

Air



NORTHEAST CORRIDOR REGIONAL MODELING PROJECT ANNUAL EMISSION INVENTORY COMPILATION AND FORMATTING

**Volume XV:
Washington, DC
Emission Inventory**

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MODELING PROJECT
ANNUAL EMISSION INVENTORY
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**Volume XV:
Washington, DC Emission Inventory**

by
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SECTION 1

INTRODUCTION

BACKGROUND

On a nationwide basis, nonattainment of the National Ambient Air Quality Standard (NAAQS) for ozone is one of the most serious and widespread air pollution problems facing the air quality management community. The Northeast Corridor, a megalopolis of urban and suburban areas extending from Washington, D.C. to Boston, bears a large extent of the ozone problem. The United States Environmental Protection Agency (USEPA), in cooperation with the northeastern states, local agencies and Metropolitan Planning Organizations (MPOs), has undertaken the Northeast Corridor Regional Modeling Project (NECRMP) to develop regional and urban ozone control strategies through the use of photochemical air quality simulation models.

To employ a regional model, an inventory of point and area source emissions covering the entire NECRMP study area had to be assembled and placed into a common format. Unfortunately, existing data bases were inadequate to either properly test or validate a regional model. To this end, USEPA's Office of Air Quality Planning and Standards retained GCA/Technology Division to complete an annual inventory for use in NECRMP. The study area, shown in Figure 1, includes the entire northeast quadrant of the United States from longitude 69 degrees to 84 degrees West and latitude 38 degrees to 45 degrees North.

OBJECTIVES

The objective of the effort reported in this volume was to assemble the most current, comprehensive and accurate emission inventory possible for the District of Columbia. This was achieved through the cooperation of the Metropolitan Washington Council of Governments (WASHCOG). The intent of the program was to avoid direct contact between GCA and individual facilities in Metropolitan Washington. Rather, GCA worked directly with WASHCOG, who in turn contacted individual sources when necessary. GCA reviewed the agency supplied data and submitted a list of potential errors to the WASHCOG contact, who was responsible for confirming the data or supplying corrections, as necessary. The major pollutants of interest were VOC and NO_x, although TSP, SO_x, and CO emissions were also compiled for point sources. Because of this emphasis, quality assurance checks focused primarily on sources of VOC and NO_x.

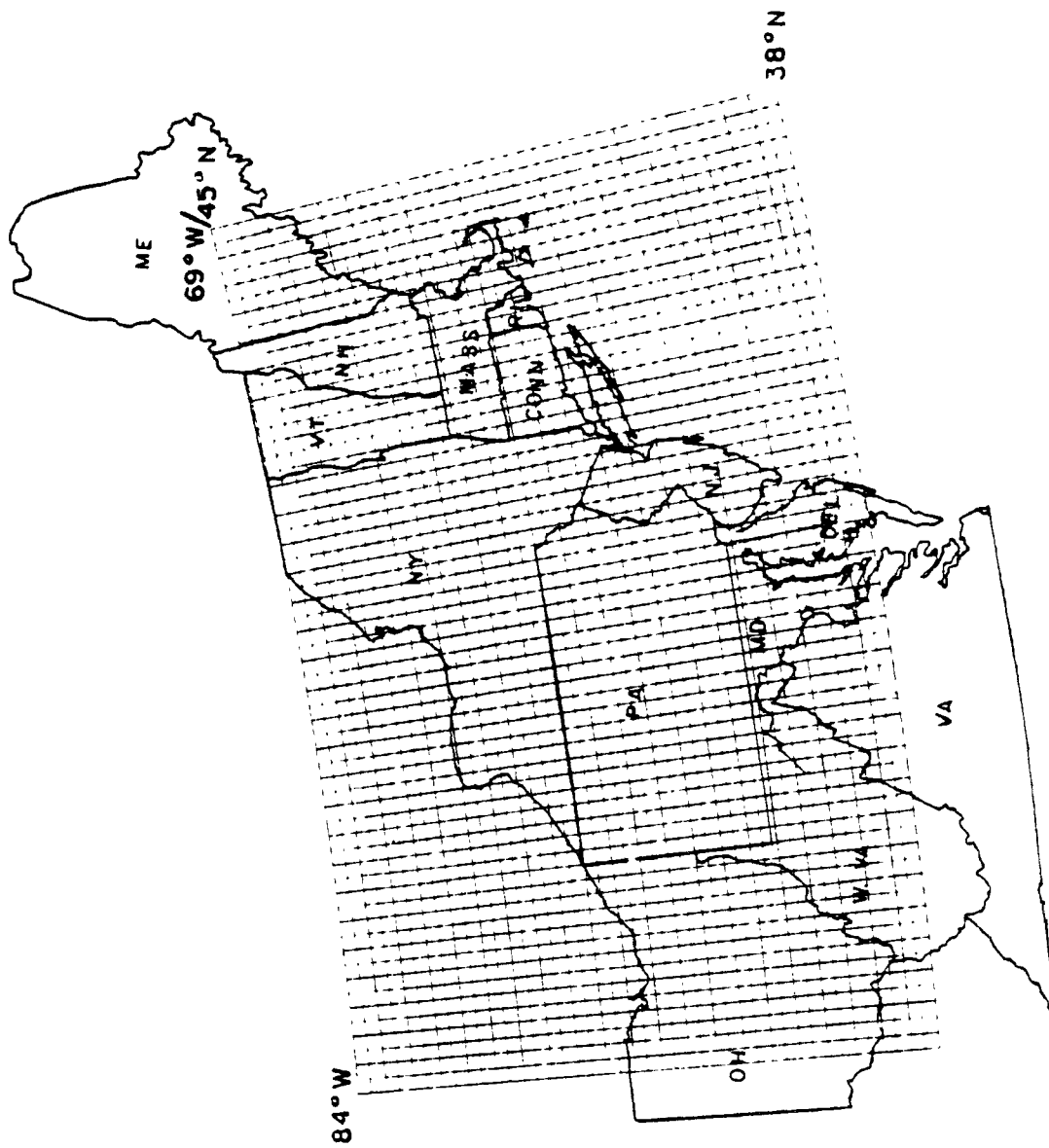


Figure 1. Boundaries of regional model grid system.

The completed inventories were computerized for further use in the NECRMP study. Point source data were computerized in the format specified in the Emission Inventory System/Point Source (EIS/PS) User's Guide¹ and area source data were coded into EIS/AS² format.

REPORT ORGANIZATION

The results of the NECRMP annual emission inventory are reported in an 18 volume set of documents. Volume I in this series describes the background of the program and discusses the methods used to compile and verify the annual emission inventory. Volumes II through XVI present a more detailed discussion of each state's inventory effort. Volume XVII describes the spatial, temporal, and species allocation factors developed to allow for the creation of modeler's tapes from the completed inventory. Volume XVIII presents a summary of the point and area source inventories for the entire study area. Also included in Volume XVIII is a detailed analysis of the overall quality of the data base and an assessment of the data's suitability for use in photochemical modeling. A directory of the NECRMP annual emission inventory reports is presented in Table 1.

This volume, which presents a discussion of the annual emission inventory for the District of Columbia, consists of five sections. Section 2 describes the project history and includes a summary of the major events that relate to the District of Columbia inventory development. Section 3 discusses in greater detail the point source inventory task, while the area source inventory development is covered in Section 4. All references cited in this volume are identified in Section 5. A computer routine used to fix two "generic" problems with the District of Columbia point source data is presented in Appendix A.

TABLE 1. DIRECTORY OF THE NECRMP ANNUAL REGIONAL
EMISSION INVENTORY REPORTS

Volume	Contents
I	Project Approach
II	Connecticut Emission Inventory
III	Delaware Emission Inventory
IV	Maine Emission Inventory
V	Maryland Emission Inventory
VI	Massachusetts Emission Inventory
VII	New Hampshire Emission Inventory
VIII	New Jersey Emission Inventory
IX	New York Emission Inventory
X	Ohio Emission Inventory
XI	Pennsylvania Emission Inventory
XII	Rhode Island Emission Inventory
XIII	Vermont Emission Inventory
XIV	Virginia Emission Inventory
XV	Washington, D.C. Emission Inventory
XVI	West Virginia Emission Inventory
XVII	Development of Allocation Factors
XVIII	Inventory Review and Evaluation

SECTION 2

PROJECT HISTORY

AGENCY CONTACTS

The EPA Project Officer provided agency contacts in the Metropolitan Washington Council of Governments (WASHCOG) and the Environmental Protection Agency, Region III (EPA/Region III). Since WASHCOG was developing the emission inventory to be used in support of the Washington, D.C. 1982 ozone State Implementation Plan they were designated as the primary contact. However, the Washington, D.C. Department of Environmental Services, Bureau of Air and Water Quality also participated in NECRMP by supplying input directly to WASHCOG. The WASHCOG contact had primary responsibility for confirming data, supplying required corrections or additional data, interfacing with individual sources as necessary, and concurring on the comprehensiveness and accuracy of the final data base. The WASHCOG contact was Ms. Kathy Bailey, (202) 223-6800.

SUMMARY OF EVENTS

Summaries of major milestones pertaining to the District of Columbia portion of the NECRMP annual emission inventory are provided separately for the point source and area source data, as follows.

Point Sources

Work on the District of Columbia point source inventory occurred primarily between October 1981 and January 1982. The finalized point source inventory was forwarded to EPA on May 4, 1982. Major milestones are identified below:

- Computer tape sent to WASHCOG for point source inventory 08/07/81
- GCA received (1980) EIS/P&R inventory data 10/15/81
- QA audit completed, lists of questions/problems sent to Project Officer, agency contacts 11/17/81
- Telephone contacts with WASHCOG staff 12/01/81
01/25/82
01/28/82

- Corrections performed by GCA 02/05/82
- Completed EIS/PS Master File (1980) forwarded to EPA 05/04/82

Area Sources

Work on the Washington, D.C. area source inventory occurred between December 1981 and July 1982. The completed area source inventory was forwarded to EPA on August 6, 1982.

- WASHCOG sent 1980 area source inventory 12/02/81
- GCA requested additional data 01/25/82
01/28/82
- EPA/Region III forwarded EIS/AS tapes 04/13/82
- GCA received additional documentation on area source inventory 06/15/82
- Completed EIS/AS master file forwarded to EPA 08/06/82

SECTION 3
POINT SOURCE INVENTORY

DATA PROCUREMENT

A computer tape was forwarded to the Metropolitan Washington Council of Governments for a copy of their latest point source inventory on August 7, 1981. The inventory, reflecting 1980 data in EIS/P&R format, was received on October 15, 1981. The tape contained data on 207 emission points at 102 facilities in the District of Columbia. It also contained data on 133 emission points at 26 facilities in Maryland and 140 emission points at 24 facilities in Virginia. GCA had already received data on the Virginia and Maryland facilities from the Virginia State Air Pollution Control Board and the Maryland Bureau of Air Quality and Noise Control, respectively. Since work on the Virginia data had already been completed and work on the Maryland data was nearing completion, GCA concentrated primarily on the data covering the District of Columbia, opting to utilize the Virginia and Maryland state supplied data for the Virginia and Maryland counties.

DATA REVIEW AND UPDATE

The District of Columbia EIS/P&R file was first translated into NEDS format to enable use of the QA checks contained in the GCA-modified version of the NEDS-to-EIS/PS Conversion Editor,¹ described previously in Volume I.³ GCA encountered two "generic" problems with the District of Columbia data that had to be addressed prior to completion of the QA review. Several VOC estimation method fields were found to be blank, and alphabetic characters appeared in certain VOC allowable emissions fields. These problems were discussed with the WASHCOG contact,⁴ and in accordance with the instructions given, the blank estimation methods were replaced with 3's (computer calculates emissions using emission factors in the NEDS SCC listing) and the alphabetic allowable emissions fields were replaced with blanks. These corrections were performed using the computer routine presented in Appendix A.

The next QA measure entailed cross-checking sources listed in the Directory of Volatile Organic Compound (VOC) Sources Covered by Reasonably Available Control Technology Requirements⁵ against those sources listed in the District of Columbia inventory to identify possible omissions. Only two sources, both industrial perchloroethylene drycleaners, were identified as potential omissions. These sources, listed in Table 2, are believed to be relatively small emitters of VOC.

TABLE 2. SOURCES LISTED IN THE RACT DIRECTORY,⁵ BUT NOT IN THE DISTRICT OF COLUMBIA INVENTORY

RACT category	Facility name	Location
Industrial Perchloroethylene Drycleaners	Rhode Island Cleaners Solon Automated Services	Wisconsin Avenue, N.W. L Street, S.E.

A manual review of all sources emitting more than 100 tons/year of VOC or NO_x or 500 tons/year of any criteria pollutant was undertaken. Additionally, all "error," "conditional", or "warning" messages resulting from the conversion of data into EIS/PS format were examined. The majority of the problems detected entailed missing maximum design rates and dropped trailing zeros in the UTM and control equipment fields. These and other minor problems were documented and forwarded to the Washington Council of Governments on November 17, 1981.

After awaiting a response from the agency for several months, GCA corrected the obvious errors (dropped zeros) and determined that the remaining problems were not sufficiently serious to warrant further delay. These were primarily missing maximum design rates and in a few cases, seasonal throughput percents. The former fields do not affect emissions and the latter will be overridden with the temporal allocation factors developed for NECRMP.⁶

RESULTS

For reporting purposes, point source emissions for the District of Columbia were aggregated into 70 categories based on specific SCC-SIC combinations. A complete description of the codes used to aggregate emissions is presented in Volume I.³ For points with multiple SCCs, no attempt was made to split emissions into more than one category. In these instances, the primary SCC was used to account for all emissions at that point. Table 3 presents 1980 point source emissions, by category, for the District of Columbia.

A list of "major" facilities was developed by totalling emissions at each facility using a criteria of 100 tons/year of VOC or NO_x to define a major source. These facilities, and their reported 1980 emissions for all five criteria pollutants, are presented in Table 4.

The completed District of Columbia point source inventory was written onto computer tape for delivery to EPA. Included on the tape, which was forwarded on May 4, 1982, were the following files:

- EIS/PS Master File (1980)
- "New" NEDS (converted from 1980 EIS/PS Master File)

Further evaluation of this inventory and improvements made can be found in Volume XVIII.

TABLE 3. POINT SOURCE EMISSIONS (1980) BY CATEGORY FOR THE DISTRICT OF COLUMBIA

COUNTY: 0020

CATEGORY	POINT COUNT	----- TSP	PRIMARY SO2	SCC EMISSIONS NOX	(TONS/YEAR) HC	----- CO
1 OIL AND GAS PRODUCTION & PROCESSING	0	0	0	0	0	0
2 SYN. ORGANIC CHEM. STORAGE & TRANSFER	0	0	0	0	0	0
3 GASOLINE AND CRUDE OIL STORAGE	0	0	0	0	0	0
4 SHIP AND BARGE TRANSFER OF VOC	0	0	0	0	0	0
5 BARGE AND TANKER CLEANING	0	0	0	0	0	0
6 BULK GASOLINE TERMINALS	0	0	0	0	0	0
7 GASOLINE BULK PLANTS	0	0	0	0	0	0
8 TANK TRUCK LOADING	2	0	0	0	21	0
9 SERVICE STATION LOADING (STAGE I)	0	0	0	0	0	0
10 SERVICE STATION UNLOADING (STAGE II)	0	0	0	0	0	0
11 OTHERS-(STORAGE, TRANSP., MKT OF VOC)	0	0	0	0	0	0
12 LUBE OIL MANUFACTURE	0	0	0	0	0	0
13 PETROLEUM REFINERIES	2	1	3	2	0	0
14 PHARMACEUTICAL MANUFACTURE	0	0	0	0	0	0
15 TEXTILE POLYMERS & RESIN MANUFACTURE	0	0	0	0	0	0
16 SYNTHETIC FIBER MANUFACTURE	0	0	0	0	0	0
17 ORGANIC CHEMICAL MANUFACTURE	0	0	0	0	0	0
18 INORGANIC CHEMICAL MANUFACTURE	0	0	0	0	0	0
19 FERMENTATION PROCESSES	0	0	0	0	0	0
20 VEGETABLE OIL PROCESSING	0	0	0	0	0	0
21 PLASTIC PRODUCTS MANUFACTURE	0	0	0	0	0	0
22 RUBBER TIRE MANUFACTURE	0	0	0	0	0	0
23 SPR RUBBER MANUFACTURE	0	0	0	0	0	0
24 OTHER CHEMICAL MANUFACTURE	0	0	0	0	0	0
25 IRON AND STEEL MANUFACTURE	0	0	0	0	0	0
26 GLASS PRODUCTS	0	0	0	0	0	0
27 FOLD PRODUCTS	3	1	0	0	0	0
28 TEXTILE MILL PRODUCTS	0	0	0	0	0	0
29 LUMBER AND WOOD PRODUCTS	0	0	0	0	0	0
30 PAPER AND ALLIED PRODUCTS	0	0	0	0	0	0
31 STONE, CLAY, GLASS, CONCRETE	1	19	0	0	0	0
32 PRIMARY & SECONDARY METALS & ELECTRICAL	0	0	0	0	0	0
33 FERTILIZED METAL PRODUCTS	0	0	0	0	0	0
34 IN-PROCESS FUEL USE	0	0	0	0	0	0
35 OTHERS - (INDUSTRIAL PROCESSES)	0	0	0	0	0	0
36 ADHESIVES	0	0	0	0	0	0
37 IND. SFC. COATING-LARGE APPLIANCES	0	0	0	0	0	0
38 IND. SFC. COATING-MAGNET WIRE	0	0	0	0	0	0
39 IND. SFC. COATING-AUTOMOBILE	0	0	0	0	0	0
40 IND. SFC. COATING-CANS	0	0	0	0	0	0
41 IND. SFC. COATING-METAL COILS	0	0	0	0	0	0
42 IND. SFC. COATING-PAPER	0	0	0	0	0	0
43 IND. SFC. COATING-FABRIC	0	0	0	0	0	0
44 IND. SFC. COATING-MISC. FURNITURE	0	0	0	0	0	0
45 IND. SFC. COATING-METAL/WOOD PRODUCTS	0	0	0	0	0	0
46 PLASTIC PARTS PAINTING	0	0	0	0	0	0
47 LARGE SHIPS	0	0	0	0	0	0
48 LARGE AIRCRAFT	0	0	0	0	0	0
49 IND. SFC. COATING-MISC. METAL PRODUCTS	0	0	0	0	0	0
50 OTHERS - (INDUSTRIAL SURFACE COATING)	0	0	0	0	0	0

TABLE 3 (continued)

CATEGORY	POINT COUNT	----- TSP	PRIMARY SO2	EMISSIONS NOX	(TUNS/YEAR) HC	----- CO
51 OIL GREASING	0	0	0	0	0	0
52 DRY CLEANING	3	0	0	0	222	0
53 GRAPHIC ARTS	15	0	0	0	1445	0
54 OTHER - (SOLVENT USE)	0	0	0	0	0	0
55 ARCHITECTURAL COATINGS	0	0	0	0	0	0
56 AUTO REFINISHING	0	0	0	0	0	0
57 OTHERS-(NON-INDUSTRIAL SURFACE COATING)	0	0	0	0	0	0
58 EXT. COMB. BOILERS-ELEC. GENERATION	11	291	6073	3476	46	234
59 EXT. COMB. BOILERS-INDUSTRIAL	20	51	436	237	7	21
60 EXT. COMB. BOILERS-COMM/INST	129	927	4285	2160	32	192
61 EXT. COMB. SPACE HEATERS-INDUST.	0	0	0	0	0	0
62 EXT. COMB. SPACE HEATERS-COMM.	0	0	0	0	0	0
63 OTHERS-(FULL COMBUSTION)	0	0	0	0	0	0
64 SOLID WASTE DISPOSAL-GOVT.	3	96	272	328	164	3818
65 SOLID WASTE DISPOSAL-COMM/INST	2	0	0	0	0	0
66 SOLID WASTE DISPOSAL-INDUSTRIAL	1	0	0	0	0	0
67 OTHER SOLID WASTE DISPOSAL	0	0	0	0	0	0
68 WASTE SOLVENT RECOVERY PROCESSES	0	0	0	0	0	0
69 STATIGUARY INTERNAL COMBUSTION ENGINES	6	10	13	142	15	30
70 NOT CLASSIFIED	2	0	0	0	0	0
COUNTY TOTALS		1398	11082	6345	1952	4295

TABLE 4. DISTRICT OF COLUMBIA POINT SOURCES EMITTING MORE THAN
100 TONS/YEAR OF VOC OR NO_x

NECRMP 1980 ANNUAL EMISSION INVENTORY LARGE FACILITIES SELECTED FOR WASHINGTON, D.C										PAGE 1	
STATE	COUNTY	AQCR	PLANT	FACILITY	TSP (*****)	S02 (*****)	NOX (100)	HC (100)	CO (*****)		
9	20	47	0001	PEPCO BENNING 3400 BENNING RD NE 20019	267	4730	3025	38	190		
9	20	47	0006	CAPITOL POWER PLANT	62	640	249	9	26		
9	20	47	0009	ST ELIZABETHS HOSP SE WASH DC 20032	28	297	141	3	12		
9	20	47	0022	HOWARD UNIV WASHINGTON DC 20059	34	454	171	3	14		
9	20	47	0024	GSA WEST HTG PLANT 1051 29TH STREET NW	658	731	639	7	25		
9	20	47	0032	WALTER REED AMC 6825 16TH ST NW 20012	32	416	158	2	14		
9	20	47	0033	NAVAL RESEARCH LAB WASH DC 20375	21	350	135	2	11		
9	20	47	0040	PEPCO BUZZARD POINT 1ST AND V STS SW	34	1356	585	19	74		
9	20	47	0047	SOLID WASTE RED CTR HR 1 BENNING RD NE	98	272	328	164	3818		
9	20	47	0045	STERLING LAUNDRY 5907 BLAIR RD NW 20011	0	0	1	159	3		
9	20	47	0088	WASHINGTON POST 1150 15TH ST NW 20071	1	13	6	987	0		
9	20	47	0089	WASHINGTON STAR 225 VA AVE SE 20061	1	15	6	277	0		
TOTALS					1236	9274	5444	1670	4184		

SECTION 4

AREA SOURCE INVENTORY DEVELOPMENT

OBJECTIVES

The area source emission inventory task entailed reviewing area source inventories prepared by the states for technical accuracy and consistency with EPA-prescribed procedures and developing these area source inventories where state-developed inventories were unavailable. The major objective of this effort was to ensure that all emissions of VOC and NO_x were accounted for and that the procedures used to develop the inventories were consistent from state to state. It was also important that the inventories be disaggregated into sufficient categories to allow for application of temporal and pollutant allocation factors and the evaluation of control scenarios in subsequent modeling efforts.

DATA PROCUREMENT AND REVIEW

The Washington, D.C. Council of Governments (WASHCOG) provided 1980 area source data on December 2, 1981. The data provided included emission summaries for the District of Columbia, five surrounding Virginia counties and two Maryland counties. Area source emissions for the Virginia counties had already been inventoried by the Virginia State Air Pollution Control Board, and therefore are not addressed in this volume. However, although the Maryland Bureau of Air Quality and Noise Control provided point source data for the entire State, the Maryland area source inventory did not address the Washington area counties of Montgomery and Prince George's. Therefore, the District of Columbia area source inventory reported herein contains data on those two Maryland counties.

The area source data were reviewed for comprehensiveness and consistency with the prescribed procedures. The most notable deficiency was the lack of process or activity data and emission factors. GCA requested this information during subsequent telephone discussions with the WASHCOG staff^{7,8}.

During April, 1982, GCA received a computerized inventory in EIS/AS format, through EPA/Region III. Although in EIS/AS format, the inventory had been compiled so differently from the other NECRMP inventories that it was of marginal utility. On June 15, 1982, GCA received more detailed documentation of the WASHCOG inventory⁹ which provided sufficient information to enable GCA to complete the District of Columbia area source inventory. For many categories, only emission factors and emission levels were provided. In these instances, GCA back calculated process rates from the WASHCOG supplied data.

Some deviations from EPA prescribed procedures and emission factors were noted, and are discussed below. Also discussed below are instances where the lack of comprehensive data dictated that GCA employ certain assumptions to derive missing process rates and/or emission factors.

Per Capita Factors

The Metropolitan Washington Council of Governments employed per capita emission factors which deviated from the factors prescribed by EPA,¹⁰ and/or recommended by GCA.³ Since three deviations from the EPA procedures had been identified and justified in the inventory documentation, they were maintained in the NECRMP Inventory.⁹

The implications of these deviations, identified below, are discussed in greater detail in Volume XVIII.¹¹

Degreasing--

WASHCOG's area source inventory accounts for VOC emissions from cold metal degreasing only, and presumes all open top vapor and conveyORIZED degreasing emissions have been accounted for in the point source inventory.

Architectural Surface Coating--

The WASHCOG inventory documentation⁹ indicates that the EPA-prescribed¹⁰ VOC emission factor of 4.6 lb/capita was felt to overstate emissions in the Metropolitan Washington area. Based on data derived from the National Paint and Coating Association's 1979 Data Bank Program, a factor of 1.76 lb/capita was determined to be a more accurate estimate of VOC emissions from architectural surface coating in the District of Columbia area.

Graphic Arts--

The WASHCOG inventory employed a 0.4 lb/capita factor to account for VOC emissions from graphic arts establishments.⁹ While the EPA prescribed value is 0.8 lb VOC/capita, WASHCOG indicated that the lower value was employed as a result of an extensive survey of local graphic arts facilities.

Autobody Refinishing--

WASHCOG discarded both the EPA per-capita and per employee factors as resulting in unrealistically high emission estimates. WASHCOG conducted a survey of 24 autopaainting businesses to determine average numbers of full and partial paint jobs performed on a typical summer day by a single shop. WASHCOG derived a VOC emission estimate using the above derived average shop workload; a 6 lb VOC/total paint job emission factor; a 3 lb VOC/partial paint job factor; and the total number of shops listed in the yellow pages.

Small Industrial Surface Coating

The WASHCOG inventory documentation did not discuss small industrial surface coating. VOC emissions from this area source category were presumed to be considered insignificant by the WASHCOG staff.

Cutback Asphalt

Application of cutback asphalt is regionally prohibited during the summer ozone season. Therefore, emissions were assumed to be zero.

On-Highway Vehicles

The WASHCOG inventory documentation provided on-highway vehicle emissions estimates, but neither emission factors nor VMT. To complete the EIS/AS required data, GCA utilized average emission factors from Virginia¹² and back calculated VMT.

Industrial Fuel Use

While the WASHCOG inventory presents VOC and NO_x emission estimates from fuel use in the residential and commercial/institutional sectors, no estimates were provided for the industrial sector. Industrial fuel use is presumed to have been considered adequately covered by the point source inventory.

Residual and Distillate Oil-Powered Vessels

According to the WASHCOG inventory documentation,⁹ the D.C. Harbor Police reported commercial vessel traffic in the region to be insignificant. Emissions in these categories were assumed to be zero.

DEVELOPMENT OF THE EIS/AS MASTER FILE

After emissions were verified for all area source categories for the District of Columbia and the Maryland counties of Montgomery and Prince George's, the inventory was coded into EIS/AS format and subjected to the series of computerized QA checks included in the EIS/AS System.² The completed Master File was then manually verified for accuracy before the finalized data were written onto computer tape for delivery to EPA.

Table 5 presents a list of the area source categories included in the District of Columbia and related Maryland counties' area source files. Also identified is the type of VOC represented by the emission factor (total or reactive).

RESULTS

Emissions of VOC and NO_x (1980) from area sources in the District of Columbia and the Maryland counties of Montgomery and Prince George's, are presented in Tables 6 through 8, respectively.

TABLE 5. AREA SOURCE CATEGORIES INVENTORIED
FOR THE DISTRICT OF COLUMBIA*

EIS/AS Category No.	Category Description	Pollutants inventoried
001	Stage I Gasoline Evaporation	TVOC
002	Stage II Gasoline Evaporation	TVOC
003	Storage Tank Breathing	TVOC
004	Gasoline Loading/Transit	TVOC
005	Small Industrial/Commercial Degreasing	RVOC
006	Dry Cleaning	RVOC
007	Architectual Surface Coating	RVOC
008	Auto Body Refinishing	RVOC
009	Small Industrial Surface Coating	TVOC
010	Graphic Arts	RVOC
011	Commercial/Consumer Solvent Use	RVOC
012	Cutback Asphalt	RVOC
013	Pesticides	RVOC
014	On-Highway Light Duty Vehicles	RVOC NO _x
015	On-Highway Light Duty Trucks--Class I	RVOC NO _x
016	On-Highway Light Duty Trucks--Class II	RVOC NO _x
017	On-Highway Heavy Duty Gas Trucks	RVOC NO _x
018	On-Highway Heavy Duty Diesel Trucks	RVOC NO _x
019	On-Highway Motorcycles	RVOC NO _x
020	Residential Anthracite Coal	TVOC NO _x
021	Residential Bituminous Coal	TVOC NO _x
022	Residential Residual Oil	TVOC NO _x
023	Residential Distillate Oil	TVOC NO _x
024	Residential Natural Gas	TVOC NO _x
025	Residential LPG	TVOC NO _x
026	Residential Wood	RVOC NO _x
027	Commercial/Institutional Anthracite	TVOC NO _x
028	Commercial/Institutional Bituminous	TVOC NO _x
029	Commercial/Institutional Residual Oil	TVOC NO _x
030	Commercial/Institutional Distillate Oil	TVOC NO _x
031	Commercial/Institutional Natural Gas	TVOC NO _x
032	Commercial/Institutional LPG	TVOC NO _x
033	Commercial/Institutional Wood/other	TVOC NO _x

(continued)

TABLE 5 (continued)

EIS/AS Category No.	Category Description	Pollutants inventoried
034	Industrial Anthracite	TVOC NO _x
035	Industrial Bituminous	TVOC NO _x
036	Industrial Residual Oil	TVOC NO _x
037	Industrial Distillate Oil	TVOC NO _x
038	Industrial Natural Gas	TVOC NO _x
039	Industrial LPG	TVOC NO _x
040	Industrial Wood/other	TVOC NO _x
041	Military Aircraft	TVOC NO _x
042	Civil Aircraft	TVOC NO _x
043	Commercial Aircraft	TVOC NO _x
044	Railroad Locomotives	TVOC NO _x
045	Gasoline Powered Vessels	TVOC NO _x
046	Distillate Oil Powered Vessels	TVOC NO _x
047	Residual Oil Powered Vessels	TVOC NO _x
048	Off Highway Vehicles--Gas	TVOC NO _x
049	Off Highway Vehicles--Diesel	TVOC NO _x
050	Onsite Incineration	TVOC NO _x
051	Open Burning	TVOC NO _x
052	Structural Fires	TVOC NO _x
053	Field/Slash Burning	TVOC NO _x
054	Forest fires	TVOC NO _x

*Includes the Maryland counties of Montgomery and Prince George's.

TABLE 6. ANNUAL EMISSIONS (1980) OF VOC AND NO_x FROM AREA SOURCES IN THE DISTRICT OF COLUMBIA.

COUNTY:0020

CATEGORY NUMBER	CATEGORY DESCRIPTION	PROCESS RATE	UNITS	POLLUTANT I.D.	EMISSION FACTOR	EMISSIONS ESTIMATE
001	STAGE I GASOLINE EVAP	000174256	THOUS GAL	THC	0.30	0000026
002	STAGE II GASOLINE EVAP	000174256	THOUS GAL	THC	9.70	0000845
003	STORAGE TANK BREATHING	000174256	THOUS GAL	THC	1.00	0000087
004	GASOLINE LOADING/TRANSIT	000168268	THOUS GAL	THC	6.87	0000578
005	SM IND/COMM DEGREASING	000637651	POPULATION	NHC	3.00	0000956
006	DRY CLEANING	000537651	POPULATION	NHC	1.50	0000478
007	ARCH SURFACE COATING	000637651	POPULATION	NHC	1.76	0000561
008	AUTO BODY REFINISHING	000000262	TON	NHC	2,000.00	0000262
009	SM IND SURFACE COATING	000000000	TON	THC	1,175.00	0000000
010	GRAPHIC ARTS	000637651	POPULATION	NHC	0.40	0000128
011	COMM/CONS SOLVENT USE	000637651	POPULATION	NHC	6.30	0002009
012	CUTBACK ASPHALT	000000000	TON	NHC	0.00	0000000
013	PESTICIDES	000000000	ACRE	NHC	3.50	0000000
014	ON-HIGHWAY LDV	002297636	THOUS VMT	NOX NHC	7.09 11.00, 0012637	0008145 0000312
015	JN-HIGHWAY LDT1	000142500	THOUS VMT	NOX NHC	8.03 12.80	0000572 0000312
016	ON-HIGHWAY LDT2	000040533	THOUS VMT	NOX NHC	9.42 15.00	0000191 0000304

TABLE 6. (continued)

COUNTY:0020		CATEGORY		PROCESS		POLLUTANT		EMISSION		EMISSIONS	
NUMBER		DESCRIPTION		RATE		UNITS		FACTOR		ESTIMATE	
017		ON-HIGHWAY HDG		000099200		THOUS WMT					
018	ON HIGHWAY HDG			000064354	THOUS WMT			NOX	30.00	0001488	
019	ON-HIGHWAY HC			000006000	THOUS WMT			NOX	20.50	0000660	
020	RESIDENTIAL ANTHRACITE			000075333	TON			NOX	0.00	0000000	
021	RESIDENTIAL BITUMINOUS			000000000	TON			NOX	3.00	0000119	
022	RESIDENTIAL RESIDUAL OIL			000000000	THOUS GAL			NOX	6.00	0000000	
023	RESIDENTIAL DISTILLATE			000098222	THOUS GAL			NOX	18.00	0000884	
024	RESIDENTIAL NATURAL GAS			000022350	MIL CU FT			NOX	86.00	0000902	
025	RESIDENTIAL LP,			000000000	THOUS GAL			NOX	7.50	0000000	
026	RESIDENTIAL WOOD			000000000	TON			NOX	1.00	0000000	
027	COMM/INST ANTHRACITE			000000000	TON			NOX	10.00	0000000	
028	COMM/INST BITUMINOUS			000000000	TON			NOX	6.00	0000000	
029	COMM/INST RESIDUAL OIL			000002933	THOUS GAL			NOX	60.00	0000088	

TABLE 6. (continued)

COUNTY:0020

CATEGORY NUMBER	CATEGORY DESCRIPTION	PROCESS RATE	UNITS	POLLUTANT I.D.	EMISSION FACTOR	EMISSIONS ESTIMATE
030	COMM/INST DISTILLATE OIL	000030000	THOUS GAL	NOX THC	22.00 1.00	0000330 0000015
031	COMM/INST NATURAL GAS	000007293	MIL CU FT	NOX THC	120.00 3.00	0000437 0000011
032	COMM/INST LPG	000000000	THOUS GAL	NOX THC	120.00 8.00	0000000 0000000
033	COMM/INST #000	000000000	TON	NOX THC	10.00 36.00	0000000 0000000
034	INDUSTRIAL ANTHRACITE	000000000	TON	NOX THC	18.00 0.00	0000000 0000000
035	INDUSTRIAL BITUMINOUS	000000000	TON	NOX THC	15.00 1.00	0000000 0000000
036	INDUSTRIAL RESIDUAL OIL	000000000	THOUS GAL	NOX THC	60.00 1.00	0000000 0000000
037	INDUSTRIAL DISTILLATE OIL	000000000	THOUS GAL	NOX THC	22.00 1.00	0000000 0000000
038	INDUSTRIAL NATURAL GAS	000000000	MIL CU FT	NOX THC	175.00 3.00	0000000 0000000
039	INDUSTRIAL LPG	000000000	THOUS GAL	NOX THC	11.65 0.30	0000000 0000000
040	INDUSTRIAL #000	000000000	TON	NOX THC	10.00 36.00	0000000 0000000
041	MILITARY AIRCRAFT	000000819	LND/TAKE OFF	NOX THC	27.10 27.10	0000011 0000011
042	CIVIL AIRCRAFT	000000000	LND/TAKE OFF	NOX THC	0.00 0.00	0000000 0000000

TABLE 6 (continued)

COUNTY:0020										
CATEGORY	CATEGORY	PROCESS	POLLUTANT	EMISSION	EMISSIONS					
NUMBER	DESCRIPTION	RATE	I.D.	FACTOR	ESTIMATE					
043	COMMERCIAL AIRCRAFT	000019765 LND/TAKE OFF	NOX	50.19	0000496					
			THC	30.66	0000303					
044	RAILROAD LOCOMOTIVES	000001390 THOUS GAL	NOX	370.00	0000257					
			THC	94.00	0000065					
045	VESSELS-GASOLINE	000000242 THOUS GAL	NOX	157.00	0000019					
			THC	289.00	0000035					
046	VESSELS-DISTILLATE OIL	000000000 THOUS GAL	NOX	270.00	0000000					
			THC	50.00	0000000					
047	VESSELS-RESIDUAL OIL	000000000 THOUS GAL	NOX	63.60	0000000					
			THC	1.72	0000000					
048	OFF-HIGHWAY VEHICLES-GAS	000000994 TON	NOX	2,000.00	0000994					
			THC	364.18	0000181					
049	OFF-HIGHWAY VEH-DIESEL	000000000 TON	NOX	6.00	0000000					
			THC	0.00	0000000					
050	ON-SITE INCINERATION	000000000 TON	NOX	3.00	0000300					
			THC	3.00	0000000					
051	OPEN BURNING	000000057 TON	NOX	2,000.00	0000087					
			THC	1,333.30	0000058					
052	STRUCTURAL FIRES	000000000 TON	NOX	1.40	0000004					
			THC	11.00	0000033					
053	FILLD/SLASH BURNING	000000000 TON	NOX	4.00	0000000					
			THC	23.00	0000000					
054	FOREST FIRES	000000000 ACRE	NOX	43.21	0000000					
			THC	261.02	0000000					
999	COUNTY TOTALS		THC		0002487					
			NHC		0018822					
			NOX		0015684					

TABLE 7. ANNUAL EMISSIONS (1980) OF VOC AND NO_x FROM AREA SOURCES IN MONTGOMERY COUNTY, MARYLAND.

COUNTY:1160						
CATEGORY NUMBER	CATEGORY DESCRIPTION	PROCESS RATE	UNITS	POLLUTANT I.D.	EMISSION FACTOR	EMISSIONS ESTIMATE
001	STAGE I GASOLINE EVAP	000266278	THOUS GAL	THC	0.30	0000040
002	STAGE II GASOLINE EVAP	000266278	THOUS GAL	THC	9.70	0001291
003	STORAGE TANK BREATHING	000266278	THOUS GAL	THC	1.00	0000133
004	GASOLINE LOADING/TRANSIT	000266278	THOUS GAL	THC	6.87	0000915
005	SM IND/COMM DEGREASING	000579053	POPULATION	NHC	3.00	0000869
006	DRY CLEANING	000579053	POPULATION	NHC	1.50	0000434
007	ARCH SURFACE COATING	000579053	POPULATION	NHC	1.76	0000510
008	AUTO BODY REFINISHING	000000351	TON	NHC	2,000.00	0000351
009	SM IND SURFACE COATING	000000000	TON	THC	1,175.00	0000000
010	GRAPHIC ARTS	000579053	POPULATION	NHC	0.40	0000116
011	COMM/CONS SOLV-NT USE	000579053	POPULATION	NHC	6.30	0001824
012	CUTBACK ASPHALT	000000000	TON	NHC	0.00	0000000
013	PESTICIDES	000054251	ACRE	NHC	3.50	0000095
014	ON-HIGHWAY LUV	002168364	THOUS VMT	NOX NHC	8.56 11.00	0009366 0012036
015	ON-HIGHWAY LOT1	000112813	THOUS VMT	NOX NHC	11.54 12.80	0000651 0000722
016	ON-HIGHWAY LOT2	000032133	THOUS VMT	NOX NHC	13.50 15.00	0000217 0000241

TABLE 7. (continued)

CATEGORY		CATEGORY DESCRIPTION	PROCESS RATE	UNITS	POLLUTANT I.D.	EMISSION FACTOR	EMISSIONS ESTIMATE
NUMBER	DESCRIPTION						
017	ON-HIGHWAY HDG		00009933	THOUS VMT	NOX NHC	30.00 8.28	0001499 0000414
018	ON HIGHWAY HDG		000066909	THOUS VMT	NOX NHC	19.90 5.50	0000666 0000184
019	ON-HIGHWAY MC		000000000	THOUS VMT	NOX NHC	0.00 0.00	0000000 0000000
020	RESIDENTIAL ANTHRACITE		000190000	TON	NOX THC	3.00 2.50	0000297 0000248
021	RESIDENTIAL BITUMINOUS		000000000	TON	NOX THC	6.00 3.00	0000000 0000000
022	RESIDENTIAL RESIDUAL OIL		000000000	THOUS GAL	NOX THC	0.00 0.00	0000000 0000000
023	RESIDENTIAL DISTILLATE		000245556	THOUS GAL	NOX THC	18.00 1.00	0002210 0000123
024	RESIDENTIAL NATURAL GAS		000056375	MIL CU FT	NOX THC	80.00 8.00	0002255 0000226
025	RESIDENTIAL LPG		000000000	THOUS GAL	NOX THC	7.50 0.70	0000000 0000000
026	RESIDENTIAL WOOD		000000000	TON	NOX THC	1.00 5.00	0000000 0000000
027	COMM/INST ANTHRACITE		000000000	TON	NOX THC	10.00 6.00	0000000 0000000
028	COMM/INST BITUMINOUS		000000000	TON	NOX THC	6.00 3.00	0000000 0000000
029	COMM/INST RESIDUAL OIL		000007367	THOUS GAL	NOX THC	60.00 1.00	0000221 0000004

TABLE 7. (continued)

CATEGORY		CATEGORY	PROCESS	UNITS	POLLUTANT	EMISSION	EMISSIONS
NUMBER		DESCRIPTION	RATE		I.D.	FACTOR	ESTIMATE
030	COMM/INST	DISTILLATE OIL	000075036	THOUS GAL	NOX	22.00	0000826
					THC	1.00	0000038
031	COMM/INST	NATURAL GAS	000018183	MIL CU FT	NOX	120.00	0001091
					THC	3.00	0000027
032	COMM/INST	LPG	000000000	THOUS GAL	NOX	120.00	0000000
					THC	6.00	0000030
033	COMM/INST	WOOD	000000000	TON	NOX	10.00	0000000
					THC	36.00	0000000
034	INDUSTRIAL	ANTHRACITE	000000000	TON	NOX	16.00	0000000
					THC	0.00	0000000
035	INDUSTRIAL	BITUMINOUS	000000000	TON	NOX	15.00	0000000
					THC	1.00	0000000
036	INDUSTRIAL	RESIDUAL OIL	000000000	THOUS GAL	NOX	60.00	0000000
					THC	1.00	0000000
037	INDUSTRIAL	DISTILLATE OIL	000000000	THOUS GAL	NOX	22.00	0000000
					THC	1.00	0000000
038	INDUSTRIAL	NATURAL GAS	000000000	MIL CU FT	NOX	175.00	0000000
					THC	3.00	0000000
039	INDUSTRIAL	LPG	000000000	THOUS GAL	NOX	11.65	0000000
					THC	0.30	0000000
040	INDUSTRIAL	WOOD	000000000	TON	NOX	10.00	0000000
					THC	36.00	0000000
041	MILITARY	AIRCRAFT	000000000	LND/TAKE OFF	NOX	0.00	0000000
					THC	0.00	0000000
042	CIVIL	AIRCRAFT	000019512	LND/TAKE OFF	NOX	0.00	0000000
					THC	0.41	0000004

TABLE 7 (continued)

COUNTY:11160						
CATEGORY NUMBER	CATEGORY DESCRIPTION	PROCESS RATE	UNITS	POLLUTANT I.D.	EMISSION FACTOR	EMISSIONS ESTIMATE
043	COMMERCIAL AIRCRAFT	000000000	LND/TAKE OFF	NOX THC	0.00 0.00	0000000 0000000
044	RAILROAD LOCOMOTIVES	000000702	THOUS GAL	NOX THC	370.00 94.00	0000130 0000033
045	VESSELS-GASOLINE	000000727	THOUS GAL	NOX THC	171.00 289.00	0000062 0000105
046	VESSELS-DISTILLATE OIL	000000000	THOUS GAL	NOX THC	276.00 50.00	0000000 0000000
047	VESSELS-RESIDUAL OIL	000000000	THOUS GAL	NOX THC	63.60 1.72	0000000 0000000
048	OFF-HIGHWAY VEHICLES-GAS	000001149	TON	NOX THC	2,000.00 374.24	0001149 0000215
049	OFF-HIGHWAY VEH-DIESEL	000000000	TON	NOX THC	0.00 0.00	0000000 0000000
050	ON-SITE INCINERATION	000002667	TON	NOX THC	3.00 3.00	0000004 0000004
051	OPEN BURNING	000000279	TON	NOX THC	2,000.00 1,419.35	0000279 0000198
052	STRUCTURAL FIRES	000020364	TON	NOX THC	1.40 11.00	0000014 0000112
053	FIELD/SLASH BURNING	000000000	TON	NOX THC	4.00 23.00	0000000 0000000
054	FOREST FIRES	000000000	ACRE	NOX THC	43.21 261.02	0000000 0000000
999	COUNTY TOTALS			THC NHC NOX		0003716 0017796 0020937

TABLE 8. ANNUAL EMISSIONS (1980) OF VOC AND NO_x FROM AREA SOURCES IN PRINCE GEORGE'S COUNTY, MARYLAND.

COUNTY:1300

CATEGORY NUMBER	CATEGORY DESCRIPTION	PROCESS RATE	UNITS	POLLUTANT I.D.	EMISSION FACTOR	EMISSIONS ESTIMATE
001	STAGE I GASOLINE EVAP	000277196	THOUS GAL	THC	0.30	0000042
002	STAGE II GASOLINE EVAP	000277196	THOUS GAL	THC	2.70	0001344
003	STORAGE TANK BREATHING	000277196	THOUS GAL	THC	1.00	0000139
004	GASOLINE LOADING/TRANSIT	000277196	THOUS GAL	THC	6.87	0000952
005	SM IND/COMM DESGREASING	000665071	POPULATION	NHC	3.00	0000998
006	DRY CLEANING	000665071	POPULATION	NHC	1.50	0000499
007	ARCH SURFACE COATING	000665071	POPULATION	NHC	1.76	0000585
008	AUTO BODY REFINISHING	000000335	TUN	NHC	2,000.00	0000335
009	SM IND SURFACE COATING	000000000	TUN	THC	1,175.00	0000000
010	GRAPHIC ARTS	000665071	POPULATION	NHC	0.40	0000133
011	COMP/CONS SOLVENT USE	000665071	POPULATION	NHC	6.30	0002095
012	CRACK ASPHALT	000000000	TUN	NHC	0.30	0000000
013	PESTICIDES	000021717	ACRE	NHC	3.50	0000038
014	ON-HIGHWAY LDV	002527091	THOUS VMT	NOX NHC	9.15 11.00	0011561 0013699
015	ON-HIGHWAY LDT1	000155938	THOUS VMT	NOX NHC	11.45 12.80	0006908 0009938
016	ON-HIGHWAY LDT2	000044400	THOUS VMT	NOX NHC	13.60 15.00	0000302 0000333

TABLE 8. (continued)

COUNTY:1306						
CATEGORY NUMBER	CATEGORY DESCRIPTION	PROCESS RATE	UNITS	POLLUTANT I.D.	MISSION FACTOR	MISSIONS ESTIMATE
017	ON-HIGHWAY HDG	000186333	THOUS VMT	NOX NHC	30.00 8.16	0002795 0000760
018	ON HIGHWAY HDD	000122909	THOUS VMT	NOX NHC	20.20 5.50	0001241 0000338
019	ON-HIGHWAY MC	000000000	THOUS VMT	NOX NHC	0.00 0.00	0000000 0000000
020	RESIDENTIAL ANTHRACITE	000202657	TON	NOX THC	3.00 2.50	0000304 0000253
021	RESIDENTIAL BITUMINOUS	000000000	TON	NOX THC	6.00 3.00	0000000 0000000
022	RESIDENTIAL RESIDUAL OIL	000000000	THOUS GAL	NOX THC	0.00 0.00	0000000 0000000
023	RESIDENTIAL DISTILLATE	000252111	THOUS GAL	NOX THC	18.00 1.00	0002269 0000126
024	RESIDENTIAL NATURAL GAS	000057900	MIL CU FT	NOX THC	80.00 6.00	0002315 0000232
025	RESIDENTIAL LPG	000000000	THOUS GAL	NOX THC	7.50 0.70	0000000 0000000
026	RESIDENTIAL WOOD	000000000	TON	NOX THC	1.00 5.00	0000000 0000000
027	COMM/INST ANTHRACITE	000000000	TON	NOX THC	10.00 0.00	0000000 0000000
028	COMM/INST BITUMINOUS	000000000	TON	NOX THC	6.00 3.00	0000000 0000000
029	COMM/INST RESIDUAL OIL	000007567	THOUS GAL	NOX THC	60.00 1.00	0000227 0000004

TABLE 8. (continued)

COUNTY:1300		CATEGORY		PROCESS		POLLUTANT EMISSION		EMISSIONS	
NUMBER	DESCRIPTION	RATE	UNITS	POLLUTANT	EMISSION FACTOR	ESTIMATE			
030	COMM/INST DISTILLATE OIL	000077090	THOUS GAL	NOX	22.00	0000848			
				THC	1.00	0000039			
031	COMM/INST NATURAL GAS	000018667	MIL CU FT	NOX	120.00	0001120			
				THC	3.00	0000028			
032	COMM/INST LPG	000000000	THOUS GAL	NOX	120.00	0000000			
				THC	8.00	0000000			
033	COMM/INST WOOD	000000000	TON	NOX	10.00	0000000			
				THC	30.00	0000000			
034	INDUSTRIAL ANTHRACITE	000000000	TON	NOX	18.00	0000000			
				THC	0.00	0000000			
035	INDUSTRIAL BITUMINOUS	000000000	TON	NOX	15.00	0000000			
				THC	1.00	0000000			
036	INDUSTRIAL RESIDUAL OIL	000000000	THOUS GAL	NOX	60.00	0000000			
				THC	1.00	0000000			
037	INDUSTRIAL DISTILLATE OIL	000000000	THOUS GAL	NOX	22.00	0000000			
				THC	1.00	0000000			
038	INDUSTRIAL NATURAL GAS	000000000	MIL CU FT	NOX	175.00	0000000			
				THC	3.00	0000000			
039	INDUSTRIAL LPG	000000000	THOUS GAL	NOX	11.65	0000000			
				THC	0.30	0000000			
040	INDUSTRIAL WOOD	000000000	TON	NOX	10.00	0000000			
				THC	36.00	0000000			
041	MILITARY AIRCRAFT	000025314	LND/TAKE OFF	NOX	17.30	0000219			
				THC	27.10	0000343			
042	CIVIL AIRCRAFT	000000000	LND/TAKE OFF	NOX	0.00	0000000			
				THC	0.00	0000000			

TABLE 8 (continued)

COUNTY:1300						
CATEGORY NUMBER	CATEGORY DESCRIPTION	PROCESS RATE	UNITS	POLLUTANT I.D.	EMISSION FACTOR	EMISSIONS ESTIMATE
043	COMMERCIAL AIRCRAFT	000000000	LND/TAKE OFF	NOX THC	0.00 0.00	0000000 0000000
044	RAILROAD LOCOMOTIVES	000001332	THOUS GAL	NOX THC	370.00 94.00	0000246 0000063
045	VESSELS-GASOLINE	000000844	THOUS GAL	NOX THC	165.87 289.00	0000070 0000122
046	VESSELS-DISTILLATE OIL	000000000	THOUS GAL	NOX THC	270.00 50.00	0000000 0000000
047	VESSELS-RESIDUAL OIL	000000000	THOUS GAL	NOX THC	63.60 1.72	0000000 0000000
048	OFF-HIGHWAY VEHICLES-GAS	000000864	TON	NOX THC	2,000.00 483.79	0000864 0000209
049	OFF-HIGHWAY VEH-DIESEL	000000000	TON	NOX THC	0.00 0.00	0000000 0000000
050	ON-SITE INCINERATION	000024667	TON	NOX THC	3.00 3.00	0000037 0000037
051	JPLN BURNING	000000322	TON	NOX THC	2,000.00 1,795.00	0000322 0000269
052	STRUCTURAL FIRES	000030117	TON	NOX THC	1.40 11.00	0000021 0000166
053	FIELD/SLASH BURNING	000000000	TON	NOX THC	4.00 23.00	0000000 0000000
054	FOREST FIRES	000000000	ACRE	NOX THC	43.21 261.02	0000000 0000000
999	COUNTY TOTALS			THC NHC NOX		0004388 0021011 0025670

SECTION 5

REFERENCES

1. McMaster, Larry M. Emission Inventory System/Point Source Users Guide. EPA-450/4-80-010. May 1980.
2. McMaster, Larry M. Emission Inventory System/Area Source Users Guide. EPA-450/4-80-009. May 1980.
3. Sellars, F. M., M. J. Geraghty, A. M. Kiddie, and B. J. Bosy. Northeast Corridor Regional Modeling Project--Annual Emission Inventory. Volume I: Project Approach. GCA/Technology Division, Bedford, MA for the U.S. Environmental Protection Agency. Final Report. EPA-450/4-82-0130a. August 1982.
4. Bailey, Kathy. Metropolitan Washington Council of Governments. Telephone Communication with Andrea Kiddie, GCA/Technology Division. November 16, 1981
5. Mehta, Dilip H., and John E. Spessard. Directory of Volatile Organic Compound (VOC) Sources Covered by Reasonably-Available Control Technology Requirements. EPA-450/4-80-007. February 1981.
6. Geraghty, M. J., F. M. Sellars, A. M. Kiddie, and B. J. Bosy. Northeast Corridor Regional Modeling Project--Annual Emission Inventory. Volume XVII: Development of Temporal, Spatial, and Species Allocation Factors. GCA/Technology Division, Bedford, MA for the U.S. Environmental Protection Agency. Final Report. EPA-450/4-82-013q. October 1982.
7. Martin, Karen. Metropolitan Washington Council of Governments. Telephone communication with Andrea Kiddie, GCA/Technology Division. January 25, 1982.
8. Kaufmann, Robert. Metropolitan Washington Council of Governments. Telephone communication with Andrea Kiddie, GCA/Technology Division. January 28, 1982.
9. Metropolitan Washington Council of Governments. Preliminary Washington Metropolitan Air Quality Plan. Appendix B. Inventory Methodology - Hydrocarbons and Nitrogen Oxides. June 1982.

10. Lamason, William H. II, and T. F. Lahre. Procedures for the Preparation of Emission Inventories for Volatile Organic Compounds: Volume I, Second Edition. EPA-450/2-77-028, 2nd Ed. U.S. Environmental Protection Agency, Research Triangle Park, NC. September 1980.
11. Sellars, F. M., and B. J. Bosy. Northeast Corridor Regional Modeling Project Annual Emission Inventory Compilation and Formatting. Volume XVIII: Inventory Review and Evaluation. EPA-450/4-82-013r. September 1982.
12. Sellars, F. M., M. J. Geraghty, A. M. Kiddie, B. J. Bosy, S. V. Capone. Northeast Corridor Regional Modeling Project Annual Emission Inventory Compilation and Formatting: Volume XIV, Virginia Emission Inventory. GCA/Technology Division for the U.S. Environmental Protection Agency. Final Report. EPA-450/4-82-013n. September 1982.

APPENDIX A

DOCUMENTATION OF THE COMPUTER ROUTINE USED FOR THE DISTRICT OF COLUMBIA POINT SOURCE INVENTORY

As discussed in Section 3, two "generic" problems with the District of Columbia point source file were addressed with a computer routine. The VOC emissions estimation methods for several sources had been inadvertently left blank, and in some instances, the VOC allowable emissions fields contained illegal alphabetic characters. The routine used to address these problems is presented as follows:

```
00000020 // EXEC GCAEZT1
00000030 /** PROGRAM TO REPLACE MISSING HC EMISSION ESTIMATION
00000040 /** METHOD CODES WITH 3'S, AND REPLACE ALPHABETIC HC
00000050 /** ALLOWABLE EMISSION FIELDS WITH BLANKS. USED FOR THE
00000060 /** DISTRICT OF COLUMBIA NEDS FILE.
00000070 //FILEB DD DSN=GCA.FTEISPT.NEDS.DC80B,DISP=SHR
00000080 //NEDS DD DSN=GCA.FTEISPT.NEDS.DC80,DISP=SHR
00000090 FILE NEDS
00000100 HCESTM 69 1 N CCODE 80 1 N HCALLEM 39 7 N
00000110 9999
00000120 IF FILE EQ FILE
00000130 IF CCODE EQ 4 THEN HCESTM = 3
00000140 IF CCODE EQ 5 AND HCALLEM NOT NUMERIC
00000150 HCALLEM = *****
00000160 WRITE
```

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA-405/4-82-0130		2.		3. RECIPIENT'S ACCESSION NO.	
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				6. PERFORMING ORGANIZATION CODE	
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16. ABSTRACT This report discusses the development of the Northeast Corridor Regional Modeling Project (NECRMP) annual regional emission inventory. The inventory reflects 1979/1980 data and focuses on point, area and mobile source emissions of Volatile Organic Compounds (VOC) and Nitrogen Oxides (NO _x), although particulate, sulfur oxides and carbon monoxide emissions were also compiled for point sources. The study area includes the entire northeast quadrant of the United States from longitude 69° to 82° West, and latitude 38° to 45° North. This Volume discusses the emission inventory for Washington, D.C.					
17. KEY WORDS AND DOCUMENT ANALYSIS					
a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS		c. COSATI Field/Group	
Emission Inventory Inventory Source Inventory Point Sources Area Sources Ozone Nitrogen Oxides Volatile Organic Compounds					
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