

Appendix E: New York Toxic Emissions Inventory

Mobile Source Emissions

On-Road Mobile Methodology

The 1999 on-road mobile emissions were grown from 1998 emissions created using the U.S. Environmental Protection Agency's (EPA's) MOBILE5B or PART5 emission models. The 1998 emissions were grown using the ratio of 1999 VMT to 1998 VMT. This ratio was created for all 8 vehicle types and all applicable road types for each county in the State. Detailed below is the methodology used to create the 1998 emission estimates.

New York State is modeled as 37 separate areas. These areas are defined on the basis of varying temperature, traffic, and/or air quality programs. Input file scenarios are then created for each hour and road type in that area. All inputs are derived from 1998 data where applicable. The entire year was then modeled by month to yield a more accurate annual inventory.

Inspection and maintenance programs, anti-tampering programs, reformulated gasoline, oxygenated gasoline, and Stage II are all modeled by area type. These inputs reflect the programs and controls that were in effect in that area in 1998.

Mileage accumulation rates were derived from the June 1998 report Update of Fleet Characterization Data for use in MOBILE6 – Final Report as prepared for the EPA. This report is available on the EPA's Office of Mobile Sources website as M6flt002.pdf.

Vehicle registration for 1998 was obtained from the NYS Department of Motor Vehicles (NYSDMV) and used to estimate the vehicle age distributions. Vehicle registration data in conjunction with the NYS Department of Transportation's (NYSDOT's) traffic count data were used to obtain a vehicle mix. The NYSDOT through the 1995 National Personal Transportation Survey (NPTS) was able to formulate a temporal distribution for twenty-two different areas. This allowed a better representation of drive times for each location and allowed a more accurate distribution of Vehicle Miles Traveled (VMT) within each area.

Temperature data for 1998 was obtained from the National Oceanic and Atmosphere Association. This data was from seventeen different airport locations throughout New York and surrounding locations. This data was then analyzed to yield an average temperature for each hour for each month. This yielded twenty-three different temperature profiles for each month. Each area modeled was then assigned to a geographically relevant temperature location from which the hourly temperature would be pulled.

Measured RVP values were also obtained for 1998. The New York State Department of Agriculture and Markets provided these values. The data included sample RVP values taken year round throughout the state. Analysis provided average monthly RVP values for oxygenated and reformulated gas areas and conventional gas areas. These monthly values were then used in

the corresponding input files.

Speed and Hot/Cold start data was obtained from the March 1993 report New York State 1990 Base Ozone Year Carbon Monoxide and Ozone Precursor On-Road Mobile Source Inventory by Radian Corporation and the New York State Department of Environmental Conservation.

Vehicle Miles Traveled information was obtained through the NYSDOT from 1996 Highway Performance Monitoring System (HPMS) data. This HPMS data was then grown to account for the VMT increase in 1998. This grown HPMS count data was then adjusted for each month using a Seasonal Adjustment Factor (SAF) before being apportioned to the county roadway level.

Non-road Source Methodology

Nonroad mobile source emissions were estimated using two separate methodologies. New York is modeled for all sixty-two counties separately on a monthly basis. In addition, New York is separated into two areas due to the federally mandated Reformulated Gas (RFG) Program. This program is in place in the New York City Metropolitan Area (NYCMA) which consists of Bronx, Kings, Nassau, New York, lower Orange, Queens, Richmond, Rockland, Suffolk and Westchester counties.

Emissions from 2-stroke gasoline, 4-stroke gasoline and diesel fueled off-highway vehicles as well as emissions from recreational marine vessels, were estimated using the U.S. EPA Draft Nonroad Model. Emissions from aircraft, commercial marine vessels and locomotives were estimated using the U.S. EPA 1999 NET Inventory.

Using the EPA Nonroad Model, nonroad emissions from New York were estimated for each individual county for each month of the year. Temperature and fuels blend data varied by month for each county across the state.

Temperature data for 1999 was acquired from the National Oceanic and Atmosphere Association which included historical weather data from seventeen airport locations across the state of New York as well as surrounding locations. This information was used to develop average high and low temperatures for each month on a county by county basis. The results were input into the Nonroad Model.

Fuels blend data for 1999 was acquired from the New York State Department of Agriculture and Markets. This data is based upon thousands of samples collected across the state from fueling stations and retention areas. These samples are then analyzed for many profiles including oxygen content, Reid Vapor Pressure (RVP) and sulfur content. The data provided average monthly fuels profiles on a county by county basis. The results were then used as inputs to the Nonroad Model.

Aircraft, commercial marine and locomotive data was downloaded from the U.S. EPA inventory website. This data is grouped by SCC codes.

Speciation of all pollutants to develop an air toxics inventory was completed using the RAPIDS emission estimator. Results for New York include twenty-nine TOG speciated pollutants and five PM speciated pollutants.

INFORMATION

For more information about New York's emissions inventory, please contact:

Mr. Robert Bielawa
New York State
Department of Environmental Conservation
Bureau of Air Quality Planning
Division of Air Resources
625 Broadway
Albany, NY 12233-3251

(P) 518-402-8396

(F) 518-402-9035

(E) bxbielaw@gw.dec.state.ny.us

E-1: New York - Statewide Emissions (lb/yr)

Pollutant	POINT Sources	Area Sources	MOBILE Sources	NONROAD Sources	Total
ACENAPTHENE	2604.16	0	0	0	2604.16
ACENAPHTHXYL	0	0	0	0	0
ACETALDEHYDE	75151.155	26305.389	3747974	2613786.175	6463216.719
ACROLEIN	19719.4808	245220.9197	451628	103720.5335	820288.9339
ACRYLAMIDE	0	0	0	0	0
ACRYLONITRIL	10084.894	21955.4099	0	0	32040.3039
ANTHRACENE	554.01	0	0	26.94305597	580.953056
ANTIMONY	29897.792	0	0	0	29897.792
ARSENIC	19214.5162	0	6	0	19220.5162
ATRIZINE	0	120278.0078	0	0	120278.0078
BENZ (A) ANTHR	80	399.12698	0	375.3075282	854.4345082
BENZ (GHI) PE	0	0	0	737.3897687	737.3897687
BENZENE	305041.189	3840934.855	22637178	4925492.008	31708646.05
BENZO (A) PYRE	30.6099	94.93689	0	221.2692071	346.8159971
BENZO (B) FLUO	8.76	0	0	192.1779579	200.9379579
BENZO (K) FLUO	0	0	0	206.383992	206.383992
BERYLLIUM	20.7007	0	0	0	20.7007
BUTADIENE,13	28492.6654	7603027.804	2905018	747936.0344	11284474.5
CADMIUM	6015.459	0	0	0	6015.459
CARBON TETRA	15167.9849	12459.578	0	0	27627.5629
CHLOROFORM	11157.3169	70805.409	0	0	81962.7259
CHROMIUM	19067.1257	0	390	1747.247331	21204.37303
CHROMIUM VI	0	7779.918	0	0	7779.918
CHRYSENE	17.5	399.1349	0	283.1549307	699.7898307
COBALT	41356.345	0	0	0	41356.345
COKE OVEN GAS	0	0	0	0	0
COPPER	36058.989	0	1785	123.915	37967.904
DIBENZAHAN	9	0	0	0	9
DIBROMOET,12	411.1007	484.3617	0	0	895.4624
DIBUTYL PHTH	27949.4458	1450014.416	0	0	1477963.861
DICHLOROETH12	20138.262	7562.27589	0	0	27700.53789
DIEYLHEX PHT	3928.29	0	0	0	3928.29
ETHYLBENZENE	144914.134	2000421.541	9001763	2392153.532	13539252.21
ETHYLENE OXI	5517.238	391867.6279	0	0	397384.8659
FLUORANTHENE	1473.47	433.25589	0	240854.0006	242760.7265
FLUORENE	0	0	0	0	0
FORMALDEHYDE	998719.363	223553.5269	9856663	4798532.386	15877468.28
GLYCOL ETHRS	132	0	0	0	132
HEXCLBENZENE	0	0	0	0	0
INDN(123CDPY	0	0.06	0	999247.7163	999247.7763
LEAD	62330.561	10.291763	19569	199.3137368	82109.1665
MANGANESE	14788.724	196.3604	717	1563.256422	17265.34082
MERCURY	2144.879	465.86638	370	706.807746	3687.553126
METHENE(B)4-	62693.6911	0	0	0	62693.6911
METHYLENE CL	1614878.78	6697310.366	0	0	8312189.146
NAPHTHALENE	27124.48159	2846096.348	1398991	958.8370202	4273170.667
NICKEL	40612.5098	0	488	9702.099772	50802.60957
PCDD	0	0	0	0	0
PCDF	0	0	0	0	0
PERC	123175.627	14999809	0	0	15122984.63
PHENANTHRENE	2892.91	0	0	105.6650591	2998.575059
PHENOL	178750.731	0	0	5396.296	184147.027
PHOSGENE	456.11	0	0	0	456.11
PYRENE	2146	0	0	160.5227664	2306.522766
STYRENE	140405.43	223341.117	3149613	145092.9546	3658452.502
TCDD,2378	13.0988	0	0	0	13.0988
TCDF,2378	0	0	0	0	0
TCE,111	31599.437	34600367.99	0	0	34631967.43
TOLUENE	2944453.47	32101180.03	62876189	10357646.38	108279468.9
TOLUENE24DII	357.76	4410.8738	0	0	4768.6338
TRICHLORETHY	335139.14	26320094.06	0	0	26655233.2
TRIFLURALIN	184.9	12756.328	0	0	12941.228
VINYL CHLOR	16945.355	250342.088	0	0	267287.443
XYLENES ISO	794149.404	23504702.39	35496981	9967785.253	69763618.05