Table A-4. National Nitrogen Oxides Emissions Estimates, 1980, 1985, 1989–2000 (thousand short tons)

Source Category	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Fuel Combustion	11,320	10,048	10,537	10,895	10,779	10,928	11,111	11,015	10,827	10,502	10,563	10,389	9,964	9,649
FUEL COMB. ELEC. UTIL.	7,024	6,127	6,593	6,663	6,519	6,504	6,651	6,565	6,384	6,141	6,279	6,231	5,672	5,266
Coal	6,123	5,240	5,676	5,642	5,559	5,579	5,744	5,636	5,579	5,574	5,644	5,436	4,929	4,573
bituminous	3,439	4,378	4,595	4,532	4,435	4,456	4,403	4,207	3,830	3,776	3,828	3,635	3,176	2,910
subbituminous	1,694	668	837	857	874	868	1,087	1,167	1,475	1,570	1,591	1,575	1,551	1,462
anthracite & lignite	542	194	245	254	250	255	255	262	273	229	225	226	201	201
other	447	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	0
Oil	901	193	285	221	212	170	180	163	96	118	145	223	188	154
residual	39	178	268	207	198	158	166	149	94	116	142	220	184	149
distillate	862	15	17	14	14	13	14	14	2	2	2	3	3	4
other	NA	NA	NA	0	NA	NA	NA	NA	NA	0	0	0	0	0
Gas	NA	646	582	565	580	579	551	591	562	285	319	381	370	353
natural	NA	646	582	565	580	579	551	591	562	273	306	363	368	351
process	NA	NA	NA	NA	NA	NA	NA	NA	NA	12	13	19	2	1
Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	7	27	19	18
Internal Combustion	NA	48	49	235	168	175	176	175	148	158	165	164	166	170
FUEL COMB. INDUSTRIAL	3,555	3,209	3,209	3,035	2,979	3,071	3,151	3,147	3,144	3,157	3,102	3,051	3,130	3,222
Coal	444	608	615	585	570	574	589	602	597	543	537	524	539	543
bituminous	306	430	446	399	387	405	413	420	412	369	364	357	367	370
subbituminous	94	14	14	18	20	21	28	38	46	46	46	44	46	46
anthracite & lignite	44	33	30	26	26	26	26	27	26	19	19	18	18	18
other	NA	131	124	141	137	122	122	117	112	109	108	105	108	109
Oil	286	309	294	265	237	244	245	241	247	225	216	209	214	228
residual	179	191	176	180	146	154	153	149	156	141	130	126	129	139
distillate	63	89	88	71	73	73	75	76	73	73	74	72	73	75
other	44	29	29	14	18	17	17	17	17	11	12	11	11	13
Gas	2,619	1,520	1,625	1,182	1,250	1,301	1,330	1,333	1,324	1,205	1,189	1,175	1,200	1,253
natural	2,469	1,282	1,405	967	1,025	1,068	1,095	1,103	1,102	993	970	958	984	1,010
process	5	227	209	211	222	230	233	228	220	210	216	215	214	240
other	145	11	10	3	3	3	2	2	2	3	3	3	3	3
Other	205	118	120	131	129	126	124	124	123	120	115	115	118	123
wood/bark waste	138	89	92	89	82	82	83	83	84	83	79	80	83	86
liquid waste	NA	12	12	8	11	10	11	11	11	9	8	8	8	9
other	67	17	16	34	36	34	30	30	28	29	28	27	27	28
Internal Combustion	NA	655	556	874	793	825	863	846	854	1,064	1,045	1,028	1,059	1,076
FUEL COMB. OTHER	741	712	736	1,196	1,281	1,353	1,308	1,303	1,298	1,204	1,182	1,107	1,162	1,161
Commercial/Institutional Coal	25	37	38	40	36	38	40	40	38	34	35	37	37	37
Commercial/Institutional Oil	155	106	106	97	88	93	93	95	103	96	97	80	79	80
Commercial/Institutional Gas	131	145	159	200	210	225	232	237	231	247	252	243	265	269
Misc. Fuel Comb. (Except Residential)	NA	11	11	34	32	28	31	31	30	27	28	29	28	29
Residential Wood	74	88	75	46	50	53	45	44	49	30	30	30	30	33
Residential Other	356	326	347	780	865	916	867	857	847	770	740	688	723	713
distillate oil	85	75	78	209	211	210	210	210	210	193	188	172	175	169
natural gas	238	248	267	449	469	489	513	516	519	470	437	400	433	431
other	33	3	3	121	185	218	144	131	118	108	114	117	116	114
Industrial Processes	666	891	852	892	816	857	861	878	873	888	923	933	933	967

Table A-4. National Nitrogen Oxides Emissions Estimates, 1980, 1985, 1989–2000 (thousand short tons) (continued)

Source Category	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
CHEMICAL & ALLIED PRODUCT MFG	213	262	273	168	165	163	155	160	158	125	127	129	131	134
Organic Chemical Mfg	54	37	42	18	22	22	19	20	20	21	21	21	21	22
Inorganic Chemical Mfg	159	22	18	12	12	10	5	6	7	6	6	6	6	6
Polymer & Resin Mfg	NA	22	23	6	6	6	5	5	4	3	3	3	3	3
Agricultural Chemical Mfg	NA	143	152	80	77	76	74	76	74	50	51	52	53	55
Paint, Varnish, Lacquer, Enamel Mfg	NA	0	0	0	0	0	0	0	0	0	0	0	0	0
Pharmaceutical Mfg	NA	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Chemical Mfg	NA	38	39	52	48	50	51	54	54	45	46	47	47	48
METALS PROCESSING	65	87	83	97	76	81	83	91	98	83	88	88	88	91
Nonferrous Metals Processing	NA	16	15	14	15	13	12	12	12	11	12	12	12	12
Ferrous Metals Processing	65	58	54	78	56	62	67	75	83	66	71	71	70	73
Metals Processing NEC	NA	13	14	6	5	6	4	4	4	6	6	6	6	7
PETROLEUM & RELATED INDUSTRIES	72	124	97	153	121	148	123	117	110	139	143	143	143	146
Oil & Gas Production	NA	69	47	104	65	68	70	63	58	86	88	88	88	90
Petroleum Refineries & Related Industries	72	55	49	47	52	76	49	49	48	47	48	48	48	49
Asphalt Manufacturing	NA	1	1	3	4	4	5	5	5	7	7	7	7	7
OTHER INDUSTRIAL PROCESSES	205	327	311	378	352	361	370	389	399	438	460	467	465	487
Agriculture, Food, & Kindred Products	NA	5	5	3	3	3	4	3	6	5	5	5	5	5
Textiles, Leather, & Apparel Products	NA	0	0	0	0	0	0	0	0	1	1	1	1	1
Wood, Pulp & Paper, & Publishing Prods	24	73	77	91	88	86	86	89	89	86	89	91	92	96
Rubber & Miscellaneous Plastic Prods	NA	0	0	0	0	0	0	0	0	0	0	0	0	0
Mineral Products	181	239	220	270	249	259	267	281	287	331	350	355	351	369
cement mfg	98	137	124	151	131	139	143	150	153	200	212	214	208	220
glass mfg	60	48	45	59	59	61	64	66	67	69	74	76	77	81
other	23	54	51	61	59	60	60	64	66	62	64	65	65	67
Machinery Products	NA	2	2	3	2	2	3	6	7	2	3	3	3	3
Electronic Equipment	NA	NA	NA	0	0	0	0	0	0	0	0	0	0	0
Transportation Equipment	NA	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous Industrial Processes	NA	8	7	10	10	10	9	9	10	12	12	12	12	12
SOLVENT UTILIZATION	NA	2	3	1	2	3	3	3	3	2	3	3	3	3
Degreasing	NA	0	0	0	0	0	0	0	0	0	0	0	0	0
Graphic Arts	NA	0	0	0	1	1	1	1	1	1	1	1	1	1
Dry Cleaning	NA	NA	NA	0	0	0	0	0	0	0	0	0	0	0
Surface Coating	NA	2	2	1	2	2	2	2	2	2	2	2	2	2
Other Industrial	NA	0	0	0	0	0	0	0	0	0	0	0	0	0
Nonindustrial	NA	NA	NA	0	0	0	0	0	0	0	0	0	0	0
Solvent Utilization NEC	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	0	0	0
STORAGE & TRANSPORT	NA	2	2	3	6	5	5	5	6	15	16	16	16	17
Bulk Terminals & Plants	NA	NA	NA	0	1	1	1	1	1	2	2	2	2	2
Petroleum & Petroleum Product Storage	NA	1	1	2	2	0	0	0	0	7	8	8	8	8
Petroleum & Petroleum Product Transport	NA	0	0	0	0	0	0	0	0	0	0	0	0	0
Service Stations: Stage I	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	0
Service Stations: Stage II	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	0	0	0
Organic Chemical Storage	NA	1	1	0	2	3	3	3	4	4	4	4	4	4
Organic Chemical Transport	NA	NA	NA	0	0	0	0	0	0	0	0	0	0	0
Inorganic Chemical Storage	NA	0	0	0	0	0	0	0	0	0	0	0	0	0
Bulk Materials Storage	NA	0	1	0	0	0	0	0	1	2	2	2	2	2

Table A-4. National Nitrogen Oxides Emissions Estimates, 1980, 1985, 1989–2000 (thousand short tons) (continued)

Source Category	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
WASTE DISPOSAL & RECYCLING	111	87	84	91	95	96	123	114	99	86	86	87	87	89
Incineration	37	27	31	49	51	51	74	65	53	53	53	54	54	55
Open Burning	74	59	52	42	43	43	44	44	44	30	30	30	30	31
POTW	NA	NA	NA	0	0	0	0	0	0	0	0	0	0	0
Industrial Waste Water	NA	NA	NA	0	0	0	0	0	0	0	0	0	0	0
TSDF	NA	NA	NA	0	0	0	0	0	0	0	0	0	0	0
Landfills	NA	0	0	0	0	1	1	1	1	2	2	2	2	2
Other	NA	0	0	0	1	1	4	3	1	1	1	1	1	1
Transportation	12,150	11,948	12,210	12,014	12,457	12,692	12,902	13,191	13,085	14,260	14,470	14,371	13,731	13,251
ON-ROAD VEHICLES	8,621	8,089	7,682	7,210	7,557	7,759	7,960	8,176	7,956	8,793	8,924	8,816	8,612	8,150
Light-Duty Gas Vehicles & Motorcycles	4,421	3,806	3,494	3,013	3,069	3,098	3,117	3,173	3,043	3,006	2,996	2,933	2,825	2,790
light-duty gas vehicles	4,416	3,797	3,483	3,002	3,058	3,086	3,105	3,161	3,031	2,994	2,983	2,920	2,813	2,777
motorcycles	5	9	11	11	11	12	12	13	12	12	12	12	12	13
Light-Duty Gas Trucks	1,408	1,530	1,386	1,552	1,839	2,004	2,131	2,160	1,991	1,709	1,742	1,703	1,676	1,608
light-duty gas trucks 1	864	926	803	901	1,074	1,171	1,242	1,251	1,183	1,166	1,185	1,157	1,141	1,099
light-duty gas trucks 2	544	603	584	651	766	833	888	909	809	543	557	546	535	509
Heavy-Duty Gas Vehicles	300	330	343	306	321	309	316	351	330	518	505	467	455	439
Diesels	2,493	2,423	2,458	2,340	2,328	2,347	2,397	2,492	2,591	3,560	3,680	3,713	3,655	3,312
heavy-duty diesel vehicles	2,463	2,389	2,416	2,248	2,284	2,302	2,351	2,446	2,544	3,538	3,662	3,698	3,644	3,300
light-duty diesel trucks	5	6	7	63	11	11	12	12	13	8	7	6	5	4
light-duty diesel vehicles	25	28	35	28	33	33	33	34	34	14	11	9	7	7
NON-ROAD ENGINES AND VEHICLES	3,529	3,859	4,528	4,804	4,900	4,934	4,942	5,015	5,128	5,467	5,546	5,555	5,558	5,558
Non-Road Gasoline	101	108	114	120	121	123	124	126	127	164	181	197	203	212
recreational	1	1	1	6	6	6	6	6	6	29	29	29	29	30
construction	4	4	4	4	4	4	4	4	4	4	5	6	6	6
industrial	13	14	13	12	12	12	11	11	11	14	14	14	15	14
lawn & garden	29	31	35	36	37	38	39	40	41	51	61	71	79	84
farm	5	5	5	6	6	6	6	6	6	4	4	4	4	4
light commercial	11	12	14	15	16	16	17	18	18	22	27	31	32	34
logging	0	0	0	0	0	0	0	0	0	3	4	5	5	5
airport service	0	0	0	0	0	0	0	0	0	0	0	0	0	0
railway maintenance	NA	0	0	0	0	0	0	0	0	0	0	0	0	0
recreational marine vessels	38	40	41	41	41	41	41	41	41	37	37	37	33	34
Non-Road Diesel	2,125	2,155	2,472	2,513	2,552	2,595	2,640	2,687	2,739	2,746	2,760	2,751	2,707	2,660
recreational	2	2	3	3	3	3	3	3	3	5	5	5	5	5
construction	843	943	1,083	1,102	1,120	1,138	1,156	1,174	1,198	1,267	1,273	1,267	1,247	1,222
industrial	193	244	270	268	265	265	268	270	274	240	242	241	237	234
lawn & garden	19	22	40	45	50	54	59	64	69	70	76	81	84	83
farm	926	755	877	898	917	936	953	970	987	935	934	926	910	894
light commercial	44	54	72	77	82	87	91	96	101	109	114	119	123	126
logging	94	118	101	94	88	82	79	77	75	79	73	67	61	56
airport service	2	3	6	7	7	8	8	9	9	10	10	10	10	10
railway maintenance	NA	2	3	3	4	4	4	4	4	4	4	4	7	7
recreational marine vessels	NA	13	16	17	17	18	19	19	20	28	29	30	23	24

Table A-4. National Nitrogen Oxides Emissions Estimates, 1980, 1985, 1989–2000 (thousand short tons) (continued)

Source Category	1980	1985	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Aircraft	106	119	138	158	155	156	156	161	165	81	81	81	81	84
Marine Vessels	467	557	747	943	995	961	917	929	936	1,083	1,084	1,084	1,083	1,090
coal	0	0	0	0	0	0	0	0	0	NA	NA	NA	NA	NA
diesel	396	469	628	630	649	621	593	604	615	996	996	996	996	1,006
residual oil	71	87	118	114	115	116	114	115	105	87	87	87	87	84
gasoline	NA	NA	NA	10	10	9	9	9	10	NA	NA	NA	NA	NA
other	NA	NA	NA	190	221	214	201	201	206	0	0	0	0	0
Railroads	731	808	923	929	929	946	945	947	990	1,183	1,222	1,215	1,242	1,230
Non-Road Other	*NA*	112	135	141	147	153	159	165	171	210	218	227	271	281
liquified petroleum gas	NA	75	98	103	109	115	120	126	132	183	190	199	240	249
compressed natural gas	NA	37	38	38	38	39	39	39	39	27	28	28	31	32
MISCELLANEOUS	248	310	293	369	286	255	241	390	267	415	401	318	343	576
Agriculture and Forestry	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	0
agricultural livestock	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	0
Other Combustion	248	310	293	368	285	253	240	388	265	415	401	318	343	576
Health Services	NA	NA	NA	NA	NA	0	0	0	0	0	0	0	0	0
Cooling Towers	NA	NA	NA	NA	NA	0	NA	0	0	0	0	0	0	0
Fugitive Dust	NA	NA	NA	1	1	1	1	1	1	0	0	0	0	0
TOTAL ALL SOURCES	24,384	23,198	23,893	24,170	24,338	24,732	25,116	25,474	25,051	26,065	26,357	26,011	25,439	24,899

Note: Some columns may not sum to totals due to rounding.