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Emission Growth Factors for the Niagara Frontier

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16. ABSTRACT

As part of the New York State Implementation Plan revision for the Niagara Frontier Air Quality Maintenance Area, the Erie and Niagara Counties Regional Planning Board has provided growth factors for the years 1982 and 1990, using 1975 as the base year for area sources and facilities within Erie and Niagara Counties which generate either sulphur dioxide or particulate matter.

Growth factors for 23 area sources were developed for 316 grid cells within the Erie-Niagara Region. The grid cell matrix within the region which this report builds upon was previously developed during a 1975 Niagara Frontier Emissions Inventory which quantified particulate matter and sulphur dioxide within the region.

Growth factors were also developed for 63 industrial facilities within the Erie-Niagara Region. A description of each facility considered, and the methodology employed in projecting growth for each facility is detailed. Further, the potential for reliability of all growth factor projections within the report are discussed.

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EMISSION GROWTH FACTORS FOR THE NIAGARA FRONTIER

EPA Contract No. 68-02-2956

Submitted to

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Region II
New York, New York 10007

Deborah Brome
Project Officer
Air Programs Branch

Submitted by

Erie and Niagara Counties Regional Planning Board
3103 Sheridan Drive
Amherst, New York

July 1979

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FOREWORD

Man's health, within his natural and constructed environment, should be protected from the deleterious effects of high concentrations of air pollutants. Equally important, however, is the realization that this should be strived for in the most practical and economic way.

This report contributes to the possibility of achieving the above goals by providing technical information in the form of growth factors for various air pollutant-generating sources, data which served as input into the New York State Implementation Plan Revision of 1978, as mandated by the Federal Clean Air Act amendments of 1977, as well as future local air quality maintenance planning efforts.

ABSTRACT

As part of the New York State Implementation Plan revision for the Niagara Frontier Air Quality Maintenance Area, and for the purpose of future air quality maintenance planning for the Niagara Frontier, the Erie and Niagara Counties Regional Planning Board has provided growth factors for the years 1982 and 1990, using 1975 as the base year for area sources and facilities within Erie and Niagara Counties which generate either sulplur dioxide or particulate matter.

Growth factors for 23 area sources were developed for 316 grid cells within the Erie-Niagara Region. The grid cell matrix within the region which this report builds upon was developed during a 1975 Niagara Frontier Emissions Inventory which quantified particulate matter and sulphur dioxide within the region.

A discussion of growth factors generated for the 23 area sources considered the methodology employed and the reliability of projections are presented in Chapter I of this report. The growth factors generated for all the area sources by grid cell are presented in Appendix A.

Growth factors were also developed for 63 industrial facilities within the Erie-Niagara Region. Chapter II of this report describes each facility considered, and the methodology employed in projecting growth for the facility, and the reliability of the projection.

The growth factors as developed and presented in this report, have been, and will continue to be used by the New York State Department of Environmental Conservation as data input for dispersion modelling, to simulate air quality conditions within the region for the years 1982 and 1990, for the purposes of future air quality maintenance planning efforts.

This report was submitted in fulfillment of Contract No. 68-02-2956 by the Erie and Niagara Counties Regional Planning Board under the sponsorship of the U.S. Environmental Protection Agency. This report covers a period from August, 1978 to March, 1979, and work was completed as of July, 1979.

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CHAPTER I

INTRODUCTION

On August 18, 1978, the United States Environmental Protection Agency (USEPA) authorized the Erie and Niagara Counties Regional Planning Board (ENCRPB) to proceed with developing growth factors for various area and point source facilities which emit either particulate matter or sulphur dioxide within the Erie-Niagara, New York Air Quality Maintenance Area (AQMA).

The Niagara Frontier AQMA is comprised of Erie and Niagara Counties, located at the westerly end of New York State, as shown in Figure 1. Currently, the Niagara Frontier AQMA has several sub areas within the region which do not meet Federal Air Quality standards for particulate matter or sulphur dioxide. These areas are delineated as shown in Figure 2.

As a result, New York State has been mandated by the Federal Government to prepare Air Quality State Implementation Plan (SIP) Revisions for the Niagara Frontier AQMA, which will bring the region into an air quality attainment status. The results of this study, discussed subsequently, form a basis for part of the SIP revision.

During the course of this study, a review of the existing base year (1975) point and area source emission inventory for the Niagara Frontier AQMA was undertaken.

In the base year inventory, twenty-two (22) categories of area sources that emit particulates and sulphur dioxide were allocated to 316 grid squares ranging in size from 1 to 100 square kilometers. Figure 3 details the grid system and its relationship to the AQMA. An additional 26 grid squares were also located in the contiguous area of the Dominion of Canada.

Additionally, there were approximately 464 facilities that were considered in the point source inventory. Approximately 275 of the facilities were identified as having emissions between one and a half to 25 tons per year. The remaining facilities, approximately 189, were identified as having emissions greater than 25 tons per year.

Within the scope of this study, twenty-three (23) area sources were evaluated for the potential of growth for the years 1982 and 1990, considering 1975 data as the base year.

Evaluation for the potential of growth was primarily based upon demographic data which was compatible with the area source under consideration.

Also within the scope of this study was consideration of 63 industrial facilities, which were evaluated for growth for the years 1982 and 1990. Again, the base year for growth reference was 1975.

The 63 industrial facilities selected for analysis were identified by the New York State Department of Environmental Conservation (NYSDEC), and generally either have emissions greater than 50 tons per year, or are located in or contiguous to an area of non-attainment.

As was previously mentioned, the results of this study, that is the growth projections, form a basis for part of the SIP revision in the following manner.

The growth factors developed herein, coupled with known emissions from the 1975 Niagara Frontier Emissions Inventory are treated as input in an air quality dispersion model to simulate air quality conditions in 1982 and 1990. Based upon the models output, various controls and/or strategies may then be necessary in order to achieve air quality standards for sulphur dioxide or particulate matter.

Consequently, the results from this study are primarily being considered for the New York State Implementation Plan revisions of 1978 for the Niagara Frontier AQMA.

The results from this study will further be used for air quality maintenance planning, that is, the planning for the addition of new facilities within air quality sensitive areas throughout the Niagara Frontier AQMA.

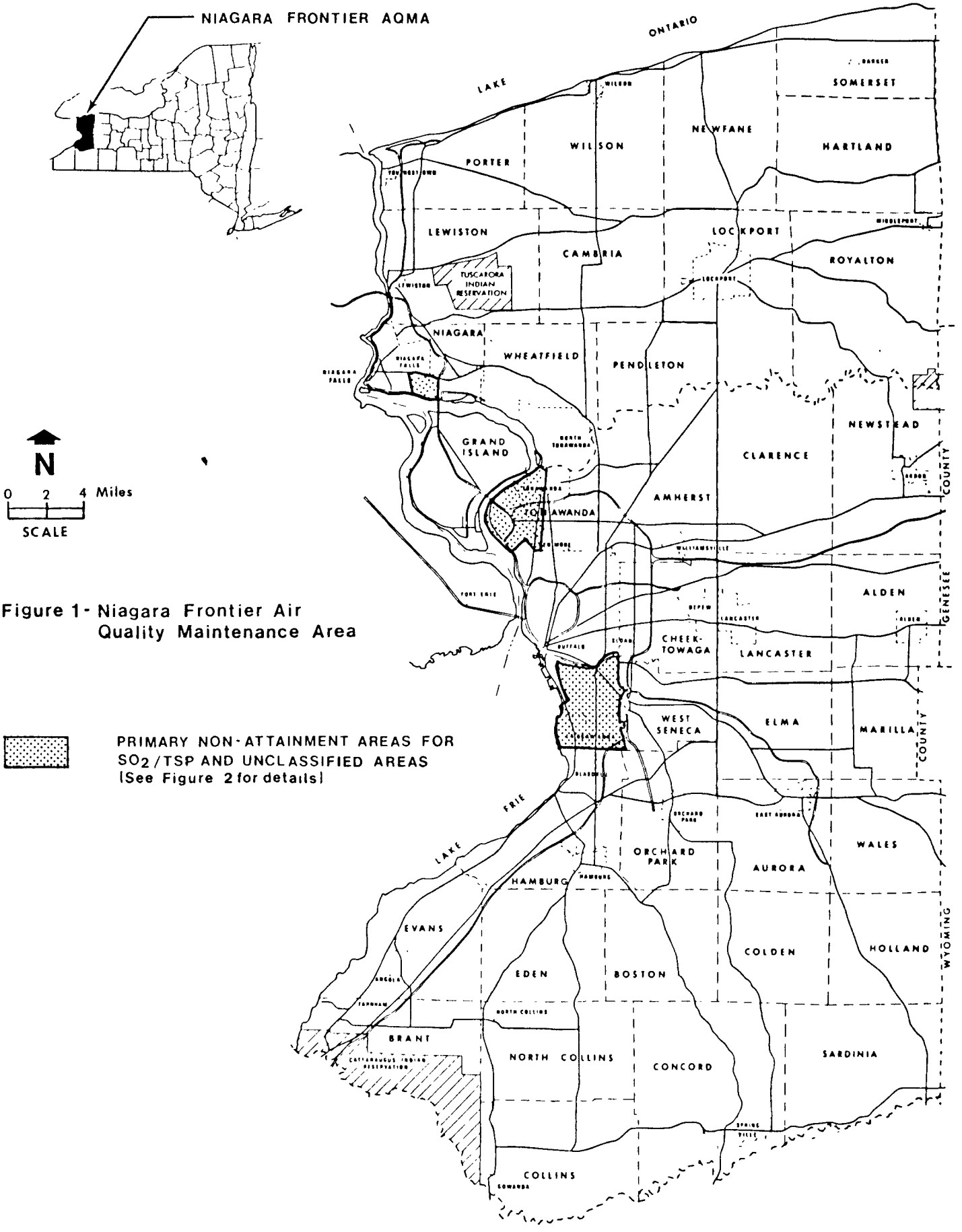

Figure 1- Niagara Frontier Air Quality Maintenance Area

PRIMARY NON-ATTAINMENT AREAS FOR SO_2/TSP AND UNCLASSIFIED AREAS (See Figure 2 for details)

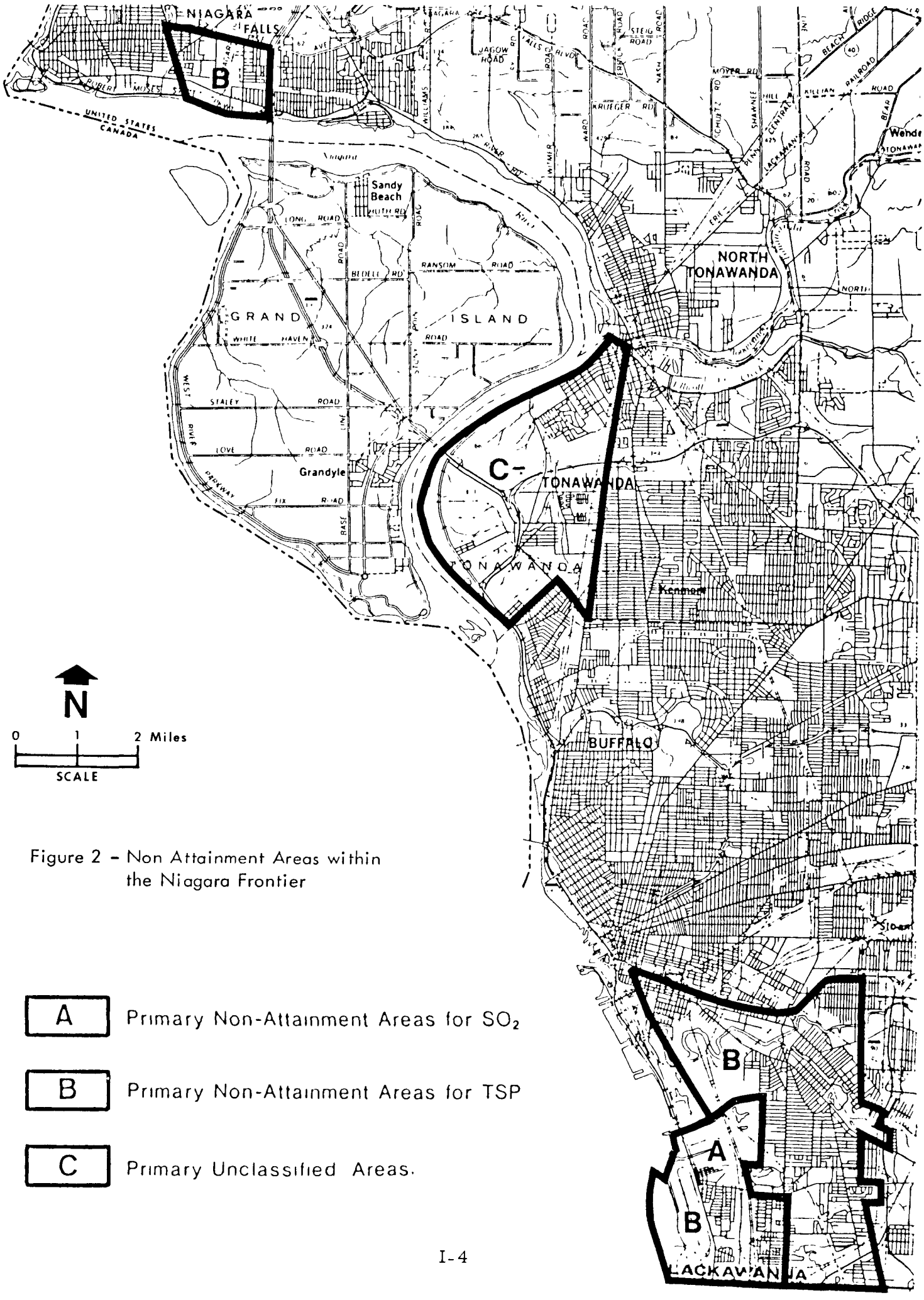

Figure 2 - Non Attainment Areas within the Niagara Frontier

A Primary Non-Attainment Areas for SO_2

B Primary Non-Attainment Areas for TSP

C Primary Unclassified Areas.

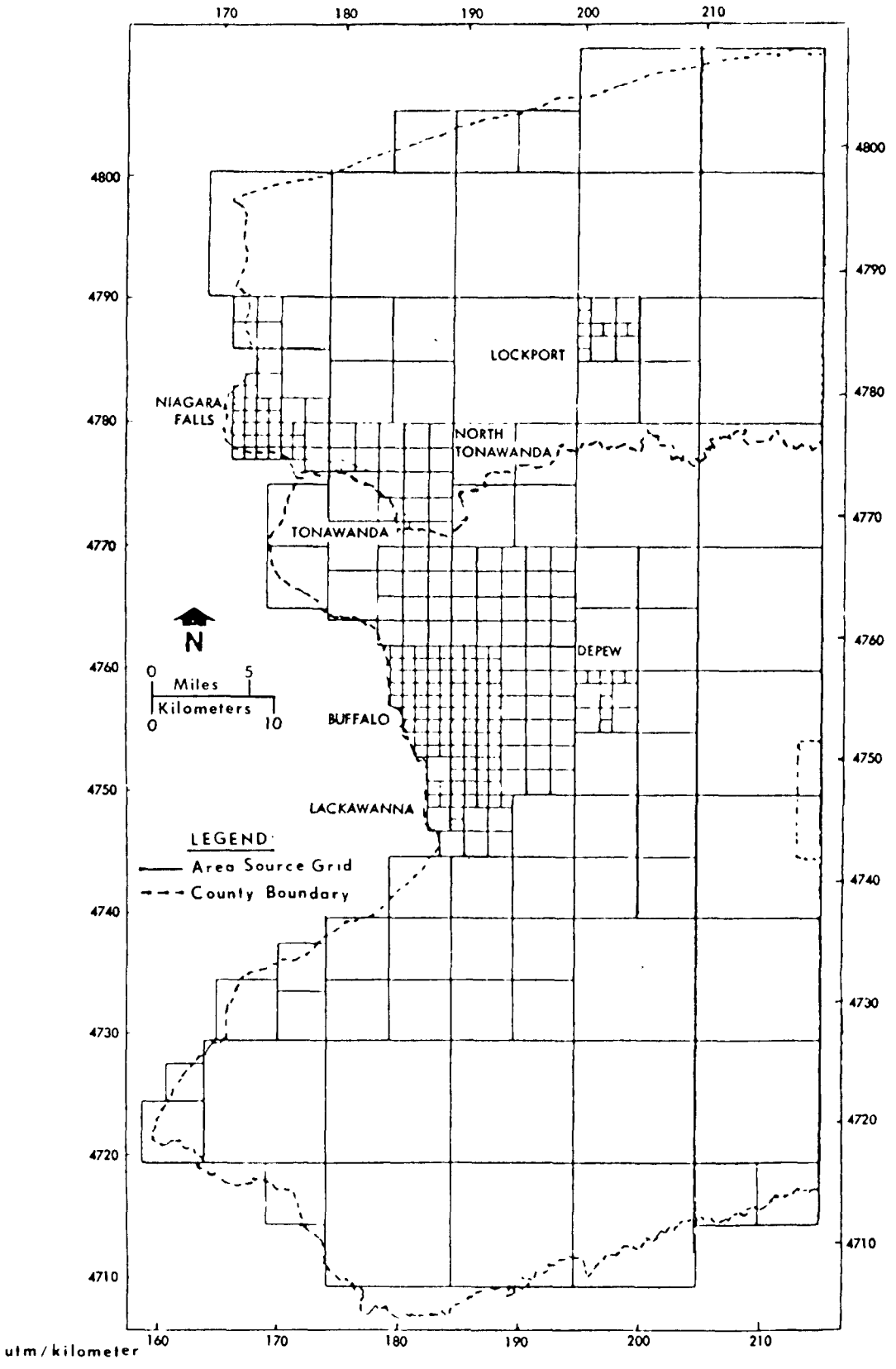

FIGURE 3. Niagara Frontier AQMA Grid Cell Matrix

CHAPTER II

AREA SOURCE GROWTH FACTORS

Area sources are generally perceived as "domestic" types of air pollution with emissions resulting from space heating, transportation, incineration and so on. These kinds of emissions are difficult to pinpoint so they are usually analyzed over some geographic area such as a census tract, municipality or county. Each area source represents the total of all minute quantities of air pollutants that are discharged over a particular geographic area. While each source may emit only a small quantity of air pollutants, because of the great number of sources, their collective impact may be very significant.

Because of their ubiquitous nature, area sources which were analyzed in the 1975 Niagara Frontier Emissions Inventory, were considered over the entire bi-county area. In determining emissions for the various area sources, various geographic and demographic data was previously utilized. In most cases, this data was accurate to the county level.

Because smaller geographic areas were necessary to provide accurate output during dispersion modeling, it became necessary to disaggregate the bi-county area into smaller geographical units, referred to as grid cells. During the 1975 Niagara Frontier Emissions Inventory, the Erie-Niagara Region was divided into 316 grid cells, as previously detailed in Figure 3. These grid cells ranged in size from one to 100 square kilometers. The more urbanized or industrialized portions of the region were divided into smaller grids, while the balance of the area, where the quantity of emissions per unit area was considered less, was assigned grids covering a larger territory.

These grids as developed were an artificial delineation of the region; they did not correspond to either municipal boundaries or any other type of geographical unit from which data was used to project emissions. As a result, data which was considered during the 1975 Emissions Inventory, was usually disaggregated from the county, Niagara Frontier Transportation Committee (NFTC) Traffic Analysis Zone or municipality level down to the grid cell level.

During the course of this study, and in the process of building upon the 1975 Niagara Frontier Emissions Inventory, growth factors were developed for 23 area sources.

In the development of growth factors for the area sources, this study considered various existing and projected demographic data. Various demographic data, usually projected through the year 1990, when compared with existing (1975) data, formed the basis for what was considered to be a growth projection.

As was previously mentioned, much of the projected demographic data is in a format where the smallest geographical unit is usually the county, municipality or traffic analysis zone. Since these geographical boundaries do not necessarily coincide with the grid cell system developed during the 1975 Niagara Frontier Emissions Inventory, growth factors generated as a result of comparing existing and projected data at the municipal or NFTC traffic analysis zone level, were by necessity disaggregated uniformly to the grid cell level.

This concept can best be illustrated by considering an area source in which the most compatible demographic data available is presented to the municipality level. In this case, growth projections obtained as a result of comparing existing with projected data within the municipality would then be disaggregated uniformly to the grid cell level. The relationship between the municipal geographical boundaries and the grid cell matrix is detailed in Table 1.

Similarly, considering an area source in which the most compatible data available is presented to the NFTC Traffic Analysis Zone level would then lead to disaggregating uniformly to the grid cell level. The relationship between the NFTC Traffic Analysis Zone and the grid cell matrix is detailed in Table 2.

What follows in the balance of this chapter is individual descriptions for each of the 23 area sources, of:

- a description of the methodology used in the 1975 emissions inventory to allocate emissions to each grid,
- a description of the data and methodology utilized in this study to develop growth factors, and
- an estimate of the reliability of the growth factor projections so derived.

These estimates of the reliability of the growth projections consisted of one of the following four descriptors: "reliable", "reasonably reliable", "questionable" and "unreliable".

For a growth projection to be considered "reliable" required the following:

- o actual trend projections for 1982 and 1990, based on historical data
- o data that was directly applicable or related to the area source in question, and
- o data within a geographical area smaller than the county level.

The term "reasonably reliable" was used for those projections made where only two of the above conditions were met. Further, growth factors were considered "questionable" when one condition was met, and "unreliable" when none of the above conditions existed.

When any of the above conditions were not present, major assumptions were made, and are described in the individual narratives for each area source.

TABLE 1 - GRID CELLS BY MUNICIPALITY

MUNICIPALITY	GRID CELL	MUNICIPALITY	GRID CELL
ERIE COUNTY		Evans Angola (V)	73, 188, 189
Buffalo (C)	103, 212-293		
Lackawanna (C)	294-8, 302-3, 305	Grand Island	62-3, 69, 71-72, 74
Tonawanda (C)	75, 76	Hamburg Hamburg (V) Blasdell (V)	161-2, 164, 175, 177, 196-7, 304
Alden Alden (V)	153	Holland	182
Amherst Williamsville (V)	79-80, 88-91, 94-101	Lancaster Lancaster (V) Depew (V)	85-6, 139-144, 147-9, 152
Aurora E. Aurora (V)	156,157	Marilla	154
Boston	179, 180	Newstead Akron (V)	82, 83
Brant Farnham (V)	187, 190	North Collins North Collins (V)	186
Cheektowaga Depew (V) (pt) Sloan (V)	104-22, 124-6, 137-8, 145-6	Orchard Park Orchard Park (V)	159, 160, 163, 178
Clarence	81, 84, 87	Sardinia	183, 201, 202
Colden	181	Tonawanda Kenmore (V)	70, 92, 93, 102, 203-11
Collins Gowanda (V) (pt)	198	Wales	--
Concord Springville (V)	184, 185, 199, 100	W. Seneca	123, 127-36 299-301
Eden	174, 176		
Elma	150, 151, 155, 158		

Table 1 - Grid Cells by Municipality (cont.)

MUNICIPALITY	GRID CELL	MUNICIPALITY	GRID CELL
NIAGARA COUNTY			
Lockport (C)	16, 18-22, 24-27	Wheatfield	30, 32, 53-60
Niagara Falls (C)	39-42, 44, 46-7, 165-71, 173, 49-52, 61, 192-3, 195, 306-315	Wilson Wilson (V)	4, 5, 8
N. Tonawanda (C)	64-68		
Cambria	28, 29		
Hartland Middleport (V)	10		
Lewiston Lewiston (V)	33-38, 43		
Lockport	12-15, 17, 23		
Newfane	2, 3, 9		
Niagara	45, 48, 172		
Pendleton	77, 78		
Porter Youngstown (V)	6, 7		
Royalton	11		
Somerset Barker (V)	1		

Table 2 - GRID CELLS BY NFTC TRAFFIC ANALYSIS ZONE

NFTC TAZ	LOCATION	GRID CELLS	NFTC TAZ	LOCATION	GRID CELLS
00	Buffalo	261-3	40	Grand Island	62, 69, 71
10	Buffalo	233, 246-9	41	Tonawanda & N. Tona. (C)	59, 64-8, 74-6 203-4
11	Buffalo	235, 244-5, 250-1	42	Amherst	80
12	Buffalo	260, 264-5, 274-7	43	Amherst	79
			44	Amherst	88-9, 96-9
20	Buffalo	213-9, 227-32, 234	45	Cheektowaga	105-8, 115-8, 125-6, 137-8,
21	Buffalo	212, 220-6			145-6
22	Buffalo	236-43, 252-4	46	West Seneca	127-8, 135-6
23	Buffalo	255-9, 266-73	47	Orchard Park	159-60
24	Buffalo	280-3, 287-90	48	Orchard Park	163
25	Buffalo	278-9, 284-6, 291-3	49	Hamburg	161, 196-7, 304
			50	Niagara Falls	40-2, 44, 46, 50, 165-9, 192-3, 306,
30	Grand Island	63, 70, 72			310-12
31	Tonawanda (Tn.)	92-3, 102, 205-11			
			51	Niagara Falls	47, 49, 51-2, 61, 170-1, 173
32	Amherst	90-1, 94-5, 100-1, 103			195, 307-9, 313-15
33	Cheektowaga	104, 109-14, 119-22, 124	52	Wheatfield	30, 32, 53-60
34	West Seneca	123, 129-34, 299-301	53	Pendleton	77-8
			54	Clarence	81, 87
35	Lackawanna	294-8, 302-3, 305			

Table 2 - Grid Cells by NFTC Traffic Analysis Zone (cont.)

NFTC TAZ	LOCATION	GRID CELLS
55	Lancaster	86, 138-44, 147-9
56	Elma	150, 158
57	Aurora	157
58	Orchard Park	178
59	Hamburg	162, 164, 175 177
60	Lockport	12-27
61	Clarence	84
62	Lancaster	85, 152
63	Elma	151, 155
64	Aurora	156
70	Niagara Lewiston Porter	6, 7, 31, 32-9, 43, 45, 48, 172
71	Wilson, Cambria	4-5, 8 28-9
72	Newfane	2-3, 9
73	Somerset, Hartland, Royalton	1, 10-11
74	Newstead, Alden	82-3, 153
75	Marilla, Wales	154
76	Colden Holland Sardinia	181-3, 201-2
77	Boston, Concord	179-80, 184-5, 199-200
78	Eden, N. Collins, Collins	174, 176, 186, 198
79	Evans, Brant	73, 187-91, 194

RESIDENTIAL FUEL

The residential fuel category refers to the combustion of fuels for such residential uses as space heating, water heating and cooking. All residential dwellings from single family residences to apartment complexes make up this category.

In the preparation of the 1975 Niagara Frontier Emission Inventory, it was reported that a fuel survey was conducted to determine the quantity of fuel utilized in the Erie-Niagara Region. This data was then calibrated with 1970 Census tract values for dwelling unit per structure and National Weather Service heating degree day information to determine emissions from this area source.

To project growth for the years 1982 and 1990 for residential fuel, it was, for the purposes of this study, determined that population data would closely approximate the growth or decline associated with this area source.

Population data from the ENCRPB 208 Water Quality Management Program[1], which provides information on existing and projected population through the year 2000 for the Erie-Niagara Region was considered the most applicable, current and reliable data available.

Although the data contained within the ENCRPB's 208 Population Report is presented to the municipality level, that is, town, village or city, it was not necessary to disaggregate this data to the grid cell level since 1" = 2 mile population dot maps were available.

The population dot maps indicate population centers and densities, and when using dot maps to compare present data, assumed to be 1975 in this case, with projected data for 1980 and 1990, one can readily determine the areas where growth or decline is indicated.

By superimposing a 1" = 2 mile Erie-Niagara Grid cell map, Figure 3, over the respective population dot maps, a determination as to the present population as well as change in population per grid cell for the years 1980 and 1990 was noted.

Since population data for 1982 was not available, a straight line interpolation of 1980 and 1990 data was used.

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1 ENCRPB - 208 Water Quality Management Program, Report 5, Population - Present and Future, October, 1978

Growth factors for this area source range from 0.25 to 2.62 for 1982, and from 0 to 5.00 for 1990.

Based upon the detail and age of the data utilized, together with the geographical fit of the data to the grid cell matrix, the growth factors by grid cell presented in Appendix A for residential fuel are considered reliable.

COMMERCIAL/INSTITUTIONAL FUEL

The commercial/institutional fuel category refers to the combustion of fuels for such purposes as space and water heating, cooking, and so on. Commercial establishments such as retail and wholesale stores, governmental buildings, hospitals, schools, churches and restaurants made up this category.

From the 1975 Niagara Frontier Emissions Inventory, it was determined that essentially all emissions related to this source occurred as a result of the combustion of natural gas or heating oil. It was also concluded that there was no commercial/institutional area source coal or residual oil usage within the Erie-Niagara Region.

During the 1975 emissions inventory, wholesale, retail and service employment for the year 1972, obtained from the NFTC, was used to allocate fuel usage by grids.

To project growth for the years 1982 and 1990 for the commercial/institutional fuel category, it was, for the purposes of this study, determined that land use data, that is, retail/commercial and public/semipublic land use would most closely approximate the growth or decline associated with this area source.

Land use data from the ENCRPB 208 Water Quality Management Program[1], which provides data on existing and projected land use through the year 2000 for the Erie-Niagara Region, was considered the most applicable, current and reliable data to utilize.

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1 ENCRPB - 208 Water Quality Management Program, Report 6, Land Use - Present and Future, October, 1978

Since the data contained within the ENCRPB's 208 Land Use Report is presented to the municipality level, that is, city, town or village, it was necessary to first determine the growth or decline in commercial and public/semipublic land use and then disaggregate from the municipality level to the grid cell level, as detailed in Table 1.

Growth factors for this area source range from 1.00 to 1.33 for 1982, and from 1.00 to 1.73 for 1990.

Based upon the detail and age of the data utilized, together with the applicability of the data to the area source, the growth factors presented by grid cell in Appendix A for commercial/institutional fuel are considered reliable.

INDUSTRIAL FUEL

The industrial fuel category refers to the combustion of fuels by all manufacturing industries for uses such as space heating and other in-plant operations.

During the 1975 Niagara Frontier Emissions Inventory, a light industrial fuel usage survey was conducted within the Erie-Niagara Region. Allocation of the fuels was then made using 1972 manufacturing employment data provided by the NFTC by traffic analysis zone, and were disaggregated to the grid cell level uniformly.

Since the number of industrial facilities (63) considered during the present study is somewhat less than the number of point sources (264) considered during the 1975 Emissions Inventory, the New York State Department of Environmental Conservation requested that growth projections be provided for the larger industrial fuel area source category, rather than the light industrial fuel area source category considered in the 1975 study.

To provide growth factors for the years 1982 and 1990 for industrial fuel, it was determined, for the purposes of this study, that manufacturing employment data would approximate the growth or decline associated with this area source.

Manufacturing employment data from the ENCRPB's Economic Development Study[1], which provides existing and projected manufacturing

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1 ENCRPB, "Economic Development in the Erie-Niagara Region", June 1975

employment data by place of work through the year 2000 for the Erie-Niagara Region, was considered the most applicable, current and reliable data available.

Since the data contained within the Economic Development Study is presented to the municipality level, that is, city, town or subregion, it was first necessary to determine the growth or decline in manufacturing employment by place of work within the respective municipality, and then disaggregate uniformly to the grid cell levels as detailed in Table 1.

Growth factors for this area source, which are presented by grid cell in Appendix A, range from 1.00 to 1.32 for the year 1982, and from 1.00 to 1.67 for the year 1990.

Based upon the detail and age of the data utilized, together with the applicability of the data to the area source, the growth factors developed for the industrial fuel category are considered reasonably reliable.

ON SITE INCINERATION

The on site incineration category refers to the combustion of waste material in small incinerators such as those used at grocery and department stores, hospitals, schools and banks, which would not be considered as a point source of emission.

In the development of the 1975 Niagara Frontier Emissions Inventory, it was assumed that all such sources within this category, were included within their point source inventory survey.

In the course of projecting growth for the on site incineration category, it was noted that all new incinerators are subject to NYSDEC Permit to Construct and Certificate to Operate requirements.

Because of a lack of relevant data, and because the NYSDEC controls whatever growth may occur in this category, it was assumed that little if any growth will be experienced for this category, and that a growth factor of 1.0 for both 1982 and 1990, as indicated in Appendix A, is warranted.

Since emissions from this area source are considered insignificant, the lack of a detailed analysis was considered justified.

Nevertheless, the projections for this area source are considered questionable.

GASOLINE FUEL - LIGHT VEHICLE

The gasoline fuel - light vehicle category refers to the combustion of gasoline fuel for automobiles and light duty trucks.

A review of the 1975 Niagara Frontier Emissions Inventory indicates that gasoline consumption for that study was calculated by considering data on vehicle miles traveled (VMT), by traffic analysis zones, as provided by the New York State Department of Transportation (NYSDOT), with an assumed gasoline consumption of 13.6 miles per gallon.

In the course of projecting growth for the years 1982 and 1990 for the gasoline fuel - light vehicle category, for this study, it was determined that existing and projected vehicle miles traveled data would most closely approximate the growth or decline associated with this area source.

This type of information, that is, existing (1975) and projected VMT data to the year 1985 by Traffic Analysis Zones, was provided by the Niagara Frontier Transportation Committee. An interpolation and extrapolation of this data provided Vehicle Miles Traveled by traffic analysis zone for the years 1982 and 1990 respectively.

Since the EPA has mandated corporate average vehicle fleet efficiencies up to 27.5 miles per gallon for the year 1985, then to hold at that level, it is apparent that consumption and likewise combustion of gasoline would decrease in the foreseeable future.

Further information supplied by the NYSDOT, which considers automotive energy forecasts and efficiencies, indicated that the fleet efficiencies for the years 1982 and 1990 would be 18.95 and 26.26 mpg respectively.[1]

For the purposes of this report, fuel efficiencies of 14.7, 18.3 and 25.5 miles per gallon for the years 1975, 1982 and 1990 respectively were utilized.

Knowing the existing and projected vehicle traffic within the previously mentioned Traffic Analysis Zones, and considering the above mentioned automotive efficiencies, gasoline consumption per zone was computed for the years 1975, 1982 and 1990.

Growth projections were then generated by comparing the 1982 and 1990 fuel consumptions with those obtained for 1975, by Traffic Analysis Zone.

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[1] Preliminary Research Report 133, NYSDOT, Dec. 1977

These growth factors were then disaggregated from the Traffic Analysis Zone to the grid cell level as detailed in Table 2.

Growth factors for this area source range from 0.69 to 2.61 for the year 1982, and from 0.49 to 5.37 for the year 1990.

Based upon the detail of the data utilized, coupled with applicability of the data to the area source, the growth factors by grid cell presented in Appendix A for gasoline fuel - light vehicle category are considered to be reliable within the metropolican areas and first ring towns of the region.

GASOLINE FUEL - HEAVY VEHICLE

The gasoline fuel - heavy vehicle category refers to the combustion of gasoline fuel for heavy duty trucks and buses.

A review of the 1975 Niagara Frontier Emissions Inventory indicates that gasoline consumption was calculated by considering NYSDOT vehicle miles traveled (VMT) data within traffic analysis zones, with an assumed gasoline consumption of 8.4 miles per gallon.

In terms of projecting growth for the years 1982 and 1990 for the gasoline fuel - heavy vehicle category, for the current study, it was determined that existing and projected vehicle miles traveled data would most closely approximate the growth or decline associated with this area source.

This type of information, that is, existing (1975) and projected VMT data to the year 1985 by Traffic Analysis Zones, was provided by the NFTC and was used to analyze the gasoline fuel - light vehicle category, as previously reported.

Likewise for this area source, this same data was again utilized, after considering that the split between light and heavy vehicles would remain relatively constant through the year 1990 over each Traffic Analysis Zone. By interpolation and extrapolation of this data, vehicle miles traveled by traffic analysis zone for the years 1982 and 1990 was then determined.

Growth projections were then generated by comparing the 1982 and 1990 projected vehicle mileage with those obtained for 1975, by Traffic Analysis Zone.

These growth factors were then disaggregated from the Traffic Analysis Zone to the grid cell level as detailed in Table 2.

Growth factors for this area source range from 0.93 to 3.25 for the year 1982, and from 0.86 to 5.84 for the year 1990.

Based upon the detail of the data utilized, coupled with the applicability of the data to the area source, the growth factors presented by grid cell in Appendix A for the gasoline fuel - heavy vehicle category are considered to be reasonably reliable within the metropolitan areas and first ring towns of the region.

GASOLINE FUEL OFF HIGHWAY - SMALL GAS ENGINES

This category refers to the combustion of gasoline by lawn mowers, garden tractors, snowmobiles, minibikes, etc.

In the 1975 Niagara Frontier Emissions Inventory, fuel usage for this area source was estimated by using New York State Economic Development Board (NYSEDB) county population projections for 1975 considering a fuel usage of 13 gallons per person per year. 1973 NFTC population by traffic analysis zone was then used to determine the area source grid allocation.

With regards to projecting growth for the years 1982 and 1990 for gasoline fuel - small gas engines, for the current study, it was determined that population data would approximate the growth or decline associated with this area source.

Population data from the ENCRPB 208 Water Quality Management Program[1], which provides information on existing and projected population through the year 2000 for the Erie-Niagara Region was considered the most applicable, current and reliable data available.

As previously reported, the data contained within the ENCRPB's 208 population report is presented to the municipality level, that is, town, village or city. However, it was not necessary to disaggregate this data to the grid cell level since 1" = 2 mile population dot maps were available.

By superimposing the 1" = 2 mile Erie-Niagara grid cell map, Figure 3 over the respective population dot maps, a determination as to the present population as well as change in population per grid cell for the years 1980 and 1990 was noted.

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1 ENCRPB - 208 Water Quality Management Program, Report 5, Population - Present and Future, October, 1978

Since population data for 1982 was not available, a straight line interpolation of 1980 and 1990 data was used.

Growth factors for this area source range from 0.25 to 2.62 for 1982, and from 0 to 5.00 for 1990.

Based upon the detail and age of the data utilized, together with the geographical fit of the data to the grid-cell matrix, the growth factors presented by grid cell in Appendix A for the gasoline fuel - off highway - small gas engines category are considered reasonably reliable.

GASOLINE FUEL OFF HIGHWAY - FARM TRACTORS

The gasoline fuel off highway - farm tractor category refers to the combustion of gasoline by farm equipment for agricultural purposes.

During the 1975 Niagara Frontier Emissions Inventory, data from the New York State Department of Agriculture and Marketing was obtained, and detailed 1973 fuel usage for agriculture purposes. This formed the basis for the allocation factors utilized and assigned to this area source.

To project growth for the years 1982 and 1990 for the gasoline fuel off highway farm tractory category for this study, it was determined that employment data would most closely approximate the growth or decline associated with this area source.

Agricultural employment data from the ENCRPB 208 Water Quality Management Program[1], which provides data on existing and projected employment through the year 2000 for the Erie-Niagara Region, was considered the most current, reliable and applicable data to utilize.

Since agricultural employment within the region is projected to be constant through the year 1990, the associated growth factors for the gasoline fuel off highway - farm tractor category are projected to remain the same.

Consequently, a growth factor of 1.0 for both 1982 and 1990 is projected for those grid cells which were identified as having agricultural activity in the 1975 Niagara Frontier Emissions Inventory.

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1 ENCRPB - 208 Water Quality Management Program, Report 5 Population/Socio-Economic Analysis Present and Future, October 1978

Based upon the data utilized, coupled with the applicability of the data to the area source, the growth factors presented by grid cell in Appendix A for the gasoline fuel off highway - farm tractors category are considered reasonably reliable.

DIESEL FUEL - HEAVY VEHICLE

The diesel fuel - heavy vehicle category refers to the combustion of diesel fuel for heavy duty trucks and buses.

A review of the 1975 Niagara Frontier Emissions Inventory indicates that diesel fuel consumption was calculated during the course of that study by considering NYSDOT vehicle miles traveled within traffic analysis zones, with an assumed diesel fuel consumption of 5.1 miles per gallon.

To project growth for the years 1982 and 1990 for the diesel fuel - heavy vehicle category for this study, it was determined that existing and projected vehicle miles traveled data would most closely approximate the growth or decline associated with this area source.

This type of information, that is, existing (1975) and projected VMT data to the year 1985 by Traffic Analysis Zones was provided by the Niagara Frontier Transportation Committee, and as previously reported was used to analyze the gasoline fuel - light vehicle category.

Likewise for this area source, the same data was again utilized, after considering that first the split between light and heavy vehicles would remain relatively constant, and secondly, that the split amoungst heavy vehicle gasoline and diesel vehicles would not change appreciably.

By interpolation and extrapolation of this data, vehicle miles traveled by traffic analysis zone for the years 1982 and 1990 was then determined.

Growth projections were then generated by comparing the 1982 and 1990 projected vehicle mileage with those obtained for 1975, by Traffic Analysis Zone. These growth factors were then disaggregated from the Traffic Analysis Zone to the grid cell level as detailed in Table 2.

Growth factors for this area source range from 0.93 to 3.25 for the year 1982, and from 0.86 to 5.84 for the year 1990.

Based upon the detail of the data utilized coupled with the applicability of the data to the area source, the growth factors presented by grid cell in Appendix A for the diesel fuel - heavy vehicle are considered to be reasonably reliable within the metropolitan areas and first ring towns of the region.

DIESEL FUEL OFF HIGHWAY - FARM TRACTORS

The diesel fuel off highway - farm tractor category refers to the combustion of diesel fuel by farm equipment for agricultural purposes.

In compiling the 1975 Niagara Frontier Emissions Inventory, data from the New York State Department of Agriculture and Marketing was obtained and detailed 1973 fuel usage for agriculture purposes. This formed the basis for the allocation factors utilized and assigned to this area source.

In projecting growth for the years 1982 and 1990 for the diesel fuel highway farm tractor category for the present study, it was determined that employment data would most closely approximate the growth or decline associated with this area source.

Agricultural employment data from the ENCRPB 208 Water Quality Management Program[1], which provides data on existing and projected employment through the year 2000 for the Erie-Niagara Region, was considered the most current, reliable and applicable data to utilize.

Since agricultural employment within the region is projected to be constant through the year 1990, the associated growth factors for the diesel fuel off highway - farm tractors category are projected to remain the same.

Consequently, the growth factor of 1.0 for both 1982 and 1990 is projected for those grid cells which were identified as having agricultural activity in the 1975 Niagara Frontier Emissions Inventory.

Based upon the data utilized, coupled with the applicability of the data to the area source, the growth factors presented by grid cell in Appendix A for the diesel fuel off highway - farm tractors category are considered reasonably reliable.

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[1] ENCRPB - 208 Water Quality Management Program, Report 5 Population/Socio-Economic Analysis - Present and Future, October 1978

DIESEL FUEL OFF HIGHWAY - CONSTRUCTION EQUIPMENT

This category applies to the combustion of diesel fuel by construction equipment, compressors, generators, etc.

In the course of the 1975 Niagara Frontier Emissions Inventory, construction equipment fuel usage was obtained by considering data from the 1975 Mineral Industrial Survey and the New York State Department of Agriculture fuel survey. After disaggregating fuel usage to Erie and Niagara Counties, 1972 Niagara Frontier Transportation Committee construction employment by Traffic Analysis Zone data was used to determine the area source grid allocation values for this category.

To project growth for the years 1982 and 1990 in the present study for the diesel fuel off highway - construction equipment category, it was determined that construction employment data would closely approximate the growth or decline associated with this area source.

Construction employment data from the ENCRPB's Economic Development Study[1], which provides existing and projected construction employment data by place of work through the year 2000 for the Erie-Niagara Region, was considered the most applicable, current and reliable data available.

Since the data contained within the Economic Development Study is presented to the municipality level, that is, city, town, or sub-region, it was first necessary to determine the growth or decline in construction employment by place of work within the respective municipality, and then disaggregate uniformly to the grid cell level, as detailed in Table 1.

Growth factors for this area source range from 0.67 to 3.25 for the year 1982, and from 0.67 to 3.25 for the year 1990.

Based upon the detail and age of the data utilized, together with the applicability of the data to the area source, the growth factors presented by grid cell in Appendix A for the diesel fuel off highway - construction equipment category are considered reasonably reliable.

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1 ENCRPB - Economic Development in the Erie-Niagara Region, June 1975

DIESEL FUEL - RAILROAD

This category refers to area source emissions from railroad switch-yard operations and long haul transportation activities.

During the 1975 Niagara Frontier Emissions Inventory, fuel usage data from two of the Railroad companies operating in the region was obtained. Fuel usage from two additional companies was estimated by considering the average daily activity of the company, assuming a fuel consumption of 9 gallons/train mile. Allocation factors for this area source were then distributed to the grid cells in which major switch yards and main transportation lines are located.

For the present study, it was determined that correspondence with each railroad company would probably provide a reasonable indication of the trend in their respective activities, and thus form the basis for projecting growth for this category for the years 1982 and 1990.

The major railroad companies operating in the region were contacted and asked to provide data on the number of train miles traveled or number of trains on particular lines for the most recent year. Conrail, Amtrak, Norfolk and Western and the Delaware and Hudson responded. The New York State Department of Transportation was then contacted to provide recent train mile information for the balance of the railroad companies that operate within the region.

This data was used to project fuel consumption, using the same methodology employed in the 1975 Emissions Inventory, and was then compared with the fuel consumption figures from the 1975 document.

The resulting growth factors were then assigned uniformly to all grid cells which were identified as having railroad activity during the 1975 Niagara Frontier Emissions Inventory, with further consideration being given to the consolidation of rail facilities in the region since 1975.

Growth factors for this area source, which are presented in Appendix A, are 0.95 for 1982 and 0.96 for 1990.

Based upon the data available, the analysis performed and the fact that a recent consolidation of rail facilities has occurred, the growth factors developed for this area source are considered reasonably reliable.

AIRCRAFT

The aircraft category represents fuel consumption for commercial, military and civilian aircraft during landings and takeoffs, as well as ground operations such as idling and taxiing.

During the 1975 Niagara Frontier Emissions Inventory, information from the Federal Aviation Administration (FAA) Air Traffic Activity publication for 1975 provided operational data for airports with FAA regulated control towers. Additional data on landing and takeoff activity for the majority of remaining airports in the two-county area was provided by the NYSDOT.

For the purposes of this study, source data was broken down into three components; commercial, military, and civil aircraft. Each of these components is discussed below:

Commercial Aircraft

Commercial aircraft in the two-county region operate primarily from the Greater Buffalo International Airport and, to a lesser degree, from the Niagara Falls International Airport.

During an interview with a representative of the Niagara Frontier Transportation Authority (NFTA), it was learned that the agency is currently preparing an airport master plan. However, it was noted that the best available data is contained in a study that was commissioned by the NFTA during the mid-seventies. This study provided historical data for 1975 in addition to forecasts of annual operations at five year intervals up to and including 1995.

Official forecasts for commercial aviation at Niagara Falls International Airport were unavailable; however, through an interview with the airport manager, it was learned that the bulk of the airport's traffic was limited to charter service. Although changing trends in charter flights did present some negative effects on current airport operations, it was anticipated that overall charter activity would increase moderately in the future.

Based on the technical data available and interviews with government and airport officials, growth factors of 1.23 for 1982 and 1.60 for 1990 are considered to be reliable for Greater Buffalo International Airport while projections for Niagara Falls International Airport of 1.10 for 1982 and 1.20 for 1990 are considered reasonably reliable.

Military Aircraft

Military aircraft activity is limited primarily to the region's two major commercial airports; Greater Buffalo International and Niagara Falls International.

In determining growth factors for this area source, interviews with an FAA official, military base commander, and airport manager indicated that no substantial changes in the level of operations were anticipated in the foreseeable future.

Based on information obtained from the sources cited above, both airports were assigned growth factors of 1.0 as shown in Appendix A. These projected growth factors may be considered to be reliable.

Civil Aircraft

Several sources were used to determine growth factors. For civilian aircraft activity at Greater Buffalo International Airport, the Regional Airport Study, Part Three A: Feasiblity of Using Existing Airports was used to forecast general aviation activity to the year 1995. Document FAA-AVP-77-17, Terminal Area Forecast published by the Federal Aviation Administration was used as source material to determine civil aviation activity at the Niagara Falls International Airport. In addition to these sources, telephone interviews with NFTA officials and federal aviation representatives were undertaken. Based on information obtained from the sources cited, growth factors of 1.55 for the year 1982, and 2.18 for the year 1990 were developed for Niagara Falls International Airport, and 1.16 and 1.13 for those same years at Greater Buffalo International Airport.

To project the growth for this category considering the private airstrips within the region, it was determined that communication with the airstrip owners or managers would provide a good indication of the general trend of civil aircraft activity.

Each of the private airstrips within the Erie-Niagara Region were contacted, first by telephone where possible, and then by correspondence, requesting that they complete and return a standard questionnaire as shown in Appendix C.

Following review of those questionnaires returned, growth projections were developed by averaging the landing/takeoff activity the owners/managers of the airstrips anticipate.

Since the intention of the questionnaire was to provide an indication of the general trend in civil aircraft activity within the region, the growth projections developed as a result of the canvassing effort were assigned uniformly to all grids in which the private airstrips were located.

As a result, the growth projections for the balance of the civil aircraft category, being 1.83 for the year 1982, and 2.67 for the year 1990, as presented in Appendix A, are considered questionable.

VESSELS

Commercial Vessels

The commercial vessel category refers to the combustion of diesel and residual oils for waterborne transportation purposes along the waterfront areas within the region.

In the 1975 Niagara Frontier Emissions Inventory, data for calculating fuel usage by vessels was obtained from Waterborne Commerce of the United States, a yearly publication of the United States Army Corps of Engineers, which tabulates cargo tonnages of various ports in the United States. A review of previous issues of this document provided tonnage data for the Port of Buffalo, as well as specific, geographically delineated subsections of it.

Examination of the 1977 issue showed that parts of the Port of Buffalo which had been used previously (i.e., the Tonawanda Harbor) for commercial vessel activity, were no longer being utilized. For the purposes of this study, it was assumed that the Tonawanda Harbor portion of the Port of Buffalo would continue to be idle through the year 1990. Conversely, the two sections of the port still in use in 1977 (the Buffalo Harbor and the Black Rock Channel) were assumed to continue to bear traffic in 1990 and the years intervening.

Projected traffic for the Port of Buffalo was obtained through consultation with representatives of the economics section of the Buffalo District United States Army Corps of Engineers.

Data provided included a projection of total cargo tonnage for the Port of Buffalo at decade intervals from 1980 to 2040. The 1990 cargo tonnage estimate was then used in developing growth projections for this area source, and an estimate for 1982 activities was obtained by interpolation of the 1980 and 1990 projections. These 1982 and 1990 tonnage figures, as

compared to the base year tonnage, became the basis for projecting growth factors.

Growth factors for the commercial vessel portion of this area source range from 0.89 to 1.17 for the year 1982, and from 1.00 to 2.00 for the year 1990.

Based on the source and type of data utilized, the growth factors presented in Appendix A for commercial vessels, are considered to be reasonably reliable.

Recreational Vessels

This category refers to the combustion of diesel and gasoline fuels for the purpose of propelling small recreational vessels.

During the 1975 Niagara Frontier Emissions Inventory, New York State Office of Parks and Recreation data on the number of recreational vessels used in Erie and Niagara Counties was utilized to estimate fuel usage. Recreational vessel fuel usage was then allocated to grid cells adjacent to the shoreline in accordance with the length of the shoreline.

With regards to projecting growth factors for recreational vessels for this study, data from the New York State Department of Motor Vehicles was considered to be most applicable. Specifically, information regarding the number of motor boats registered in New York State by size class from 1962 to 1977, and the number of motor boats registered in New York State by county of principle usage from 1975 to 1977 was obtained.

Trends were developed using the above mentioned data, and adjustments were made to account for the various sizes of the motor boats under consideration.

This in effect provided a weighted average for the various sized vessels, which, when summed together for the year under consideration, provided the basis for projecting growth factors.

Growth factors for this area source were then assigned uniformly to those grid cells which were previously identified in the 1975 Niagara Frontier Emissions Inventory, since the regional type of analysis which was performed, did not provide for sufficient detail at the grid cell level.

The growth factor for the recreational vessel category is 1.26 for the year 1982, 1.58 for the year 1990, and are tabulated by grid cells in Appendix A.

Based upon the data utilized, and the analysis that was necessary, growth factors for the recreational vessel category are considered questionable.

DIRT ROADS TRAVELLED

The dirt roads traveled category represents the generation of particulate matter as a result of transit over unpaved dirt and crushed stone roadways.

The 1975 Niagara Frontier Emissions Inventory reported that the NYSDOT data services bureau provided a computer listing of town, village and city unpaved roads in the local Highway System Inventory. The NYSDOT Regional Maintenance Engineer was then consulted on the approximate volume and speed of vehicles using unpaved roadways within the Erie-Niagara Region. This information, coupled with the location of the unpaved roads, provided the basis for allocating this area source to the grid cell matrix.

To project growth for the years 1982 and 1990 for the dirt roads traveled category, for the current study, it was determined that a review of past as well as present data from the NYSDOT Local Highway System Inventory would provide the best background for approximating the growth or decline associated with this area source.

A review of the Local Highway System Inventory, which details information on the material construction and length of essentially all roadways within Erie and Niagara Counties by political jurisdiction, (i.e., city, town, or village) provided the basic data necessary to project growth for this category.

The length of all unpaved roadways within each municipality was determined for the years 1970, 1975 and 1977, and trend patterns were developed by extrapolation of data to the years 1982 and 1990.

By assuming that the characteristics of drivers will not change appreciably through the year 1990, growth projections were generated by comparing the extrapolated trend data of unpaved roads by municipality for the years 1982 and 1990, with that observed for 1975.

Growth factors for this area source range from 0 to 1.65 for the year 1982, and from 0 to 2.39 for the year 1990.

Based upon the data available, and the extrapolation necessary, the growth factors presented by grid cell in Appendix A are considered unreliable.

DIRT AIRSTRIPS

This category refers to dust generated from landings and take offs of aircraft on dirt airstrips and taxiways.

During the 1975 Niagara Frontier Emissions Inventory, operational data was obtained from the NYSDOT, which provided information on the number of landings and take offs for the majority of the dirt airstrips in the Erie-Niagara Region for the year 1975.

To project growth for the years 1982 and 1990 for the dirt airstrips category for the present study, it was determined that communication with the airstrip owners or managers would provide a good indication of the general trend of civil aircraft activity. From this, it was hoped that a reasonable projection of dirt airstrip activity could be made.

Each of the 38 dirt airstrips within the Erie-Niagara Region were contacted, first by telephone where possible, and then by correspondence, requesting that they complete and return a standard questionnaire as shown in Appendix C.

The questionnaire responses were reviewed, and growth projections were developed by averaging the landing and takeoff activity that the owners and/or managers of the airstrips anticipated.

Since the intention of the questionnaire was to provide an indication of the general trend in civil aircraft activity within the region, the growth projections developed as a result of the canvassing effort were assigned uniformly to all grids in which dirt airstrips were located.

As a result, growth projections for the dirt airstrip category, which are 1.83 for the year 1982, and 2.67 for the year 1990, as presented in Appendix A, are considered questionable.

CONSTRUCTION LAND AREA - CONSTRUCTION AREA

This category refers to the generation of dust from construction related activities.

During the 1975 Niagara Frontier Emissions Inventory, data relating to construction employment, construction acreage and construction dollar value was obtained. Allocated values of construction acreage were then disaggregated from 1972 NFTC construction employment by Traffic Analysis Zones to the grid cell level.

To project growth for the years 1982 and 1990 for the construction land area - construction area category for this study, it was determined that construction employment data would closely approximate the growth or decline associated with this area source.

Construction employment data from the ENCRPB's Economic Development Study[1], which provides existing and projected construction employment data by place of work through the year 2000 for the Erie-Niagara Region, was considered the most applicable, current and reliable data available.

Since the data contained within the Economic Development Study is presented to the municipality level, that is, city, town, or subregion, it was first necessary to determine the growth or decline in construction employment by place of work within the respective municipality, and then disaggregate uniformly to the grid cell level, as detailed in Table 1.

Growth factors for this area source, which are presented by grid cells in Appendix A, range from 0.67 to 3.25 for the year 1982, and from 0.67 to 3.25 for the year 1990.

Based upon the detail and age of the data utilized, together with the applicability of the data to the area source, the growth factors developed for the construction land area - construction area category are considered reasonably reliable.

CONSTRUCTION LAND AREA - CROPLAND

The construction land area - cropland category pertains to the dust generated from agricultural activities.

Data utilized in the 1975 Niagara Frontier Emissions Inventory for this area source was derived from the 1974 Census of Agriculture, which provided tilled cropland acreage. Allocation factors for this area source were then established by considering emission factors for agricultural tilling.

To project growth for the years 1982 and 1990 for the present study, it was determined that land use data would most closely approximate the growth or decline associated with the construction land area - cropland category.

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1 ENCRPB - Economic Development in the Erie-Niagara Region, June, 1975

Agricultural land use data from the ENCRPB 208 Water Quality Management Program[1], which provides data on existing and projected land use through the year 2000 for the Erie-Niagara Region, was considered the most current, reliable and applicable data to utilize.

Since active agricultural land use within the region is projected to be constant through the year 1990, the associated growth factors for the construction land area - cropland category are projected to remain the same.

Consequently, a growth factor of 1.0 for both 1982 and 1990 is projected for those grid cells which were identified as having agricultural activity in the 1975 Niagara Frontier Emissions Inventory.

Based upon the data utilized, coupled with the applicability of the data to the area source, the growth factors presented by grid cell in Appendix A for construction land area - cropland are considered reliable.

ROCK HANDLING AND STORAGE

The rock handling and storage category represents the dust emissions from storing and handling crushed stone or gravel.

During the 1975 Niagara Frontier Emissions Inventory, information was obtained from the Mined Land Reclamation Permit program of the NYSDEC, which included tons of materials processed from the point source inventory, and provided the basis for assigning allocation factors for this area source to the respective grid cells.

To project growth for the years 1982 and 1990 for the rock handling and storage category in the course of the present study, it was determined that NYSDEC mined land reclamation data, coupled with either adjacent projected construction land area, or specific data obtained from the point source inventory would most closely define the growth or decline associated with this area source.

During the course of this study, contact was made with the seven major limestone quarrys within the region, requesting data on the quantity of material processed over a range of years. This information was provided by two of the quarrying operations, and was used to project growth factors.

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1 ENCRPB - 208 Water Quality Management Program, Report 6 Land Use - Present and Future, October 1978

For the small stone and gravel facilities, and the balance of the large limestone quarrys, a review of the NYSDEC Mined Land Reclamation Permits, and the projected construction land in areas contiguous to the facility provided the basis for projecting growth factors.

It was reasoned that quarrying and stone and gravel operations are closely associated with the construction industry, and any projected construction activity contiguous to the facility would suggest activity at the facility.

Growth factors for this area source range from 0 to 2.1 for the year 1982, and from 0 to 2.2 for the year 1990.

Based upon the data utilized, and the indirect applicability of the data to the area source, the growth factors presented by grid cell in Appendix A for the rock handling and storage category are considered questionable.

SLASH BURNING

The slash burning category refers to the agricultural burning activities that occur in Niagara County. During the 1975 Niagara Frontier Emissions Inventory, data was extracted from NYSDEC burning permits. A review of the permits then provided the basis for estimating the quantity of material burned, as well as the location of each fire. This provided the basis for assigning the quantity of material burned within a specific grid cell.

To project growth for the years 1982 and 1990 for the slash burning category for the purposes of the present study, it was determined that land use data would most closely approximate the growth or decline associated with this area source.

Agricultural land use data from the ENCRPB 208 Water Quality Management Program[1], which provides data on existing and projected land use through the year 2000 for the Erie-Niagara Region, was considered the most current, reliable and applicable data to utilize.

Since active agricultural land use within the region is projected to be constant through the year 1990, the associated growth factors for the slash burning category are projected to remain the same.

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1 ENCRPB - 208 Water Quality Management Program, Report 6 Land Use - Present and Future, October 1978

Consequently, the growth factor of 1.0 for both 1982 and 1990 is projected for this area source.

Based upon the data utilized, coupled with the applicability of the data to the area source, the growth factors presented by grid cell in Appendix A for the slash burning category are considered reliable.

STRUCTURAL FIRES

The structural fire category pertains to emissions resulting from building fires.

In the 1975 Niagara Frontier Emissions Inventory, 1975 NYSEDB county populations, and the nationwide average of 4 fires per 1000 population provided the base data utilized to project emissions for this area source. This information was then allocated to grid cells utilizing the 1973 NFTC Traffic Analysis Zone population data.

In projecting growth for the years 1982 and 1990 for structural fires in this study, it was determined that population data would closely approximate the growth or decline associated with this area source.

Population data from the ENCRPB 208 Water Quality Management Program[1], which provides information on existing and projected population through the year 2000 for the Erie-Niagara Region was considered the most applicable, current and reliable data available.

As previously reported, 1" = 2 mile population dot maps were utilized to determine areas of growth or decline.

By superimposing the 1" = 2 mile Erie-Niagara grid cell map over the respective population dot maps, a determination as to the present population as well as change in population per grid cell for the years 1980 and 1990 was noted.

Since population data for 1982 was not available, a straight line interpolation of 1980 and 1990 data was used.

ENCRPB - 208 Water Quality Management Program, Report 5, Population - Present and Future, October 1978

Growth factors for this area source range from 0.25 to 2.62 for 1982, and from 0 to 5.00 for 1990

Based upon the detail and age of the data utilized, together with the geographical fit of the data to the grid cell matrix, the growth factors presented by grid cell in Appendix A for the structural fires category are considered reliable.

REENTRAINED DUST

The reentrained dust category represents tire wear and reentrainment of road surface particulate matter.

A review of the 1975 Niagara Frontier Emissions Inventory indicates that NYSDOT vehicle miles traveled data within Traffic Analysis Zones was considered in developing allocation factors for this area source.

For the present report, it was determined that existing and projected vehicle miles traveled data would most closely approximate the growth or decline associated with the reentrained dust category, and would provide a basis for developing growth factors for 1982 and 1990.

This type of information, that is, existing (1975) and projected VMT data to the year 1985 by Traffic Analysis Zones, was provided by the Niagara Frontier Transportation Committee. An interpolation and extrapolation of this data provided vehicle miles traveled by traffic analysis zones for the years 1982 and 1990 respectively.

Growth projections were then generated by comparing the 1982 and 1990 vehicle miles traveled data with those obtained for 1975, by Traffic Analysis Zone.

These growth factors were then disaggregated from the Traffic Analysis Zone to the grid cell level as detailed in Table 2.

Growth Factors for this area source range from 0.93 to 3.25 for the year 1982, and from 0.86 to 5.84 for the year 1990.

Based upon the detail of the data utilized coupled with the applicability of the data to the area source, the growth factors presented by grid cell in Appendix A for the reentrained dust category are considered to be reliable within the metropolitan areas and first ring towns of the region.

INDUSTRIAL PROCESS SOURCES

The industrial process category refers to the combustion of fuel or the generation of particulates as a result of processes undertaken within a manufacturing facility to produce a particular item or product.

This category includes all small point sources that are not accounted for and treated as discreet point sources in Air Quality Dispersion modeling efforts.

During the 1975 Niagara Frontier Emissions Inventory, 264 point sources having emissions greater than 25 tons per year were considered. Within the scope of this study, due to time constraints, 63 industrial facilities were considered and evaluated with regards to growth. These 63 facilities account for approximately 180 point sources with emissions greater than 25 tons per year.

As a result, some of the facilities which were considered as discreet point sources during the 1975 Emissions Inventory, are now being accounted for under the industrial process category.

To account for the range in diverse manufacturing processes that are found within the Erie-Niagara Region, this category was further refined by considering the specific type of industry group. As a result, our analysis of this category led us to consider the Standard Industrial Classification (SIC) System for the manufacturing category, SIC groups 20, and 22 through 39 inclusive, within the 316 grid cells that comprise the region.

Data which was utilized for this category included the following:

1. New York State Department of Labor (NYSDOL) employment projections by industry type for the Buffalo-Niagara Falls Standard Metropolitan Statistical Area (SMSA) for the year 1985, which was furnished by the New York State Department of Environmental Conservation, Division of Air Resources,

2. Employment and geographical location of specific industries, from the Industrial Directory of the Buffalo Area Chamber of Commerce (1976-77) and the Niagara Falls Chamber of Commerce, and

3. Information obtained from meetings with and/or questionnaires received from a select group of facilities which contained point sources emitting large amounts of pollutants, and considered during this study as a 'facility'.

The methodology used to derive the individual growth factors for each separate SIC group included the following:

1. The industrial facilities from the industrial directories were screened for their total employment and those listing fifty or more employees were disaggregated into separate lists, one for each general SIC group.

2. The facilities on each such list were then geographically located and assigned to a particular grid, along with their respective employment data.

3. The NYSDOL employment projections by industry type for the Buffalo-Niagara Falls SMSA was interpolated for the year 1982, and extrapolated to the year 1990, and provided the general trend guidelines for each SIC group.

4. For those SIC groups where information had been obtained during personal interviews with facilities where growth factors had been projected for the facility, a comparison of the projected growth of the facility and the general trend indicated by NYSDOL employment projections was made.

5. The facilities within the specific SIC group which were not interviewed or corresponded with, were then provided adjusted growth factors to balance the trend indicated by the NYSDOL employment projections.

6. If for a particular SIC group, there was no facility that had been interviewed or corresponded with, the growth projections for the facilities were then assigned uniformly, again to insure that the NYSDOL employment projection trends would hold.

The end result of this analysis was a 19 by 316 matrix (i.e., 19 SIC groups and 316 grid cells) represented by a series of tables, one for each industry group, as presented in Appendix A.

Each number in the tables represents the growth factor for that particular industry group for a particular grid. For some grids, as can be seen, no number is given, which indicates that no facilities belonging to that SIC group were found to be located in that grid.

Based upon the methodology employed, and considering that approximately 1300 industrial facilities were reviewed, the growth factors projected for this area source are believed to be reasonably reliable.

CHAPTER III

FACILITY SOURCE GROWTH FACTORS

For the 1975 Niagara Frontier Emission Inventory, a comprehensive update and identification of all point sources which emit more than 25 tons per year of particulates or sulfur dioxide was completed. In that study, 264 point sources having emissions greater than 25 tons per year were identified.

For the current study, the New York State Department of Environmental Conservation identified 63 facilities which that agency believed warranted further consideration. The criteria for this selection process was that the facility be either within or contiguous to our area of non-attainment, or generate emissions of greater than 50 tons per year of either of the two pollutants.

It should be stated that during the 1975 study, specific point sources (i.e., stacks) were tabulated, while during the course of this study, growth factors for facilities (in most cases industrial plants which could include many stacks) were developed. As a result, the 63 facilities that were considered during this study, do not necessarily correspond to the same number of point sources.

The facilities were analyzed for growth through the year 1990, using 1975 as a base year to develop growth factors. A standard questionnaire used to solicit pertinent data for these projections is presented in Appendix C.

What follows in this chapter is a brief discussion of each facility considered in the study, a description of what was considered to be significant in projecting growth for each, and an estimate of the reliability of the growth factors that were generated.

The estimates of the reliability of the growth factors consist of one of the following three descriptors: "reasonably accurate", "questionable", and "unreliable". A discussion on each of the descriptors follows:

1. "Reasonably accurate" was used when describing firm growth factors based on what was considered sufficient information.

Confidence in the growth projection is expressed in this statement.

2. "Questionable" is used when describing growth factors based on only partially sufficient information. This descriptor indicates that the projections are open to debate within a longer range than those considered "reasonably accurate".

3. "Unreliable" is essentially a no-confidence statement based on very sparse or conflicting data.

Each of the facilities have been located geographically using the Universal Transverse Mercator (UTM) coordinate system, the same system used in the 1975 Niagara Frontier Emissions Inventory.

The growth factors for each facility are shown in Appendix B.

BETHLEHEM STEEL CORPORATION

The Bethlehem Steel Corporation is located within the western portion of the City of Lackawanna Universal Transverse Mercator (UTM) coordinates 745.8 - 748.5 N, and 184.8 - 185.8 E. Coke oven batteries, blast furnaces, a scrap melter, lime kilns, sinter machines and basic oxygen furnaces form the primary steel operations. Slab and billet mills, bar mills, hot and cold strip mills and a galvanizing mill produce the primary products made at the Lackawanna facility. These products are utilized by various heavy construction industries, as well as other large scale steel users.

Because the facility was located in an area which currently does not meet air quality standards, and because of the quantity of emissions generated, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility.

While interviewing the facility, several factors listed below were considered significant. They included:

1. There has been a decline in production since 1970, with permanent cutbacks in operations as of August 1977 involving the layoff of 3,500 employees.

2. They are operating 3 shifts, 365 days per year.

3. Present wastewater treatment is considered expensive; and costs are expected to increase when an additional treatment facility, now under construction, is brought into service.

4. There are plans to install a basic oxygen furnace process computer, and

5. Where practical, there is an ongoing energy conservation program.

In projecting growth factors for this facility, the following were considered as most significant:

1. Company representatives indicated that the SIP could have an adverse impact if unneeded control strategies are adopted.

2. The Environmental Protection Agency's more stringent Water Quality Standards, and future National Pollutant Discharge Elimination System (NPDES) Permit requirements are cited as possibly having a tremendous impact on future growth and production.

3. According to the company, taxes in Lackawanna are 2-8 times higher than in their other major steel producing plants.

4. Both transportation costs and regulations have affected production since the market is some distance from the plant. Transport on the New York State Thruway has created serious problems with respect to the type of trailers used and the large tonnage shipped.

5. The representative indicated that this facility will achieve its production capabilities for the year 1978.

6. Production data, used for years 1975 through 1978 indicate an overall increase projected for the future.

Based on the data supplied by this facility, the projected growth factors of 1.04 for 1982 and 1.09 for 1990 are considered to be reasonably accurate.

CLARENCE HACKETT INC.

Clarence Hackett, Inc. is located within the City of Lackawanna at UTM coordinates 746.3N and 184.3 E. The company reclaims the ferrous metallic portion from slag and resells it back to Bethlehem Steel, as well as performing various other services for the company.

Although the facility was located in an area which currently does not meet air quality standards, it was decided that a standard questionnaire would be utilized to solicit pertinent information regarding the facility in lieu of a personal interview. This decision was based upon the quantity of emissions generated at the facility.

The questionnaire returned by Clarence Hackett indicated that they are solely dependent on the operation of Bethlehem Steel since they are the only steel mill in Erie and Niagara County serviced by this company.

Based on the information contained in the questionnaire prepared by both this facility and Bethlehem Steel, the projected growth factor of 1.04 for 1982 and 1.09 for 1990 are considered questionable.

ASHLAND PETROLEUM COMPANY

The Ashland Petroleum Company is a refinery producing gasoline, oil, ashphalt and other petroleum based products for distribution throughout western New York and Canadian outlets. The plant is located with the Town of Tonawanda at UTM coordinates 767.6 N and 180.1 E.

Since the facility was located in an area which is currently unclassified by air quality standards, and because of the quantity of emissions generated, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility.

During an interview with a company official, it was learned that the facility's current production and employment are stable. Although the company owns vacant property which could be used for expansion, no plans to do so were projected. It was also noted that increased operating costs are directly passed on to the consumer in the product price, thus maintaining a stable profit structure.

In projecting growth factors for this facility, continued stable production appeared to be the most significant item.

Based on the personal interview and the completed questionnaire, the projected growth factors of 1.05 for 1982 and 1.10 for 1990 are considered questionable.

NIAGARA MOHAWK HUNTLEY STEAM STATION

The Niagara Mohawk Steam Station is located within the Town of Tonawanda at UTM coordinates 767.9 N and 179.3 E. The station generates electrical power utilizing pulverized coal as its fuel. Over the past eight years, this plant has generated an average of 4.07×10^6 MWH on a yearly basis.

Because the facility was located in an area which is currently unclassified by air quality standards, and because of the quantity of emissions generated, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility.

During the interview, it was learned that the company is run on a continuous three-shift per day, seven days per week schedule. Also significant was them striving to obtain only low content sulphur coal for use in power generation.

In projecting growth factors, the following information was considered as most significant:

1. Projected coal consumption from Federal Power Commission form 67 entitled "Steam Electric Plant Air and Water Control Data for the Year Ended December 31, 1977", which was utilized to obtain yearly coal consumption, provided the following:

   a. 1975 coal consumption totaled 1.742 million tons per year.

   b. 1982 coal consumption was projected to be 2,000 million tons per year.

   c. 1990 coal consumption, extrapolated from 1987 projections is projected to be 1,920 million tons per year.

Based on data provided by this facility, the projected growth factors of 1.15 for 1982 and 1.10 for 1990 are considered to be reasonably accurate.

DUNLOP TIRE AND RUBBER COMPANY

The Dunlop Tire and Rubber Company is located within the Town of Tonawanda at UTM coordinates 764.9 N and 180.4 E. The company manufactures replacement vehicle tires with distribution to the general public through wholesale and retail stores.

Although the facility was located in an area which is currently unclassified by air quality standards, it was decided that a standard questionnaire would be utilized to solicit pertinent information regarding the facility in lieu of a personal interview, since the quantity of emissions is an order of magnitude less than other facilities within this area.

The questionnaire returned by Dunlop indicated that no recent pollution control equipment has been installed and that the effects of water pollution controls in the plant are minimal at this time. Taxes, however, have impacted on the operation of the plant.

In projecting growth factors for this facility, fuel consumption figures for the years 1974 through 1977 were considered as significant.

Based on data supplied by the facility, the projected growth factors of 1.05 for 1982 and 1.12 for 1990 are considered questionable.

FMC CORPORATION

The FMC Corporation, Industrial Chemical Division is located within the Town of Tonawanda at UTM coordinates 765.1 N and 179.8 E. The company manufactures peroxygen chemicals which it sells to the detergent, plastics and metal etching industries.

Although the facility was located in an area which is currently unclassified by air quality standards, it was decided that a standard questionnaire would be utilized to solicit pertinent information regarding the facility in lieu of a personal interview.

The questionnaire returned by FMC indicated that the company is not producing at capacity and production has declined since 1970, although it has been relatively stable since 1973.

In projecting growth factors, their stable production since 1973, as well as the effects of taxes, environmental and safety regulations, as included in the questionnaire, were significant factors to be considered.

Based on data supplied by this facility, the projected growth factors of 1.0 for 1982 and 1.0 for 1990 are considered to be unreliable.

J. H. WILLIAMS COMPANY

The J. H. Williams Company is located within the Town of Tonawanda at UTM coordinates 764.0 N and 181.5 E. The company is engaged in the forging, heat-treating, machining and polishing of steel hand tools which are sold to various distributors for retail sale under different name brands.

Although the facility was located in an area which is currently unclassified by air quality standards, it was decided that a standard questionnaire would be utilized to solicit pertinent information regarding the facility in lieu of a personal interview.

The questionnaire returned by J. H. Williams indicated that, while most environmental, Occupational Safety and Health Act (OSHA) and safety regulations are not impacting on the plant taxes, the cost of labor, inflation, and energy costs are. The fact that any future expansion of this company would be assumed by their Columbus, Georgia facility was also considered significant.

A large portion of their product line now being manufactured in the new plant in Georgia, and the impact of additional costs imposed by the Buffalo Sewer Authority are considered significant in projecting growth factors.

Based on data supplied by this facility, the projected growth factors of 1.0 for 1982 and .91 for 1990 are considered to be questionable.

TONAWANDA COKE COMPANY

The Tonawanda Coke Company is a producer of foundry coke, located within the Town of Tonawanda at UTM coordinates 766.3 N and 179.8 E. The Company's product is used mainly by the Chevrolet Tonawanda and various other U.S. and Canadian foundries.

Because the facility was located in an area which currently does not meet air quality standards, and because of the quantity of emissions generated, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding this facility.

While interviewing the facility, it was learned that the plant was recently purchased, and the company is newly formed. The representative indicated that environmental factors are critical to the operation of this plant although not prohibitive at this time. Also significant was the indication by the representative that the Chevrolet foundry has become heavily dependent on this facility for its coke.

In projecting growth factors, the continued operation of the Chevrolet foundry, and the ability to ship coke to Canadian customers were the most significant factors.

Based on data supplied by this facility, a projected growth factor of 1.01 for 1982 and 1.00 for 1990 can be considered to be reasonable accurate.

CHEVROLET MOTOR DIVISION PLANTS

The Chevrolet Motor Division Plants (i.e., Plants #1 and #4) are located within the Town of Tonawanda at UTM coordinates 764.3 N and 180.9 E, and 764.3 N and 180.8 E, respectively. The facilities are engaged in the machining and assembly of automobile engines for various General Motors products.

Because the facilities are located in an area which currently is unclassified by air quality standards, and because of the quantity of emissions generated, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding their operations.

While interviewing the facilities, it was learned that the company has an ongoing energy conservation program, an Occupational Safety and Health Act safety regulation program, and are willing to modify process lines for energy cost savings if it can be done in an acceptable amount of time. That there are no tax or other environmental problems to hinder the plant's operations and expansion as a possibility were also considered significant.

The questionnaire lacked any production or employment information and none was discussed while interviewing since the company considered this information too confidential. In projecting growth factors, reliance was placed on data as indicated by other auto parts manufacturers, as well as the general outlook for the future.

Based on information provided by the company and corroborating data from other auto parts manufacturers, the projected growth factors of 1.40 for 1982 and 1.45 for 1990 are considered reasonably accurate.

CHEVROLET METAL CASTING PLANT

The Chevrolet Metal Casting Plant (i.e., Plant #2) is a major gray iron casting foundry located within the Town of Tonawanda at UTM coordinates 764.1 N and 180.9 E. The company's primary product consists of cast engine blocks, steering linkages, brake drums and raw gear assemblies. These products are shipped to various Chevrolet Motot Division assembly plants as well as the Delco Parts Division.

Since this facility was located in an area which is currently unclassified by air quality standards, and because of the quantity of emissions generated, it was decided that a standard questionnaire followed up with a personal interview would be used to solicit pertinent information regarding the facility.

From the information gathered from these sources, it was learned that the Chevrolet Motor Division is planning to introduce a new line of energy-saving engines within the near future. It was also noted that the geographical location of the plant, which is relatively new, is ideal for obtaining coke and other raw materials necessary for foundry operations.

The most significant item in projecting growth factors appeared to be the introduction of the company's energy-saving engine for a new type of automobile to be marketed soon. However, it was noted that any growth of the facility would be dependent upon the variables of the automobile industry.

Based on the information provided by the company, the projected growth factors of 1.40 for 1982 and 1.45 for 1990 can be considered to be reasonably accurate.

CHEVROLET FORGE PLANT #3

The Chevrolet Forge (i.e., Plant #3), a producer of automotive components, is located within the Town of Tonawanda at UTM coordinates 764.3 N and 180.8 E. The company's products are used by various General Motors Divisions in the production of auto parts.

Because the facility was located in an area which currently does not meet air quality standards, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility. However, due to the difficulty Chevrolet had with their Detroit facility in obtaining permission for an interview and releasing information on the questionnaire, information from other Chevrolet Divisions and auto parts manufacturers already interviewed were used.

Since all divisions of Chevrolet are dependant upon each other, it was assumed that growth factors would not vary significantly between divisions.

Based on data supplied by other auto parts manufacturers, the projected growth factors of 1.40 for 1982 and 1.45 for 1990 are considered to be reasonably accurate.

FORD MOTOR COMPANY

The Ford Motor Company is a metal stamping plant located within the Village of Blasdell at UTM coordinates 744.1 and 185.6 E. The stampings produced at this plant are shipped to the company's various assembly divisions throughout the country.

Since the facility was located adjacent to an area which currently does not meet air quality standards, it was decided that a standard questionnaire followed by a personal interview would be used to solicit pertinent informa-

tion regarding this facility. Although representatives of the company declined to be interviewed, they did complete and return the questionnaire.

The only significant fact that appeared on the questionnaire was that the company is considering expanding its parking lot to accommodate more employees, It was also noted that, for the past 8 years, the company has shown a moderate increase in employment; however, production figures were not available. The plant, which is comparatively new, is considered at maximum size for efficient operation.

Based on the company's moderate employment growth within the past decade, the projected growth factors of 1.40 for 1982 and 1.45 for 1990 were considered to be reasonably accurate.

BUFFALO COLOR CORPORATION

The Buffalo Color Corporation is a dye manufacturer located within the City of Buffalo at UTM Coordinates 757.5 N and 185.5 E. The company produces dyes and organic chemicals for various industries. It is the only indigo blue dye plant in the nation, selling to blue denim manufacturers, but it's customers also include the food, fabric, cosmetic and plastics industries.

Because the facility was located in an area which currently does not meet air quality standards, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility.

While interviewing Buffalo Color, several factors appeared significant. They included the following:

1. The company has only one facility.

2. It is the only producer of indigo dye for blue jeans.

3. The company was formed from the dye division of Allied Chemical.

4. They have sufficient land for development, and are in the process of demolishing old buildings for future growth.

5. They are concentrating on profitable produce lines and dropping less profitable ones, so that total production may be down, but the profitability of the company has increased.

In projecting growth factors, the company's concentration on profitable lines, enjoying a good share of their market, and optimistic indications by the company representative that the company will grow were considered significant factors.

Based on information provided by the company representatives, the projected growth factors of 1.50 for 1982 and 1.61 for 1990 are considered to be reasonably accurate.

THE AMERICAN MALTING COMPANY

The American Malting Company is a producer of brewers malt and is located within the City of Buffalo at UTM coordinates 752.5 N and 184.3 E. The company's product is used primarily by brewers throughout the country.

Although this facility was located in an area which currently does not meet air quality standards, it was decided that a standard questionnaire would be used to solicit pertinent information regarding the facility in lieu of a personal interview. This decision was based upon the quantity of emissions generated at the facility.

It was noted on the returned questionnaire that there had been no new investments in processing equipment by the company since the mid-sixties; however, a substantial expenditure for pollution control equipment was made during the past year. The questionnaire also cited tax disadvantages as a negative factor when compared to those in other states.

In projecting growth factors, the most significant items included a fluctuating trend in production and employment which at this time appears to be declining and anticipated high water pollution control costs which will occur when the facility connects to public sewers.

Based on data supplied by this company, the projected growth factors of 0.91 for 1982 and 0.85 for 1990 are considered questionable.

ANACONDA COMPANY

The Anaconda Company, a manufacturer of copper and brass products, is located within the City of Buffalo at UTM coordinates 762.3 N and 182.4 E. The company's products are used primarily by the automotive industry in the manufacture of radiators.

Although the facility was located in an area which currently meets air quality standards, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility. This decision was based upon the quantity of emissions generated at the facility.

Representatives of the company expressed optimistic projections for the copper and brass industry, with a 100% increase in growth forecast by 1990. It was noted that the company recently acquired additional property and is currently undergoing a $10 million expansion program. Although company officials appeared enthusiastic about the company's future, some concern was expressed over electrical rates in this energy intensive industry.

In projecting growth factors for this facility, current installation of a new furnace with a second scheduled for completion by 1983 was considered the most significant item.

Based on information provided by company officials during an interview the projected growth factors of 1.45 for 1982 and 2.00 for 1990 were considered to be reasonably accurate.

BUFFALO EVENING NEWS

The Buffalo Evening News is a daily newspaper located within the City of Buffalo at UTM coordinates 754.3 N and 183.5 E. The company is engaged in the printing and distribution of a daily newspaper for the general public.

Although the facility was located in an area which currently does not meet air quality standards, it was decided that a standard questionnaire would be utilized to solicit pertinent information regarding the facility in lieu of a personal interview. This decision was based upon the quantity of emissions generated at the facility.

The questionnaire returned by Buffalo Evening News indicated that they recently added a Sunday morning edition to its circulation, this increasing production. Representatives of the paper indicated that they were optimistic regarding continued growth in circulation.

In projecting growth factors, expanded production was considered a significant factor, although no data was available to substantiate this expansion. However, detailed statistics concerning fuel consumption were provided.

Based on data supplied by this facility, the projected growth factors of 1.25 for 1982 and 1.40 for 1990 are considered to be reasonably accurate.

BUFFALO CONSERVATORY

The Buffalo South Park Conservatory, located within the City of Buffalo at UTM coordinates 748.6 N and 187.3 E, services as the city's botanical gardens which house a variety of tropical and sub tropic flora.

Although the facility was located in an area which currently does not meet air quality standards, and because of the quantity of emissions generated, it was decided that a standard questionnaire would be utilized to solicit pertinent information regarding the facility in lieu of a personal interview.

In projecting growth factors for this facility, it was noted that heating oil consumption has remained constant over the past 5 years.

Based on the above data, the projected growth factors of 1.00 for 1982 and 1.00 for 1990 were considered to be reasonably accurate.

BUFFALO WEST SIDE INCINERATOR

The Buffalo Municipal Interceptor plant is located within the City of Buffalo at UTM coordinates 759.6 N and 181.5 E. The incinerator has been used by the City of Buffalo to dispose of approximately 100,000 tons of solid waste per year.

Since the facility was located in an area which currently meets air quality standards, it was decided that a standard questionnaire would be utilized to solicit pertinent information regarding the facility in lieu of a personal interview.

With regards to projecting growth factors for this facility, it was noted that the city closed this facility and that it is now being used as a transfer station. Consequently, the projected growth factors of 0 for 1982 and 0 for 1990 were considered reasonably accurate.

COMMODORE PERRY HOMES & EXTENSION

The Commodore Perry Homes & Extension is located within the City of Buffalo at UTM coordinates 753.7 N and 184.[illegible] E. The facility is an apartment house complex and high rises having 1244 units, with occupancy dominated by the elderly.

Although the facility was located in an area which currently does not meet air quality standards, it was decided that a standard questionnaire would be utilized to solicit pertinent information regarding the facility in lieu of a personal interview, since the quantity of emissions is an order of magnitude less than other facilities.

Although the questionnaire was not returned, a telephone conversation with a representative indicated that there are no plans for expansion or additions since no land is available. It was noted, however, that since the elderly occupants prefer high rise living, the apartments are being gradually renovated to provide more units. Although there are more home units vacant now than in 1975, planned modernization and rehabilitation should increase occupancy. In projecting growth, fuel consumption based on occupied units was considered significant.

Based on the telephone conversation data provided, the projected growth factors of 1.05 for 1982 and 1.10 for 1990 were considered questionable.

DONNER-HANNA COKE COMPANY

The Donner-Hanna Coke Company is located within the City of Buffalo at UTM coordinates 751.6 N and 186.4 E. The company produces blast furnace and foundry coke, with plans to sell sulphuric acid from its coal desulphurization process. The largest outlet for the company's products are the iron and steel industries, specifically Hanna Furnace and Republic Steel.

Because the facility was located in an area which currently does not meet air quality standards, it was decided that a standard questionnaire and a

personal interview would be utilized to solicit pertinent information regarding the facility.

During the interview, several factors appeared to be most significant. They included the following:

1. The coke manufacturing machinery is a very costly investment and it is very difficult to obtain financing of new coke ovens.

2. Environmental factors are restrictive in the coke industry, and the company has expended considerable capital to comply with environmental regulations.

In projecting growth factors, the company's investment in new capital construction for the desulpherization plant, its dependancy on Donner-Hanna Coke, and foreign competition were all considered significant factors.

Based on data supplied by the facility, the projected growth factors of 1.08 for 1982 and 1.15 for 1990 can be considered reasonably accurate.

CHEVROLET GEAR AND AXYLE

The Chevrolet Gear and Axyle plant is located within the City of Buffalo at UTM coordinates 758.6 N and 188.2 E. The company is a major producer of automotive rear axles and steering linkage assemblies for various General Motor assembly plants throughout the country.

Although the facility was located in an area which currently meets air quality standards, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility. This decision was based on the quantity of emissions generated at the facility.

Although the company officials expressed confidence in the plant's future during an interview, there appeared to be some uncertainty over the future of the automobile industry as a whole. The company, it was noted, has enjoyed stable employment throughout the past and has expanded its rear axle production. However, it was brought out during the interview that plant expansion is unlikely because of a lack of available land.

In projecting growth factors for this facility, the trend toward front wheel drive axles would undoubtedly have an impact on rear axle production.

Based on information provided during a personal interview with company officials and the completed questionnaire, the projected growth factors of 1.15 for 1982 and 1.25 for 1990 are considered to be reasonably accurate.

GENERAL MILLS

General Mills, Inc. is a flour mill and grain elevator located in the City of Buffalo at UTM coordinates 753.7 N and 183.1 E. The company is engaged in the production of various grain products for consumption by the general public.

Because the facility was located in an area which currently is unclassified by air quality standards, and because of the quantity of emissions generated at the facility, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility. However, the company declined to participate in an interview or return the questionnaire.

In projecting growth for this company, projected data on the amount of grains moving through the Port of Buffalo on vessels, as obtained from the Economics Section of the United States Army Corps of Engineers, Buffalo District, was utilized.

Based on the limited information available, the projected growth factors of 1.5 for 1982 and 1.6 for 1990 are considered questionable.

WESTVACO, H & D CONTAINER DIVISION

The Westvaco H & D Container Division is located within the City of Buffalo at UTM coordinates 754.8 N and 187.2 E. The company is engaged in the manufacture of corrugated shipping containers which are used by most industries who ship their product in boxes.

Because the facility was located in an area which currently meets standards, it was decided that a standard questionnaire would be utilized to solicit pertinent information regarding the facility in lieu of a personal interview.

The questionnaire returned by the H & D Container Division indicated that there is a possibility of adding a third shift, and of acquiring additional property. Also, they have an energy conservation program, lowering their consumption by 30% since 1972.

In projecting growth factors, a recent increase in production after several years of fluctuation, and the optimism concerning additional shifts, property and energy were considered significant factors.

Based on data supplied by this company, the projected growth factors of 1.10 for 1982 and 1.17 for 1990 are considered questionable.

HANNA FURNACE CORPORATION

The Hanna Furnace Corporation is located within the City of Buffalo at UTM coordinates 749.7 N and 184.9 E. The company produces pig iron ingots for various foundaries and hot pig iron for Shenango Steel, located adjacent to the facility.

Because the facility was located in an area which currently does not meet air quality standards, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility.

During the interview, Hanna Furnace indicated that foreign competition is seriously effecting its operation, as well as the steel industry in general. The company, which is owned by National Steel, controls one-half interest in Donner-Hanna Coke, which supplies all coke for Hanna Furnace and Republic Steel.

In projecting growth factors, foreign competition and the possibility of acquiring additional business from a midwestern competitor who is going out of business were considered significant factors.

Based on data supplied by the facility, the projected growth factors of .80 for 1982 and .62 for 1990 are considered to be questionable.

ALLIED CHEMICAL CORPORATION

The Allied Chemical Corporation, a major producer of inorganic chemicals and oxalic acid, is located within the City of Buffalo at UTM coordinates 766.3 N and 179.8 E. The company's products are used primarily by the iron and steel industries.

Since the facility was located in an area which currently does not meet air quality standards, it was decided that a standard questionnaire and a

personal interview would be utilized to solicit pertinent information regarding the facility.

During a subsequent interview with a company spokesman, it was learned that the Allied Chemical plant is the only facility in the United States producing oxalic acid. It was also noted that during the past several years, two subsidiary facilities were dropped from their operations. These facilities included the Dye division (now Buffalo Color) and the Semet Solvay division (now Tonawanda Coke). The spokesman declared that the Buffalo plant is not competitive with similar plants because of the cost of doing business locally, taxes and workmen's compensation considerations. Other factors such as Canadian imports and competition from a local coke producer coupled with a declining areawide market tended to erode the profitability of the Buffalo operations.

Based on the information provided by the company spokesman, the projected growth factors of 0.90 for 1982 and 0.80 for 1990 are considered questionable.

INTERNATIONAL MULTIFOODS COMPANY

The International Multifoods Company is a flour mill and grain elevator located within the City of Buffalo at UTM coordinates 752.5 N and 184.4 E. The company is engaged in the production of flours from various grains for the baking industry.

Although the facility was located in an area which currently does not meet air quality standards, it was decided that a standard questionnaire would be utilized to solicit pertinent information regarding the facility in lieu of a personal interview. This decision was based upon the quantity of emissions generated at the facility.

The questionnaire returned by International Multifoods indicated that they have enjoyed stable production and employment since 1970 and are planning capital investments in equipment. Also significant was the complaint by representatives that taxes, labor, power, and transportation costs are all impacting heavily on the plant.

In projecting growth factors, the company's stable production and employment over the last seven years was considered a significant factor.

Based on data supplied by this facility, the growth factors of 1.0 for 1982 and 1.0 for 1990 are considered questionable.

TOWN OF TONAWANDA INCINERATOR

The Town of Tonawanda incinerator is located within the Town of Tonawanda at UTM coordinates 767.5 N and 181.8 E. The facility provides incineration and sanitary landfill services for the Town of Tonawanda and the Village of Kenmore.

Although the facility was located in an area which is currently unclassified by air quality standards, it was decided that a standard questionnaire would be utilized to solicit pertinent information regarding the facility since the quantity of emissions is an order of magnitude less than that for other facilities in this area.

The questionnaire returned by the facility indicated only a "marginal" possibility of acquiring any additional property to increase the operation, with no problems anticipated in any specific areas. The questionnaire returned provided little information on possible future plans for the facility.

Because the activities at the facility are dependent upon the quantities of solid waste generated, population projections for the Town of Tonawanda and the Village of Kenmore were used in predicting activity at this facility.

Based upon population projections from the ENCRPB 208 Water Quality Management Program[1], growth factors of 1.03 for 1982 and 1.05 for 1990 are indicated. These growth factors are considered questionable.

MARINE DRIVE APARTMENT COMPLEX

The Marine Drive Apartment Complex is a series of high rise, high density dwelling units located within the City of Buffalo at UTM coordinates 754.6 N and 183.0 E. The complex provides housing for lower income households.

Although the facility was located in an area which currently does not meet air quality standards, it was decided that a standard questionnaire and interview would be utilized to solicit pertinent information regarding the facility in lieu of a personal interview.

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1 ENCRPB - 208 Water Quality Management Program, Report 5, Population - Present and Future, October 1978

The questionnaire returned by the complex indicated that the complex is usually 100% occupied with the present occupancy rate expected to continue, and that there are no plans for expanding the size of the complex.

Since the occupancy rate for the apartments does not fluctuate, consumption of #6 fuel oil, and therefore emissions, are dependent only on weather conditions.

Based on data supplied by this facility, the projected growth factors of 1.00 for 1982 and 1.00 for 1990 are considered to be reasonably accurate.

MERCY HOSPITAL

Mercy Hospital is a health facility located within the City of Buffalo at UTM coordinates 251.6 N and 188.4 E. The hospital is a general admissions facility serving the public.

Although the facility was located in an area which currently does not meet air quality standards, it was decided that a standard questionnaire would be utilized to solicit pertinent information regarding the facility in lieu of a personal interview. This decision was based upon the quantity of emissions generated at the facility.

The questionnaire returned by Mercy Hospital indicated that they are presently installing additional boiler equipment, and have, in the last six months, reduced #6 oil consumption, using only natural gas for the last six months. They also indicated that growth for this facility is regulated by New York State.

In projecting growth factors, considered significant was the fact that, although doubling their boiler equipment, they expect only a 10 - 20% increase in fuel consumption.

Based on data supplied by this facility, the projected growth factors of 1.15 for 1982 and 1.15 for 1990 are considered to be questionable.

MOBIL OIL CORPORATION

The Mobil Oil Corporation, located within the City of Buffalo at UTM coordinates 252.8 N and 187.2 E, is a major refiner of Canadian crude oil. The refined petroleum is used as fuel oil and gasoline fuel.

This facility is located in an area which currently does not meet air quality standards, and as such, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility. Company representatives, however, refused to grant a personal interview, but did agree to complete and return the standard questionnaire.

It was noted in the questionnaire that Mobil Oil Refinery is one of two refineries located in New York State; the other being Ashland Oil Refinery in Tonawanda. The company representative noted that substantial capital investments were made in the past for water pollution abatement facilities and that future costs were expected to be considerable for handling process waste waters once the Buffalo Sewer Authority secondary sewage treatment facility is on line.

Stable employment and present plant capacity geared to meet current and long range product demands appeared to be the most significant items in projecting growth factors for this facility.

Based on the information provided in the questionnaire, the projected growth factors of 1.05 for 1982 and 1.05 for 1990 are considered questionable.

PEAVY COMPANY

The Peavey Company is a grain elevator and flour mill located in the City of Buffalo at UTM coordinates 752.4 N and 184.1 E. The company is engaged in the production of various grain products.

Although the facility was located in an area which currently is unclassified by air quality standards, it was decided that a standard questionnaire would be utilized to solicit pertinent information regarding the facility in lieu of a personal interview. This decision was based upon the quantity of emissions generated at the facility. However, the company declined to participate and returned the uncompleted questionnaire.

In projecting growth for this company, projected data on the amount of grains moving through the Port of Buffalo on vessels, as obtained from the Economics Section of the United States Army Corps of Engineers, Buffalo District, was utilized.

Based on the limited information available, the projected growth factors of 1.5 for 1982 and 1.6 for 1990 are considered questionable.

REPUBLIC STEEL CORPORATION

The Republic Steel Corporation is a steel mill located within the City of Buffalo at UTM coordinates 752.5 N and 186.1 E. The facility produces carbon alloy steel bars which it sells to the automotive, heavy machine equipment and related transportation industries.

Because the facility was located in an area which currently does not meet air quality standards, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility.

During the course of interviewing Republic, several factors appeared to be most significant. They included the following:

1. Due to the abandoned Right-of-Way dividing the property, the plant has a problem of materials handling.

2. The representatives indicated that raw materials will be difficult to bring in by ship in the future.

3. An abandoned row of conrail tracks divides the property which Republic is trying to purchase.

4. The company has recently expanded and updated their operations.

5. It is the only plant in the United States to pelletize slag and sell it at a profit.

In projecting growth factors, the company's plan to purchase land and modernize the plant, as well as constantly updating and improving the facility were considered significant. It was noted, however, that the steel market is moving west, giving Republic more competition since shipping is more expensive for eastern plants.

Based on data supplied by this facility, the projected growth factors of 1.02 for 1982 and 1.06 for 1990 can be considered to be reasonably accurate.

SHENANGO CORPORATION

The Shenango Corporation is located within the City of Buffalo at UTM coordinates 741.8 N and 181.8 E. The company is engaged in the manufacture of ingot molds for the casting industry.

Although the facility was located in an area which currently does not meet air quality standards, it was decided that a standard questionnaire would be utilized to solicit pertinent information regarding the facility in lieu of a personal interview. This decision was based upon the quantity of emissions generated at the facility.

The questionnaire returned by Shenango indicated that they have recently installed more efficient burners to aid in energy conservation with the possibility of new investments to change and improve methods of manufacture.

In projecting growth factors, there were several significant factors to consider. They included the following:

1. They are currently producing at 3 shifts per day, 6 to 7 days per week.

2. The units of primary process over the last 7 years indicate an increase in production.

3. The representative indicated that future forecasts call for a reduction in the demand of molds.

Based on data supplied by this facility, the projected growth factors of 1.01 for 1982 and 1.02 for 1990 can be considered to be reasonably accurate.

TRICO PRODUCTS CORPORATION
(Plants #2 and #3)

Plants #2 and #3 of the Trico Products Corporation are located within the City of Buffalo at UTM coordinates 750.6 N and 185.6 E; and 753.2 N and 186.7 E respectively. Trico Products is one of the largest producers of automotive wiper arms and blades, linkage systems and washing solvents. The primary market for the company's products is the automotive industry, in addition to a large consumer market for replacement parts.

Because the facility was located in an area which currently meets air quality standards, it was decided that a standard questionnaire would be

utilized to solicit pertinent information regarding the facility. After receiving the questionnaire, a representative of the company requested a personal interview at his facility to clarify questions contained within the questionnaire.

During the course of the interview, it was learned that production and employment at Trico Products Corporation are currently at maximum. However, it was noted by the company representative that production and employment are directly related to the fluctuating trend of automobile production. It was also noted by the company representative that competition from other manufacturers has made it imperative for the company to develop new product lines for future stability. The representative added that currently Trico Products has the most modern, up-to-date manufacturing equipment within the industry.

Maximum production and employment in addition to anticipated capital investments for potential new product lines appeared to be the most significant items in projecting growth factors.

Based on information provided by the company representative, the projected growth of 1.37 for 1982 and 1.37 for 1990 can be considered to be reasonably accurate.

WORTHINGTON CEI

The Worthington CEI Corporation, a major manufacturer of cast iron and brass compressors, is located within the City of Buffalo at UTM coordinates 753.2 N and 188.2 E. The company's customers include gas, oil, and chemical industries as well as the government.

Although the facility was located in an area which currently does not meet air quality standards, it was decided that a standard questionnaire would be utilized to solicit pertinent information regarding the facility in lieu of a personal interview since the quantity of emissions from the facility is in order of magnitude less than other facilities in the area.

At the request of a company representative, a follow-up interview was arranged to clarify questions contained within the questionnaire. It was noted during the interview that the compressor market is currently in a decline and that cutbacks in production are being considered. The only optimistic note sounded was that business may increase if natural gas is deregulated.

A declining market, pending lay-offs and little hope for expansion were the most significant items in projecting growth factors.

Based on the information furnished during the interview, the projected growth factors of 0.94 for 1982 and 0.94 for 1990 were considered to be reasonably accurate.

STATE UNIVERSITY OF NEW YORK AT BUFFALO

The State University of New York at Buffalo (SUNYAB) is an educational facility located within the City of Buffalo at UTM coordinates 762.5 N and 188.5 E. This particular facility is the heating plant for the SUNYAB Main Street Campus buildings.

Although the facility was located in an area which currently meets air quality standards, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility.

While interviewing the SUNYAB heating facility, it was indicated that the main thrust of University development is at the Amherst campus; and no growth is anticipated at the Main Street Campus. Therefore, there will be no need for expansion of this heating plant.

In projecting growth factors, considered a significant factor was that no growth is projected at this campus; and their consumption of coal and oil will likely remain the same.

Based on the data supplied by this facility, the projected growth factors of 1.0 for 1982 and 1.0 for 1990 can be considered to be reasonably accurate.

BUFFALO PUBLIC SCHOOL #65

Buffalo Public School #65 is an elementary grade school located within the City of Buffalo at UTM coordinates 764.0 N and 182.0 E.

Although the facility was located adjacent to an area which currently does not meet air quality standards, it was decided that a standard questionnaire would be used to solicit pertinent information regarding the facility in lieu of a personal interview.

Since most questions were not applicable to this type of facility, little significant data was contained in the questionnaire.

Fuel consumption did not relate to the number of children in attendance since a constant temperature is maintained throughout the facility regardless of attendance. Although expansion plans were unavailable, the declining population in the area would make expansion unlikely.

Based on the available data, the projected growth factor of 1.0 for 1982 and 1.0 for 1990 can be considered to be reasonably accurate.

UPSON COMPANY

The Upson Company is located within the City of Lockport at UTM coordinates 785.7 N and 198.5 E. The company manufactures and sells fiberboard products to various building industries.

Since the facility was located in an area which currently meets air quality standards, it was decided that a standard questionnaire would be utilized to solicit pertinent information regarding the facility in lieu of a personal interview.

The questionnaire returned by the Upson Company indicated that the company has recently installed new equipment and are considering one additional shift. Taxes, however, are cited as a factor in restricting further growth at this point.

In projecting growth factors, the most significant factor was that the company has scheduled no new product lines or investments for the next several years.

Based on data supplied by this facility, the projected growth factors of 1.05 for 1982 and 1.10 for 1990 are considered questionable.

HARRISON RADIATOR DIVISION

The Harrison Radiator Division of General Motors, plants #2 and #4, are producers of radiators, air conditioners and other automotive equipment, and are located within the City of Lockport at UTM coordinates 785.7 N and 196.4 E, and 785.0 N and 196.8 E, respectively.

Although the facility was located in an area which currently meets air quality standards, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility since emissions from this facility are considered substantial. However, representatives from the facility declined to participate in an interview or return the questionnaire. In a telephone conversation with company representatives, they maintained that they would not offer any projections concerning their growth.

Since no substantial data was available, this study utilized other sources of information in projecting growth factors for the facility. These sources were optimistic on Harrison's future, indicating that Harrison had been contacting local labor unions, inquiring as to the availability of manpower and building materials for possible future expansions. There is, however, no documentation to either confirm or deny this information.

Further correspondence with workers at the facility provided information that Harrison is currently developing solar panels for the U.S. Department of Energy, and if successfully marketed, could impact strongly upon the operations at the facility.

Based upon the sketchy data and information supplied by the sources other than the facility, growth factors of 2.0 for 1982 and 1.0 for 1990 are considered questionable.

AIRCO SPEER CORPORATION

The Airco Speer Corporation, a producer of carbon and graphite electrodes and anodes, is located within the City of Niagara Falls at UTM coordinates 779.5 N and 174.1 E. Production from this facility accounts for a substantial portion of the market, which is utilized by both steel and foundry industries where components for electric furnaces are required.

Although the facility was located adjacent to an area which currently does not meet air quality standards, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility since emissions from this facility were considered substantial.

While interviewing this facility, several factors listed below appeared to be most significant. They included:

1. Environmental regulations have created operational problems.

2. Low electric rates prevail at this facility, in an energy intensive industry.

3. Constant growth has occurred since 1970, with the exception of the 1975 recession year, and

4. The facility currently supplies a substantial share of the market.

In projecting growth factors, the low power rates available, and the ownership of undeveloped property, which the company expressed a desire to use for expansion, were considered significant.

Based on the interview and questionnaire data supplied by this facility, the projected growth factors of 1.25 for 1982 and 1.35 for 1990 are considered to be reasonably accurate.

PYRON COMPANY

The Pyron Company (formerly AMAX), a producer of iron powder from iron scale, is located within the City of Niagara Falls at UTM coordinates 779.7 N and 174.5 E. The scale is obtained from Pennsylvania based steel mills and the final product is utilized by auto manufacturers for various auto parts which it can produce with less machining than when casted.

Since the facility was located adjacent to an area which currently does not meet air quality standards, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility since the emissions from this facility are considered substantial.

While interviewing the facility, it was learned that they have experienced relatively stable production over the past 7 years, with 1975 totaling only 84% of their current capability. The company is being run 3 shifts per day and expansion is a possibility. Also significant was that a potential for a new product line exists.

In projecting growth factors, the company's ability to increase production 19% without capital expenditures, and their current 8% increase over 1975 production figures were considered most important.

Based on the interview and data supplied by this company, the growth factors of 1.07 for 1982 and 1.15 for 1990 can be considered to be reasonably accurate.

UNION CARBIDE - NATIONAL, ACHESON & REPUBLIC DIVISIONS

The National and Acheson Divisions of Union Carbide are located within the City of Niagara Falls at UTM coordinates 781.9 N and 171.1 E and at 777.6 N and 171.2 E respectively; the Republic Division is located within the Town of Niagara at UTM coordinates 781.8 N and 171.8 E. All three facilities are involved in the manufacture of carbon products.

Although the three facilities are located in areas which currently meet air quality standards, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility. However, the company declined to participate in an interview or complete the questionnaire; consequently, any projections concerning growth factors would be speculative. It was learned subsequently from a company representative that the facility plans to remain at static although stabilized level of operations.

Based upon the limited information available, the projected growth factors of 1.00 for 1982 and 1.00 for 1990 are considered questionable.

ELECTRO-MINERALS DIV. OF CARBORUNDUM

The Electro-Minerals Division of Carborundum is located in the City of Niagara Falls at UTM coordinates 777.3 N and 171.6 E. The company furnaces silicon carbide, aluminum oxide and boron carbide, processing these materials into grains and powders for the bonded abrasives industry. The Company also produces various ceramic specialty products, some of which are used by the military.

Because the facility was located adjacent to an area which currently does not meet air quality standards, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility, since the emissions for this facility are considered substantial.

While interviewing this facility, the company representative indicated that:

1. The Electro Minerals division of Carborundum is the largest producer of the above products in the free world.

2. The plant is currently producing at its capacity, however, it is utilizing only 85% of its total power allotment.

3. The potential for new products exists.

4. Products produced at this facility are labor intensive.

5. A modification and consolidation of the plant is possible, thereby reducing labor costs, becoming more economical.

As well as the above information, in projecting growth factors, the representatives past and projected growth rate of 1% per year in production was considered significant.

Based on data supplied by this facility, the projected growth of 1.06 for 1982 and 1.12 for 1990 are considered to be reasonable accurate.

CARBORUNDUM GLOBAR

The Carborundum Globar plant, a manufacturer of pilotless ignition systems for appliances and electrical components, is located within the City of Niagara Falls at UTM coordinates 781.8 N and 171.7 E. The company's products are used by manufacturers of appliances and electrical components.

Although the facility was located in an area which currently meets air quality standards, it was decided that a standard questionnaire and a personal interview would be used to solicit pertinent information regarding the facility since emissions for this facility were considered substantial.

During the course of the interview with company representatives, it was learned that the Globar plant has expanded considerably during the past several years. The reasons for this expansion were cited as an increased demand for pilotless ignition systems coupled with the inflated dollar which has made foreign produced electrical products less competitive than those produced locally.

It was noted by representatives of the company that the market for electrical components is expanding rapidly and that Globar's technology is geared to take advantage of this expansion.

Based on the company's optimistic projections for continued expansion, the projected growth factors of 1.40 for 1982 and 2.00 for 1990 were considered to be reasonably accurate.

GENERAL ABRASIVE COMPANY

The General Abrasive Company, a producer of abrasive grains, is located within the City of Niagara Falls at UTM coordinates 782.0 N and 171.5 E. The company's product is used primarily as a base by manufacturers of sandpaper, abrasive wheels and discs and other abrasive type components.

Since the facility was located in an area which currently meets air quality standards, it was decided that a standard questionnaire would be used to solicit pertinent information regarding the facility.

Although the company declined to answer the questionnaire, a subsequent telephone conversation with a company representative revealed that the firm had recently been purchased by Dresser Industries. It was also learned that the company is enjoying growth, in a mature market, of 1% to 2% a year. According to the company representative, this trend was expected to continue into 1990.

A moderate growth pattern appeared to be the most significant item in projecting growth factors for this facility.

Based on the information provided by the company representative, the projected growth factors of 1.06 for 1982 and 1.12 for 1990 can be considered to be reasonably accurate.

GOODYEAR TIRE AND RUBBER COMPANY

The Goodyear Tire and Rubber Company, located within the City of Niagara Falls at UTM coordinates 777.8 N and 174.4 E, is engaged in the polymerization of poly vinyl chloride (PVC) resins and the manufacturer of rubber chemical accelerators and staining antioxidants. These products are used by various industries throughout the country.

Although the facility was located in an area which currently does not meet air quality standards, it was decided that a standard questionnaire would be used to solicit pertinent information regarding the facility in lieu of a personal interview since the quantity of emissions is an order of magnitude less than other facilities in the non-attainment area.

Information supplied in the questionnaire noted that a 50% reduction in production was required in their PVC plant during 1975 to meet Occupational Safety and Health Act (OSHA) regulations. Since that time, however, capital

expenditures have been made to bring the plant to OSHA compliance.

The most significant item in projecting growth factors appears to be the completion this year of expanded PVC facilities to recover production capability lost during 1975. Company officials feel confident that this increase in production will again put their products in a competitive position.

Based on the information furnished by the company, the projected growth factors of 1.0 for 1982 and 1.05 for 1990 are considered questionable.

GREAT LAKES CARBON CORPORATION

The Great Lakes Carbon Corporation is located within the City of Niagara Falls at UTM coordinates 778.3 N and 175.1 E. The Company manufactures carbon and graphite products, including electrodes for stainless steel producing furnaces.

Because the facility was located adjacent to an area which currently does not meet air quality standards, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility since emissions from this facility are considered substantial.

During the interview with company representatives, it was learned that the cost of Workmen's Compensation, high New York State taxes and escalating operating and labor costs have impacted on this plant. Attempts are now also being made toward energy conservation.

In projecting growth factors, it was noted that although production has fluctuated over the last 8 years, there is an overall steady increase in productivity.

Based on data supplied by the facility, the projected growth factors of 1.20 for 1982 and 1.40 for 1990 are considered to be questionable.

HOOKER CHEMICAL COMPANY

The Hooker Chemical Company is located within the City of Niagara Falls at UTM coordinates 173.6 N and 777.4 E. The Company manufactures industrial chemicals such as chlorine, phosphate, halogenated toluene, and inorganic phosphorus compounds for the organic chemical using industries.

Because the facility was located in an area which currently does not meet air quality standards, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility.

While interviewing Hooker Chemical, they indicated that they are presently constructing a refuse recycling plant to convert from coal, and have an ongoing energy conservation program. Also significant was the fact that they are heavily energy intensive and the low power rates are a prime factor in their remaining in the area.

In projecting growth factors, their capital investment in the recycling plant and their dependency on cheap power provided by the area were considered the most significant factors.

Based on data supplied by this facility, the projected growth factors of 1.1 for 1982 and 1.1 for 1990 can be considered questionable.

DU PONT COMPANY

The DuPont Company is an industrial chemical manufacturer located in the City of Niagara Falls at UTM coordinates 777.3 N and 173.0 E. The company sells its products to other departments of DuPont, and to the plastics industry.

Although the facility was located in an area which currently does not meet air quality standards, it was decided that a standard questionnaire would be utilized to solicit pertinent information regarding the facility in lieu of a personal interview. This decision was based upon the quantity of emissions generated at the facility.

The questionnaire returned by DuPont indicated that the company has cited escalating disposal and transportation costs, water pollution control equipment, and taxes as significant in lowering profitability. Representatives of the company suggest that the introduction of additional products would incur additional environmental burdens, impacting unfavorably on the plant.

In projecting growth factors, declining employment over the last eight years was considered a significant factor, although no production data was available to substantiate a declining trend. However, a letter sent with the questionnaire in September 1978 states that neither expansion nor reduction is anticipated over the next twelve years.

Based on conflicting and questionable data provided by the company, the growth factors of 1.0 for 1982 and 1.0 for 1990 are considered unreliable.

LINDE DIVISION OF UNION CARBIDE CORPORATION

The Linde Division of Union Carbide Corporation, located within the City of Niagara Falls at UTM coordinates 778.7 N and 173.8 E, is a major producer of sub-arc welding flux. The company's product is used primarily for heavy industrial welding by structural steel companies and railroad car manufacturers.

Since the facility was located in an area which currently does not meet air quality standards, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility.

An interview with a company official disclosed that cheap power costs for their electrically intensive industry was one of the positive factors in operating the facility at a profit. However, it was pointed out that any significant increase in the cost of electrical power could make the operations of the plant uneconomical.

Transportation costs were cited as another problem area since the major markets for the company's product were in the south and southwest. It was also noted that although land was available for expansion, the company had no plans to expand their facility. The company official added that if a new plant were to be built, it would probably be in the midwest, closer to their major markets.

Static growth prospects coupled with possible expansion outside of New York State appeared to be the most significant items in projecting growth factors for this facility.

Based on the interview and completed questionnaire, the projected growth factors of 0.95 for 1982 and 0.93 for 1990 are considered questionable.

NABISCO COMPANY

The Nabisco Company is a baking facility located with the City of Niagara Falls at UTM coordinates 777.8 N and 170.3 E. The Company is engaged in the baking of various wheat products which are distributed throughout the United States.

Because the facility was located in an area which currently meets air quality standards, it was decided that a standard questionnaire would be utilized to solicit pertinent information regarding the facility in lieu of a personal interview.

The questionnaire returned by the representative of the New Jersey office indicated that there will be limited expansion without pretreatment of its wastewater since the local Sewage Treatment Plant is not capable of handling an increased discharge. They also cited taxes and environmental restraints as possible factors that could hinder the operation of the plant.

In projecting growth factors, increased employment and production over the last eight years was considered a significant factor. Occupational Safety and Health Act regulations and environmental restraints mentioned as timely factors in considering expansion have not impacted on the plant's increased production.

Based on data supplied by this facility, the projected growth factors of 1.80 for 1982 and 2.80 for 1990 can be considered to be reasonably accurate.

NIAGARA STONE DIVISION

The Niagara Stone Division is a quarry and rock handling facility located in the Town of Niagara at UTM coordinates 782.0 N and 196.8 E. The product is utilized by the building and construction industries for use in foundations, roadways, dam building, etc.

Because the facility was located in an area which currently meets air quality standards, it was decided that written communication would be utilized to solicit pertinent information regarding the facility in lieu of a personal interview.

Correspondence returned by Niagara Stone indicated only average tonnage produced for years 1970 - 1977. A followup telephone conversation with the company representative provided a yearly breakdown. Although the data fluctuates, there is a steady increase noted overall.

In projecting growth factors, the overall increase in production was considered to be the most significant factor.

Based on data supplied by this facility, a projected growth factor of 1.2 for 1982 and 1.42 for 1990 are considered to be reasonably accurate.

PRESTOLITE BATTERY DIVISION

The Prestolite Battery Division is a principal manufacturer of battery containers and covers and is located within the City of Niagara Falls at UTM coordinates 781.5 N and 170.6 E. The largest outlet for the company's product is the Internal Battery Division of Prestolite, which in turn distributes batteries to the automotive and light truck industry as well as major department stores under various brand names.

Since this facility was located in an area which currently meets air quality standards, it was decided that a standard questionnaire would be utilized to solicit pertinent information regarding the facility in lieu of a personal interview.

Based on information furnished in the questionnaire and a subsequent telephone conversation with a company representative, production at the Prestolite Battery Division is expected to increase substantially within the next several years. Although current operating costs were considered reasonable by national standards, the possibility of higher labor costs, taxes and environmental regulations in the future were cited as important factors in remaining competitive within the region.

It was also noted in the questionnaire that emissions are expected to decline because of material conversions and manufacturing process changes.

In projecting growth factors, expanded production activity was considered a significant factor.

Based on the data supplied by this company, the projected growth factors of 2.08 for 1982 and 2.08 for 1990 can be considered to be reasonably accurate.

NITEC PAPER COMPANY

The Nitec Paper Company, a manufacturer of various types of paper, is located within the City of Niagara Falls at UTM coordinates 778.4 N and 173.3 E. The company's products include bath and facial tissue and magazine paper which are used by the general public and magazine printers.

Because the facility was located adjacent to an area which currently does not meet air quality standards, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility.

During the interview, the representatives indicated that the facility is in operation 24 hours per day, producing at capacity while using less than 50% of the available acreage, making expansion a possibility. The fact that the company is newly formed, having taken over the Kimberly-Clark site was also considered significant.

In projecting growth factors, a significant increase in employment since opening in 1974, an increase in magazine publications, and the optimism concerning profit potential indicated by the representative were all important considerations.

Based on data supplied by the facility, the projected growth of 1.20 for 1982 and 1.38 for 1990 can be considered to be reasonably accurate.

BONDED ABRASIVES DIVISION OF CARBORUNDUM

The Bonded Abrasives Division of Carborundum, a manufacturer of bonded abrasive wheels and abrasive specialty products, is located within the City of Niagara Falls at UTM coordinates 777.7 N and 171.2 E.

Because the facility was located adjacent to an area which currently does not meet air quality standards, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility.

The materials for the facility's products are obtained from the Electro-Minerals division of Carborundum, and are produced into abrasive products and sold to a variety of industries, with the steel industry utilizing abrasive wheels, etc. for grinding operations.

During the course of interviewing, several factors appeared significant. They included the following:

1. Of the three manufacturers who hold 50% of the market, Bonded Abrasives Division is the second largest.

2. Representatives indicate another Bonded Abrasives facility is to be built in the future; the location, however, is presently unknown.

3. The facility is totally dependant on the Electro-Minerals Division of Carborundum for its materials at this time, and

4. This facility's product is labor intensive.

A projected decline of 5% per year in production over the next 12 years, as well as some question as to the plants contributing to Carborundums profitability, as indicated by the representative, were considered significant in projecting growth factors.

Based on data supplied by the company in September 1978, the projected growth factors of .65 for 1982 and .35 for 1990 were considered questionable.

DUREZ DIVISION - HOOKER CHEMICAL COMPANY

The Durez Division of the Hooker Chemical Company is located within the City of North Tonawanda at UTM coordinates 773.0 N and 185.4 E. The company produces phenolic compounds and formaldehyde hexamines for the plastics industry.

Although the facility was located in an area which currently meets air quality standards, it was decided that a standard questionnaire and a personal interview would be utilized to solicit pertinent information regarding the facility since emissions from this facility are considered substantial.

While interviewing this facility, it was learned that there is a 3% growth rate per year in the phenolic compound industry at this time. There are no major occupational, safety or health related problems, and the labor market is good. Also significant was the fact that Durez Division has undertaken a major energy conservation program within the plant.

In projecting growth factors, a 30% increase in production without additional machinery, and the growth rate of 3% per year for their particular products were considered as most significant.

Based on information provided by the company representatives, the projected growth of 1.11 for 1982 and 1.25 for 1990 can be considered to be reasonably accurate.

R T JONES LUMBER COMPANY

The R T Jones Lumber Company is a wholesale lumber company located within the City of North Tonawanda at UTM coordinates 771.5 N and 183.5 E. The company sells lumber to various local industries.

Although the facility was located adjacent to an area which currently does not meet air quality standards, it was decided that a standard questionnaire would be utilized to solicit pertinent information regarding the facility in lieu of a personal interview since emissions for this facility are not considered substantial.

The questionnaire returned by the R T Jones Lumber Co. indicated that there has been recent capital investments for buildings and equipment, and that they would modify process lines to aid energy conservation. Another significant factor noted was that elimination of the rail spur to Tonawanda Island would seriously effect their activities.

In projecting growth factors, we have optimistically projected no elimination of the rail spur. Also noted was that the employment figures, although fluctuating, indicates increased growth.

Based on data supplied by this facility, growth factors of 1.18 for 1982 and 1.40 for 1990 can be considered to be reasonably accurate.

TABLE A-1

SUMMARY OF AREA SOURCE GROWTH FACTORS

	AREA SOURCE	Range of Growth Factors (Low - High) 1982	1990
1.	Residential Fuel	.25 - 2.62	0 - 5.00
2.	Commercial/Institutional Fuel	1.00 - 1.33	1.00 - 1.73
3.	Industrial Fuel	1.00 - 1.32	1.00 - 1.67
4.	On-Site Incineration	1.00 - 1.00	1.00 - 1.00
5.	Gasoline Fuel - Light Vehicle	.69 - 2.61	.49 - 3.37
6.	Gasoline Fuel - Heavy Vehicle	.93 - 3.25	.86 - 5.84
7.	Gasoline Fuel Off Highway - Small Gas Engines	0.25 - 2.62	0 - 5.00
8.	Gasoline Fuel Off Highway - Farm Tractors	1.00 - 1.00	1.00 - 1.00
9.	Diesel Fuel - Heavy Vehicle	.93 - 3.25	.86 - 5.84
10.	Diesel Fuel Off Highway - Farm Tractors	1.00 - 1.00	1.00 - 1.00
11.	Diesel Fuel Off Highway - Construction Equipment	.67 - 3.25	.67 - 3.25
12.	Diesel Fuel - Railroad	.95 - .95	.96 - .96
13.	Aircraft		
	a. commercial	1.10 - 1.23	1.2 - 1.60
	b. civil	1.16 - 1.83	1.13 - 2.67
	c. military	1.00 - 1.00	1.00 - 1.00
14.	Vessels		
	a. commercial	.89 - 1.17	1.00 - 2.00
	b. recreational	1.26 - 1.26	1.58 - 1.58
15.	Dirt Roads Traveled	0 - 1.65	0 - 2.39
16.	Dirt Airstrips	1.83 - 1.83	2.67 - 2.67
17.	Construction Land Area (construction area)	.67 - 3.25	.67 - 3.25
18.	Construction Land Area (cropland)	1.00 - 1.00	1.00 - 1.00
19.	Rock Handling Storage	0 - 2.10	0 - 2.20
20.	Slash Burning	1.00 - 1.00	1.00 - 1.00
21.	Structural Fires	.25 - 2.62	0 - 3.50
22.	Reentrained Dust	.93 - 3.25	.86 - 5.84

Summary of Area Source Growth Factors (cont.)

AREA SOURCE	Range of Growth Factors (Low - High)	
	1982	1990
23. Industrial Process Sources		
- Food and Kindred Products	.78 - 3.41	.71 - 4.22
- Textile Mill Products	.48 - .96	.11 - .22
- Apparel and other Textile Products	.80 - .80	.57 - .57
- Lumber and Wood Products	.85 - 1.70	.82 - 1.64
- Furniture and Fixtures	.77 - .77	.50 - .50
- Paper and Allied Products	.86 - 1.91	.71 - 1.81
- Printing and Publishing	1.04 - 4.16	1.15 - 4.60
- Chemicals and Allied Products	.84 - 2.34	.64 - 2.64
- Petroleum Products	.85 - 1.05	.80 - 1.10
- Rubber and Plastics Products	1.07 - 3.19	1.10 - 2.72
- Leather and Leather Products	1.00 - 1.00	1.00 - 1.00
- Stone, Glass and Clay Products	1.03 - 2.06	1.05 - 2.12
- Primary Metal Industries	.95 - 3.48	.93 - 3.87
- Fabricated Metal Products	.93 - 2.79	.87 - 2.61
- Machinery, excluding Electric	.94 - 2.14	.94 - 2.28
- Electrical Equipment and Supplies	.83 - 2.40	.64 - 3.00
- Transportation Equipment	.80 - 2.00	.85 - 2.00
- Instruments and Related	1.04 - 1.04	1.09 - 1.09
- Miscellaneous Manufacturing	1.05 - 2.10	1.10 - 2.20

TABLE A-2
RESIDENTIAL FUEL GROWTH FACTORS (GF)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
1	0.75	1.00	49	1.00	1.00
2	1.16	1.00	50	1.80	1.40
3	1.00	1.00	51	2.00	3.00
4	1.16	1.00	52	1.10	0.80
5	1.00	1.00	53	1.00	1.00
6	0.93	0.86	54	1.50	2.00
7	1.06	1.00	55	1.00	1.00
8	1.00	1.00	56	1.00	1.00
9	0.95	1.00	57	1.50	2.00
10	0.83	0.88	58	0.66	0.66
11	0.83	1.00	59	2.00	1.00
12	1.00	1.00	60	0.50	0.00
13	1.00	1.00	61	0.75	0.83
14	1.33	1.55	62	1.20	1.80
15	0.62	0.75	63	1.45	2.00
16	1.35	0.85	64	0.71	0.85
17	1.00	1.00	65	1.22	1.36
18	1.00	1.00	66	1.00	0.90
19	0.83	1.00	67	1.00	0.83
20	1.83	1.66	68	0.90	0.95
21	1.00	1.00	69	1.00	0.75
22	0.70	1.00	70	0.72	1.00
23	0.50	1.00	71	1.35	1.71
24	0.66	1.66	72	1.50	1.66
25	0.87	0.85	73	1.07	1.14
26	1.50	1.00	74	1.16	0.83
27	1.00	1.00	75	0.92	0.80
28	0.95	0.90	76	1.27	1.18
29	0.75	1.00	77	2.50	1.00
30	0.83	0.83	78	0.91	0.83
31	1.00	1.00	79	2.00	2.00
32	1.08	1.00	80	1.27	1.34
33	1.00	1.00	81	2.00	1.58
34	1.16	1.00	82	1.27	1.00
35	1.50	1.00	83	1.15	1.20
36	0.83	0.83	84	1.00	0.85
37	0.75	0.50	85	1.37	0.75
38	1.33	0.66	86	1.41	1.21
39	2.00	1.00	87	1.50	1.35
40	0.83	0.66	88	0.50	1.00
41	1.00	1.25	89	1.38	1.22
42	0.75	1.00	90	1.41	1.83
43	0.66	1.00	91	0.75	3.50
44	2.00	1.66	92	1.11	0.88
45	1.50	2.00	93	0.96	0.96
46	0.75	1.00	94	1.08	1.08
47	0.75	0.50	95	1.35	1.28
48	0.90	1.00	96	0.92	0.92

RESIDENTIAL FUEL GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
97	1.31	1.25	145	1.06	1.00
98	0.87	0.75	146	2.62	3.00
99	1.15	1.10	147	0.58	0.66
100	1.03	1.09	148	2.50	0.00
101	0.92	1.04	149	1.87	2.00
102	0.88	1.11	150	1.59	1.36
103	1.00	0.69	151	1.33	1.00
104	1.04	1.04	152	2.25	1.00
105	1.28	2.00	153	1.40	1.50
106	1.50	1.00	154	1.43	1.62
107	1.22	1.55	155	0.72	1.00
108	0.84	1.10	156	1.27	0.95
109	0.79	0.70	157	2.00	2.25
110	0.37	0.50	158	1.25	1.50
111	1.25	1.00	159	1.05	1.39
112	1.00	1.00	160	1.34	1.68
113	0.42	0.57	161	1.16	1.38
114	0.75	1.00	162	1.15	1.30
115	0.90	1.00	163	0.93	1.00
116	0.85	1.00	164	1.35	1.50
117	1.75	2.00	165	0.70	0.80
118	1.21	1.85	166	0.25	0.75
119	0.90	1.27	167	0.71	0.85
120	0.83	0.66	168	0.93	1.25
121	0.83	0.83	169	0.83	1.00
122	0.75	0.83	170	1.00	1.00
123	1.75	2.00	171	1.00	1.00
124	0.96	1.26	172	1.00	1.00
125	1.33	1.16	173	1.05	1.00
126	1.25	1.50	174	0.75	0.75
127	1.07	1.14	175	1.55	1.70
128	1.12	1.50	176	0.91	1.00
129	1.00	1.12	177	1.02	1.28
130	0.66	0.66	178	1.12	1.25
131	0.87	1.00	179	1.08	1.33
132	1.00	1.25	180	0.92	1.00
133	0.64	0.85	181	1.45	1.20
134	0.95	0.90	182	1.28	1.00
135	1.30	1.50	183	1.10	1.60
136	1.37	2.25	184	0.80	1.00
137	0.53	0.62	185	1.50	2.00
138	2.50	5.00	186	1.04	0.83
139	1.00	1.00	187	0.94	1.17
140	1.00	1.00	188	2.00	2.00
141	1.00	1.00	189	1.37	1.50
142	1.08	1.16	190	1.75	2.00
143	0.87	0.75	191	0.37	0.50
144	0.83	0.50	192	0.61	1.00

RESIDENTIAL FUEL GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
193	0.68	1.00	241	1.10	1.20
194	1.00	1.00	242	0.86	0.73
195	0.65	0.62	243	0.92	0.84
196	0.88	1.22	244	0.80	0.60
197	0.85	0.90	245	0.79	0.81
198	1.16	1.00	246	1.07	1.07
199	1.50	1.50	247	1.06	1.06
200	0.92	0.85	248	0.87	1.00
201	1.00	1.00	249	1.00	1.00
202	0.75	1.00	250	0.93	0.93
203	0.88	0.77	[illegible]	1.05	0.90
204	0.96	1.00	252	1.12	0.91
205	1.04	1.15	253	1.09	0.90
206	0.93	0.96	254	1.18	2.25
207	1.02	1.13	255	1.00	1.00
208	0.79	0.75	256	0.77	0.81
209	0.50	0.50	257	1.00	1.00
210	1.06	1.03	258	0.75	0.25
211	1.13	1.08	259	0.85	0.90
212	0.98	0.93	260	1.10	1.00
213	0.92	0.82	261	0.77	1.00
214	1.02	1.00	262	0.75	0.75
215	0.87	0.80	263	1.00	1.00
216	1.08	1.00	264	0.90	1.30
217	0.87	0.62	265	0.95	0.83
218	0.87	1.25	266	1.37	1.25
219	0.70	0.70	267	1.00	1.20
220	0.87	0.87	268	1.00	1.00
221	1.18	1.12	269	1.00	1.00
222	1.09	0.90	270	2.12	2.25
223	1.00	1.16	271	1.00	1.00
224	1.14	1.14	272	0.75	1.50
225	1.16	1.33	273	1.00	1.00
226	0.89	0.84	274	0.77	0.72
227	1.00	1.00	275	0.94	0.88
228	0.72	0.77	276	1.00	1.00
229	0.81	0.81	277	1.50	1.00
230	1.11	1.00	278	1.00	1.00
231	0.82	0.75	279	2.00	1.00
232	1.02	0.95	280	0.94	0.88
233	1.06	1.00	281	0.58	0.66
234	1.28	1.28	282	0.88	0.66
235	0.97	0.94	283	0.84	0.76
236	0.81	0.81	284	0.83	0.77
237	1.03	0.84	285	1.00	1.00
238	0.60	0.46	286	0.93	0.87
239	0.94	0.88	287	0.83	0.83
240	0.91	1.00	288	0.80	0.80

RESIDENTIAL FUEL GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
289	0.95	0.63			
290	0.93	0.85			
291	2.00	2.00			
292	1.00	1.00			
293	1.00	1.00			
294	1.00	1.00			
295	0.90	0.80			
296	1.12	0.50			
297	0.50	0.75			
298	0.68	0.87			
299	1.00	0.50			
300	1.00	2.50			
301	0.96	0.92			
302	0.75	0.85			
303	0.75	1.00			
304	0.83	0.66			
305	0.50	0.50			
306	0.70	0.90			
307	0.64	0.85			
308	0.50	0.00			
309	1.75	1.50			
310	1.00	1.00			
311	1.00	1.00			
312	1.00	1.00			
313	1.00	1.00			
314	1.00	1.00			
315	0.50	0.67			
316	1.00	1.00			

TABLE A-3
COMMERCIAL INSTITUTIONAL FUEL GROWTH FACTORS (GF)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
1	1.00	1.00	49	1.00	1.00
2	1.00	1.00	50	1.00	1.00
3	1.00	1.00	51	1.00	1.00
4	1.00	1.00	52	1.00	1.00
5	1.00	1.00	53	1.01	1.01
6	1.02	1.03	54	1.01	1.01
7	1.02	1.03	55	1.01	1.01
8	1.00	1.00	56	1.01	1.01
9	1.00	1.00	57	1.01	1.01
10	1.01	1.01	58	1.01	1.01
11	1.03	1.05	59	1.01	1.01
12	1.11	1.19	60	1.01	1.01
[illegible]	1.11	1.19	61	1.00	1.00
[illegible]	1.11	1.19	62	1.33	1.73
[illegible]	1.11	1.19	63	1.33	1.73
16	1.01	1.03	64	1.03	1.04
17	1.11	1.19	65	1.03	1.04
18	1.01	1.03	66	1.03	1.04
19	1.01	1.03	67	1.03	1.04
20	1.01	1.03	68	1.03	1.04
[illegible]	1.01	1.03	69	1.33	1.73
[illegible]	1.01	1.03	70	1.33	1.73
[illegible]	1.11	1.19	71	1.33	1.73
24	1.01	1.03	72	1.33	1.73
25	1.01	1.03	73	1.13	1.29
[illegible]	1.01	1.03	74	1.13	1.73
27	1.01	1.03	75	1.00	1.00
28	1.05	1.07	76	1.00	1.00
29	1.05	1.07	77	1.02	1.03
30	1.01	1.01	78	1.02	1.03
31	1.00	1.00	79	1.20	1.44
32	1.01	1.01	80	1.20	1.44
33	1.02	1.03	81	1.02	1.05
34	1.02	1.03	82	1.03	1.05
35	1.02	1.03	83	1.03	1.05
36	1.02	1.03	84	1.02	1.05
37	1.02	1.03	85	1.06	1.08
38	1.02	1.03	86	1.06	1.08
39	1.00	1.00	87	1.02	1.05
40	1.00	1.00	88	1.20	1.44
41	1.00	1.00	89	1.20	1.44
42	1.00	1.00	90	1.20	1.44
43	1.02	1.03	91	1.20	1.44
44	1.00	1.00	92	1.02	1.05
45	1.02	1.04	93	1.02	1.05
46	1.00	1.00	94	1.20	1.44
47	1.00	1.00	95	1.20	1.44
48	1.02	1.04	96	1.20	1.44

COMMERCIAL INSTITUTIONAL FUEL GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
97	1.20	1.44	145	1.09	1.19
98	1.20	1.44	146	1.09	1.19
99	1.20	1.44	147	1.06	1.08
100	1.20	1.44	148	1.06	1.08
101	1.20	1.44	149	1.05	1.08
102	1.02	1.05	150	1.06	1.13
103	1.00	1.00	151	1.06	1.13
104	1.09	1.19	152	1.06	1.08
105	1.09	1.19	153	1.10	1.24
106	1.09	1.19	154	1.26	1.60
107	1.09	1.19	155	1.06	1.13
108	1.09	1.19	156	1.00	1.00
109	1.09	1.19	157	1.00	1.00
110	1.09	1.19	158	1.06	1.13
111	1.09	1.19	159	1.28	1.61
112	1.09	1.19	160	1.28	1.61
113	1.09	1.19	161	1.15	1.32
114	1.09	1.19	162	1.15	1.32
115	1.09	1.19	163	1.28	1.61
116	1.09	1.19	164	1.15	1.32
117	1.19	1.19	165	1.00	1.00
[illegible]	1.09	1.19	166	1.00	1.00
[illegible]	1.09	1.19	167	1.00	1.00
120	1.09	1.19	168	1.00	1.00
121	1.09	1.19	169	1.00	1.00
122	1.09	1.19	170	1.00	1.00
123	1.06	1.22	171	1.00	1.00
124	1.09	1.19	172	1.02	1.04
125	1.09	1.19	173	1.00	1.00
126	1.09	1.19	174	1.01	1.02
127	1.06	1.22	175	1.15	1.32
128	1.06	1.22	176	1.01	1.02
129	1.06	1.22	177	1.15	1.32
130	1.06	1.22	178	1.28	1.61
131	1.06	1.22	179	1.00	1.00
132	1.06	1.22	180	1.00	1.00
133	1.06	1.22	181	1.08	1.17
134	1.06	1.22	182	1.13	1.22
135	1.06	1.22	183	1.14	1.32
136	1.06	1.22	184	1.04	1.10
137	1.09	1.19	185	1.04	1.10
138	1.09	1.19	186	1.02	1.05
139	1.06	1.08	187	1.03	1.08
140	1.06	1.08	188	1.13	1.29
141	1.06	1.08	189	1.13	1.29
142	1.06	1.08	190	1.03	1.08
143	1.06	1.08	191	1.00	1.00
144	1.06	1.08	192	1.00	1.00

COMMERCIAL INSTITUTIONAL FUEL GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
193	1.00	1.00	241	1.00	1.00
194	1.00	1.00	242	1.00	1.00
195	1.00	1.00	243	1.00	1.00
196	1.15	1.32	244	1.00	1.00
197	1.15	1.32	245	1.00	1.00
198	1.00	1.00	246	1.00	1.00
199	1.04	1.10	247	1.00	1.00
200	1.04	1.10	248	1.00	1.00
201	1.14	1.32	249	1.00	1.00
202	1.14	1.32	250	1.00	1.00
203	1.02	1.05	251	1.00	1.00
204	1.02	1.05	252	1.00	1.00
205	1.02	1.05	253	1.00	1.00
206	1.02	1.05	254	1.00	1.00
207	1.02	1.05	255	1.00	1.00
208	1.02	1.05	256	1.00	1.00
209	1.02	1.05	257	1.00	1.00
210	1.02	1.05	258	1.00	1.00
211	1.02	1.05	259	1.00	1.00
212	1.00	1.00	260	1.00	1.00
213	1.00	1.00	261	1.00	1.00
214	1.00	1.00	262	1.00	1.00
215	1.00	1.00	263	1.00	1.00
216	1.00	1.00	264	1.00	1.00
217	1.00	1.00	265	1.00	1.00
218	1.00	1.00	266	1.00	1.00
219	1.00	1.00	267	1.00	1.00
220	1.00	1.00	268	1.00	1.00
221	1.00	1.00	269	1.00	1.00
222	1.00	1.00	270	1.00	1.00
223	1.00	1.00	271	1.00	1.00
224	1.00	1.00	272	1.00	1.00
225	1.00	1.00	273	1.00	1.00
226	1.00	1.00	274	1.00	1.00
227	1.00	1.00	275	1.00	1.00
228	1.00	1.00	276	1.00	1.00
229	1.00	1.00	277	1.00	1.00
230	1.00	1.00	278	1.00	1.00
231	1.00	1.00	279	1.00	1.00
232	1.00	1.00	280	1.00	1.00
233	1.00	1.00	281	1.00	1.00
234	1.00	1.00	282	1.00	1.00
235	1.00	1.00	283	1.00	1.00
236	1.00	1.00	284	1.00	1.00
237	1.00	1.00	285	1.00	1.00
238	1.00	1.00	286	1.00	1.00
239	1.00	1.00	287	1.00	1.00
240	1.00	1.00	288	1.00	1.00

COMMERCIAL INSTITUTIONAL FUEL GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
289	1.00	1.00			
290	1.00	1.00			
291	1.00	1.00			
292	1.00	1.00			
293	1.00	1.00			
294	1.00	1.00			
295	1.00	1.00			
296	1.00	1.00			
297	1.00	1.00			
298	1.00	1.00			
299	1.06	1.22			
300	1.06	1.22			
301	1.06	1.22			
302	1.00	1.00			
303	1.00	1.00			
304	1.15	1.32			
305	1.00	1.00			
306	1.00	1.00			
307	1.00	1.00			
308	1.00	1.00			
309	1.00	1.00			
310	1.00	1.00			
311	1.00	1.00			
312	1.00	1.00			
313	1.00	1.00			
314	1.00	1.00			
315	1.00	1.00			
316	**	**			

** Lake Erie

TABLE A-4
INDUSTRIAL FUEL GROWTH FACTORS (GF)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
1	1.00	1.00	49	1.00	1.00
2	1.00	1.02	50	1.00	1.00
3	1.00	1.00	51	1.00	1.00
4	1.00	1.00	52	1.00	1.00
5	1.00	1.00	53	1.01	1.02
6	1.01	1.02	54	1.00	1.00
7	1.01	1.02	55	1.00	1.00
8	1.00	1.00	56	1.00	1.00
9	1.00	1.02	57	1.00	1.00
10	1.00	1.00	58	1.00	1.00
11	1.03	1.05	59	1.00	1.00
12	1.11	1.18	60	1.00	1.00
13	1.00	1.00	61	1.00	1.00
14	1.00	1.00	62	1.00	1.00
15	1.00	1.00	63	1.00	1.00
16	1.01	1.03	64	1.00	1.00
17	1.00	1.00	65	1.00	1.00
18	1.00	1.00	66	1.01	1.03
19	1.00	1.00	67	1.01	1.03
20	1.01	1.03	68	1.01	1.03
21	1.00	1.00	69	1.00	1.00
22	1.00	1.00	70	1.00	1.00
23	1.00	1.00	71	1.30	1.67
24	1.00	1.00	72	1.00	1.00
25	1.00	1.00	73	1.00	1.00
26	1.00	1.00	74	1.00	1.00
27	1.00	1.00	75	1.01	1.03
28	1.06	1.09	76	1.01	1.03
29	1.00	1.00	77	1.00	1.00
30	1.01	1.02	78	1.00	1.00
31	1.00	1.00	79	1.22	1.47
32	1.01	1.02	80	1.22	1.47
33	1.00	1.01	81	1.01	1.04
34	1.00	1.01	82	1.04	1.08
35	1.00	1.00	83	1.00	1.00
36	1.00	1.00	84	1.01	1.04
37	1.00	1.00	85	1.00	1.00
38	1.00	1.00	86	1.00	1.00
39	1.00	1.00	87	1.01	1.04
40	1.00	1.00	88	1.22	1.47
41	1.00	1.00	89	1.22	1.47
42	1.00	1.00	90	1.22	1.47
43	1.00	1.01	91	1.22	1.47
44	1.00	1.00	92	1.00	1.00
45	1.02	1.04	93	1.00	1.00
46	1.00	1.00	94	1.22	1.47
47	1.00	1.00	95	1.22	1.47
48	1.02	1.04	96	1.22	1.47

INDUSTRIAL FUEL GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
97	1.22	1.47	145	1.00	1.00
98	1.22	1.47	146	1.00	1.00
99	1.22	1.47	147	1.00	1.00
100	1.22	1.47	148	1.00	1.00
101	1.22	1.47	149	1.00	1.00
102	1.00	1.00	150	1.02	1.09
103	1.00	1.00	151	1.00	1.00
104	1.00	1.00	152	1.00	1.00
105	1.00	1.00	153	1.13	1.30
106	1.08	1.17	154	1.00	1.00
107	1.08	1.17	155	1.02	1.09
108	1.00	1.00	156	1.00	1.00
109	1.00	1.00	157	1.00	1.00
110	1.00	1.00	158	1.02	1.09
111	1.00	1.00	159	1.00	1.00
112	1.00	1.00	160	1.00	1.00
113	1.08	1.17	161	1.00	1.00
114	1.08	1.17	162	1.13	1.29
115	1.08	1.17	163	1.26	1.57
116	1.08	1.17	164	1.13	1.29
117	1.08	1.17	165	1.00	1.00
118	1.08	1.17	166	1.00	1.00
119	1.08	1.17	167	1.00	1.00
120	1.08	1.17	168	1.00	1.00
121	1.08	1.17	169	1.00	1.00
122	1.00	1.00	170	1.00	1.00
123	1.32	1.52	171	1.00	1.00
124	1.08	1.17	172	1.02	1.04
125	1.08	1.17	173	1.00	1.00
126	1.00	1.00	174	1.00	1.01
127	1.32	1.52	175	1.13	1.29
128	1.32	1.52	176	1.00	1.00
129	1.32	1.52	177	1.00	1.00
130	1.32	1.52	178	1.00	1.00
131	1.00	1.00	179	1.00	1.14
132	1.00	1.00	180	1.00	1.14
133	1.00	1.00	181	1.04	1.11
134	1.00	1.00	182	1.10	1.22
135	1.00	1.00	183	1.00	1.00
136	1.00	1.00	184	1.00	1.00
137	1.00	1.00	185	1.00	1.00
138	1.08	1.17	186	1.00	1.00
139	1.01	1.02	187	1.00	1.00
140	1.00	1.00	188	1.11	1.23
141	1.00	1.00	189	1.11	1.23
142	1.00	1.00	190	1.04	1.07
143	1.00	1.00	191	1.00	1.00
144	1.00	1.00	192	1.00	1.00

INDUSTRIAL FUEL GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
192	1.00	1.00			
193	1.00	1.00			
194	1.00	1.00			
195	1.00	1.00			
196	1.00	1.00			
197	1.00	1.00			
198	1.00	1.00			
199	1.00	1.00			
200	1.11	1.24			
201	1.00	1.00			
202	1.00	1.00			
203	1.02	1.05			
204	1.02	1.05			
205	1.00	1.00			
206	1.00	1.00			
207	1.02	1.05			
208	1.02	1.05			
209	1.02	1.05			
210	1.02	1.05			
211 - 316	1.00	1.00			

TABLE A-5
ON-SITE INCINERATION GROWTH FACTORS (GF)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
*1 - 316	1.00	1.00			

TABLE A-6
GAS FUEL - LIGHT VEHICLE GROWTH FACTORS (GF)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
1	0.85	0.64	49	0.84	0.63
2	0.84	0.64	50	0.91	0.74
3	0.84	0.64	51	0.84	0.63
4	0.81	0.59	52	0.84	0.63
5	0.81	0.59	53	0.87	0.68
6	0.81	0.59	54	0.87	0.68
7	0.86	0.66	55	0.87	0.68
8	0,81	0.59	56	0.87	0.68
9	0.84	0.64	57	0.87	0.68
10	0.85	0.64	58	0.87	0.68
11	0.85	0.64	59	0.87	0.68
12	0.84	0.63	60	0.87	0.68
13	0.84	0.63	61	0.84	0.63
14	0.84	0.63	62	0.79	0.55
15	0.84	0.63	63	0.83	0.61
16	0.84	0.63	64	0.86	0.67
17	0.84	0.63	65	0.86	0.67
18	0.84	0.63	66	0.86	0.67
19	0.84	0.63	67	0.86	0.67
20	0.84	0.63	68	0.86	0.67
21	0.84	0.63	69	0.79	0.55
22	0.84	0.63	70	0.83	0.61
23	0.84	0.63	71	0.79	0.55
24	0.84	0.63	72	0.83	0.61
25	0.84	0.63	73	0.79	0.56
26	0.84	0.63	74	0.86	0.67
27	0.84	0.63	75	0.86	0.67
28	0.81	0.59	76	0.86	0.67
29	0.81	0.59	77	0.69	0.78
30	0.87	0.68	78	1.01	0.89
31	0.86	0.66	79	1.01	0.89
32	0.86	0.66	80	1.37	1.45
33	0.86	0.66	81	0.94	0.78
34	0.86	0.66	82	0.86	0.66
35	0.86	0.66	83	0.86	0.66
36	0.86	0.66	84	2.61	3.37
37	0.86	0.66	85	0.84	0.63
38	0.86	0.66	86	0.90	0.72
39	0.86	0.66	87	0.94	0.78
40	0.91	0.74	88	0.89	0.71
41	0.91	0.74	89	0.89	0.71
42	0.91	0.74	90	0.95	0.81
43	0.86	0.66	91	0.95	0.81
44	0.91	0.74	92	0.87	0.67
45	0.86	0.66	93	0.87	0.67
46	0.91	0.74	94	0.95	0.81
47	0.84	0.63	95	0.95	0.81
48	0.86	0.66	96	0.89	0.71

GAS FUEL - LIGHT VEHICLE GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
97	0.89	0.71	145	0.97	0.83
98	0.89	0.71	146	0.97	0.83
99	0.89	0.71	147	0.90	0.72
100	0.95	0.81	148	0.90	0.72
101	0.95	0.81	149	0.90	0.72
102	0.87	0.67	150	0.93	0.78
103	0.95	0.81	151	0.93	0.77
104	0.86	0.66	152	0.84	0.63
105	0.97	0.83	153	0.86	0.66
106	0.97	0.83	154	0.84	0.63
107	0.97	0.83	155	0.93	0.77
108	0.97	0.83	156	0.83	0.62
109	0.86	0.66	157	0.91	0.72
110	0.86	0.66	158	0.93	0.78
111	0.86	0.66	159	1.03	1.00
112	0.86	0.66	160	1.03	1.00
113	0.86	0.66	161	0.97	0.84
114	0.86	0.66	162	0.94	0.79
115	0.97	0.83	163	1.04	0.95
116	0.97	0.83	164	0.86	0.67
117	0.97	0.83	165	0.91	0.74
118	0.97	0.83	166	0.91	0.74
119	0.86	0.66	167	0.91	0.74
120	0.86	0.66	168	0.91	0.74
121	0.86	0.66	169	0.91	0.74
122	0.86	0.66	170	0.84	0.63
123	0.89	0.71	171	0.84	0.63
124	0.86	0.66	172	0.86	0.66
125	0.97	0.83	173	0.84	0.63
126	0.97	0.83	174	0.76	0.60
127	0.95	0.81	175	0.94	0.79
128	0.95	0.81	176	0.76	0.60
129	0.89	0.71	177	0.94	0.79
130	0.89	0.71	178	1.04	0.94
131	0.89	0.71	179	0.96	0.81
132	0.89	0.71	180	0.96	0.81
133	0.89	0.71	181	0.81	0.59
134	0.89	0.71	182	0.81	0.59
135	0.95	0.81	183	0.81	0.59
136	0.95	0.81	184	0.96	0.81
137	0.97	0.83	185	0.96	0.81
138	0.97	0.83	186	0.76	0.60
139	0.90	0.72	187	0.79	0.56
140	0.90	0.72	188	0.79	0.56
141	0.90	0.72	189	0.79	0.56
142	0.90	0.72	190	0.79	0.56
143	0.90	0.72	191	0.79	0.56
144	0.90	0.72	192	0.91	0.74

GAS FUEL - LIGHT VEHICLE GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
193	0.91	0.74	241	0.82	0.60
194	0.79	0.56	242	0.82	0.60
195	0.84	0.63	243	0.82	0.60
196	0.97	0.84	244	0.82	0.60
197	0.97	0.84	245	0.82	0.60
198	0.76	0.60	246	0.75	0.49
199	0.96	0.81	247	0.75	0.49
200	0.96	0.81	248	0.75	0.49
201	0.81	0.59	249	0.75	0.49
202	0.81	0.59	250	0.82	0.60
203	0.86	0.67	251	0.82	0.60
204	0.86	0.67	252	0.82	0.60
205	0.87	0.67	253	0.82	0.60
206	0.87	0.67	254	0.82	0.60
207	0.87	0.67	255	0.79	0.56
208	0.87	0.67	256	0.79	0.56
209	0.87	0.67	257	0.79	0.56
210	0.87	0.67	258	0.79	0.56
211	0.87	0.67	259	0.79	0.56
212	0.83	0.61	260	0.83	0.61
213	0.80	0.57	261	0.82	0.59
214	0.80	0.57	262	0.82	0.59
215	0.80	0.57	263	0.82	0.59
216	0.80	0.57	264	0.83	0.61
217	0.80	0.57	265	0.83	0.61
218	0.80	0.57	266	0.79	0.56
219	0.80	0.57	267	0.79	0.56
220	0.83	0.61	268	0.79	0.56
221	0.83	0.61	269	0.79	0.56
222	0.83	0.61	270	0.79	0.56
223	0.83	0.61	271	0.79	0.56
224	0.83	0.61	272	0.79	0.56
225	0.83	0.61	273	0.79	0.56
226	0.83	0.61	274.	0.83	0.61
227	0.80	0.57	275	0.83	0.61
228	0.80	0.57	276	0.83	0.61
229	0.80	0.57	277	0.83	0.61
230	0.80	0.57	278	0.88	0.70
231	0.80	0.57	279	0.88	0.70
232	0.80	0.57	280	0.89	0.72
233	0.80	0.57	281	0.89	0.72
234	0.80	0.57	282	0.89	0.72
235	0.82	0.60	283	0.89	0.72
236	0.82	0.60	284	0.88	0.70
237	0.82	0.60	285	0.88	0.70
238	0.82	0.60	286	0.88	0.70
239	0.82	0.60	287	0.89	0.72
240	0.82	0.60	288	0.89	0.72

GAS FUEL - LIGHT VEHICLE GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
289	0.89	0.72			
290	0.89	0.72			
291	0.88	0.70			
292	0.88	0.70			
293	0.88	0.70			
294	0.93	0.78			
295	0.93	0.78			
296	0.93	0.78			
297	0.93	0.78			
298	0.93	0.78			
299	0.89	0.71			
300	0.89	0.71			
301	0.89	0.71			
302	0.93	0.78			
303	0.93	0.78			
304	0.97	0.84			
305	0.93	0.78			
306	0.91	0.74			
307	0.84	0.63			
308	0.84	0.63			
309	0.84	0.63			
310	0.91	0.74			
311	0.91	0.74			
312	0.91	0.74			
313	0.84	0.63			
314	0.84	0.63			
315	0.84	0.63			

TABLE A-7
GASOLINE FUEL - HEAVY VEHICLE GROWTH FACTORS (GF)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
1	1.05	1.11	49	1.05	1.10
2	1.05	1.10	50	1.13	1.28
3	1.05	1.10	51	1.05	1.10
4	1.01	1.02	52	1.05	1.10
5	1.01	1.02	53	1.08	1.17
6	1.01	1.03	54	1.08	1.17
7	1.07	1.14	55	1.08	1.17
8	1.01	1.02	56	1.08	1.17
9	1.05	1.10	57	1.08	1.17
10	1.05	1.11	58	1.08	1.17
11	1.05	1.11	59	1.08	1.17
12	1.04	1.09	60	1.08	1.17
13	1.04	1.09	61	1.05	1.10
14	1.04	1.09	62	0.98	0.96
15	1.04	1.09	63	1.03	1.06
16	1.04	1.09	64	1.08	1.16
17	1.04	1.09	65	1.08	1.16
18	1.04	1.09	66	1.08	1.16
19	1.04	1.09	67	1.08	1.16
20	1.04	1.09	68	1.08	1.16
21	1.04	1.09	69	0.98	0.96
22	1.04	1.09	70	1.03	1.06
23	1.04	1.09	71	0.98	0.96
24	1.04	1.09	72	1.03	1.06
25	1.04	1.09	73	0.98	0.97
26	1.04	1.09	74	1.08	1.16
27	1.04	1.09	75	1.08	1.16
28	1.01	1.02	76	1.08	1.16
29	1.01	1.02	77	1.17	1.36
30	1.08	1.17	78	1.26	1.55
31	1.07	1.14	79	1.26	1.55
32	1.07	1.14	80	1.70	2.50
33	1.07	1.14	81	1.17	1.36
34	1.07	1.14	82	1.07	1.14
35	1.07	1.14	83	1.07	1.14
36	1.07	1.14	84	3.25	5.84
37	1.07	1.14	85	1.05	1.10
38	1.07	1.14	86	1.11	1.25
39	1.07	1.14	87	1.17	1.36
40	1.13	1.28	88	1.11	1.23
41	1.13	1.28	89	1.11	1.23
42	1.13	1.28	90	1.19	1.40
43	1.07	1.14	91	1.19	1.40
44	1.13	1.28	92	1.08	1.17
45	1.07	1.14	93	1.08	1.17
46	1.13	1.28	94	1.19	1.40
47	1.05	1.10	95	1.19	1.40
48	1.07	1.14	96	1.11	1.23

GASOLINE FUEL - HEAVY VEHICLE GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
97	1.11	1.23	145	1.21	1.44
98	1.11	1.23	146	1.21	1.44
99	1.11	1.23	147	1.11	1.25
100	1.19	1.40	148	1.11	1.25
101	1.19	1.40	149	1.11	1.25
102	1.08	1.17	150	1.16	1.34
103	1.19	1.40	151	1.16	1.34
104	1.06	1.14	152	1.05	1.10
105	1.21	1.44	153	1.07	1.14
106	1.21	1.44	154	1.04	1.09
107	1.21	1.44	155	1.16	1.34
108	1.21	1.44	156	1.03	1.07
109	1.06	1.14	157	1.24	1.30
110	1.06	1.14	158	1.16	1.34
111	1.06	1.14	159	1.34	1.74
112	1.06	1.14	160	1.34	1.74
113	1.06	1.14	161	1.21	1.46
114	1.06	1.14	162	1.17	1.36
115	1.22	1.44	163	1.30	1.64
116	1.22	1.44	164	1.08	1.16
117	1.22	1.44	165	1.13	1.28
118	1.22	1.44	166	1.13	1.28
119	1.06	1.14	167	1.13	1.28
120	1.06	1.14	168	1.13	1.28
121	1.06	1.14	169	1.13	1.28
122	1.06	1.14	170	1.05	1.10
123	1.11	1.23	171	1.05	1.10
124	1.06	1.14	172	1.07	1.14
125	1.22	1.44	173	1.05	1.10
126	1.22	1.44	174	1.02	1.04
127	1.19	1.40	175	1.17	1.32
128	1.19	1.40	176	1.02	1.04
129	1.11	1.23	177	1.17	1.36
130	1.11	1.23	178	1.30	1.64
131	1.11	1.23	179	1.19	1.41
132	1.11	1.23	180	1.19	1.41
133	1.11	1.23	181	1.01	1.03
134	1.11	1.23	182	1.01	1.03
135	1.19	1.40	183	1.01	1.03
136	1.19	1.40	184	1.19	1.41
137	1.22	1.44	185	1.19	1.41
138	1.22	1.44	186	1.02	1.04
139	1.11	1.25	187	0.98	0.97
140	1.11	1.25	188	0.98	0.97
141	1.11	1.25	189	0.98	0.97
142	1.11	1.25	190	0.98	0.97
143	1.11	1.25	191	0.98	0.97
144	1.11	1.25	192	1.13	1.28

GASOLINE FUEL - HEAVY VEHICLE GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
193	1.13	1.28	241	1.01	1.02
194	0.98	0.97	242	1.01	1.02
195	1.05	1.10	243	1.01	1.02
196	1.21	1.46	244	1.02	1.05
197	1.21	1.46	245	1.02	1.05
198	1.02	1.04	246	0.93	0.86
199	1.19	1.41	247	0.93	0.86
200	1.19	1.41	248	0.93	0.86
201	1.01	1.03	249	0.93	0.86
202	1.01	1.03	250	1.02	1.05
203	1.08	1.16	251	1.02	1.05
204	1.08	1.16	252	1.01	1.02
205	1.08	1.17	253	1.01	1.02
206	1.08	1.17	254	1.01	1.02
207	1.08	1.17	255	0.99	0.97
208	1.08	1.17	256	0.99	0.97
209	1.08	1.17	257	0.99	0.97
210	1.08	1.17	258	0.99	0.97
211	1.08	1.17	259	0.99	0.97
212	1.03	1.03	260	1.03	1.06
213	1.00	1.00	261	1.01	1.03
214	1.00	1.00	262	1.01	1.03
215	1.00	1.00	263	1.01	1.03
216	1.00	1.00	264	1.03	1.06
217	1.00	1.00	265	1.03	1.06
218	1.00	1.00	266	0.99	0.97
219	1.00	1.00	267	0.99	0.97
220	1.03	1.03	268	0.99	0.97
221	1.03	1.03	269	0.99	0.97
222	1.03	1.03	270	0.99	0.97
223	1.03	1.03	271	0.99	0.97
224	1.03	1.03	272	0.99	0.97
225	1.03	1.03	273	0.99	0.97
226	1.03	1.03	274	1.03	1.06
227	1.00	1.00	275	1.03	1.06
228	1.00	1.00	276	1.03	1.06
229	1.00	1.00	277	1.03	1.06
230	1.00	1.00	278	1.10	1.21
231	1.00	1.00	279	1.10	1.21
232	1.00	1.00	280	1.11	1.24
233	1.93	1.86	281	1.11	1.24
234	1.00	1.00	282	1.11	1.24
235	1.02	1.05	283	1.11	1.24
236	1.01	1.02	284	1.10	1.21
237	1.01	1.02	285	1.10	1.21
238	1.01	1.02	286	1.10	1.21
239	1.01	1.02	287	1.11	1.24
240	1.01	1.02	288	1.11	1.24

GASOLINE FUEL - HEAVY VEHICLE GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
289	1.11	1.24			
290	1.11	1.24			
291	1.10	1.21			
292	1.10	1.21			
293	1.10	1.21			
294	1.16	1.35			
295	1.16	1.35			
296	1.16	1.35			
297	1.16	1.35			
298	1.16	1.35			
299	1.11	1.23			
300	1.11	1.23			
301	1.11	1.23			
302	1.16	1.35			
303	1.16	1.35			
304	1.21	1.46			
305	1.16	1.35			
306	1.13	1.28			
307	1.05	1.10			
308	1.05	1.10			
309	1.05	1.10			
310	1.13	1.28			
311	1.13	1.28			
312	1.13	1.28			
313	1.13	1.28			
314	1.13	1.28			
315	1.13	1.28			

TABLE A-8

GASOLINE FUEL - OFF HIGHWAY - SMALL GAS ENGINES GROWTH FACTORS (GF)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
1	0.75	1.00	49	1.00	1.00
2	1.16	1.00	50	1.80	1.40
3	1.00	1.00	51	2.00	3.00
4	1.16	1.00	52	1.10	0.80
5	1.00	1.00	53	1.00	1.00
6	0.93	0.86	54	1.50	2.00
7	1.06	1.00	55	1.00	1.00
8	1.00	1.00	56	1.00	1.00
9	0.95	1.00	57	1.50	2.00
10	0.83	0.88	58	0.66	0.66
11	0.83	1.00	59	2.00	1.00
12	1.00	1.00	60	0.50	0.00
13	1.00	1.00	61	0.75	0.83
14	1.33	1.55	62	1.20	1.80
15	0.62	0.75	63	1.45	2.00
16	1.35	0.85	64	0.71	0.85
17	1.00	1.00	65	1.22	1.36
18	1.00	1.00	66	1.00	0.90
19	0.83	1.00	67	1.00	0.83
20	1.83	1.66	68	0.90	0.95
21	1.00	1.00	69	1.00	0.75
22	0.70	1.00	70	0.72	1.00
23	0.50	1.00	71	1.35	1.71
24	0.66	1.66	72	1.50	1.66
25	0.87	0.85	73	1.07	1.14
26	1.50	1.00	74	1.16	0.83
27	1.00	1.00	75	0.92	0.80
28	0.95	0.90	76	1.27	1.18
29	0.75	1.00	77	2.50	1.00
30	0.83	0.83	78	0.91	0.83
31	1.00	1.00	79	2.00	2.00
32	1.08	1.00	80	1.27	1.34
33	1.00	1.00	81	2.00	1.58
34	1.16	1.00	82	1.27	1.00
35	1.50	1.00	83	1.15	1.20
36	0.83	0.83	84	1.00	0.85
37	0.75	0.50	85	1.37	0.75
38	1.33	0.66	86	1.41	1.21
39	2.00	1.00	87	1.50	1.35
40	0.83	0.66	88	0.50	1.00
41	1.00	1.25	89	1.38	1.22
42	0.75	1.00	90	1.41	1.83
43	0.66	1.00	91	0.75	3.50
44	2.00	1.66	92	1.11	0.88
45	1.50	2.00	93	0.96	0.96
46	0.75	1.00	94	1.08	1.08
47	0.75	0.50	95	1.35	1.28
48	0.90	1.00	96	0.92	0.92

GASOLINE FUEL - OFF HIGHWAY - SMALL GAS ENGINES GROWTH FACTORS (GF)(co

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
97	1.31	1.25	145	1.06	1.00
98	0.87	0.75	146	2.62	3.00
99	1.15	1.10	147	0.58	0.66
100	1.03	1.19	148	2.50	0.00
101	0.92	1.04	149	1.87	2.00
102	0.88	1.11	150	1.59	1.36
103	1.00	0.69	151	1.33	1.00
104	1.04	1.04	152	2.25	1.00
105	1.28	2.00	153	1.40	1.50
106	1.50	1.00	154	1.43	1.62
107	1.22	1.55	155	0.72	1.00
108	0.84	1.10	156	1.27	0.95
109	0.79	0.70	157	2.00	2.25
110	0.37	0.50	158	1.25	1.50
111	1.25	1.00	159	1.05	1.39
112	1.00	1.00	160	1.34	1.68
113	0.42	0.57	161	1.16	1.38
114	0.75	1.00	162	1.15	1.30
115	0.90	1.00	163	0.93	1.00
116	0.85	1.00	164	1.35	1.50
117	1.75	2.00	165	0.70	0.80
118	1.21	1.85	166	0.25	0.75
119	0.90	1.27	167	0.71	0.85
120	0.83	0.66	168	0.93	1.25
121	0.83	0.83	169	0.83	1.00
122	0.75	0.83	170	1.00	1.00
123	1.75	2.00	171	1.00	1.00
124	0.96	1.26	172	1.00	1.00
125	1.33	1.16	173	1.05	1.00
126	1.25	1.50	174	0.75	0.75
127	1.07	1.14	175	1.55	1.70
128	1.12	1.50	176	0.91	1.00
129	1.00	1.12	177	1.02	1.28
130	0.66	0.66	178	1.12	1.25
131	0.87	1.00	179	1.08	1.33
132	1.00	1.25	180	0.92	1.00
133	0.64	0.85	181	1.45	1.20
134	0.95	0.90	182	1.28	1.00
135	1.30	1.50	183	1.10	1.60
136	1.37	2.25	184	0.80	1.00
137	0.53	0.62	185	1.50	2.00
138	2.50	5.00	186	1.04	0.83
139	1.00	1.00	187	0.94	1.17
140	1.00	1.00	188	2.00	2.00
141	1.00	1.00	189	1.37	1.50
142	1.08	1.16	190	1.75	2.00
143	0.87	0.75	191	0.37	0.50
144	0.83	0.50	192	0.61	1.00

GASOLINE FUEL - OFF HIGHWAY - SMALL GAS ENGINES GROWTH FACTORS (GF)(cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
193	0.68	1.00	241	1.10	1.20
194	1.00	1.00	242	0.86	0.73
195	0.65	0.62	243	0.92	0.84
196	0.88	1.22	244	0.80	0.60
197	0.85	0.90	245	0.79	0.81
198	1.16	1.00	246	1.07	1.07
199	1.50	1.50	247	1.06	1.06
200	0.92	0.85	248	0.87	1.00
201	1,00	1.00	249	1.00	1.00
202	0.75	1.00	250	0.93	0.93
203	0.88	0.77	251	1.05	0.90
204	0.96	1.00	252	1.12	0.91
205	1.04	1.15	253	1.09	0.90
206	0.93	0.96	254	1.18	2.25
207	1.02	1.13	255	1.00	1.00
208	0.79	0.75	256	0.77	0.81
209	0.50	0.50	257	1.00	1.00
210	1.06	1.03	258	0.75	0.25
211	1.13	1.08	259	0.85	0.90
212	0.98	0.93	260	1.10	1.00
213	0.92	0.82	261	0.77	1.00
214	1.02	1.00	262	0.75	0.75
215	0.87	0.80	263	1.00	1.00
216	1.08	1.00	264	0.90	1.30
217	0.87	0.62	265	0.95	0.83
218	0.87	1.25	266	1.37	1.25
219	0.70	0.70	267	1.00	1.20
220	0.87	0.87	268	1.00	1.00
221	1.18	1.12	269	1.00	1.00
222	1.09	0.90	270	2.12	2.25
223	1.00	1.16	271	1.00	1.00
224	1.14	1.14	272	0.75	1.50
225	1.16	1.33	273	1.00	1.00
226	0.89	0.84	274	0.77	0.72
227	1.00	1.00	275	0.94	0.88
228	0.72	0.77	276	1.00	1.00
229	0.81	0.81	277	1.50	1.00
230	1.11	1.00	278	1.00	1.00
231	0.82	0.75	279	2.00	1.00
232	1.02	0.95	280	0.94	0.88
233	1.06	1.00	281	0.58	0.66
234	1.28	1.28	282	0.88	0.66
235	0.97	0.94	283	0.84	0.76
236	0.81	0.81	284	0.83	0.77
237	1.03	0.84	285	1.00	1.00
238	0.60	0.46	286	0.93	0.87
239	0.94	0.88	287	0.83	0.83
240	0.91	1.00	288	0.80	0.80

, GASOLINE FUEL - OFF HIGHWAY - SMALL GAS ENGINES GROWTH FACTORS (GF)(cc

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
289	0.95	0.63			
290	0.93	0.85			
291	2.00	2.00			
292	1.00	1.00			
293	1.00	1.00			
294	1.00	1.00			
295	0.90	0.80			
296	1.12	0.50			
297	0.50	0.75			
298	0.68	0.87			
299	1.00	0.50			
300	1.00	2.50			
301	0.96	0.92			
302	0.75	0.85			
303	0.75	1.00			
304	0.83	0.66			
305	0.50	0.50			
306	0.70	0.90			
307	0.64	0.85			
308	0.50	0.00			
309	1.75	1.50			
310	1.00	1.00			
311	1.00	1.00			
312	1.00	1.00			
313	1.00	1.00			
314	1.00	1.00			
315	0.50	0.67			
316	1.00	1.00			

TABLE A-9
GAS FUEL - OFF HIGHWAY (FARM TRACTORS) GROWTH FACTORS (GF)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
1	1.00	1.0	80	1.00	1.00
2	1.00	1.00	81	1.00	1.00
3	1.00	1.00	82	1.00	1.00
6	1.00	1.00	83	1.00	1.00
7	1.00	1.00	84	1.00	1.00
8	1.00	1.00	85	1.00	1.00
9	1.00	1.00	86	1.00	1.00
10	1.00	1.00	87	1.00	1.00
11	1.00	1.00	88	1.00	1.00
12	1.00	1.00	89	1.00	1.00
13	1.00	1.00	90	1.00	1.00
14	1.00	1.00	91	1.00	1.00
16	1.00	1.00	92	1.00	1.00
17	1.00	1.00	93	1.00	1.00
24	1.00	1.00	94	1.00	1.00
25	1.00	1.00	95	1.00	1.00
27	1.00	1.00	96	1.00	1.00
28	1.00	1.00	97	1.00	1.00
29	1.00	1.00	98	1.00	1.00
30	1.00	1.00	99	1.00	1.00
31	1.00	1.00	101	1.00	1.00
32	1.00	1.00	103	1.00	1.00
33	1.00	1.00	108	1.00	1.00
34	1.00	1.00	109	1.00	1.00
35	1.00	1.00	110	1.00	1.00
36	1.00	1.00	111	1.00	1.00
37	1.00	1.00	112	1.00	1.00
38	1.00	1.00	113	1.00	1.00
39	1.00	1.00	116	1.00	1.00
43	1.00	1.00	124	1.00	1.00
45	1.00	1.00	127	1.00	1.00
48	1.00	1.00	128	1.00	1.00
49	1.00	1.00	129	1.00	1.00
52	1.00	1.00	132	1.00	1.00
53	1.00	1.00	134	1.00	1.00
54	1.00	1.00	135	1.00	1.00
56	1.00	1.00	136	1.00	1.00
57	1.00	1.00	138	1.00	1.00
58	1.00	1.00	139	1.00	1.00
59	1.00	1.00	142	1.00	1.00
60	1.00	1.00	143	1.00	1.00
61	1.00	1.00	144	1.00	1.00
63	1.00	1.00	145	1.00	1.00
70	1.00	1.00	146	1.00	1.00
76	1.00	1.00	147	1.00	1.00
77	1.00	1.00	148	1.00	1.00
78	1.00	1.00	149	1.00	1.00
79	1.00	1.00	150	1.00	1.00

GAS FUEL - OFF HIGHWAY (FARM TRACTORS) GROWTH FACTORS (GF)(cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
151	1.00	1.00			
152	1.00	1.00			
153	1.00	1.00			
154	1.00	1.00			
155	1.00	1.00			
156	1.00	1.00			
157	1.00	1.00			
158	1.00	1.00			
159	1.00	1.00			
160	1.00	1.00			
161	1.00	1.00			
162	1.00	1.00			
164	1.00	1.00			
173	1.00	1.00			
174	1.00	1.00			
175	1.00	1.00			
176	1.00	1.00			
177	1.00	1.00			
178	1.00	1.00			
179	1.00	1.00			
180	1.00	1.00			
181	1.00	1.00			
182	1.00	1.00			
183	1.00	1.00			
184	1.00	1.00			
185	1.00	1.00			
186	1.00	1.00			
187	1.00	1.00			
188	1.00	1.00			
189	1.00	1.00			
196	1.00	1.00			
197	1.00	1.00			
198	1.00	1.00			
199	1.00	1.00			
200	1.00	1.00			
201	1.00	1.00			
202	1.00	1.00			
204	1.00	1.00			
205	1.00	1.00			
206	1.00	1.00			
207	1.00	1.00			
210	1.00	1.00			
211	1.00	1.00			

TABLE A-10

DIESEL FUEL HEAVY VEHICLES GROWTH FACTORS (GF)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
1	1.05	1.11	49	1.05	1.10
2	1.05	1.13	50	1.13	1.28
3	1.05	1.13	51	1.05	1.10
4	1.01	1.02	52	1.05	1.10
5	1.01	1.02	53	1.08	1.17
6	1.01	1.03	54	1.08	1.17
7	1.07	1.14	55	1.08	1.17
8	1.01	1.02	56	1.08	1.17
9	1.05	1.10	57	1.08	1.17
10	1.05	1.11	58	1.08	1.17
11	1.05	1.11	59	1.08	1.17
12	1.04	1.09	60	1.08	1.17
13	1.04	1.09	61	1.05	1.10
14	1.04	1.09	62	0.98	0.96
15	1.04	1.09	63	1.03	1.06
16	1.04	1.09	64	1.08	1.16
17	1.04	1.09	65	1.08	1.16
18	1.04	1.09	66	1.08	1.16
19	1.04	1.09	67	1.08	1.16
20	1.04	1.09	68	1.08	1.16
21	1.04	1.09	69	0.98	0.96
22	1.04	1.09	70	1.03	1.06
23	1.04	1.09	71	0.98	0.96
24	1.04	1.09	72	1.03	1.06
25	1.04	1.09	73	0.98	0.97
26	1.04	1.09	74	1.08	1.16
27	1.04	1.09	75	1.08	1.16
28	1.01	1.02	76	1.08	1.16
29	1.01	1.02	77	1.17	1.36
30	1.08	1.17	78	1.26	1.55
31	1.07	1.14	79	1.26	1.55
32	1.07	1.14	80	1.70	2.50
33	1.07	1.14	81	1.17	1.36
34	1.07	1.14	82	1.07	1.14
35	1.07	1.14	83	1.07	1.14
36	1.07	1.14	84	3.25	5.84
37	1.07	1.14	85	1.05	1.10
38	1.07	1.14	86	1.11	1.25
39	1.07	1.14	87	1.17	1.36
40	1.13	1.28	88	1.11	1.23
41	1.13	1.28	89	1.11	1.23
42	1.13	1.28	90	1.19	1.40
43	1.07	1.14	91	1.19	1.40
44	1.13	1.28	92	1.08	1.17
45	1.07	1.14	93	1.08	1.17
46	1.13	1.28	94	1.19	1.40
47	1.05	1.10	95	1.19	1.40
48	1.07	1.14	96	1.11	1.23

DIESEL FUEL HEAVY VEHICLE GROWTH FACTORS (GF)(cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
97	1.11	1.23	145	1.21	1.44
98	1.11	1.23	146	1.21	1.44
99	1.11	1.23	147	1.11	1.25
100	1.19	1.40	148	1.11	1.25
101	1.19	1.40	149	1.11	1.25
102	1.08	1.17	150	1.16	1.34
103	1.19	1.40	151	1.16	1.34
104	1.06	1.14	152	1.05	1.10
105	1.21	1.44	153	1.07	1.14
106	1.21	1.44	154	1.04	1.09
107	1.21	1.44	[illegible]	1.16	1.34
108	1.21	1.44	156	1.03	1.07
109	1.06	1.14	157	1.24	1.30
110	1.06	1.14	158	1.16	1.34
111	1.06	1.14	159	1.34	1.74
112	1.06	1.14	160	1.34	1.74
113	1.06	1.14	161	1.21	1.46
114	1.06	1.14	162	1.17	1.36
115	1.22	1.44	163	1.30	1.64
116	1.22	1.44	164	1.08	1.16
117	1.22	1.44	165	1.13	1.28
118	1.22	1.44	166	1.13	1.28
119	1.06	1.14	167	1.13	1.28
120	1.06	1.14	168	1.13	1.28
121	1.06	1.14	169	1.13	1.28
122	1.06	1.14	170	1.05	1.10
123	1.11	1.23	171	1.05	1.10
124	1.06	1.14	172	1.07	1.14
125	1.22	1.44	173	1.05	1.10
126	1.22	1.44	174	1.02	1.04
127	1.19	1.40	175	1.17	1.32
128	1.19	1.40	176	1.02	1.04
129	1.11	1.23	177	1.17	1.36
130	1.11	1.23	178	1.30	1.64
131	1.11	1.23	179	1.19	1.41
132	1.11	1.23	180	1.19	1.41
133	1.11	1.23	181	1.01	1.03
134	1.11	1.23	182	1.01	1.03
135	1.19	1.40	183	1.01	1.03
136	1.19	1.40	184	1.19	1.41
137	1.22	1.44	185	1.19	1.41
138	1.22	1.44	186	1.02	1.04
139	1.11	1.25	187	0.98	0.97
140	1.11	1.25	188	0.98	0.97
141	1.11	1.25	189	0.98	0.97
142	1.11	1.25	190	0.98	0.97
143	1.11	1.25	191	0.98	0.97
144	1.11	1.25	192	1.13	1.28

DIESEL FUEL HEAVY VEHICLES GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
193	1.13	1.28	241	1.01	1.02
194	.98	.97	242	1.01	1.02
195	1.05	1.10	243	1.01	1.02
196	1.21	1.46	244	1.02	1.05
197	1.21	1.46	245	1.02	1.05
198	1.02	1.04	246	0.93	0.86
199	1.19	1.41	247	0.93	0.86
200	1.19	1.41	248	0.93	0.86
201	1.01	1.03	249	0.93	0.86
202	1.01	1.03	250	1.02	1.05
203	1.08	1.16	251	1.02	1.05
204	1.08	1.16	252	1.01	1.02
205	1.08	1.17	253	1.01	1.02
206	1.08	1.17	254	1.01	1.02
207	1.08	1.17	255	0.99	0.97
208	1.08	1.17	256	0.99	0.97
209	1.08	1.17	257	0.99	0.97
210	1.08	1.17	258	0.99	0.97
211	1.08	1.17	259	0.99	0.97
212	1.03	1.03	260	1.03	1.06
213	1.00	1.00	261	1.01	1.03
214	1.00	1.00	262	1.01	1.03
215	1.00	1.00	263	1.01	1.03
216	1.00	1.00	264	1.03	1.06
217	1.00	1.00	265	1.03	1.06
218	1.00	1.00	266	0.99	0.97
219	1.00	1.00	267	0.99	0.97
220	1.03	1.03	268	0.99	0.97
221	1.03	1.03	269	0.99	0.97
222	1.03	1.03	270	0.99	0.97
223	1.03	1.03	271	0.99	0.97
224	1.03	1.03	272	0.99	0.97
225	1.03	1.03	273	0.99	0.97
226	1.03	1.03	274	1.03	1.06
227	1.00	1.00	275	1.03	1.06
228	1.00	1.00	276	1.03	1.06
229	1.00	1 00	277	1.03	1.06
230	1.00	1.00	278	1.10	1.21
231	1.00	1.00	279	1.10	1.21
232	1.00	1.00	280	1.11	1.24
233	0.93	0.86	281	1.11	1.24
234	1.00	1.00	282	1.11	1.24
235	1.02	1.05	283	1.11	1.24
236	1.01	1.02	284	1.10	1.21
237	1.01	1.02	285	1.10	1.21
238	1.01	1.02	286	1.10	1.21
239	1.01	1.02	287	1.11	1.24
240	1.01	1.02	288	1.11	1.24

DIESEL FUEL HEAVY VEHICLES GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
289	1.11	1.24			
290	1.11	1.24			
291	1.10	1.21			
292	1.10	1.21			
293	1.10	1.21			
294	1.16	1.35			
295	1.16	1.35			
296	1.16	1.35			
297	1.16	1.35			
298	1.16	1.35			
299	1.11	1.23			
300	1.11	1.23			
301	1.11	1.23			
302	1.16	1.35			
303	1.16	1.35			
304	1.21	1.46			
305	1.16	1.35			
306	1.13	1.28			
307	1.05	1.10			
308	1.05	1.10			
309	1.05	1.10			
310	1.13	1.28			
311	1.13	1.28			
312	1.13	1.28			
313	1.13	1.28			
314	1.13	1.28			
315	1.13	1.28			

TABLE A-11

DIESEL FUEL - OFF HIGHWAY (FARM TRACTORS) GROWTH FACTORS (GF)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
1	1.00	1.00	80	1.00	1.00
2	1.00	1.00	81	1.00	1.00
3	1.00	1.00	82	1.00	1.00
6	1.00	1.00	83	1.00	1.00
7	1.00	1.00	84	1.00	1.00
8	1.00	1.00	85	1.00	1.00
9	1.00	1.00	86	1.00	1.00
10	1.00	1.00	87	1.00	1.00
11	1.00	1.00	88	1.00	1.00
12	1.00	1.00	89	1.00	1.00
13	1.00	1.00	90	1.00	1.00
14	1.00	1.00	91	1.00	1.00
16	1.00	1.00	92	1.00	1.00
17	1.00	1.00	93	1.00	1.00
24	1.00	1.00	94	1.00	1.00
25	1.00	1.00	95	1.00	1.00
27	1.00	1.00	96	1.00	1.00
28	1.00	1.00	97	1.00	1.00
29	1.00	1.00	98	1.00	1.00
30	1.00	1.00	99	1.00	1.00
31	1.00	1.00	101	1.00	1.00
32	1.00	1.00	103	1.00	1.00
33	1.00	1.00	108	1.00	1.00
34	1.00	1.00	109	1.00	1.00
35	1.00	1.00	110	1.00	1.00
36	1.00	1.00	111	1.00	1.00
37	1.00	1.00	112	1.00	1.00
38	1.00	1.00	113	1.00	1.00
39	1.00	1.00	116	1.00	1.00
43	1.00	1.00	124	1.00	1.00
45	1.00	1.00	127	1.00	1.00
48	1.00	1.00	128	1.00	1.00
49	1.00	1.00	129	1.00	1.00
52	1.00	1.00	132	1.00	1.00
53	1.00	1.00	134	1.00	1.00
54	1.00	1.00	135	1.00	1.00
56	1.00	1.00	136	1.00	1.00
57	1.00	1.00	138	1.00	1.00
58	1.00	1.00	139	1.00	1.00
59	1.00	1.00	142	1.00	1.00
60	1.00	1.00	143	1.00	1.00
61	1.00	1.00	144	1.00	1.00
63	1.00	1.00	145	1.00	1.00
70	1.00	1.00	146	1.00	1.00
76	1.00	1.00	147	1.00	1.00
77	1.00	1.00	148	1.00	1.00
78	1.00	1.00	149	1.00	1.00
79	1.00	1.00	150	1.00	1.00

DIESEL FUEL - OFF HIGHWAY (FARM TRACTORS) GROWTH FACTORS (GF)(cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
151	1.00	1.00			
152	1.00	1.00			
153	1.00	1.00			
154	1.00	1.00			
155	1.00	1.00			
156	1.00	1.00			
157	1.00	1.00			
158	1.00	1.00			
159	1.00	1.00			
160	1.00	1.00			
161	1.00	1.00			
162	1.00	1.00			
164	1.00	1.00			
173	1.00	1.00			
174	1.00	1.00			
175	1.00	1.00			
176	1.00	1.00			
177	1.00	1.00			
178	1.00	1.00			
179	1.00	1.00			
180	1.00	1.00			
181	1.00	1.00			
182	1.00	1.00			
183	1.00	1.00			
184	1.00	1.00			
185	1.00	1.00			
186	1.00	1.00			
187	1.00	1.00			
188	1.00	1.00			
189	1.00	1.00			
196	1.00	1.00			
197	1.00	1.00			
198	1.00	1.00			
199	1.00	1.00			
200	1.00	1.00			
201	1.00	1.00			
202	1.00	1.00			
204	1.00	1.00			
205	1.00	1.00			
206	1.00	1.00			
207	1.00	1.00			
210	1.00	1.00			
211	1.00	1.00			

TABLE A-12

DIESEL FUEL - OFF HIGHWAY (CONSTRUCTION EQUIPMENT) GROWTH FACTORS (GF)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
1	1.80	1.80	51	1.12	1.16
2	1.43	1.43	52	1.12	1.16
3	1.43	1.43	53	1.43	1.43
4	1.67	1.67	54	1.43	1.43
5	1.67	1.67	55	1.43	1.43
6	2.25	2.25	56	1.43	1.43
7	2.25	2.25	57	1.43	1.43
8	1.67	1.67	58	1.43	1.43
9	1.43	1.43	59	1.43	1.43
10	2.00	2.00	60	1.43	1.43
11	3.25	3.25	61	1.12	1.16
12	2.30	2.30	62	1.02	1.08
13	2.30	2.30	63	1.02	1.08
14	2.30	2.30	64	1.17	1.17
15	2.30	2.30	65	1.17	1.17
16	1.18	1.18	66	1.17	1.17
17	2.30	2.30	67	1.17	1.17
18	1.18	1.18	68	1.17	1.17
19	1.18	1.18	69	1.02	1.08
20	1.18	1.18	70	1.03	1.08
21	1.18	1.18	71	1.02	1.08
22	1.18	1.18	72	1.02	1.08
23	2.30	2.30	73	1.14	1.79
24	1.18	1.18	74	1.02	1.08
25	1.18	1.18	75	1.01	1.05
26	1.18	1.18	76	1.01	1.05
27	1.18	1.18	77	1.00	1.00
28	1.93	1.93	78	1.00	1.00
29	1.93	1.93	79	1.04	1.11
30	1.43	1.43	80	1.04	1.11
31	1.00	1.00	81	1.03	1.17
32	1.43	1.43	82	1.00	1.17
33	1.50	1.50	83	1.00	1.17
34	1.50	1.50	84	1.03	1.17
35	1.50	1.50	85	1.01	1.06
36	1.50	1.50	86	1.01	1.06
37	1.50	1.50	87	1.03	1.17
38	1.50	1.50	88	1.04	1.11
39	1.12	1.16	89	1.04	1.11
40	1.12	1.16	90	1.04	1.11
41	1.12	1.16	91	1.04	1.11
42	1.12	1.16	92	1.03	1.08
43	1.15	1.15	93	1.03	1.08
44	1.12	1.16	94	1.04	1.11
45	1.15	1.15	95	1.04	1.11
46	1.12	1.16	96	1.04	1.11
47	1.12	1.16	97	1.04	1.11
48	1.12	1.15	98	1.04	1.11
49	1.12	1.16	99	1.04	1.11
50	1.12	1.16	100	1.04	1.11

DIESEL FUEL - OFF HIGHWAY (CONSTRUCTION EQUIPMENT) GROWTH FACTORS (G
(cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
101	1.04	1.11	151	1.01	1.03
102	1.03	1.08	152	1.01	1.06
103	1.02	1.08	153	1.01	1.06
104	1.01	1.07	154	1.00	1.00
105	1.01	1.07	155	1.01	1.03
106	1.01	1.07	156	1.12	1.62
107	1.01	1.07	157	1.12	1.62
108	1.01	1.07	158	1.01	1.03
109	1.01	1.07	159	1.02	1.08
110	1.01	1.07	160	1.02	1.08
111	1.01	1.07	161	1.02	1.09
112	1.01	1.07	162	1.02	1.09
113	1.01	1.07	163	1.02	1.08
114	1.01	1.07	164	1.02	1.09
115	1.01	1.07	165	1.12	1.16
116	1.01	1.07	166	1.12	1.16
117	1.01	1.07	167	1.12	1.16
118	1.01	1.07	168	1.12	1.16
119	1.01	1.07	169	1.12	1.16
120	1.01	1.07	170	1.12	1.16
121	1.01	1.07	171	1.12	1.16
122	1.01	1.07	172	1.15	1.15
123	1.05	1.10	173	1.12	1.16
124	1.01	1.07	174	1.08	1.36
125	1.01	1.07	175	1.02	1.09
126	1.01	1.07	176	1.08	1.36
127	1.05	1.10	177	1.02	1.09
128	1.05	1.10	178	1.02	1.08
129	1.05	1.10	179	1.00	1.00
130	1.05	1.10	180	1.00	1.00
131	1.05	1.10	181	1.00	0.88
132	1.05	1.10	182	0.86	0.86
133	1.05	1.10	183	0.67	0.67
134	1.05	1.10	184	1.00	0.83
135	1.05	1.10	185	1.00	0.83
136	1.05	1.10	186	0.93	0.79
137	1.01	1.07	187	1.00	1.00
138	1.01	1.07	188	1.14	1.79
139	1.01	1.06	189	1.14	1.79
140	1.01	1.06	190	1.00	1.00
141	1.01	1.06	191	1.00	1.00
142	1.01	1.06	192	1.12	1.16
143	1.01	1.06	193	1.12	1.16
144	1.01	1.06	194	1.00	1.00
145	1.01	1.07	195	1.12	1.16
146	1.01	1.07	196	1.02	1.09
147	1.01	1.06	197	1.02	1.09
148	1.06	1.06	198	0.96	0.87
149	1.06	1.06	199	1.00	0.83
150	1.01	1.03	200	1.00	0.83

DIESEL FUEL - OFF HIGHWAY (CONSTRUCTION EQUIPMENT) GROWTH FACTORS (GF

(cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
201	.67	.67	251	1.02	1.08
202	.67	.67	252	1.02	1.08
203	1.03	1.08	253	1.02	1.08
204	1.03	1.08	254	1.02	1.08
205	1.03	1.08	255	1.02	1.08
206	1.03	1.08	256	1.02	1.08
207	1.03	1.08	257	1.02	1.08
208	1.03	1.08	258	1.02	1.08
209	1.03	1.08	259	1.02	1.08
210	1.03	1.08	260	1.02	1.08
211	1.03	1.08	261	1.02	1.08
212	1.02	1.08	262	1.02	1.08
213	1.02	1.08	263	1.02	1.08
214	1.02	1.08	264	1.02	1.08
215	1.02	1.08	265	1.02	1.08
216	1.02	1.08	266	1.02	1.08
217	1.02	1.08	267	1.02	1.08
218	1.02	1.08	268	1.02	1.08
219	1.02	1.08	269	1.02	1.08
220	1.02	1.08	270	1.02	1.08
221	1.02	1.08	271	1.02	1.08
222	1.02	1.08	272	1.02	1.08
223	1.02	1.08	273	1.02	1.08
224	1.02	1.08	274	1.02	1.08
225	1.02	1.08	275	1.02	1.08
226	1.02	1.08	276	1.02	1.08
227	1.02	1.08	277	1.02	1.08
228	1.02	1.08	278	1.02	1.08
229	1.02	1.08	279	1.02	1.08
230	1.02	1.08	280	1.02	1.08
231	1.02	1.08	281	1.02	1.08
232	1.02	1.08	282	1.02	1.08
233	1.02	1.08	283	1.02	1.08
234	1.02	1.08	284	1.02	1.08
235	1.02	1.08	285	1.02	1.08
236	1.02	1.08	286	1.02	1.08
237	1.02	1.08	287	1.02	1.08
238	1.02	1.08	288	1.02	1.08
239	1.02	1.08	289	1.02	1.08
240	1.02	1.08	290	1.02	1.08
241	1.02	1.08	291	1.02	1.08
242	1.02	1.08	292	1.02	1.08
243	1.02	1.08	293	1.02	1.08
244	1.02	1.08	294	1.00	1.00
245	1.02	1.08	295	1.00	1.00
246	1.02	1.08	296	1.00	1.00
247	1.02	1.08	297	1.00	1.00
248	1.02	1.08	298	1.00	1.00
249	1.02	1.08	299	1.05	1.10
250	1.02	1.08	300	1.05	1.10

DIESEL FUEL - OFF HIGHWAY (CONSTRUCTION EQUIPMENT) GROWTH FACTORS (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
301	1.05	1.10			
302	1.00	1.00			
303	1.00	1.00			
304	1.02	1.09			
305	1.00	1.00			
306	1.12	1.16			
307	1.12	1.16			
308	1.12	1.16			
309	1.12	1.16			
310	1.12	1.16			
311	1.12	1.16			
312	1.12	1.16			
313	1.12	1.16			
314	1.12	1.16			
315	1.12	1.16			
316	1.00	1.00			

TABLE A-13

DIESEL FUEL - RAILROADS GROWTH FACTORS (GF)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
9	0.95	0.96	130	0.95	0.96
10	0.95	0.96	134	0.95	0.96
12	0.95	0.96	135	0.95	0.96
15	0.95	0.96	136	0.95	0.96
16	0.95	0.96	138	0.95	0.96
17	0.95	0.96	139	0.95	0.96
19	0.95	0.96	140	0.95	0.96
20	0.95	0.96	141	0.95	0.96
26	0.95	0.96	142	0.95	0.96
28	0.95	0.96	143	0.95	0.96
30	0.95	0.96	145	0.95	0.96
32	0.95	0.96	150	0.95	0.96
34	0.95	0.96	151	0.95	0.96
42	0.95	0.96	152	0.95	0.96
44	0.95	0.96	153	0.95	0.96
46*	0.95	0.96	155	0.95	0.96
47*	0.95	0.96	156	0.95	0.96
49*	0.95	0.96	157	0.95	0.96
53	0.95	0.96	160	0.95	0.96
60	0.95	0.96	161	0.95	0.96
62	0.95	0.96	162	0.95	0.96
64	0.95	0.96	163	0.95	0.96
66	0.95	0.96	164	0.95	0.96
67	0.95	0.96	175	0.95	0.96
68	0.95	0.96	176	0.95	0.96
70	0.95	0.96	181	0.95	0.96
73	0.95	0.96	182	0.95	0.96
75	0.95	0.96	183	0.95	0.96
76	0.95	0.96	184	0.95	0.96
77	0.95	0.96	186	0.95	0.96
82	0.95	0.96	187	0.95	0.96
83	0.95	0.96	188	0.95	0.96
84	0.95	0.96	189	0.95	0.96
85	0.95	0.96	191	0.95	0.96
86	0.95	0.96	196	0.95	0.96
102	0.95	0.96	197	0.95	0.96
107	0.95	0.96	198	0.95	0.96
108	0.95	0.96	200	0.95	0.96
113*	0.95	0.96	202	0.95	0.96
114	0.95	0.96	204	0.95	0.96
115	0.95	0.96	205	0.95	0.96
116	0.95	0.96	206	0.95	0.96
117	0.95	0.96	208*	0.95	0.96
118	0.95	0.96	209*	0.95	0.96
119	0.95	0.96	210	0.95	0.96
120	0.95	0.96	211	0.95	0.96
121*	0.95	0.96	212	0.95	0.96
125	0.95	0.96	213	0.95	0.96
128	0.95	0.96	214	0.95	0.96
129	0.95	0.96	215	0.95	0.96

DIESEL FUEL - RAILROADS GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
220	0.95	0.96	297	0.95	0.96
221	0.95	0.96	301	0.95	0.96
222	0.95	0.96	302	0.95	0.96
225	0.95	0.96	303*	0.95	0.96
226	0.95	0.96	304*	0.95	0.96
227	0.95	0.96	305*	0.95	0.96
237	0.95	0.96			
238	0.95	0.96			
239	0.95	0.96			
240	0.95	0.96			
241	0.95	0.96			
247	0.95	0.96			
248	0.95	0.96			
254	0.95	0.96			
255	0.95	0.96			
256*	0.95	0.96			
257	0.95	0.96			
258	0.95	0.96			
262	0.95	0.96			
263	0.95	0.96			
264	0.95	0.96			
265	0.95	0.96			
266	0.95	0.96			
267	0.95	0.96			
268*	0.95	0.96			
269*	0.95	0.96			
270	0.95	0.96			
271	0.95	0.96			
272	0.95	0.96			
273	0.95	0.96			
274*	0.95	0.96			
275*	0.95	0.96			
276*	0.95	0.96			
277*	0.95	0.96			
278	0.95	0.96			
279	0.95	0.96			
281	0.95	0.96			
285	0.95	0.96			
286	0.95	0.96			
290	0.95	0.96			
291*	0.95	0.96			
292*	0.95	0.96			
294*	0.95	0.96			
295*	0.95	0.96			
296*	0.95	0.96			

*Grid Cells containing railroad yard activity

TABLE A-14
AIRCRAFT GROWTH FACTORS (GF)

Grid #	Commercial 1982	Commercial 1990	Civil 1982	Civil 1990	Military 1982	Military 1990
1			1.83	2.67		
3			1.83	2.67		
8			1.83	2.67		
10			1.83	2.67		
11			1.83	2.67		
14			1.83	2.67		
28			1.83	2.67		
*32	1.10	1.20	1.55	2.18	1.00	1.00
34			1.83	2.67		
77			1.83	2.67		
81			1.83	2.67		
82			1.83	2.67		
**106	1.23	1.60	1.16	1.13	1.00	1.00
116			1.83	2.67		
127			1.83	2.67		
178			1.83	2.67		
179			1.83	2.67		
181			1.83	2.67		
183			1.83	2.67		
188			1.83	2.67		
189			1.83	2.67		
198			1.83	2.67		
199			1.83	2.67		
260			1.83	2.67		
263			1.83	2.67		
310			1.83	2.67		
158			1.83	2.67		
159			1.83	2.67		
164			1.83	2.67		

* Contains Niagara Falls International Airport
** Contains Greater Buffalo International Airport

TABLE A-15
VESSEL GROWTH FACTORS (GF)

GRID #	Commercial Vessels 1982	Commercial Vessels 1990	Recreational Vessels 1982	Recreational Vessels 1990
1			1.26	1.58
2			1.26	1.58
3			1.26	1.58
4			1.26	1.58
5			1.26	1.58
6			1.26	1.58
7			1.26	1.58
36			1.26	1.58
* 63	0.89	1.00		
69				
* 70	0.89	1.00		
73			1.26	1.58
74				
162			1.26	1.58
164			1.26	1.58
187			1.26	1.58
189			1.26	1.58
190			1.26	1.58
191			1.26	1.58
197			1.26	1.58
*215	0.89	1.00		
**216	1.17	2.00		
**231	1.17	2.00		
**232	1.17	2.00		
247			1.26	1.58
248			1.26	1.58
262			1.26	1.58
263			1.26	1.58
275			1.26	1.58
276			1.26	1.58
**277	1.17	2.00		
**278	1.17	2.00		
**279	1.17	2.00		
**293	1.17	2.00	1.26	1.58
294			1.26	1.58
305			1.26	1.58
# 316	1.14	1.90	1.26	1.58

* Contains Niagara River - Black Rock Channel section of Port of Buffalo

** Contains Buffalo Harbor section of Port of Buffalo

\# 10 by 10 kilometer grid in Lake Erie

TABLE A-16
DIRT ROADS TRAVELED GROWTH FACTORS (GF)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
1	0.59	0.13	49	0.00	0.00
2	1.65	2.39	50	0.00	0.00
3	1.65	2.39	51	0.00	0.00
4	0.00	0.00	52	0.00	0.00
5	0.00	0.00	53	0.00	0.00
6	1.07	1.15	54	0.00	0.00
7	0.00	0.00	55	0.00	0.00
8	0.00	0.00	56	0.00	0.00
9	1.65	2.39	57	0.00	0.00
10	0.72	0.40	58	0.00	0.00
11	0.00	0.00	59	0.00	0.00
12	0.00	0.00	60	0.00	0.00
13	0.00	0.00	61	0.00	0.00
14	0.00	0.00	62	1.00	1.00
15	0.00	0.00	63	1.00	1.00
16	0.00	0.00	64	0.00	0.00
17	0.00	0.00	65	0.45	0.00
18	0.00	0.00	66	0.00	0.00
19	0.00	0.00	67	0.00	0.00
20	0.00	0.00	68	0.45	0.00
21	0.00	0.00	69	0.00	0.00
22	0.00	0.00	70	1.00	1.00
23	0.00	0.00	71	1.00	1.00
24	0.00	0.00	72	0.00	0.00
25	0.00	0.00	73	0.00	0.00
26	0.00	0.00	74	1.00	1.00
27	0.00	0.00	75	0.85	0.68
28	0.55	0.03	76	0.85	0.68
29	0.55	0.03	77	0.00	0.00
30	0.80	0.57	78	1.00	1.00
31	0.00	0.00	79	0.00	0.00
32	0.80	0.57	80	0.00	0.00
33	0.00	0.00	81	0.30	0.00
34	0.95	0.88	82	0.24	0.00
35	0.95	0.88	83	0.24	0.00
36	0.95	0.88	84	0.30	0.00
37	0.95	0.88	85	0.00	0.00
38	0.95	0.88	86	0.00	0.00
39	0.00	0.00	87	0.00	0.00
40	0.00	0.00	88	0.00	0.00
41	0.00	0.00	89	0.00	0.00
42	0.00	0.00	90	0.00	0.00
43	0.95	0.88	91	0.00	0.00
44	0.00	0.00	92	0.00	0.00
45	0.00	0.00	93	0.00	0.00
46	0.00	0.00	94	0.00	0.00
47	0.00	0.00	95	0.00	0.00
48	0.00	0.00	96	0.00	0.00

DIRT ROADS TRAVELED GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
97	0.00	0.00	145	0.00	0.00
98	0.00	0.00	146	0.00	0.00
99	0.00	0.00	147	0.00	0.00
100	0.00	0.00	148	0.00	0.00
101	0.00	0.00	149	0.00	0.00
102	1.13	1.27	150	0.76	0.48
103	0.00	0.00	151	0.76	0.48
104	0.00	0.00	152	0.00	0.00
105	0.37	0.00	153	0.00	0.00
106	0.00	0.00	154	1.53	2.13
107	0.00	0.00	155	0.76	0.48
108	0.37	0.00	156	0.00	0.00
109	0.37	0.00	157	0.91	0.81
110	0.00	0.00	158	0.76	0.48
111	0.00	0.00	159	0.63	0.38
112	0.00	0.00	160	0.00	0.00
113	0.00	0.00	161	0.87	0.72
114	0.00	0.00	162	0.87	0.72
115	0.00	0.00	163	0.63	0.38
116	0.37	0.00	164	0.87	0.72
117	0.00	0.00	165	0.00	0.00
118	0.00	0.00	166	0.00	0.00
119	0.37	0.00	167	0.00	0.00
120	0.00	0.00	168	0.00	0.00
121	0.00	0.00	169	0.00	0.00
122	0.00	0.00	170	0.00	0.00
123	0.00	0.00	171	0.00	0.00
124	0.00	0.00	172	0.00	0.00
125	0.00	0.00	173	0.00	0.00
126	0.37	0.00	174	1.00	1.00
127	0.00	0.00	175	0.87	0.72
128	0.00	0.00	176	1.00	1.00
129	0.00	0.00	177	0.00	0.00
130	0.00	0.00	178	0.00	0.00
131	0.00	0.00	179	0.00	0.00
132	0.00	0.00	180	1.03	1.06
133	0.00	0.00	181	1.41	1.88
134	0.00	0.00	182	0.72	0.41
135	0.00	0.00	183	0.85	0.68
136	0.00	0.00	184	0.96	0.92
137	0.37	0.00	185	0.96	0.92
138	0.00	0.00	186	0.83	0.63
139	0.00	0.00	187	1.05	1.11
140	0.00	0.00	188	0.00	0.00
141	0.00	0.00	189	1.41	1.87
142	0.00	0.00	190	0.00	0.00
143	0.00	0.00	191	0.00	0.00
144	0.00	0.00	192	0.00	0.00

DIRT ROADS TRAVELED GROWTH FACTORS (GF)(cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
193	0.00	0.00	241	0.00	0.00
194	0.00	0.00	242	0.00	0.00
195	0.00	0.00	243	0.00	0.00
196	0.87	0.72	244	0.00	0.00
197	0.87	0.72	245	0.00	0.00
198	1.00	1.00	246	0.00	0.00
199	0.96	0.92	247	0.00	0.00
200	0.96	0.92	248	0.00	0.00
201	0.85	0.68	249	0.00	0.00
202	0.85	0.68	250	0.00	0.00
203	1.13	1.27	251	0.00	0.00
204	1.13	1.27	252	0.00	0.00
205	1.13	1.27	253	0.00	0.00
206	1.13	1.27	254	0.00	0.00
207	0.00	0.00	255	0.21	0.00
208	0.00	0.00	256	0.00	0.00
209	0.00	0.00	257	0.00	0.00
210	0.00	0.00	258	0.21	0.00
211	0.00	0.00	259	0.00	0.00
212	0.00	0.00	260	0.00	0.00
213	0.00	0.00	261	0.00	0.00
214	0.00	0.00	262	0.21	0.00
215	0.00	0.00	263	0.21	0.00
216	0.21	0.00	264	0.00	0.00
217	0.00	0.00	265	0.00	0.00
218	0.00	0.00	266	0.00	0.00
219	0.00	0.00	267	0.00	0.00
220	0.00	0.00	268	0.00	0.00
221	0.00	0.00	269	0.00	0.00
222	0.00	0.00	270	0.00	0.00
223	0.00	0.00	271	0.00	0.00
224	0.00	0.00	272	0.00	0.00
225	0.00	0.00	273	0.00	0.00
226	0.00	0.00	274	0.00	0.00
227	0.00	0.00	275	0.00	0.00
228	0.00	0.00	276	0.00	0.00
229	0.00	0.00	277	0.00	0.00
230	0.00	0.00	278	0.00	0.00
231	0.00	0.00	279	0.00	0.00
232	0.00	0.00	280	0.00	0.00
233	0.00	0.00	281	0.00	0.00
234	0.00	0.00	282	0.00	0.00
235	0.00	0.00	283	0.00	0.00
236	0.00	0.00	284	0.00	0.00
237	0.00	0.00	285	0.00	0.00
238	0.00	0.00	286	0.00	0.00
239	0.00	0.00	287	0.00	0.00
240	0.21	0.00	288	0.00	0.00

DIRT ROADS TRAVELED GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
289	0.00	0.00			
290	0.00	0.00			
291	0.00	0.00			
292	0.00	0.00			
293	0.00	0.00			
294	0.00	0.00			
295	0.00	0.00			
296	0.00	0.00			
297	0.00	0.00			
298	0.00	0.00			
299	0.00	0.00			
300	0.00	0.00			
301	0.52	0.00			
302	0.00	0.00			
303	0.00	0.00			
304	0.00	0.00			
305	0.00	0.00			
306	0.00	0.00			
307	0.00	0.00			
308	0.00	0.00			
309	0.00	0.00			
310	0.00	0.00			
311	0.00	0.00			
312	0.00	0.00			
313	0.00	0.00			
314	0.00	0.00			
315	0.00	0.00			
316	0.00	0.00			

TABLE A-17
DIRT AIRSTRIPS GROWTH FACTORS (GF)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
1	1.83	2.67			
3	1.83	2.67			
6	1.83	2.67			
8	1.83	2.67			
11	1.83	2.67			
28	1.83	2.67			
34	1.83	2.67			
77	1.83	2.67			
81	1.83	2.67			
158	1.83	2.67			
159	1.83	2.67			
178	1.83	2.67			
179	1.83	2.67			
189	1.83	2.67			
198	1.83	2.67			

TABLE A-18
CONSTRUCTION LAND AREA (CONSTRUCTION AREA) GROWTH FACTORS (GF)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
1	1.80	1.80	51	1.12	1.16
2	1.43	1.43	52	1.12	1.16
3	1.43	1.43	53	1.43	1.43
4	1.67	1.67	54	1.43	1.43
5	1.67	1.67	55	1.43	1.43
6	2.25	2.25	56	1.43	1.43
7	2.25	2.25	57	1.43	1.43
8	1.67	1.67	58	1.43	1.43
9	1.43	1.43	59	1.43	1.43
10	2.00	2.00	60	1.43	1.43
11	3.25	3.25	61	1.12	1.16
12	2.30	2.30	62	1.02	1.08
13	2.30	2.30	63	1.02	1.08
14	2.30	2.30	64	1.17	1.17
15	2.30	2.30	65	1.17	1.17
16	1.18	1.18	66	1.17	1.17
17	2.30	2.30	67	1.17	1.17
18	1.18	1.18	68	1.17	1.17
19	1.18	1.18	69	1.02	1.08
20	1.18	1.18	70	1.03	1.08
21	1.18	1.18	71	1.02	1.08
22	1.18	1.18	72	1.02	1.08
23	2.30	2.30	73	1.14	1.79
24	1.18	1.18	74	1.02	1.08
25	1.18	1.18	75	1.01	1.05
26	1.18	1.18	76	1.01	1.05
27	1.18	1.18	77	1.00	1.00
28	1.93	1.93	78	1.00	1.00
29	1.93	1.93	79	1.04	1.11
30	1.43	1.43	80	1.04	1.11
31	1.00	1.00	81	1.03	1.17
32	1.43	1.43	82	1.00	1.17
33	1.50	1.50	83	1.00	1.17
34	1.50	1.50	84	1.03	1.17
35	1.50	1.50	85	1.01	1.06
36	1.50	1.50	86	1.01	1.06
37	1.50	1.50	87	1.03	1.17
38	1.50	1.50	88	1.04	1.11
39	1.12	1.16	89	1.04	1.11
40	1.12	1.16	90	1.04	1.11
41	1.12	1.16	91	1.04	1.11
42	1.12	1.16	92	1.03	1.08
43	1.15	1.15	93	1.03	1.08
44	1.12	1.16	94	1.04	1.11
45	1.15	1.15	95	1.04	1.11
46	1.12	1.16	96	1.04	1.11
47	1.12	1.16	97	1.04	1.11
48	1.12	1.15	98	1.04	1.11
49	1.12	1.16	99	1.04	1.11
50	1.12	1.16	100	1.04	1.11

CONSTRUCTION LAND AREA (CONSTRUCTION AREA) GROWTH FACTORS (GF)(cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
101	1.04	1.11	151	1.01	1.03
102	1.03	1.08	152	1.01	1.06
103	1.02	1.06	153	1.01	1.06
104	1.01	1.[illegible]	154	1.00	1.00
105	1.01	1.07	155	1.01	1.03
106	1.01	1.07	156	1.12	1.62
107	1.01	1.07	157	1.12	1.62
108	1.01	1.07	158	1.01	1.03
109	1.01	1.07	159	1.02	1.08
110	1.01	1.07	160	1.02	1.08
111	1.01	1.07	161	1.02	1.09
112	1.01	1.07	162	1.02	1.09
113	1.01	1.07	163	1.02	1.08
114	1.01	1.07	164	1.02	1.09
115	1.01	1.07	165	1.12	1.16
116	1.01	1.07	166	1.12	1.16
117	1.01	1.07	167	1.12	1.16
118	1.01	1.07	168	1.12	1.16
119	1.01	1.07	169	1.12	1.16
120	1.01	1.07	170	1.12	1.16
121	1.01	1.07	171	1.12	1.16
122	1.01	1.07	172	1.15	1.15
123	1.05	1.10	173	1.12	1.16
124	1.01	1.07	174	1.08	1.36
125	1.01	1.07	175	1.02	1.09
126	1.01	1.07	176	1.08	1.36
127	1.05	1.10	177	1.02	1.09
128	1.05	1.10	178	1.02	1.08
129	1.05	1.10	179	1.00	1.00
130	1.05	1.10	180	1.00	1.00
131	1.05	1.10	181	1.00	0.88
132	1.05	1.10	182	0.86	0.86
133	1.05	1.10	183	0.67	0.67
134	1.05	1.10	184	1.00	0.83
135	1.05	1.10	185	1.00	0.83
136	1.05	1.10	186	0.93	0.79
137	1.01	1.07	187	1.00	1.00
138	1.01	1.07	188	1.14	1.79
139	1.01	1.06	189	1.14	1.79
140	1.01	1.06	190	1.00	1.00
141	1.01	1.06	191	1.00	1.00
142	1.01	1.06	192	1.12	1.16
143	1.01	1.06	193	1.12	1.16
144	1.01	1.06	194	1.00	1.00
145	1.01	1.07	195	1.12	1.16
146	1.01	1.07	196	1.02	1.09
147	1.01	1.06	197	1.02	1.09
148	1.06	1.06	198	0.96	0.87
149	1.06	1.06	199	1.00	0.83
150	1.01	1.03	200	1.00	0.83

CONSTRUCTION LAND AREA (CONSTRUCTION AREA) GROWTH FACTORS (GF)(cont.

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
201	0.67	0.67	251	1.02	1.08
202	0.67	0.67	252	1.02	1.08
203	1.03	1.08	253	1.02	1.08
204	1.03	1.08	254	1.02	1.08
205	1.03	1.08	255	1.02	1.08
206	1.03	1.08	256	1.02	1.08
207	1.03	1.08	257	1.02	1.08
208	1.03	1.08	258	1.02	1.08
209	1.03	1.08	259	1.02	1.08
210	1.03	1.08	260	1.02	1.08
211	1.03	1.08	261	1.02	1.08
212	1.02	1.08	262	1.02	1.08
213	1.02	1.08	263	1.02	1.08
214	1.02	1.08	264	1.02	1.08
215	1.02	1.08	265	1.02	1.08
216	1.02	1.08	266	1.02	1.08
217	1.02	1.08	267	1.02	1.08
218	1.02	1.08	268	1.02	1.08
219	1.02	1.08	269	1.02	1.08
220	1.02	1.08	270	1.02	1.08
221	1.02	1.08	271	1.02	1.08
222	1.02	1.08	272	1.02	1.08
223	1.02	1.08	273	1.02	1.08
224	1.02	1.08	274	1.02	1.08
225	1.02	1.08	275	1.02	1.08
226	1.02	1.08	276	1.02	1.08
227	1.02	1.08	277	1.02	1.08
228	1.02	1.08	278	1.02	1.08
229	1.02	1.08	279	1.02	1.08
230	1.02	1.08	280	1.02	1.08
231	1.02	1.08	281	1.02	1.08
232	1.02	1.08	282	1.02	1.08
233	1.02	1.08	283	1.02	1.08
234	1.02	1.08	284	1.02	1.08
235	1.02	1.08	285	1.02	1.08
236	1.02	1.08	286	1.02	1.08
237	1.02	1.08	287	1.02	1.08
238	1.02	1.08	288	1.02	1.08
239	1.02	1.08	289	1.02	1.08
240	1.02	1.08	290	1.02	1.08
241	1.02	1.08	291	1.02	1.08
242	1.02	1.08	292	1.02	1.08
243	1.02	1.08	293	1.02	1.08
244	1.02	1.08	294	1.00	1.00
245	1.02	1.08	295	1.00	1.00
246	1.02	1.08	296	1.00	1.00
247	1.02	1.08	297	1.00	1.00
248	1.02	1.08	298	1.00	1.00
249	1.02	1.08	299	1.05	1.10
250	1.02	1.08	300	1.05	1.10

CONSTRUCTION LAND AREA (CONSTRUCTION AREA) GROWTH FACTORS (GF)(cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
301	1.05	1.10			
302	1.00	1.00			
303	1.00	1.00			
304	1.02	1.09			
305	1.00	1.00			
306	1.12	1.16			
307	1.12	1.16			
308	1.12	1.16			
309	1.12	1.16			
310	1.12	1.16			
311	1.12	1.16			
312	1.12	1.16			
313	1.12	1.16			
314	1.12	1.16			
315	1.12	1.16			
316	1.00	1.00			

TABLE A-19
CONSTRUCTION LAND AREA (CROPLAND) GROWTH FACTORS (GF)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
1	1.00	1.00	81	1.00	1.00
2	1.00	1.00	82	1.00	1.00
3	1.00	1.00	83	1.00	1.00
6	1.00	1.00	84	1.00	1.00
7	1.00	1.00	85	1.00	1.00
8	1.00	1.00	86	1.00	1.00
9	1.00	1.00	87	1.00	1.00
10	1.00	1.00	88	1.00	1.00
11	1.00	1.00	89	1.00	1.00
12	1.00	1.00	90	1.00	1.00
13	1.00	1.00	91	1.00	1.00
14	1.00	1.00	92	1.00	1.00
16	1.00	1.00	93	1.00	1.00
17	1.00	1.00	94	1.00	1.00
24	1.00	1.00	95	1.00	1.00
25	1.00	1.00	96	1.00	1.00
27	1.00	1.00	97	1.00	1.00
28	1.00	1.00	98	1.00	1.00
29	1.00	1.00	99	1.00	1.00
30	1.00	1.00	101	1.00	1.00
31	1.00	1.00	103	1.00	1.00
32	1.00	1.00	108	1.00	1.00
33	1.00	1.00	109	1.00	1.00
34	1.00	1.00	110	1.00	1.00
35	1.00	1.00	111	1.00	1.00
36	1.00	1.00	112	1.00	1.00
37	1.00	1.00	113	1.00	1.00
38	1.00	1.00	116	1.00	1.00
39	1.00	1.00	124	1.00	1.00
43	1.00	1.00	127	1.00	1.00
45	1.00	1.00	128	1.00	1.00
48	1.00	1.00	129	1.00	1.00
49	1.00	1.00	132	1.00	1.00
52	1.00	1.00	134	1.00	1.00
53	1.00	1.00	135	1.00	1.00
54	1.00	1.00	136	1.00	1.00
56	1.00	1.00	138	1.00	1.00
57	1.00	1.00	139	1.00	1.00
58	1.00	1.00	142	1.00	1.00
59	1.00	1.00	143	1.00	1.00
60	1.00	1.00	144	1.00	1.00
61	1.00	1.00	145	1.00	1.00
63	1.00	1.00	146	1.00	1.00
70	1.00	1.00	147	1.00	1.00
76	1.00	1.00	148	1.00	1.00
77	1.00	1.00	149	1.00	1.00
78	1.00	1.00	150	1.00	1.00
79	1.00	1.00	151	1.00	1.00
80	1.00	1.00	152	1.00	1.00

CONSTRUCTION LAND AREA (CROPLAND) GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
153	1.00	1.00			
154	1.00	1.00			
155	1.00	1.00			
156	1.00	1.00			
157	1.00	1.00			
158	1.00	1.00			
159	1.00	1.00			
160	1.00	1.00			
161	1.00	1.00			
162	1.00	1.00			
164	1.00	1.00			
173	1.00	1.00			
174	1.00	1.00			
175	1.00	1.00			
176	1.00	1.00			
177	1.00	1.00			
178	1.00	1.00			
179	1.00	1.00			
180	1.00	1.00			
181	1.00	1.00			
182	1.00	1.00			
183	1.00	1.00			
184	1.00	1.00			
185	1.00	1.00			
186	1.00	1.00			
187	1.00	1.00			
188	1.00	1.00			
189	1.00	1.00			
196	1.00	1.00			
197	1.00	1.00			
198	1.00	1.00			
199	1.00	1.00			
200	1.00	1.00			
201	1.00	1.00			
202	1.00	1.00			
204	1.00	1.00			
205	1.00	1.00			
206	1.00	1.00			
207	1.00	1.00			
210	1.00	1.00			
211	1.00	1.00			

TABLE A-20
ROCK HANDLING AND STORAGE GROWTH FACTORS (GF)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
7	0.00	0.00			
10	2.10	2.10			
28	1.50	1.50			
34	1.20	1.42			
83	1.02	1.07			
85	1.02	1.07			
117	1.60	2.20			
141	0.00	0.00			
153	1.00	1.00			
154	1.02	1.15			
159	0.00	0.00			
160	1.03	1.12			
181	0.00	0.00			
198	0.98	0.94			
199	0.98	0.83			
200	0.98	0.83			
202	0.78	0.72			

TABLE A-21
SLASH BURNING GROWTH FACTORS (GF)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
1	1.00	1.00			
2	1.00	1.00			
3	1.00	1.00			
4	1.00	1.00			
6	1.00	1.00			
7	1.00	1.00			
8	1.00	1.00			
9	1.00	1.00			
10	1.00	1.00			
11	1.00	1.00			
12	1.00	1.00			
13	1.00	1.00			
28	1.00	1.00			
29	1.00	1.00			
31	1.00	1.00			
33	1.00	1.00			
34	1.00	1.00			
53	1.00	1.00			
82	1.00	1.00			

TABLE A-22
STRUCTURAL FIRES GROWTH FACTORS (GF)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
1	0.75	1.00	49	1.00	1.00
2	1.16	1.00	50	1.80	1.40
3	1.00	1.00	51	2.00	3.00
4	1.16	1.00	52	1.10	0.80
5	1.00	1.00	53	1.00	1.00
6	0.93	0.86	54	1.50	2.00
7	1.06	1.00	55	1.00	1.00
8	1.00	1.00	56	1.00	1.00
9	0.95	1.00	57	1.50	2.00
10	0.83	0.88	58	0.66	0.66
11	0.83	1.00	59	2.00	1.00
12	1.00	1.00	60	0.50	0.00
13	1.00	1.00	61	0.75	0.83
14	1.33	1.55	62	1.20	1.80
15	0.62	0.75	63	1.45	2.00
16	1.35	0.85	64	0.71	0.85
17	1.00	1.00	65	1.22	1.36
18	1.00	1.00	66	1.00	0.90
19	0.83	1.00	67	1.00	0.83
20	1.83	1.66	68	0.90	0.95
21	1.00	1.00	69	1.00	0.75
22	0.70	1.00	70	0.72	1.00
23	0.50	1.00	71	1.35	1.71
24	0.66	1.66	72	1.50	1.66
25	0.87	0.85	73	1.07	1.14
26	1.50	1.00	74	1.16	0.83
27	1.00	1.00	75	0.92	0.80
28	0.95	0.90	76	1.27	1.18
29	0.75	1.00	77	2.50	1.00
30	0.83	0.83	78	0.91	0.83
31	1.00	1.00	79	2.00	2.00
32	1.08	1.00	80	1.27	1.34
33	1.00	1.00	81	2.00	1.58
34	1.16	1.00	82	1.27	1.00
35	1.50	1.00	83	1.15	1.20
36	0.83	0.83	84	1.00	0.85
37	0.75	0.50	85	1.37	0.75
38	1.33	0.66	86	1.41	1.21
39	2.00	1.00	87	1.50	1.35
40	0.83	0.66	88	0.50	1.00
41	1.00	1.25	89	1.38	1.22
42	0.75	1.00	90	1.41	1.83
43	0.66	1.00	91	0.75	3.50
44	2.00	1.66	92	1.11	0.88
45	1.50	2.00	93	0.96	0.96
46	0.75	1.00	94	1.08	1.08
47	0.75	0.50	95	1.35	1.28
48	0.90	1.00	96	0.92	0.92

STRUCTURAL FIRES GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
97	1.31	1.25	145	1.06	1.00
98	0.87	0.75	146	2.62	3.00
99	1.15	1.10	147	0.58	0.66
100	1.03	1.00	148	2.50	0.00
101	0.92	1.04	149	1.87	2.00
102	0.88	1.11	150	1.59	1.36
103	1.00	0.69	151	1.33	1.00
104	1.04	1.04	152	2.25	1.00
105	1.28	2.00	153	1.40	1.50
106	1.50	1.00	154	1.43	1.62
107	1.22	1.55	155	0.72	1.00
108	0.84	1.10	156	1.27	0.95
109	0.79	0.70	157	2.00	2.25
110	0.37	0.50	158	1.25	1.50
111	1.25	1.00	159	1.05	1.39
112	1.00	1.00	160	1.34	1.68
113	0.42	0.57	161	1.16	1.38
114	0.75	1.00	162	1.15	1.30
115	0.90	1.00	163	0.93	1.00
116	0.85	1.00	164	1.35	1.50
117	1.75	2.00	165	0.70	0.80
118	1.21	1.85	166	0.25	0.75
119	0.90	1.27	167	0.71	0.85
120	0.83	0.66	168	0.93	1.25
121	0.83	0.83	169	0.83	1.00
122	0.75	0.83	170	1.00	1.00
123	1.75	2.00	171	1.00	1.00
124	0.96	1.26	172	1.00	1.00
125	1.33	1.16	173	1.05	1.00
126	1.25	1.50	174	0.75	0.75
127	1.07	1.14	175	1.55	1.70
128	1.12	1.50	176	0.91	1.00
129	1.00	1.12	177	1.02	1.28
130	0.66	0.66	178	1.12	1.25
131	0.87	1.00	179	1.08	1.33
132	1.00	1.25	180	0.92	1.00
133	0.64	0.85	181	1.45	1.20
134	0.95	0.90	182	1.28	1.00
135	1.30	1.50	183	1.10	1.60
136	1.37	2.25	184	0.80	1.00
137	0.53	0.62	185	1.50	2.00
138	2.50	5.00	186	1.04	0.83
139	1.00	1.00	187	0.94	1.17
140	1.00	1.00	188	2.00	2.00
141	1.00	1.00	189	1.37	1.50
142	1.08	1.16	190	1.75	2.00
143	0.87	0.75	191	0.37	0.50
144	0.83	0.50	192	0.61	1.00

STRUCTURAL FIRES GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
193	0.68	1.00	241	1.10	1.20
194	1.00	1.00	242	0.86	0.73
195	0.65	0.62	243	0.92	0.84
196	0.88	1.22	244	0.80	0.60
197	0.85	0.90	245	0.79	0.81
198	1.16	1.00	246	1.07	1.07
199	1.50	1.50	247	1.06	1.06
200	0.92	0.85	248	0.87	1.00
201	1,00	1.00	249	1.00	1.00
202	0.75	1.00	250	0.93	0.93
203	0.88	0.77	251	1.05	0.90
204	0.96	1.00	252	1.12	0.91
205	1.04	1.15	253	1.09	0.90
206	0.93	0.96	254	1.18	2.25
207	1.02	1.13	255	1.00	1.00
208	0.79	0.75	256	0.77	0.81
209	0.50	0.50	257	1.00	1.00
210	1.06	1.03	258	0.75	0.25
211	1.13	1.08	259	0.85	0.90
212	0.98	0.93	260	1.10	1.00
213	0.92	0.82	261	0.77	1.00
214	1.02	1.00	262	0.75	0.75
215	0.87	0.80	263	1.00	1.00
216	1.08	1.00	264	0.90	1.30
217	0.87	0.62	265	0.95	0.83
218	0.87	1.25	266	1.37	1.25
219	0.70	0.70	267	1.00	1.20
220	0.87	0.87	268	1.00	1.00
221	1.18	1.12	269	1.00	1.00
222	1.09	0.90	270	2.12	2.25
223	1.00	1.16	271	1.00	1.00
224	1.14	1.14	272	0.75	1.50
225	1.16	1.33	273	1.00	1.00
226	0.89	0.84	274	0.77	0.72
227	1.00	1.00	275	0.94	0.88
228	0.72	0.77	276	1.00	1.00
229	0.81	0.81	277	1.50	1.00
230	1.11	1.00	278	1.00	1.00
231	0.82	0.75	279	2.00	1.00
232	1.02	0.95	280	0.94	0.88
233	1.06	1.00	281	0.58	0.66
234	1.28	1.28	282	0.88	0.66
235	0.97	0.94	283	0.84	0.76
236	0.81	0.81	284	0.83	0.77
237	1.03	0.84	285	1.00	1.00
238	0.60	0.46	286	0.93	0.87
239	0.94	0.88	287	0.83	0.83
240	0.91	1.00	288	0.80	0.80

STRUCTURAL FIRES GROWTH FACTORS (GF) (cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
289	0.95	0.63			
290	0.93	0.85			
291	2.00	2.00			
292	1.00	1.00			
293	1.00	1.00			
294	1.00	1.00			
295	0.90	0.80			
296	1.12	0.50			
297	0.50	0.75			
298	0.68	0.87			
299	1.00	0.50			
300	1.00	2.50			
301	0.96	0.92			
302	0.75	0.85			
303	0.75	1.00			
304	0.83	0.66			
305	0.50	0.50			
306	0.70	0.90			
307	0.64	0.85			
308	0.50	0.00			
309	1.75	1.50			
310	1.00	1.00			
311	1.00	1.00			
312	1.00	1.00			
313	1.00	1.00			
314	1.00	1.00			
315	0.50	0.67			

TABLE A-23
REENTRAINED DUST GROWTH FACTORS (GF)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
1	1.05	1.11	49	1.05	1.10
2	1.05	1.10	50	1.13	1.28
3	1.05	1.10	51	1.05	1.10
4	1.01	1.02	52	1.05	1.10
5	1.01	1.02	53	1.08	1.17
6	1.01	1.03	54	1.08	1.17
7	1.07	1.14	55	1.08	1.17
8	1.01	1.02	56	1.08	1.17
9	1.05	1.10	57	1.08	1.17
10	1.05	1.11	58	1.08	1.17
11	1.05	1.11	59	1.08	1.17
12	1.04	1.09	60	1.08	1.17
13	1.04	1.09	61	1.05	1.10
14	1.04	1.09	62	0.98	0.96
15	1.04	1.09	63	1.03	1.06
16	1.04	1.09	64	1.08	1.16
17	1.04	1.09	65	1.08	1.16
18	1.04	1.09	66	1.08	1.16
19	1.04	1.09	67	1.08	1.16
20	1.04	1.09	68	1.08	1.16
21	1.04	1.09	69	0.98	0.96
22	1.04	1.09	70	1.03	1.06
23	1.04	1.09	71	0.98	0.96
24	1.04	1.09	72	1.03	1.06
25	1.04	1.09	73	0.98	0.97
26	1.04	1.09	74	1.08	1.16
27	1.04	1.09	75	1.08	1.16
28	1.01	1.02	76	1.08	1.16
29	1.01	1.02	77	1.17	1.36
30	1.08	1.17	78	1.26	1.55
31	1.07	1.14	79	1.26	1.55
32	1.07	1.14	80	1.70	2.50
33	1.07	1.14	81	1.17	1.36
34	1.07	1.14	82	1.07	1.14
35	1.07	1.14	83	1.07	1.14
36	1.07	1.14	84	3.25	5.84
37	1.07	1.14	85	1.05	1.10
38	1.07	1.14	86	1.11	1.25
39	1.07	1.14	87	1.17	1.36
40	1.13	1.28	88	1.11	1.23
41	1.13	1.28	89	1.11	1.23
42	1.13	1.28	90	1.19	1.40
43	1.07	1.14	91	1.19	1.40
44	1.13	1.28	92	1.08	1.17
45	1.07	1.14	93	1.08	1.17
46	1.13	1.28	94	1.19	1.40
47	1.05	1.10	95	1.19	1.40
48	1.07	1.14	96	1.11	1.23

REENTRAINED DUST GROWTH FACTORS (GF)(cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
97	1.11	1.23	145	1.21	1.44
98	1.11	1.23	146	1.21	1.44
99	1.11	1.23	147	1.11	1.25
100	1.19	1.40	148	1.11	1.25
101	1.19	1.40	149	1.11	1.25
102	1.08	1.17	150	1.16	1.34
103	1.19	1.40	151	1.16	1.34
104	1.06	1.14	152	1.05	1.10
105	1.21	1.44	153	1.07	1.14
106	1.21	1.44	154	1.04	1.09
107	1.21	1.44	155	1.16	1.34
108	1.21	1.44	156	1.03	1.07
109	1.06	1.14	157	1.24	1.30
110	1.06	1.14	158	1.16	1.34
111	1.06	1.14	159	1.34	1.74
112	1.06	1.14	160	1.34	1.74
113	1.06	1.14	161	1.21	1.46
114	1.06	1.14	162	1.17	1.36
115	1.22	1.44	163	1.30	1.64
116	1.22	1.44	164	1.08	1.16
117	1.22	1.44	165	1.13	1.28
118	1.22	1.44	166	1.13	1.28
119	1.06	1.14	167	1.13	1.28
120	1.06	1.14	168	1.13	1.28
121	1.06	1.14	169	1.13	1.28
122	1.06	1.14	170	1.05	1.10
123	1.11	1.23	171	1.05	1.10
124	1.06	1.14	172	1.07	1.14
125	1.22	1.44	173	1.05	1.10
126	1.22	1.44	174	1.02	1.04
127	1.19	1.40	175	1.17	1.32
128	1.19	1.40	176	1.02	1.04
129	1.11	1.23	177	1.17	1.36
130	1.11	1.23	178	1.30	1.64
131	1.11	1.23	179	1.19	1.41
132	1.11	1.23	180	1.19	1.41
133	1.11	1.23	181	1.01	1.03
134	1.11	1.23	182	1.01	1.03
135	1.19	1.40	183	1.01	1.03
136	1.19	1.40	184	1.19	1.41
137	1.22	1.44	185	1.19	1.41
138	1.22	1.44	186	1.02	1.04
139	1.11	1.25	187	0.98	0.97
140	1.11	1.25	188	0.98	0.97
141	1.11	1.25	189	0.98	0.97
142	1.11	1.25	190	0.98	0.97
143	1.11	1.25	191	0.98	0.97
144	1.11	1.25	192	1.13	1.28

REENTRAINED DUST GROWTH FACTORS (GF)(cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
193	1.13	1.28	241	1.01	1.02
194	0.98	0.97	242	1.01	1.02
195	1.05	1.10	243	1.01	1.02
196	1.21	1.46	244	1.02	1.05
197	1.21	1.46	245	1.02	1.05
198	1.02	1.04	246	0.93	0.86
199	1.19	1.41	247	0.93	0.86
200	1.19	1.41	248	0.93	0.86
201	1.01	1.03	249	0.93	0.86
202	1.01	1.03	250	1.02	1.05
203	1.08	1.16	251	1.02	1.05
204	1.08	1.16	252	1.01	1.02
205	1.08	1.17	253	1.01	1.02
206	1.08	1.17	254	1.01	1.02
207	1.08	1.17	255	0.99	0.97
208	1.08	1.17	256	0.99	0.97
209	1.08	1.17	257	0.99	0.97
210	1.08	1.17	258	0.99	0.97
211	1.08	1.17	259	0.99	0.97
212	1.03	1.03	260	1.03	1.06
213	1.00	1.00	261	1.01	1.03
214	1.00	1.00	262	1.01	1.03
215	1.00	1.00	263	1.01	1.03
216	1.00	1.00	264	1.03	1.06
217	1.00	1.00	265	1.03	1.06
218	1.00	1.00	266	0.99	0.97
219	1.00	1.00	267	0.99	0.97
220	1.03	1.03	268	0.99	0.97
221	1.03	1.03	269	0.99	0.97
222	1.03	1.03	270	0.99	0.97
223	1.03	1.03	271	0.99	0.97
224	1.03	1.03	272	0.99	0.97
225	1.03	1.03	273	0.99	0.97
226	1.03	1.03	274	1.03	1.06
227	1.00	1.00	275	1.03	1.06
228	1.00	1.00	276	1.03	1.06
229	1.00	1.00	277	1.03	1.06
230	1.00	1.00	278	1.10	1.21
231	1.00	1.00	279	1.10	1.21
232	1.00	1.00	280	1.11	1.24
233	0.93	0.86	281	1.11	1.24
234	1.00	1.00	282	1.11	1.24
235	1.02	1.05	283	1.11	1.24
236	1.01	1.02	284	1.10	1.21
237	1.01	1.02	285	1.10	1.21
238	1.01	1.02	286	1.10	1.21
239	1.01	1.02	287	1.11	1.24
240	1.01	1.02	288	1.11	1.24

REENTRAINED DUST GROWTH FACTORS (GF)(cont.)

CELL #	GF 1982	GF 1990	CELL #	GF 1982	GF 1990
289	1.11	1.24			
290	1.11	1.24			
291	1.10	1.21			
292	1.10	1.21			
293	1.10	1.21			
294	1.16	1.35			
295	1.16	1.35			
296	1.16	1.35			
297	1.16	1.35			
298	1.16	1.35			
299	1.11	1.23			
300	1.11	1.23			
301	1.11	1.23			
302	1.16	1.35			
303	1.16	1.35			
304	1.21	1.46			
305	1.16	1.35			
306	1.13	1.28			
307	1.05	1.10			
308	1.05	1.10			
309	1.05	1.10			
310	1.13	1.28			
311	1.13	1.28			
312	1.13	1.28			
313	1.13	1.28			
314	1.13	1.28			
315	1.13	1.28			

TABLE A-24a
INDUSTRIAL PROCESS AREA SOURCES
GROWTH FACTORS (GF)
SIC Group 20 - Food and Kindred Products

Grid #	Employment	GF 1982	GF 1990
16	340	0.78	0.71
71	270	0.78	0.71
82	286	1.56	1.42
108	150	0.78	0.71
114	420	0.78	0.71
123	50	0.78	0.71
124	600	0.78	0.71
125	908	0.78	0.71
128	51	0.78	0.71
176	400	0.78	0.71
187	98	0.78	0.71
200	80	0.78	0.71
210	135	0.78	0.71
219	50	0.78	0.71
220	280	0.78	0.71
231	70	0.78	0.71
232	50	0.78	0.71
* 237	835	3.36	4.22
247	360	0.78	0.71
259	81	0.78	0.71
261	190	1.56	1.42
264	175	1.56	1.42
**265	800	1.00	1.00
269	160	0.78	0.71
270	50	0.78	0.71
276	147	0.78	0.71
# 277	494	3.41	3.45
290	65	0.78	0.71
306	61	0.78	0.71
311	500	0.78	0.71

* Includes employment of 500 and growth factors of 1.8 and 2.8 for 1982 and 1990, respectively, for a facility included in the point source projections.

** Represents a facility included in the point source projections.

\# Represents the sum of employments and growth factors for 3 facilities included in the point source projections.

TABLE A-24b
INDUSTRIAL PROCESS AREA SOURCES
GROWTH FACTORS (GF)
SIC Group 22 - Textile Mill Products

Grid #	Employment	GF 1982	GF 1990
2	180	0.48	0.11
265	550	0.96	0.22

TABLE A-24c
INDUSTRIAL PROCESS AREA SOURCES
GROWTH FACTORS (GF)
SIC Group 23 - Apparel and Other Textile Products

Grid #	Employment	GF 1982	GF 1990
30	75	0.80	0.57
140	50	0.80	0.57
215	100	0.80	0.57
232	50	0.80	0.57
250	1300	0.80	0.57
253	75	0.80	0.57
264	60	0.80	0.57
273	236	0.80	0.57

TABLE A-24d
INDUSTRIAL PROCESS AREA SOURCES
GROWTH FACTORS (GF)
SIC Group 24 - Lumber and Wood Products

Grid #	Employment	GF 1982	GF 1990
10	120	0.85	0.82
* 68	55	1.18	1.40
75	50	0.85	0.82
160	103	1.70	1.64
214	75	0.85	0.82
271	75	0.85	0.82

* Represents a facility included in the point source projections.

TABLE A-24e
INDUSTRIAL PROCESS AREA SOURCES
GROWTH FACTORS (GF)
SIC Group 25 - Furniture and Fixtures

Grid #	Employment	GF 1982	GF 1990
75	60	0.77	0.50
124	55	0.77	0.50
214	269	0.77	0.50
238	75	0.77	0.50
240	55	0.77	0.50
271	100	0.77	0.50

TABLE A-24f
INDUSTRIAL PROCESS AREA SOURCES
GROWTH FACTORS (GF)
SIC Group 26 - Paper and Allied Products

Grid #	Employment	GF 1982	GF 1990
2	200	0.86	0.71
* 19	475	1.91	1.81
68	650	1.72	1.42
77	170	0.86	0.71
84	225	0.86	0.71
115	630	0.86	0.71
117	240	0.86	0.71
141	100	0.86	0.71
205	170	0.86	0.71
214	135	1.72	1.42
227	70	0.86	0.71
225	80	0.86	0.71
260	100	0.86	0.71
265	125	0.86	0.71
266	50	0.86	0.71
**268	175	1.10	1.17
270	101	0.86	0.71
271	60	0.86	0.71
**308	600	1.20	1.38

* Includes employment of 350 and growth factors of 1.05 and 1.10 for the years 1982 and 1990, respectively, for a facility included in the point source projections.

** Represents a facility included in the point source projections.

TABLE A-24g
INDUSTRIAL PROCESS AREA SOURCES
GROWTH FACTORS (GF)
SIC Group 27 - Printing and Publishing

Grid #	Employment	GF 1982	GF 1990
46	100	1.04	1.15
152	55	1.04	1.15
177	70	1.05	1.15
208	50	1.04	1.15
209	110	1.04	1.15
215	166	1.04	1.15
232	100	1.04	1.15
243	130	1.04	1.15
244	55	1.04	1.15
250	1063	4.16	4.60
* 264	1100	1.04	1.15
265	60	1.04	1.15
273	465	1.04	1.15
310	600	2.08	2.30
318	1400	1.04	1.15

* Represents a facility included in the point source projections.

TABLE A-24h
INDUSTRIAL PROCESS AREA SOURCES
GROWTH FACTORS (GF)
SIC Group 28 - Chemicals and Allied Products

Grid #	Employment	GF 1982	GF 1990
2	127	0.84	0.64
10	440	0.84	0.64
43	175	0.84	0.64
63	219	0.84	0.64
* 67	950	1.11	1.25
* .70	170	1.00	1.00
71	500	0.84	0.64
74	536	0.84	0.64
207	210	1.68	1.28
209	220	0.84	0.64
232	70	0.84	0.64
275	500	1.68	1.28
* 278	560	1.50	1.61
* 279	130	0.90	0.80
291	90	0.84	0.64
308	54	0.84	0.64
**312	2800	1.84	1.64
# 313	118	2.34	2.64
* 314	2000	1.10	1.10

TABLE A-24i
INDUSTRIAL PROCESS AREA SOURCES
GROWTH FACTORS (GF)
SIC Group 29 - Petroleum Products

Grid #	Employment	GF 1982	GF 1990
* 63	327	1.05	1.10
70	50	0.85	0.80
* 280	235	1.05	1.10

* Represents a facility included in the point source projections.
** Includes employment of 800 and growth factors of 1.00 for both 1982 and 1990 for a facility included in the point source projections.
# Includes employment of 68 and growth factors of 1.50 and 2.00 for 1982 and 1990, respectively, for a facility included in the point source projections.

TABLE A-24j
INDUSTRIAL PROCESS AREA SOURCES
GROWTH FACTORS (GF)
SIC Group 30 - Rubber and Plastics Products

Grid #	Employment	GF 1982	GF 1990
16	510	2.14	2.72
* 70	2094	3.19	2.48
75	100	1.07	1.36
83	152	1.07	1.36
115	80	1.07	1.36
119	50	1.07	1.36
122	65	1.07	1.36
177	50	1.07	1.36
**314	3400	1.10	1.10
209	50	1.07	1.36
213	126	2.14	2.72
214	55	1.07	1.36
239	106	1.07	1.36
271	300	1.07	1.36
291	50	1.07	1.36

TABLE A-24k
INDUSTRIAL PROCESS AREA SOURCES
GROWTH FACTORS (GF)
SIC Group 31 - Leather and Leather Products

Grid #	Employment	GF 1982	GF 1990
259	200	1.00	1.00
264	70	1.00	1.00

* Includes employment of 1400, a 1982 growth factor of 1.05 and a 1990 growth factor of 1.12 for a facility included in the point source projection.

** Represents data for a facility included in the point source projections.

TABLE A-241
INDUSTRIAL PROCESS AREA SOURCES
GROWTH FACTORS (GF)
SIC Group 32 - Stone, Glass and Clay Products

Grid #	Employment	GF 1982	GF 1990
32	1000	1.03	1.06
* 34	50	1.20	1.42
39	74	1.03	1.06
* 41	175	1.06	1.05
67	550	1.03	1.06
76	175	1.03	1.06
82	150	1.03	1.06
86	150	1.03	1.06
123	404	1.03	1.06
152	75	1.03	1.06
192	8850	2.06	2.12
208	54	1.03	1.06
214	300	1.03	1.06
250	1970	1.03	1.06
259	100	1.03	1.06
265	200	1.03	1.06
271	130	1.03	1.06
272	240	1.03	1.06
309	350	1.03	1.06
**312	1775	1.68	1.41

* Represents a facility included in the point source projections.
** Includes employment of 1500 and growth factors of .65 and .35 for 1982 and 1990, respectively, for a facility included in the point source projections.

TABLE A-24m
INDUSTRIAL PROCESS AREA SOURCES

GROWTH FACTORS (GF)
SIC Group 33 - Primary Metal Industries

Grid #	Employment	GF 1982	GF 1990
16	57	1.16	1.29
26	900	1.16	1.29
41	650	2.32	2.58
42	1250	1.16	1.29
68	245	1.16	1.29
* 70	590	2.17	2.29
115	141	1.16	1.29
139	1369	1.16	1.29
171	130	1.16	1.29
**172	120	1.07	1.15
208	50	1.16	1.29
209	2889	3.48	3.87
212	102	1.16	1.29
214	185	1.16	1.29
**215	735	1.45	2.00
216	890	3.48	3.87
250	60	1.16	1.29
270	276	2.32	2.58
271	50	1.16	1.29
**279	2600	1.02	1.06
* 284	400	1.08	1.15
286	215	1.16	1.29
* 293	190	1.16	1.29
# 294	5000	1.04	1.09
303	50	1.16	1.29
##305	5200	2.20	2.38
**308	1000	0.95	0.93
**312	650	1.16	1.29

* Includes employment of 200 and growth factors of 1.01 and 1.00 for the years 1982 and 1990, respectively, for a facility included in the point source projections.

** Represents a facility included in the point source inventory.

\# Represents a facility located in two adjacent grids, one-half the total employment is shown; growth factors are from the point source projections.

Includes a facility located in two adjacent grids; for the grid shown, the facility has an employment of 5000, and growth factors of 1.04 and 1.09 for the years 1982 and 1990, respectively, from the point source projections.

TABLE A-24n
INDUSTRIAL PROCESS AREA SOURCES
GROWTH FACTORS (GF)
SIC Group 34 - Fabricated Metal Products

Grid #	Employment	GF 1982	GF 1990
2	110	0.93	0.87
10	95	0.93	0.87
16	300	1.86	1.74
40	224	0.93	0.87
68	190	0.93	0.87
* 75	732	0.93	0.87
93	150	0.93	0.87
116	585	0.93	0.87
119	300	0.93	0.87
145	209	0.93	0.87
153	133	0.93	0.87
162	200	0.93	0.87
186	102	0.93	0.87
187	108	0.93	0.87
197	5000	0.93	0.87
203	75	0.93	0.87
208	135	0.93	0.87
*209	1468	1.00	0.91
212	85	0.93	0.87
215	53	0.93	0.87
231	50	0.93	0.87
232	285	2.79	2.61
238	100	0.93	0.87
250	135	0.93	0.87
257	100	0.93	0.87
260	300	0.93	0.87
261	986	0.93	0.87
264	50	0.93	0.87
265	120	0.93	0.87
267	235	1.86	1.74
270	146	0.93	0.87
301	507	1.86	1.74
305	96	0.93	0.87
313	75	0.93	0.87

*Represents a facility included in the point source projections.

TABLE A-24o
INDUSTRIAL PROCESS AREA SOURCES
GROWTH FACTORS (GF)
SIC Group 35 - Machinery, excluding Electric

Grid #	Employment	GF 1982	GF 1990
10	60	1.07	1.14
25	150	1.07	1.14
28	100	1.07	1.14
40	224	1.07	1.14
65	110	1.07	1.14
66	100	1.07	1.14
67	90	1.07	1.14
68	103	2.14	2.28
71	50	1.07	1.14
75	675	2.14	2.28
82	500	1.07	1.14
105	130	1.07	1.14
114	94	1.07	1.14
117	275	1.07	1.14
119	55	1.07	1.14
125	210	1.07	1.14
140	50	1.07	1.14
142	60	1.07	1.14
200	400	1.07	1.14
203	110	1.07	1.14
204	380	2.14	2.28
209	206	2.14	2.28
214	102	2.14	2.28
238	425	1.07	1.14
231	50	1.07	1.14
232	220	2.14	2.28
236	330	1.07	1.14
237	600	1.07	1.14
256	75	1.07	1.14
260	1280	1.07	1.14
264	120	1.07	1.14
*270	1550	0.94	0.94
272	115	1.07	1.14
273	150	2.14	2.28
276	187	1.07	1.14
293	470	1.07	1.14
308	1800	1.07	1.14

*Represents a facility included in the point source projections.

TABLE A-24p
INDUSTRIAL PROCESS AREA SOURCES
GROWTH FACTORS (GF)
SIC Group 36 - Electrical Equipment and Supplies

Grid #	Employment	GF 1982	GF 1990
42	175	0.83	0.64
* 44	1250	2.40	3.00
54	175	0.83	0.64
108	480	1.66	1.28
115	600	0.83	0.64
118	65	0.83	0.64
119	70	0.83	0.64
125	149	1.66	1.28
156	275	0.83	0.64
**172	732	1.25	1.35
**173	350	1.20	1.40
216	150	0.83	0.64

TABLE A-24q
INDUSTRIAL PROCESS AREA SOURCES
GROWTH FACTORS (GF)
SIC Group 37 Industries - Transportation Equipment

Grid #	Employment	GF 1982	GF 1990
** 28	8800	2.00	2.00
32	4000	0.80	0.85
** 70	9000	1.40	1.45
80	95	0.80	0.85
82	150	0.80	0.85
83	200	0.80	0.85
119	100	0.80	0.85
216	289	0.80	0.85
220	1100	1.37	1.37
221	54	0.80	0.85
**238	180	0.80	0.85
239	3400	1.15	1.25
261	50	0.80	0.85
268	68	0.80	0.85
**272	2300	1.37	1.37

* Includes the sum of employment and growth factors for two facilities included in the point source projections.

** Represents a facility included in the point source projections.

TABLE A-24r
INDUSTRIAL PROCESS AREA SOURCES
GROWTH FACTORS (GF)
SIC Group 38 - Instruments and Related

Grid #	Employment	GF 1982	GF 1990
107	80	1.04	1.09
152	524	1.04	1.09

TABLE A-24s
INDUSTRIAL PROCESS AREA SOURCES
GROWTH FACTORS (GF)
SIC Group 39 - Miscellaneous Manufacturing

Grid #	Employment	GF 1982	GF 1990
207	50	1.05	1.10
250	100	1.05	1.10
264	700	2.10	2.20

TABLE B-1

SUMMARY OF FACILITY GROWTH FACTORS

Facility Name	Growth Factor 1982	Growth Factor 1990
Bethlehem Steel Corp.	1.04	1.09
Clarence A. Hackett, Inc.	1.04	1.09
Ashland Petroleum Co.	1.05	1.10
C. R. Huntley Steam Station	1.15	1.10
Dunlop Tire & Rubber Corp.	1.05	1.12
FMC Corp. Industrial Chemical Div.	1.00	1.00
J. H. Williams	1.00	0.91
Tonawanda Coke Company	1.01	1.00
Chevrolet-Tonawanda Motor Plant (River Rd.)	1.40	1.45
Chevrolet-Tonawanda Plant (Irene St.)	1.40	1.45
Chevrolet-Tonawanda (Kenmore Ave.)	1.40	1.45
Chevrolet-Tonawanda Forge (River Rd.)	1.40	1.45
Ford Motor Co.	1.40	1.45
Buffalo Color Corp.	1.50	1.61
American Malting	0.91	0.85
Anaconda Co. - Brass Division	1.45	2.00
Buffalo Evening News, Inc.	1.25	1.40
Buffalo South Park Conservatory	1.00	1.00
City of Buffalo, West Side, Incinerator	0.00	0.00
Commodore Perry Homes	1.05	1.10
Donner-Hanna Coke Corp.	1.08	1.15
General Motors Corp. (Axyle Plant)	1.15	1.25
General Mills, Inc.	1.50	1.60
H & D Division (Westvaco)	1.10	1.17
Hanna Furnace Corp.	0.80	0.62
Industrial Chemical Div. (Allied Chemical)	0.90	0.80
International Multifoods	1.00	1.00
Town of Tonawanda Incinerator	1.03	1.05
Marine Drive Apartments, Inc.	1.00	1.00
Mercy Hospital	1.15	1.15
Mobil Oil Corporation	1.05	1.05
Peavey Company Flour Mills	1.50	1.60
Republic Steel Corporation	1.02	1.06
Shenango, Inc.	1.01	1.02
Trico Products #2	1.37	1.37
Trico Products #3	1.37	1.37
Worthington - CEI, Inc.	0.94	0.94
SUNY - Buffalo	1.00	1.00
School 65	1.00	1.00
Upson Company	1.05	1.10
Harrison Radiator Div.	2.00	2.00
Harrison Radiator Div.	2.00	2.00

Summary of Facility Growth Factors (cont.)

Facility Name	Growth Factor 1982	Growth Factor 1990
Airco Speer Carbon Graphite	1.25	1.35
Pyron Co.	1.07	1.15
Union Carbide Carbon Products Div. (National)	1.00	1.00
Union Carbide Carbon Products Div. (Acheson)	1.00	1.00
Union Carbide Carbon Products Div. (Republic)	1.00	1.00
Carborundum Co. (Electro-Minerals)	1.06	1.12
Globar Plant (Carborundum)	1.40	2.00
General Abrasive Co.	1.06	1.12
Goodyear Niagara Falls Chemical	1.00	1.05
Great Lakes Carbon Corp.	1.20	1.40
Hooker Chemical Corp.	1.10	1.10
Hooker Chemicals and Plastics	1.10	1.10
Industrial Chemical Dept. (Dupont)	1.00	1.00
Linde Div. (Union Carbide)	0.95	0.93
Nabisco, Inc.	1.80	2.80
Niagara Stone, Div.	1.20	1.42
Prestolite Div. Eltra Corp.	2.08	2.08
Nitec Paper Corp.	1.20	1.38
Carborundum - Bonded Abrasives Division	0.65	0.35
Durez Div. (Hooker Chem.)	1.11	1.25
R. T. Jones Lumber Company	1.18	1.40

INTERVIEW FOR STATE IMPLEMENTATION PLAN (AIR QUALITY)
GROWTH PROJECTIONS FOR AREA FACILITIES

1. **Principal Activities at Facility:** _____

2. **Does Facility Processes Relate to SO_2 or TSP generation?** _____

3. **Number of Units for Primary Process (i.e., steel produced, bushels of grain milled, barrels of crude oil refined)** _____

4. **Representative Number of Units Processed from Years 1970 - 1977 Year by Year. (If diversified, list on separate sheet.)** _____

5. SO_2 generation data on gallons of oil or natural gas consumed on yearly basis from 1970 - 1977. _____

   a. Are there any plans to convert to coal at this plant? _____

6. The number of people employed for years 1970 - 1977 on a yearly basis.

7. Quality of the Labor Market and availability of long-term labor pool, labor management cooperation. _____

8. Number of shifts worked (possibility of additional shifts). _____

9. Any possibilities of aquiring additional property adjacent to site to increase operation? _____

10. OSHA - the sensitivity of the plant to bring the operation into compliance with new regulations especially as it relates to capitol equipment. _____

11. Cost of Water Pollution Control:

    a. How do these costs impact on the operation of the plant? _____

    b. Does the plant pretreat? _____ Does the cost of pretreatment prohibit the addition of new product lines or expansion of current lines?

12. Is this plant competitive with other plants in the company in regards to production cost? _____

13. Age of Invested Capital:
    a. Physical plant buildings: _____
    b. Pollution control equipment: _____
    c. Processing equipment: _____

14. Possibility of introducing new product lines or investments in new capital equipment. _____

15. Any Solid Waste Disposal Problems? _____
    a. Location waste storage and type: _____
    b. Transport of waste (methods): _____
    c. Incineration facilities: _____

16. If your plant incinerates,
    a. Hours of operation: _____
    b. Control of emissions: _____
    c. Purpose of incineration: _____
        (1) reduce mass _____
        (2) dispose of toxics _____
        (3) energy generation _____

17. Any plans for energy conservation? _____

18. Will you modify process lines to aid in energy conservation? _____

19. Are there any problems that would hamper activities at this plant that would restrict production or limit growth? _____

20. Have governmental regulations or taxing systems hindered the operation of this particular plant versus others in your system? If so, how? (taxes, environmental, safety (OSHA)) _____

21. Have transportation costs and regulations affected the production at this plant? _____

22. If this plant could grow (expand product, add new products) would it? If not, why wouldn't it? _____

INTERVIEW FOR STATE IMPLEMENTATION PLAN (AIR QUALITY)

GROWTH PROJECTIONS FOR LANDING STRIPS

1. a. Name of Landing Strip: _____
Location: _____ Town: _____

b. Owners Name: _____
Address: _____

2. How long has this airstrip been in operation? _____

3. Is landing strip paved or unpaved? _____
Are there plans to pave in future, if so, when? _____

4. How many landings and takeoffs have there been since 1970 on a yearly basis?
_____
If this information is unavailable, how many in 1975? _____

5. Do you expect an increase in 1982 over your 1975 number of landings and takeoffs? _____ If so, how much? (in %)_____ In 1990? _____

6. Any hanger facilities? _____

7. How many planes are kept at field? _____

8. How many planes kept outside? _____
How many planes kept outside in winter? _____

9. What type of plane is kept at field? (civil, commercial)_____
How many seats in largest? _____

10. If there are cargo flights, who runs? _____
The percentage of total landing strip use, compared to other landings and takeoffs is? _____

11. Do you intend to stay in business? _____ If not, will business be taken over and used as airport? _____
Any expansion plans? _____

12. Any other information that might be of help?

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Written Correspondence on Point Source Facility Growth Patterns

1. Mr. K. Hackett, Clarence A. Hackett, Incorporated.

2. Mr. D. Pyanoski, Dunlop Tire and Rubber Company, Incorporated.

3. Mr. F. Capenhurst, FMC Corporation

Written Correspondence on Point Source Facility Growth Patterns (cont.)

4. Mr. R. Klemecko, J. H. Williams Company.
5. Mr. Lindbergh, American Malting Incorporated
6. Mr. J. Kiernan, Buffalo Evening News
7. Mr. R. O'Hara, South Park Conservatory
8. _____, City of Buffalo, West Side Incinerator
9. Mr. K. Whelan, Commodore Perry Homes - Municipal Housing Authority
10. Mr. R. Bauer, Westvaco Corporation (H & D Division)
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12. Mrs. L. Lattner, Marine Drive Apartments
13. Mr. A. Rebmon, Mercy Hospital
14. Mr. J. Close, Shenango, Incorporated
15. Mr. Wolf, Trico Products Corporation (Plants #2 and #3)
16. Mr. J. Mohr, Worthington - CEI, Incorporated
17. Mr. Baxter, Buffalo Board of Education
18. Mr. K. Boos, Upson Company
19. Mr. Vincent, General Abrasive Company
20. Mr. R. Evans, Goodyear Tire and Rubber Company
21. Mr. D. Roberson, DuPont, E. I. Denemours and Company, Incorporated (Industrial Chemicals Division)
22. Mr. J. Miller, Nabisco, Incorporated
23. Mr. R. Lowery, Eltra Corporation (Prestolite Division
24. Mr. Croglio, R T Jones Lumber Company

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Personal Communications on Point Source Growth Patterns

1. Mr. J. Bellafaire, Chevrolet (River Rd. and Kenmore Plants)

2. Mr. D. Brady, Plant Engineer, Bethlehem Steel Corporation

3. Mr. J. Crane, President, Tonawanda Coke Corporation

Personal Communications on Point Source Growth Patterns (cont.)

4. Mr. P. Depatris, Carborundum Company (Globar Plant)

5. Mr. B. Carreno, Environmental Control Division, Hooker Chemicals and Plastics Corporation (Niagara Falls Plant)

6. Mr. Emley, Anaconda Brass Company

7. Mr. G. Frazell, Vice President and General Manager, Hanna Furnace Company

8. Mr. J. Gburek, General Manager, Durez Division, Hooker Chemicals

9. Mr. R. Gritsko, Mobil Oil Company

10. Mr. J. Kirsch, General Motors Corporation (Axyle Plant)

11. Mr. J. Kneeland, Vice President and General Manager, Nitec Paper Corporation

12. Mr. K. Mahar, Environmental Control Manager, Donner Hanna Coke Corporation

13. Mr. J. Mohr, Worthington CEI, Incorporated

14. Mr. S. Molnar, General Manager, Electro-Minerals Division, Carborundum Company

15. Mr. Mullins, Superintendent of Maintenance, Heating Plant, State University of New York at Buffalo (Main St. Campus)

16. Mr. J. Nasil, Niagara Mohawk Power Corporation (Huntley generating station)

17. Mr. J. Potwara, Plant Engineer, Republic Steel Corporation

18. Mr. M. Reele, Manager, Division of Environmental Control, Great Lakes Carbon Corporation

19. Mr. G. Rees, Plant Manager, Linde Division, Union Carbide Company

20. Mr. J. Richardson, Chevrolet (Irene St. Plant)

21. Mr. Ridgeway, Director of Energy and Environmental Systems, Airco Speer Carbon Graphite Company

Personal Communications on Point Source Growth Patterns (cont.)

22. Mr. A. Rudolf, Pyron Company

23. Mr. J. Scalise, Environmental Supervisor, Ashland Oil Corporation (Tonawanda Refinery)

24. Mr. F. Schiffhauer, Plant Manager, Allied Chemical Corporation

25. Mr. C. Smith, General Manager, Bonded Abrasives Division, Carborundum Company

26. Mr. Wlodarzak, Supervisor of Environmental Services, Buffalo Color Corporation

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