyond-the-floor option includes NO_x control (SNCR) and unit meets beyond-the-floor limit, then control level emissions = baseline emissions x (100% - 45% control with SNCR).
- Emission reduction (lb/yr) = baseline emissions (lb/yr) - control level emissions (lb/yr)
- Total emission reduction (lb/yr) = ∑(HCl, CO, Pb, Cd, Hg, PM, NO_x, SO₂ lb/yr) + (total CDD/CDF g/yr x lb/453.59237 g)

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	SO ₂ BTF emission reduction (lb/yr)	Total BTF emission reduction (lb/yr)	HCl MACT floor + BTF emission reduction (lb/yr)	CO MACT floor + BTF emission reduction (lb/yr)	Pb MACT floor + BTF emission reduction (lb/yr)	Cd MACT floor + BTF emission reduction (lb/yr)	Hg MACT floor + BTF emission reduction (lb/yr)	PM MACT floor + BTF emission reduction (lb/yr)	CDD/CDF MACT floor + BTF emission reduction (lb/yr)
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8. Molecular weights:

HCl g/g-mol = 36

CO g/g-mol = 28

NO_x g/g-mol = 46

SO₂ g/g-mol = 64

Sources:

1. Inventory database

2. Beyond-the-floor memo

3. NO_x removal efficiency: Clean Air Technology Center. EPA

Technical Bulletin: Nitrogen Oxides (NO_x)--Why and How They Are

Controlled. 456/F-99-006R. November 1999.

Key:

CA = Carbon adsorber

CC = Combustion control

Cd = Cadmium

CDD/CDF = Dioxins/furans

CO = Carbon monoxide

DI = Dry sorbent injection

DIFF = Dry injection fabric filter

dscf = Dry standard cubic feet

dscm = Dry standard cubic meter

E = Existing HMIWI

ESP = Electrostatic precipitator

FF = Fabric filter

gr = Grains

HCl = Hydrogen chloride

Hg = Mercury

HMIWI = Hospital/medical/infectious waste incinerator(s)

L = Large HMIWI

M = Medium HMIWI

mg = Milligrams

N = New HMIWI

ng = Nanograms

NO_x = Nitrogen oxides

Pb = Lead

PM = Particulate matter

ppmvd = Parts per million by volume, dry

S = Small HMIWI

SO₂ = Sulfur dioxide

SR = Small rural HMIWI

TEQ = 2,3,7,8-TCDD toxic equivalent

WESP = Wet ESP

WS = Wet scrubber

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	TEQ MACT floor + BTF emission reduction (lb/yr)	NO _x MACT floor + BTF emission reduction (lb/yr)	SO ₂ MACT floor + BTF emission reduction (lb/yr)	Total MACT floor + BTF emission reduction (lb/yr)
1	1	1	Bristol-Myers Squibb Co.		0.004	1,023	745	2,753
2	5	5	Merck & Company, Inc.		0.005	8,604	193	8,804
3	15	15--1	Curtis Bay Energy	Unit 1	0.180	93,331	35,535	217,180
4	15	15--2	Curtis Bay Energy	Unit 2	0.046	92,048	60,565	232,849
5	20	20--1	Fort Detrick	Unit 5	0.004	1,182	29	1,278
6	20	20--2	Fort Detrick	Unit 6	0.006	1,115	27	1,221
7	29	29	Hamot Medical Center		0.001	1,058	61	1,748
8	36	36--1	Merck & Company, Inc.	Unit 2	0.0002	941	0	998
9	36	36--2	Merck & Company, Inc.	Unit 5	0.023	9,822	145	10,522
10	40	40	Charleston Area Medical Center, General Hospital		0.00001	1,103	6	1,788
11	42	42	Stericycle, Inc.		0.069	10,515	0	17,407
12	43	43	Boca Raton Community Hospital		0.026	6,761	165	8,098
13	44	44	Bethesda Memorial Hospital		0.028	3,646	347	4,566
14	46	46	Holy Cross Hospital		0.038	1,981	0	2,559
15	48	48	Memorial Regional Hospital		0.049	4,563	300	5,865
16	51	51	Lakeland Regional Medical Center		0.045	4,057	37	4,522
17	54	54	Bayfront Medical Center		0.013	1,877	0	2,187

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	TEQ MACT floor + BTF emission reduction (lb/yr)	NO _x MACT floor + BTF emission reduction (lb/yr)	SO ₂ MACT floor + BTF emission reduction (lb/yr)	Total MACT floor + BTF emission reduction (lb/yr)
18	55	55	St. Joseph's Hospital		0.061	6,517	102	7,941
19	59	59--1	Stericycle, Inc.	Unit 1	0.003	11,594	283	13,310
20	59	59--2	Stericycle, Inc.	Unit 2	0.004	11,292	275	13,862
21	60	60--1	BMWNC, Inc.	Unit 1	0.012	11,070	1,696	21,804
22	65	65--1	Stericycle, Inc.	Unit 1	0	8,620	210	10,863
23	65	65--2	Stericycle, Inc.	Unit 2	0	8,064	197	9,452
24	71	71	Loyola University Medical Center		0.018	4,989	0	6,208
25	77	77	Parkview Hospital		0.003	8,303	203	10,256
26	84	84	Mayo Clinic, Waste Management Facility		0	13,534	0	19,022
27	87	87	MedCentral Health System, Mansfield Hospital		0.007	2,090	396	3,268
28	94	94	Stericycle, Inc.		0.012	7,424	181	8,027
29	98	98--1	University of Texas Medical Branch		0.043	5,687	0	7,986
30	106	106	Stericycle, Inc.		0.0002	10,546	257	12,005
31	109	109	Healthcare Environmental Services Inc.		0.028	4,034	1,058	7,856
32	110	110	Stericycle, Inc.		0.005	35,032	598	37,207

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	TEQ MACT floor + BTF emission reduction (lb/yr)	NO _x MACT floor + BTF emission reduction (lb/yr)	SO ₂ MACT floor + BTF emission reduction (lb/yr)	Total MACT floor + BTF emission reduction (lb/yr)
33	120	120--1	Municipality of Chambers County, Resource Recovery Center	Unit 1	0	12,905	0	17,909
34	120	120--2	Municipality of Chambers County, Resource Recovery Center	Unit 2	0	14,280	0	18,434
35	125	125	East Carolina University, Health Sciences Campus, HSC Utility Plant		0	380	0	448
36	130	130	Department of Veterans Affairs Medical Center		0.00009	6,028	1,299	9,761
37	13	13	University of Maryland at Baltimore, Environmental Health and Safety Facility		0.0002	1,023	0	1,101
38	16	16	Johns Hopkins Medical Institute, Department of Health, Safety, and Environment		0.0006	754	44	1,319
39	18	18	Franklin Square Hospital Center		0.027	5,578	1,678	9,704
40	21	21	Washington County Hospital		0.010	2,039	115	2,733
41	25	25	Holy Spirit Hospital		0.0002	3,059	173	3,612
42	30	30	Riddle Memorial Hospital		0.012	2,360	0	2,478
43	34	34	Pennsylvania State University, Animal Diagnostic Lab Incinerator		0	868	8	1,138
44	38	38	Wilkes-Barre General Hospital		0.003	3,202	74	3,551
45	41	41	Thomas Memorial Hospital		0	1,117	46	1,628
46	47	47	Malcolm Randall Veterans Affairs Medical Center		0.0005	1,986	44	2,353
47	63	63	St. Jude Children's Research Hospital		0.0006	1,169	22	1,448
48	81	81	South Bend Medical Foundation		0.0003	207	465	1,012
49	82	82	Good Samaritan Hospital		0.0005	1,508	85	1,706
50	88	88	Medina General Hospital		0.003	1,584	90	2,385

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	TEQ MACT floor + BTF emission reduction (lb/yr)	NO _x MACT floor + BTF emission reduction (lb/yr)	SO ₂ MACT floor + BTF emission reduction (lb/yr)	Total MACT floor + BTF emission reduction (lb/yr)
51	95	95	St. Joseph's Hospital		0.0001	856	21	913
52	108	108--1	Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases	Unit 1	0	1,323	3	1,552
53	111	111	Wyoming Medical Center		0.003	980	14	1,002
54	86	86	Fairfield Medical Center		0.0005	2,514	142	2,846
55	129	129	Centers for Disease Control and Prevention--Clifton, Building 18	Unit 3	0	859	49	988
56	115	115	Kona Community Hospital		0.001	94	6	270
57	116	116	Yukon-Kuskokwim Delta Regional Hospital		0.004	98	52	551
Large total					0.733	426,017	104,910	759,961
Medium total					0.0607	29,612	2,882	39,635
Small total					0.000508	3,373	191	3,834
Small rural total					0.00473	192	58.4	820
Nationwide total					0.798	459,194	108,041	804,251
Nationwide % reduction					96%	42%	86%	53%

Notes:

- HCl, CO, NO_x, SO₂ control level emissions (lb/yr) = emission limit (ppmvd) x molecular weight (g/g-mol) x g-mol-°K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-µg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ µg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
- Pb, Cd, Hg control level emissions (lb/yr) = emission limit (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
- PM control level emissions (lb/yr) = emission limit (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
- CDD/CDF, TEQ control level emissions (g/yr) = emission limit (ng/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x g/10⁹ ng x 60 min/hr x operating hours (hr/yr)
- If baseline concentration < emission limit, then control level emissions = baseline emissions, except when beyond-the-floor option includes NO_x control (SNCR) and unit meets beyond-the-floor limit, then control level emissions = baseline emissions x (100% - 45% control with SNCR).
- Emission reduction (lb/yr) = baseline emissions (lb/yr) - control level emissions (lb/yr)
- Total emission reduction (lb/yr) = ∑(HCl, CO, Pb, Cd, Hg, PM, NO_x, SO₂ lb/yr) + (total CDD/CDF g/yr x lb/453.59237 g)

Table 4. Beyond-the-Floor Emission Reductions for Exist

No.	FACID	UNITID	Facility name	Unit number	TEQ MACT floor + BTF emission reduction (lb/yr)	NO _x MACT floor + BTF emission reduction (lb/yr)	SO ₂ MACT floor + BTF emission reduction (lb/yr)	Total MACT floor + BTF emission reduction (lb/yr)
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8. Molecular weights:

HCl g/g-mol = 36

CO g/g-mol = 28

NO_x g/g-mol = 46

SO₂ g/g-mol = 64

Sources:

1. Inventory database

2. Beyond-the-floor memo

3. NO_x removal efficiency: Clean Air Technology Center. EPA

Technical Bulletin: Nitrogen Oxides (NO_x)--Why and How They Are

Controlled. 456/F-99-006R. November 1999.

Key:

CA = Carbon adsorber

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Cd = Cadmium

CDD/CDF = Dioxins/furans

CO = Carbon monoxide

DI = Dry sorbent injection

DIFF = Dry injection fabric filter

dscf = Dry standard cubic feet

dscm = Dry standard cubic meter

E = Existing HMIWI

ESP = Electrostatic precipitator

FF = Fabric filter

gr = Grains

HCl = Hydrogen chloride

Hg = Mercury

HMIWI = Hospital/medical/infectious waste incinerator(s)

L = Large HMIWI

M = Medium HMIWI

mg = Milligrams

N = New HMIWI

ng = Nanograms

NO_x = Nitrogen oxides

Pb = Lead

PM = Particulate matter

ppmvd = Parts per million by volume, dry

S = Small HMIWI

SO₂ = Sulfur dioxide

SR = Small rural HMIWI

TEQ = 2,3,7,8-TCDD toxic equivalent

WESP = Wet ESP

WS = Wet scrubber

Table 5. Baseline Emissions for New HMIWI

Facility name	City	State	Category	New/ existing	APCD code	APCD type	Maximum charge rate (lb/hr)	Stack gas flow rate (dscfm)	Stack gas temperature (°F)	Stack gas temperature (°C)	Operating hours (hr/yr)	HCl unit average (ppmvd)	CO unit average (ppmvd)	Pb unit average (mg/dscm)	Cd unit average (mg/dscm)
Basis for New Sources															
Municipality of Chambers County, Resource Recovery Center, Unit 1	Anahuac	TX	L	N	DIFF	Dry	4,167	10,031	296	147	7,896	11.0	3.96	0.0187	0.00132
Municipality of Chambers County, Resource Recovery Center, Unit 2	Anahuac	TX	L	N	DIFF	Dry	4,167	9,028	291	144	7,896	5.30	2.86	0.00778	0.000889
Municipality of Chambers County, Resource Recovery Center, Average	Anahuac	TX	L	N	DIFF	Dry	4,167	9,529	294	145	7,896	8.17	3.41	0.0132	0.00111
Wilkes-Barre General Hospital	Wilkes-Barre	PA	M	N	DIFF	Dry	400	2,063	274	134	4,472	8.95	2.08	0.00406	0.00106
Centers for Disease Control and Prevention--Clifton, Building 18, Unit 3	Atlanta	GA	S	N	WS	Wet	120	717	161	72	2,920	1.30	12.11	0.0727	0.00545
New Sources															
Facility A			L	N	DIFF	Dry	4,000	10,000	300	149	8,000	8.17	3.41	0.0132	0.00111
Facility B			M	N	DIFF	Dry	400	2,000	275	135	4,500	8.95	2.08	0.00406	0.00106
Facility C			S	N	WS	Wet	100	700	160	71	3,000	1.30	12.1	0.0727	0.00545
Nationwide total															

Notes:

1. Patterned new sources after those new HMIWI installed in last 10 years.
2. HCl, CO, NO_x, SO₂ baseline emissions (lb/yr) = concentration (ppmvd) x molecular weight (g/g-mol) x g-mol-°K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-µg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ µg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
3. Pb, Cd, Hg baseline emissions (lb/yr) = concentration (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
4. PM baseline emissions (lb/yr) = concentration (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
5. CDD/CDF, TEQ baseline emissions (g/yr) = concentration (ng/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x g/10⁹ ng x 60 min/hr x operating hours (hr/yr)
6. Baseline emissions estimated from average emissions data were calculated using the same equations above.
7. Total baseline emissions (lb/yr) = Σ(HCl, CO, Pb, Cd, Hg, PM, NO_x, SO₂ lb/yr) + (total CDD/CDF g/yr x lb/453.59237 g)
8. Molecular weights:
 HCl g/g-mol = 36
 CO g/g-mol = 28
 NO_x g/g-mol = 46
 SO₂ g/g-mol = 64

Table 5. Baseline Emissions for New HMIWI

Facility name	City	State	Category	New/ existing	APCD code	APCD type	Maximum charge rate (lb/hr)	Stack gas flow rate (dscfm)	Stack gas temperature (°F)	Stack gas temperature (°C)	Operating hours (hr/yr)	HCl unit average (ppmvd)	CO unit average (ppmvd)	Pb unit average (mg/dscm)	Cd unit average (mg/dscm)
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Key:

 Emissions data unavailable; used average emissions data from Table 2 to estimate emissions

- Cd = Cadmium
- CDD/CDF = Dioxins/furans
- CO = Carbon monoxide
- DIFF = Dry injection fabric filter
- dscf = Dry standard cubic feet
- dscm = Dry standard cubic meter
- gr = Grains
- HCl = Hydrogen chloride
- Hg = Mercury
- HMIWI = Hospital/medical/infectious waste incinerator(s)
- L = Large HMIWI
- M = Medium HMIWI
- mg = Milligrams
- N = New HMIWI
- ng = Nanograms
- NO_x = Nitrogen oxides
- Pb = Lead
- PM = Particulate matter
- ppmvd = Parts per million by volume, dry
- S = Small HMIWI
- SO₂ = Sulfur dioxide
- TEQ = 2,3,7,8-TCDD toxic equivalent
- WS = Wet scrubber

Table 5. Baseline Emissions for New HMIWI

Facility name	City	State	Category	New/ existing	APCD code	Hg unit average (mg/dscm)	PM unit average (gr/dscf)	CDD/CDF unit average (ng/dscm)	TEQ unit average (ng/dscm)	NO _x unit average (ppmvd)	SO ₂ unit average (ppmvd)	HCl baseline (lb/yr)	CO baseline (lb/yr)	Pb baseline (lb/yr)	Cd baseline (lb/yr)	Hg baseline (lb/yr)
Basis for New Sources																
Municipality of Chambers County, Resource Recovery Center, Unit 1	Anahuac	TX	L	N	DIFF	0.0130	0.00702	0.498	0.00807	72.4	1.21					
Municipality of Chambers County, Resource Recovery Center, Unit 2	Anahuac	TX	L	N	DIFF	0.00559	0.00947	0.152	0.00378	88.4	0.462					
Municipality of Chambers County, Resource Recovery Center, Average	Anahuac	TX	L	N	DIFF	0.00930	0.00825	0.325	0.00592	80.4	0.838					
Wilkes-Barre General Hospital	Wilkes-Barre	PA	M	N	DIFF	0.00927	0.00399	16.3	0.193		1.90					
Centers for Disease Control and Prevention--Clifton, Building 18, Unit 3	Atlanta	GA	S	N	WS	0.00292	0.00760		0.00453							
New Sources																
Facility A			L	N	DIFF	0.00930	0.00825	0.325	0.00592	80.4	0.838	2,578	827	3.96	0.332	2.79
Facility B			M	N	DIFF	0.00927	0.00399	16.3	0.193	105	1.90	328	58.7	0.137	0.0358	0.312
Facility C			S	N	WS	0.00292	0.00760	2.89	0.00453	105	3.52	13.2	94.5	0.572	0.0429	0.0230
Nationwide total												2,919	980	4.67	0.410	3.12

Notes:

1. Patterned new sources after those new HMIWI installed in last 10 years.
2. HCl, CO, NO_x, SO₂ baseline emissions (lb/yr) = concentration (ppmvd) x molecular weight (g/g-mol) x g-mol-°K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-µg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ µg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
3. Pb, Cd, Hg baseline emissions (lb/yr) = concentration (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
4. PM baseline emissions (lb/yr) = concentration (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
5. CDD/CDF, TEQ baseline emissions (g/yr) = concentration (ng/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x g/10⁹ ng x 60 min/hr x operating hours (hr/yr)
6. Baseline emissions estimated from average emissions data were calculated using the same equations above.
7. Total baseline emissions (lb/yr) = ∑(HCl, CO, Pb, Cd, Hg, PM, NO_x, SO₂ lb/yr) + (total CDD/CDF g/yr x lb/453.59237 g)
8. Molecular weights:
 HCl g/g-mol = 36
 CO g/g-mol = 28
 NO_x g/g-mol = 46
 SO₂ g/g-mol = 64

Table 5. Baseline Emissions for New HMIWI

Facility name	City	State	Category	New/ existing	APCD code	Hg unit average (mg/dscm)	PM unit average (gr/dscf)	CDD/CDF unit average (ng/dscm)	TEQ unit average (ng/dscm)	NO _x unit average (ppmvd)	SO ₂ unit average (ppmvd)	HCl baseline (lb/yr)	CO baseline (lb/yr)	Pb baseline (lb/yr)	Cd baseline (lb/yr)	Hg baseline (lb/yr)
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Key:

- Emissions data unavailable; used average emissions data from Table 2 to estimate emissions
- Cd = Cadmium
- CDD/CDF = Dioxins/furans
- CO = Carbon monoxide
- DIFF = Dry injection fabric filter
- dscf = Dry standard cubic feet
- dscm = Dry standard cubic meter
- gr = Grains
- HCl = Hydrogen chloride
- Hg = Mercury
- HMIWI = Hospital/medical/infectious waste incinerator(s)
- L = Large HMIWI
- M = Medium HMIWI
- mg = Milligrams
- N = New HMIWI
- ng = Nanograms
- NO_x = Nitrogen oxides
- Pb = Lead
- PM = Particulate matter
- ppmvd = Parts per million by volume, dry
- S = Small HMIWI
- SO₂ = Sulfur dioxide
- TEQ = 2,3,7,8-TCDD toxic equivalent
- WS = Wet scrubber

Table 5. Baseline Emissions for New HMIWI

Facility name	City	State	Category	New/ existing	APCD code	PM baseline (lb/yr)	CDD/CDF baseline (g/yr)	TEQ baseline (g/yr)	NO _x baseline (lb/yr)	SO ₂ baseline (lb/yr)	Total baseline (lb/yr)
Basis for New Sources											
Municipality of Chambers County, Resource Recovery Center, Unit 1	Anahuac	TX	L	N	DIFF						
Municipality of Chambers County, Resource Recovery Center, Unit 2	Anahuac	TX	L	N	DIFF						
Municipality of Chambers County, Resource Recovery Center, Average	Anahuac	TX	L	N	DIFF						
Wilkes-Barre General Hospital	Wilkes-Barre	PA	M	N	DIFF						
Centers for Disease Control and Prevention--Clifton, Building 18, Unit 3	Atlanta	GA	S	N	WS						
New Sources											
Facility A			L	N	DIFF	5,656	0.0442	0.000805	32,001	465	41,533
Facility B			M	N	DIFF	308	0.249	0.00294	4,879	122	5,697
Facility C			S	N	WS	137	0.0103	0.0000162	1,350	62.8	1,658
Nationwide total						6,100	0.304	0.00376	38,230	650	48,888

Notes:

1. Patterned new sources after those new HMIWI installed in last 10 years.
2. HCl, CO, NO_x, SO₂ baseline emissions (lb/yr) = concentration (ppmvd) x molecular weight (g/g-mol) x g-mol-°K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-µg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ µg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
3. Pb, Cd, Hg baseline emissions (lb/yr) = concentration (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
4. PM baseline emissions (lb/yr) = concentration (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
5. CDD/CDF, TEQ baseline emissions (g/yr) = concentration (ng/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x g/10⁹ ng x 60 min/hr x operating hours (hr/yr)
6. Baseline emissions estimated from average emissions data were calculated using the same equations above.
7. Total baseline emissions (lb/yr) = Σ(HCl, CO, Pb, Cd, Hg, PM, NO_x, SO₂ lb/yr) + (total CDD/CDF g/yr x lb/453.59237 g)
8. Molecular weights:
 HCl g/g-mol = 36
 CO g/g-mol = 28
 NO_x g/g-mol = 46
 SO₂ g/g-mol = 64

Table 5. Baseline Emissions for New HMIWI

Facility name	City	State	Category	New/ existing	APCD code	PM baseline (lb/yr)	CDD/CDF baseline (g/yr)	TEQ baseline (g/yr)	NO _x baseline (lb/yr)	SO ₂ baseline (lb/yr)	Total baseline (lb/yr)
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- ng = Nanograms
- NO_x = Nitrogen oxides
- Pb = Lead
- PM = Particulate matter
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- S = Small HMIWI
- SO₂ = Sulfur dioxide
- TEQ = 2,3,7,8-TCDD toxic equivalent
- WS = Wet scrubber

Table 6. MACT Floor Emission Reductions for New HMIWI

Facility name	Category	New/ existing	APCD code	APCD type	HCl MACT floor limit (ppmvd)	CO MACT floor limit (ppmvd)	Pb MACT floor limit (ppmvd)	Cd MACT floor limit (ppmvd)	Hg MACT floor limit (ppmvd)	PM MACT floor limit (ppmvd)	CDD/CDF MACT floor limit (ppmvd)	TEQ MACT floor limit (ppmvd)	NO _x MACT floor limit (ppmvd)	SO ₂ MACT floor limit (ppmvd)	HCl MACT floor control level (lb/yr)
Facility A	L	N	DIFF	Dry	0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.60	0.014	110	1.9	237
Facility B	M	N	DIFF	Dry	1.8	1.9	0.016	0.0081	0.0020	0.0099	0.35	0.0097	38	0.78	66
Facility C	S	N	WS	Wet	4.5	8.2	0.18	0.012	0.0075	0.017	8.3	0.0080	38	0.78	13
Nationwide total															316
Nationwide % reduction															

Notes:

1. Patterned new sources after those new HMIWI installed in last 10 years.
2. HCl, CO, NO_x, SO₂ control level emissions (lb/yr) = emission limit (ppmvd) x molecular weight (g/g-mol) x g-mol⁻¹K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-μg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ μg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
3. Pb, Cd, Hg control level emissions (lb/yr) = emission limit (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
4. PM control level emissions (lb/yr) = emission limit (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
5. CDD/CDF, TEQ control level emissions (g/yr) = emission limit (ng/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x g/10⁹ ng x 60 min/hr x operating hours (hr/yr)
6. If baseline concentration < emission limit, then control level emissions = baseline emissions.
7. Emission reduction (lb/yr) = baseline emissions (lb/yr) - control level emissions (lb/yr)
8. Total emission reduction (lb/yr) = Σ(HCl, CO, Pb, Cd, Hg, PM, NO_x, SO₂ lb/yr) + (total CDD/CDF g/yr x lb/453.59237 g)
9. Molecular weights:
 HCl g/g-mol = 36
 CO g/g-mol = 28
 NO_x g/g-mol = 46
 SO₂ g/g-mol = 64

Key:

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- ng = Nanograms
- NO_x = Nitrogen oxides
- Pb = Lead
- PM = Particulate matter
- ppmvd = Parts per million by volume, dry
- S = Small HMIWI
- SO₂ = Sulfur dioxide
- TEQ = 2,3,7,8-TCDD toxic equivalent
- WS = Wet scrubber

Table 6. MACT Floor Emission Reductions for New HMIWI

Facility name	Category	New/ existing	APCD code	APCD type	CO MACT floor control level (lb/yr)	Pb MACT floor control level (lb/yr)	Cd MACT floor control level (lb/yr)	Hg MACT floor control level (lb/yr)	PM MACT floor control level (lb/yr)	CDD/CDF MACT floor control level (g/yr)	TEQ MACT floor control level (g/yr)	NO _x MACT floor control level (lb/yr)	SO ₂ MACT floor control level (lb/yr)
Facility A	L	N	DIFF	Dry	703	0.141	0.036	0.279	3,291	0.0442	0.000805	32,001	465
Facility B	M	N	DIFF	Dry	54	0.137	0.036	0.067	308	0.0054	0.000148	1,760	50
Facility C	S	N	WS	Wet	64	0.572	0.043	0.023	137	0.0103	0.000016	487	14
Nationwide total					821	0.849	0.115	0.369	3,736	0.0598	0.000969	34,248	529
Nationwide % reduction													

Notes:

1. Patterned new sources after those new HMIWI installed in last 10 years.
2. HCl, CO, NO_x, SO₂ control level emissions (lb/yr) = emission limit (ppmvd) x molecular weight (g/g-mol) x g-mol⁻¹K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-μg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ μg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
3. Pb, Cd, Hg control level emissions (lb/yr) = emission limit (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
4. PM control level emissions (lb/yr) = emission limit (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
5. CDD/CDF, TEQ control level emissions (g/yr) = emission limit (ng/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x g/10⁹ ng x 60 min/hr x operating hours (hr/yr)
6. If baseline concentration < emission limit, then control level emissions = baseline emissions.
7. Emission reduction (lb/yr) = baseline emissions (lb/yr) - control level emissions (lb/yr)
8. Total emission reduction (lb/yr) = Σ(HCl, CO, Pb, Cd, Hg, PM, NO_x, SO₂ lb/yr) + (total CDD/CDF g/yr x lb/453.59237 g)
9. Molecular weights:
 HCl g/g-mol = 36
 CO g/g-mol = 28
 NO_x g/g-mol = 46
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Key:

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- TEQ = 2,3,7,8-TCDD toxic equivalent
- WS = Wet scrubber

Table 6. MACT Floor Emission Reductions for New HMIWI

Facility name	Category	New/ existing	APCD code	APCD type	Total MACT floor control level (lb/yr)	HCl MACT floor emission reduction (lb/yr)	CO MACT floor emission reduction (lb/yr)	Pb MACT floor emission reduction (lb/yr)	Cd MACT floor emission reduction (lb/yr)	Hg MACT floor emission reduction (lb/yr)	PM MACT floor emission reduction (lb/yr)	CDD/CDF MACT floor emission reduction (lb/yr)
Facility A	L	N	DIFF	Dry	36,697	2,341	124	3.82	0.296	2.51	2,364	0
Facility B	M	N	DIFF	Dry	2,238	262	5.15	0	0	0.245	0	0.244
Facility C	S	N	WS	Wet	716	0	30.5	0	0	0	0	0
Nationwide total					39,651	2,603	159	3.82	0.296	2.75	2,364	0.244
Nationwide % reduction						89%	16%	82%	72%	88%	39%	80%

Notes:

1. Patterned new sources after those new HMIWI installed in last 10 years.
2. HCl, CO, NO_x, SO₂ control level emissions (lb/yr) = emission limit (ppmvd) x molecular weight (g/g-mol) x g-mol⁻¹K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-μg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ μg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
3. Pb, Cd, Hg control level emissions (lb/yr) = emission limit (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
4. PM control level emissions (lb/yr) = emission limit (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
5. CDD/CDF, TEQ control level emissions (g/yr) = emission limit (ng/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x g/10⁹ ng x 60 min/hr x operating hours (hr/yr)
6. If baseline concentration < emission limit, then control level emissions = baseline emissions.
7. Emission reduction (lb/yr) = baseline emissions (lb/yr) - control level emissions (lb/yr)
8. Total emission reduction (lb/yr) = Σ(HCl, CO, Pb, Cd, Hg, PM, NO_x, SO₂ lb/yr) + (total CDD/CDF g/yr x lb/453.59237 g)
9. Molecular weights:
 HCl g/g-mol = 36
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 SO₂ g/g-mol = 64

Key:

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- M = Medium HMIWI
- mg = Milligrams
- N = New HMIWI
- ng = Nanograms
- NO_x = Nitrogen oxides
- Pb = Lead
- PM = Particulate matter
- ppmvd = Parts per million by volume, dry
- S = Small HMIWI
- SO₂ = Sulfur dioxide
- TEQ = 2,3,7,8-TCDD toxic equivalent
- WS = Wet scrubber

Table 7. Beyond-the-Floor Emission Reductions for New HMIWI

Facility name	Category	New/ existing	APCD code	APCD type	HCl BTF limit (ppmvd)	CO BTF limit (ppmvd)	Pb BTF limit (ppmvd)	Cd BTF limit (ppmvd)	Hg BTF limit (ppmvd)	PM BTF limit (ppmvd)	CDD/CDF BTF limit (ppmvd)	TEQ BTF limit (ppmvd)	NO _x BTF limit (ppmvd)	SO ₂ BTF limit (ppmvd)
Facility A	L	N	DIFF	Dry	0.75	2.9	0.00047	0.00012	0.00093	0.0048	0.60	0.014	60.5	1.9
Facility B	M	N	DIFF	Dry	1.8	1.9	0.016	0.0071	0.0020	0.0099	0.35	0.0097	38	0.78
Facility C	S	N	WS	Wet	1.8	8.2	0.016	0.0071	0.0020	0.0099	0.35	0.0080	38	0.78
Nationwide total														
Nationwide % reduction														

Notes:

1. Patterned new sources after those new HMIWI installed in last 10 years.
2. The only beyond-the-floor options available for new sources are SNCR (large HMIWI), no additional controls available (medium HMIWI), and DIFF with activated carbon (small HMIWI). Assumed 45% reduction in NO_x with SNCR for large HMIWI based on an SNCR control efficiency estimate for HMIWI for 2007 provided in the EPA technical bulletin "Nitrogen Oxides (NO_x), Why and How They Are Controlled." Assumed no emission reduction for medium HMIWI since no additional beyond-the-floor controls are available for them. For small HMIWI, assumed emission levels for HCl, metals, PM, and CDD/CDF similar to those achieved by medium HMIWI at the MACT floor, since small HMIWI would be equipped beyond-the-floor with controls similar to those used by medium HMIWI at the MACT floor (DIFF with activated carbon and a wet scrubber).
3. HCl, CO, NO_x, SO₂ control level emissions (lb/yr) = emission limit (ppmvd) x molecular weight (g/g-mol) x g-mol-°K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-µg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ µg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
4. Pb, Cd, Hg control level emissions (lb/yr) = emission limit (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
5. PM control level emissions (lb/yr) = emission limit (gr/dscf) x stack gas flow rate (dscfm) x lb/7000 gr x 60 min/hr x operating hours (hr/yr)
6. CDD/CDF, TEQ control level emissions (g/yr) = emission limit (ng/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x g/10⁹ ng x 60 min/hr x operating hours (hr/yr)
7. If baseline concentration < emission limit, then control level emissions = baseline emissions.
8. Emission reduction (lb/yr) = baseline emissions (lb/yr) - control level emissions (lb/yr)
9. Total emission reduction (lb/yr) = ∑(HCl, CO, Pb, Cd, Hg, PM, NO_x, SO₂ lb/yr) + (total CDD/CDF g/yr x lb/453.59237 g)
10. Molecular weights:

HCl g/g-mol =	36
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<u>Key:</u>	
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Facility name	Category	New/ existing	APCD code	APCD type	HCl BTF control level (lb/yr)	CO BTF control level (lb/yr)	Pb BTF control level (lb/yr)	Cd BTF control level (lb/yr)	Hg BTF control level (lb/yr)	PM BTF control level (lb/yr)	CDD/CDF BTF control level (lb/yr)	TEQ BTF control level (lb/yr)	NO _x BTF control level (lb/yr)
Facility A	L	N	DIFF	Dry	237	703	0.141	0.0360	0.279	3,291	0.0442	0.000805	24,091
Facility B	M	N	DIFF	Dry	66.1	53.6	0.137	0.0358	0.0674	308	0.00535	0.000148	1,760
Facility C	S	N	WS	Wet	13.2	64.0	0.126	0.0429	0.0157	137	0.00125	0.0000162	487
Nationwide total					316	821	0.404	0.115	0.362	3,736	0.0508	0.000969	26,338
Nationwide % reduction													

Notes:

1. Patterned new sources after those new HMIWI installed in last 10 years.
2. The only beyond-the-floor options available for new sources are SNCR (large HMIWI), no additional controls available (medium HMIWI), and DIFF with activated carbon (small HMIWI). Assumed 45% reduction in NO_x with SNCR for large HMIWI based on an SNCR control efficiency estimate for HMIWI for 2007 provided in the EPA technical bulletin "Nitrogen Oxides (NO_x), Why and How They Are Controlled." Assumed no emission reduction for medium HMIWI since no additional beyond-the-floor controls are available for them. For small HMIWI, assumed emission levels for HCl, metals, PM, and CDD/CDF similar to those achieved by medium HMIWI at the MACT floor, since small HMIWI would be equipped beyond-the-floor with controls similar to those used by medium HMIWI at the MACT floor (DIFF with activated carbon and a wet scrubber).
3. HCl, CO, NO_x, SO₂ control level emissions (lb/yr) = emission limit (ppmvd) x molecular weight (g/g-mol) x g-mol-°K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-µg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ µg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
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6. CDD/CDF, TEQ control level emissions (g/yr) = emission limit (ng/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x g/10⁹ ng x 60 min/hr x operating hours (hr/yr)
7. If baseline concentration < emission limit, then control level emissions = baseline emissions.
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9. Total emission reduction (lb/yr) = Σ(HCl, CO, Pb, Cd, Hg, PM, NO_x, SO₂ lb/yr) + (total CDD/CDF g/yr x lb/453.59237 g)
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Facility name	Category	New/ existing	APCD code	APCD type	SO ₂ BTF control level (lb/yr)	Total BTF control level (lb/yr)	HCl BTF emission reduction (lb/yr)	CO BTF emission reduction (lb/yr)	Pb BTF emission reduction (lb/yr)	Cd BTF emission reduction (lb/yr)	Hg BTF emission reduction (lb/yr)	PM BTF emission reduction (lb/yr)	CDD/CDF BTF emission reduction (lb/yr)
Facility A	L	N	DIFF	Dry	465	28,787	0	0	0	0	0	0	0
Facility B	M	N	DIFF	Dry	50.3	2,238	0	0	0	0	0	0	0
Facility C	S	N	WS	Wet	13.9	715	0	0	0.446	0	0.00726	0	0.00905
Nationwide total					529	31,741	0	0	0.446	0	0.00726	0	0.00905
Nationwide % reduction							0%	0%	52%	0%	2%	0%	15%

Notes:

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2. The only beyond-the-floor options available for new sources are SNCR (large HMIWI), no additional controls available (medium HMIWI), and DIFF with activated carbon (small HMIWI). Assumed 45% reduction in NO_x with SNCR for large HMIWI based on an SNCR control efficiency estimate for HMIWI for 2007 provided in the EPA technical bulletin "Nitrogen Oxides (NO_x), Why and How They Are Controlled." Assumed no emission reduction for medium HMIWI since no additional beyond-the-floor controls are available for them. For small HMIWI, assumed emission levels for HCl, metals, PM, and CDD/CDF similar to those achieved by medium HMIWI at the MACT floor, since small HMIWI would be equipped beyond-the-floor with controls similar to those used by medium HMIWI at the MACT floor (DIFF with activated carbon and a wet scrubber).
3. HCl, CO, NO_x, SO₂ control level emissions (lb/yr) = emission limit (ppmvd) x molecular weight (g/g-mol) x g-mol-°K/0.08206 L-atm x 1 atm x 1/stack gas temperature (°C + 273) x 1,000 L-µg/g-m³ x 0.028316847 m³/ft³ x g/10⁶ µg x lb/453.59237 g x stack gas flow rate (dscfm) x 60 min/hr x operating hours (hr/yr)
4. Pb, Cd, Hg control level emissions (lb/yr) = emission limit (mg/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x lb/453.59237 g x g/10³ mg x 60 min/hr x operating hours (hr/yr)
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6. CDD/CDF, TEQ control level emissions (g/yr) = emission limit (ng/dscm) x dscm/35.31467 dscf x stack gas flow rate (dscfm) x g/10⁹ ng x 60 min/hr x operating hours (hr/yr)
7. If baseline concentration < emission limit, then control level emissions = baseline emissions.
8. Emission reduction (lb/yr) = baseline emissions (lb/yr) - control level emissions (lb/yr)
9. Total emission reduction (lb/yr) = Σ(HCl, CO, Pb, Cd, Hg, PM, NO_x, SO₂ lb/yr) + (total CDD/CDF g/yr x lb/453.59237 g)
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Facility name	Category	New/ existing	APCD code	APCD type	TEQ BTF emission reduction (lb/yr)	NO _x BTF emission reduction (lb/yr)	SO ₂ BTF emission reduction (lb/yr)	Total BTF emission reduction (lb/yr)	HCl MACT floor + BTF emission reduction (lb/yr)	CO MACT floor + BTF emission reduction (lb/yr)	Pb MACT floor + BTF emission reduction (lb/yr)	Cd MACT floor + BTF emission reduction (lb/yr)
Facility A	L	N	DIFF	Dry	0	7,910	0	7,910	2,341	124	3.82	0.296
Facility B	M	N	DIFF	Dry	0	0	0	0	262	5.15	0	0
Facility C	S	N	WS	Wet	0	0	0	0.453	0	30.5	0.446	0
Nationwide total					0	7,910	0	7,910	2,603	159	4.27	0.296
Nationwide % reduction					0%	23%	0%	20%	89%	16%	91%	72%

Notes:

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9. Total emission reduction (lb/yr) = ∑(HCl, CO, Pb, Cd, Hg, PM, NO_x, SO₂ lb/yr) + (total CDD/CDF g/yr x lb/453.59237 g)
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Facility name	Category	New/ existing	APCD code	APCD type	Hg MACT floor + BTF emission reduction (lb/yr)	PM MACT floor + BTF emission reduction (lb/yr)	CDD/CDF MACT floor + BTF emission reduction (lb/yr)	TEQ MACT floor + BTF emission reduction (lb/yr)	NO _x MACT floor + BTF emission reduction (lb/yr)	SO ₂ MACT floor + BTF emission reduction (lb/yr)	Total MACT floor + BTF emission reduction (lb/yr)
Facility A	L	N	DIFF	Dry	2.51	2,364	0	0	7,910	0	12,745
Facility B	M	N	DIFF	Dry	0.245	0	0.244	0.00280	3,119	71.9	3,459
Facility C	S	N	WS	Wet	0.00726	0	0.00905	0	863	48.8	943
Nationwide total					2.76	2,364	0.253	0.00280	11,892	121	17,147
Nationwide % reduction					88%	39%	83%	74%	31%	19%	35%

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