

**THE REGIONAL
AIR POLLUTION STUDY (RAPS)
GRID SYSTEM**

by

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Errata:

1. The total number of grids is 1989, not 1988 as stated on page 7.
2. The grid missing in the printout is No. 1573. It is located in Madison Co., Illinois (4680). Its coordinates are:

UTM Zone 15

E	764.0	764.0	765.0	765.0
N	4289.0	4290.0	4290.0	4289.0

3. Grid No. 868 is incorrectly assigned to St. Louis City (4280) in the printout on page 170. In the data base, it is located in St. Louis County (4300).

SECTION E: AREA SOURCES

SECTION E: AREA SOURCES (continued)

Area Sources

Emissions from all sources which do not meet point source criteria, are dealt with in this section. Whereas point sources are characterized by a specific geographic location on UTM coordinates, area sources are assigned to a grid within the gridding system described in report No. 1. Both stationary and mobile sources are included in this section.

1. The RAPS Grid System; Research Triangle Institute, EPA-450/3-76-021, December 1975.
2. Residential and Commercial Area Source Emission Inventory; Environmental Science and Engineering, EPA-450/3-75-078, September 1975.
3. Industrial Area Source Emission Inventory; Rockwell International - 68-02-2093 T0108D, August 1976.
4. Methodology for Line Source Emissions; Washington University, St. Louis, EPA-450/3-76-035, February 1975.
5. Methodology for Line and Area Source Emissions from Motor Vehicles; Washington University, St. Louis.
6. River Towboat Air Pollution; Department of Transportation DOT-TSC-OST-75-42, February 1976.
7. Airport Emission Methodology; GCA/Technology Division, EPA-450/3-75-048 December 1974.
8. Emission Inventory from Rail Operations; Walden Research
9. Off-Highway Mobile Sources Methodology; Southwest Research Institute, EPA-450/3-75-002, October 1974.
10. Off-Highway Mobile Source Emission Inventory; Rockwell International - 68-02-2093 T0108E, January 1977.
11. Development of a Methodology and Emission Inventory for Fugitive Dust for the Regional Air Pollution Study; Midwest Research Institute, EPA-450/3-76-003, January 1976.

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Introduction

The Regional Air Pollution Study (RAPS), which encompasses the St. Louis Air Quality Control Region, is the largest and most comprehensive attempt to date to obtain a quantitative understanding of urban air pollution. Its aim is to describe the complex relationships between emissions to the atmosphere, atmospheric dispersions and transformation processes, and ambient concentrations of pollutants. An accurate, detailed and comprehensive inventory of emission to the atmosphere constitutes a basic input to this understanding. Its aim is to obtain hourly data for key pollutants based insofar as possible, on measured values. Thus, emission data will be commensurate in detail and accuracy with data on ambient concentrations and micrometeorological information gathered by the Regional Air Monitoring Stations (RAMS).

The ultimate value of the RAPS Study will, it is hoped, not be confined to the St. Louis area, but rather will provide a model for future studies of this type in other areas.

Background

The EPA Office of Research and Development has overall responsibility for the Regional Air Pollution Study. EPA's Office of Air Quality Planning and Standards has been given the responsibility of development of the emission inventory.

The purpose of the Regional Air Pollution Study (RAPS) is:

The development of relationships between sources of pollution and ambient air quality through an understanding of pollutant emission, transport, transformation, and removal processes on the scale of an air quality control region.

The verification and development of these relationships will allow control actions to become more sophisticated and selective. General control actions can be confidently tested through these relationships to develop strategies for a region which provide the desired level of control for the lowest cost. The verification and development of such relationships will also allow impact on air quality to become a factor in community and industrial planning for future growth. They can also be utilized to optimize the size of a monitoring network needed to define a region's air quality.¹

Goals and Objectives of RAPS

Once the purpose of RAPS was defined, goals and objectives to attain the goals could be defined.

The goals of the Regional Air Pollution Study are:

1. Verification of relationships between sources of pollution and ambient air quality for all criteria pollutants on the scale of an air quality control region.
2. Development of improved relationships for source, transport, dispersion, transformation, and removal processes for all criteria pollutants (sulfur dioxide, particulates, carbon monoxide, nitrogen oxides, oxidants and hydrocarbons), but particularly for sulfur oxides.

The attainment of these goals requires the achievement of several major objectives:

1. Development of improved emission inventory procedures to supply emission data for the study region with unprecedented high spatial and temporal resolution.
2. Development of an atmospheric monitoring system capable of reporting pollutant and meteorological characteristics of the atmosphere over the study region with very high accuracy and temporal resolution.

3. Creation of an extensive validated data bank containing emission, air quality and meteorological data, as well as other relevant information, for the study region, with appropriate data handling procedures, to be used in verification of existing and improved relationships.
4. Improvement in our understanding of the pollutant transport and dispersion processes of the atmosphere through experimental studies of energy and momentum fluxes over the study region.
5. Improvement in our understanding of the pollutant transformations occurring in the atmosphere through experimental studies of the role of sulfur dioxide, carbon monoxide, nitric oxide, and organics in producing sulfates, nitrogen dioxide, nitrates, ozone, organic aerosols and other finely divided particulate materials in the atmosphere over the study region.
6. Improvement in our understanding of pollutant removal processes, particularly experimental determination of dry deposition velocities of sulfur dioxide for various types of land surfaces in the study region.
7. Improvement in our understanding of local-scale phenomena which complement regional-scale relationships.

Potential Products of the Regional Air Pollution Study

As a result of achieving these objectives, several products can be expected from the RAPS. The primary product is a group of relationships between sources of pollution and ambient air quality which are available to other EPA Offices, air pollution control and planning agencies of State, Regional, County and Local governments, and industry. These relationships will be in an appropriate form for use; they will have been tested and verified, and their best use identified in consideration of their accuracy and required input data, as well as their spatial and temporal resolution.

A second major product is improved methodologies for emission inventories. Because of the stringent demands of the RAPS, new approaches to emission inventories must be developed. This will result in methodologies

offering air pollution control agencies an opportunity to improve their inventories and thereby their understanding of pollution sources in their areas and control of these sources.

Another important product is a data bank with unprecedented resolution of air quality, meteorological and emission information. This data bank, with its associated data management system, will be invaluable in the testing and verification of relationships between pollution sources and ambient air quality. This extensive description of a region may also suggest new forms for these relationships and assist in the development of new relationships.

The RAPS will also provide an opportunity for new instruments and instrument systems to be tested under field conditions and compared with a state-of-the-art monitoring system. This will allow verification of their measurements and a demonstration of their utility in monitoring systems of the future.

A very important product of the RAPS, and perhaps one with the greatest implications for future control of air pollution, is an improved understanding of the processes of pollutant transport and dispersion, and pollutant transformation and removal in the atmosphere. These may be expressed as improvements in the overall relationships between sources and ambient air quality.

Selection of Study Area

Thirty-three Standard Metropolitan Statistical Areas larger than 400,000 population were evaluated with regard to:

1. Surrounding area — Isolation from other large areas containing sources of considerable air pollution, presence of a clear-cut gradient of emissions around the edge of the urban area, and absence of large bodies of water.

2. Heterogeneous emissions — Presence of a satisfactory mixture of emissions and types of sources within the area.
3. Area size — An indication of the scope and magnitude of the study for each site.
4. Pollution control program — Existence of a well-developed control program as a source of background data, experience, and industrial cooperation.
5. Historical information — Adequate meteorological, air quality, economic, and other forms of information for the study.
6. Climate — Relatively uncomplicated meteorological patterns and a climate suitable for year-round outside work.

The recommendation that St. Louis be selected as the study site was accepted and approved by the EPA.

Emission Inventory

Emission inventories are an essential part of any attempt to predict air quality through a regional air quality simulation model. The accuracy of such predictions is directly proportional to the overall accuracy of the inventories.

The emission inventory activity consists of three basic sub-activities:

1. Establishing Emission Inventory Methodologies — Developing methodologies for each of the inventories needed in the RAPS in light of the characteristics of each category of sources, and the state-of-the-art for such inventories, and the RAPS needs.
2. Developing the Emission Inventory Data System — Design and implementation of a system capable of recording, storing, retrieving, editing, and updating all data required for the computation of emissions consistent with the RAPS requirements.
3. Gathering Emission Inventory Data — According to methodologies and data system.

The primary division of sources into categories separates stationary from mobile sources, since these present radically different problems with respect to both emission inventories and modeling. In the secondary division, stationary sources are divided into area sources and point sources, whereas mobile sources are composed of area and line sources. Well-defined and heavily traveled traffic arteries, such as freeways, can be treated as individual line sources. The more diffuse traffic on city streets can best be handled on an area basis.

The division of stationary sources into point and area sources is necessarily arbitrary. The point sources, or source units, are those large enough to warrant individual consideration. Area source units are, by contrast, units having relatively small emissions, and they cannot for practical purposes be treated individually. The emissions from those small units existing in a given area are therefore aggregated and estimated from some facts, such as the consumption of fuel within the specified area.

The criterion of size for the definition of point source units is relative, and is related mainly to the precision desired for the inventory and for the diffusion estimates derived from it. A unit emitting a small absolute quantity of pollutant material may in fact be an important point source if it nevertheless contributes an appreciable fraction of the total emission of that specific pollutant into the region. A given source unit may be relatively insignificant with respect to one pollutant of interest, and at the same time be a very large emitter of another pollutant.

In consideration of the various user needs the RAPS emission inventories contain the following information:

1. Criteria Pollutants — Sulfur dioxide (SO_2 and SO_3 breakdown), carbon monoxide, nitrogen oxides, hydrocarbons (methane and nonmethane breakdown), and particulates (size breakdown).
2. Non-Criteria Pollutants — Arsenic, asbestos, barium, beryllium, boron, cadmium, chromium, copper, lead, magnesium, manganese, mercury, molybdenum, nickel, phosphorus, selenium, silver, titanium, vanadium, zinc, polycyclic organic matter, and heat.
3. Resolution — Temporal, for criteria pollutants and heat hourly values with options to summarize to yearly values. For non-criteria pollutants only yearly summary values will be calculated. Spatial, accuracy to 0.01 kilometers for point sources depending on their size and down to one square kilometer for area sources. There are 1988 grid squares ranging from 1 to 100 square kilometers.
4. Area Covered — The St. Louis Air Quality Control Region. This includes the counties of Bond, Clinton, Madison, Monroe, Randolph, St. Clair, and Washington in Illinois and Franklin, Jefferson, St. Charles, St. Louis, and St. Louis City in Missouri.
5. Period Covered — Emissions data will be available for all pollutants from January 1975 through December 1976. Additional SO_2 data back to October 1974 will also be included.
6. Units — Emissions in metric or English units; distance in kilometers; location in Universal Transverse Mercator (UTM) coordinates.
7. Other Information — Point sources: stack parameters, control equipment and efficiency and process rate information. Area sources: vehicle traffic counts and registration data for mobile sources and census data, natural gas flow data and various trade publications as required for use in the appropriate emission model.

Use of a Grid to Describe Area Sources for Modeling

The transport and dispersion models generally use point sources (and in some cases line sources) directly. Point sources are those individually identifiable boiler stacks, process vents, etc., emitting more than some arbitrarily specified mass of pollutant. Area sources must be described in some manner which approximates point (or line) sources for the models to operate with reasonable precision. Area sources, however, include the more ubiquitous, individually small sources which cannot be specifically located.

Basic data for the determination of area source emissions seldom, if ever, are available for geographic or political units or areas smaller than the county, or in some cases, the large city which functions politically independently of the surrounding county. These basic data are in the form of, for example, annual fuel consumption, by fuel type, for residential, for commercial and institutional, and for industrial heating; acreage burned by forest fires; landing-takeoff cycles for military, for commercial and for civil aircraft; gasoline or diesel fuel consumed by light, heavy and off-highway vehicles, or vehicle miles traveled by road classification; etc. These data can be converted to pollutant emissions by the application of appropriate emission factors.

The geographic size of a county, however, is too large for practical use in simulation models for AQCR's. Logical procedures are required for distributing the county's total basic data or derived emissions data to smaller areas. Further constraints imposed by the simulation models require that these small areas be squares, although they need not be of uniform size. Various criteria have been proposed as bases for selecting the sizes and distribution of the emission area squares. Urbanization, land use, housing counts, and population have all been used subjectively to grid AQCR's into

emission area squares (hereafter called grid squares) and subsequently to apportion county totals of pollutant emissions into each grid square. In general, the philosophy followed has required that urbanized or industrialized portions of the county or AQCR be gridded into small squares to provide for detailed representation of concentration of pollution sources. Conversely, rural areas with few pollution sources are adequately represented by large grid squares. Essentially, application of this philosophy results in apportioning county total emissions to grid squares according to subjective estimates of the distribution of population. Since air pollution derives from human activity this procedure provides a reasonable approach to developing area source emission distributions.

In order to accomplish the objective of the distribution of emissions in a representative way, two separate techniques must be designed and implemented. First, the area must be divided into squares which allow a reasonable precision and efficiency in modeling, and second, the area source emissions must be distributed (apportioned) among the resulting grid squares. Only the division of the area into grid squares is discussed in this report. Individual methodologies for apportioning emissions to the RAPS grid system are discussed elsewhere.

Early Gridding of the St. Louis Area

In the early fall of 1962 a group of representatives from Illinois, Missouri, and local metropolitan area agencies met and drafted what is now the Interstate Air Pollution Study project agreement. The study project was designed for two parts. The first, Phase I, was started on January 1, 1963, and lasted for six months, to June 30 of that year. The purpose of Phase I was to make an appraisal of air pollution in the St. Louis - East

St. Louis Metropolitan Area and prepare a report that would indicate areas of major importance that were to be studied in more detail during Phase II. Phase II was to begin at the end of Phase I and last for an additional year. The data gathered during the two phases would then be studied and recommendations made for an air resource management program.

The study area consisted of six counties plus the City of St. Louis. They were St. Louis, St. Charles, and Jefferson Counties in Missouri and St. Clair, Madison, and Monroe Counties in Illinois. This is the area covered by the Bi-State Development Agency. It consists of the St. Louis Standard Metropolitan Statistical Area plus Monroe County. The grid used for area source emissions in the study area consisted of squares, 5,000 feet on a side, covering the area of study.

The final goal of the project was to develop an air resource management program plan to recommend to the citizens of the two-state metropolitan area.

The Regional Air Pollution Study Grid System

With the initiation of the Regional Air Pollution Study the need to re-grid the study area was required because of one major fact; the requirement to have the grid system in the Universal Transverse Mercator (UTM) coordinate system. Based on the philosophy expressed earlier in apportioning grid squares according to population distributions the need for using a form of automated assistance in gridding the study area became pressing. It was decided to use the latest census data available to assist in constructing a grid in which each square contained as nearly as possible a constant population count, as long as the minimum grid square size was one square kilometer. Census data by census enumeration district with the geographic

coordinates of the center of the enumeration district is readily available. The Computer-Assisted Area Source Emissions (CAASE) gridding procedure was used which utilizes a series of computer programs and manual procedures to expedite the gridding process.² At present, the actual grid drawing is a manual procedure, but the CAASE system of computer programs provides computer-drawn population centroid distributions to map scale along with population density indicators, and after manual selection of a grid, provides a checkout grid, then draws the final grid.

The first CAASE-produced RAPS grids included sections with squares of 7.5 km per side and 2.5 km per side (produced by the quartering of 15 km per side and 5 km per side grid squares).³ Due to the inability of some air quality diffusion models to accept grids of non-integer side lengths, these sections have been redefined to be of integer side length. Grid squares numbered below 2000 are from the first CAASE-produced grid; squares numbered 2000 and above are the integer side length grid squares which replace areas of 2.5 km and 7.5 km grid squares.

The current grid for AQCR 070, Metropolitan St. Louis, is shown in Figure 1 and listed in Table 1. (See the Appendix for tables and figures.) Included in Figure 1 are the computer-drawn county and city boundaries and rivers. Note that Table 1 includes the locations of each corner of each grid square and that grid squares in UTM Zone 16 also have their equivalent UTM Zone 15 coordinates shown.

The dividing line between UTM Zone 15 and 16 cuts through the eastern portion of the RAPS study area. It was decided to grid the entire area using UTM Zone 15 as the primary zone and extending it into Zone 16 whenever necessary. For persons using United States Geological Survey quadrangle maps in the RAPS data gathering efforts, the maps of the RAPS

study area in Zone 16 will only have Zone 16 coordinates listed, therefore, we have listed all RAPS grid squares with both Zone 15 and 16 coordinates.

Enlarged grids of each county and St. Louis City in AQCR 070, including county boundaries, rivers, and the assigned numbers for each grid square are shown as Figures 2 through 13.

Summary

The Regional Air Pollution Study (RAPS), which encompasses the St. Louis Air Quality Control Region, is the largest and most comprehensive attempt to date to obtain a quantitative understanding of urban air pollution. Its aim is to describe the complex relationships between emissions to the atmosphere, atmospheric dispersions and transformation processes, and ambient concentrations of pollutants.

An accurate, detailed and comprehensive inventory of emission to the atmosphere constitutes a basic input to this understanding. The RAPS emission inventory was planned to provide far more detailed information than has been available anywhere in the past; its aim is to obtain hourly data for key pollutants based insofar as possible, on measured values. Thus, emission data should be available for a base period of a year, commensurate in detail and accuracy with data on ambient concentrations and micrometeorological information gathered by the Regional Air Monitoring Stations (RAMS).

The ultimate value of the RAPS Study will, it is hoped, not be confined to the St. Louis area, but rather will provide a model for future studies of this type in other areas.

References

1. Zegel, William C., Regional Air Pollution Study, Expeditionary Research Program--Summer 1975, Task Order No. 50, EPA Contract 68-02-1081, July 1975.
2. Haws, et al, Computer Assisted Area Source Emissions Gridding Procedure (CAASE) User's Manual, EPA-450/3-74-035, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina, January 1975.
3. Haws, Richard C. and Richard E. Paddock, Presentation of NEDS Emissions Data for Air Pollution Studies, EPA-450/3-75-026, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina, November 1974.

Appendix

Presented in the appendix are figures of the Regional Air Pollution Study Grid System, both on a regional scale, as shown in Figure 1 and on a county scale, as shown in Figures 2 through 13. The grid numbers are shown in Figures 2 through 13 only due to scale and it should be noted that the scale for each figure is not the same.

Table 1 is a listing of each Regional Air Pollution Study grid square. From left to right the data presented are: 1) Grid ID number, 2) the easting and northing coordinates in kilometers of the four corners of each grid in Zone 15 and Zone 16, 3) the state with which the grid square is associated, and 4) the county with which the grid square is associated.

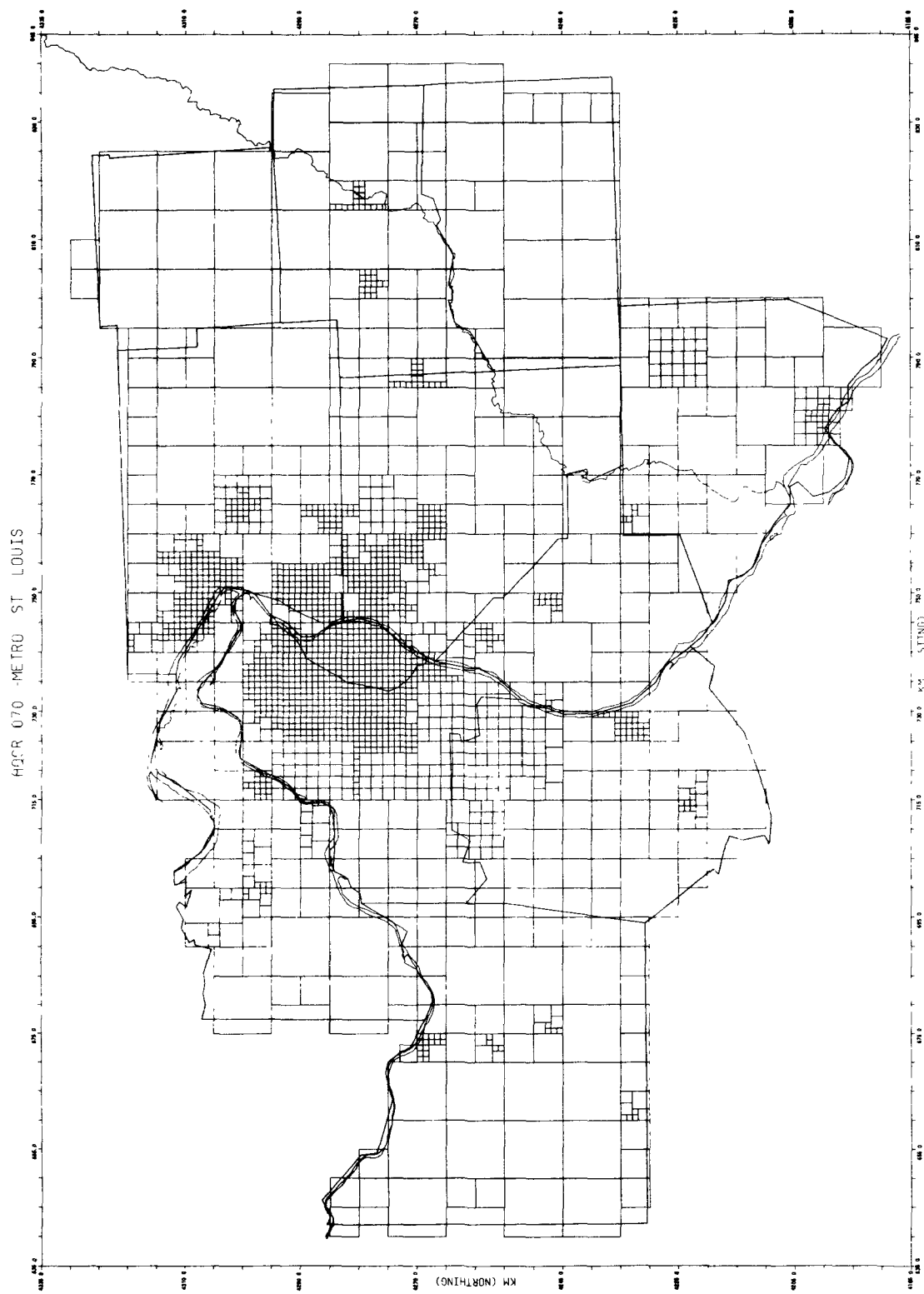


Figure 1: Grid Display of the Regional Air Pollution Study Area

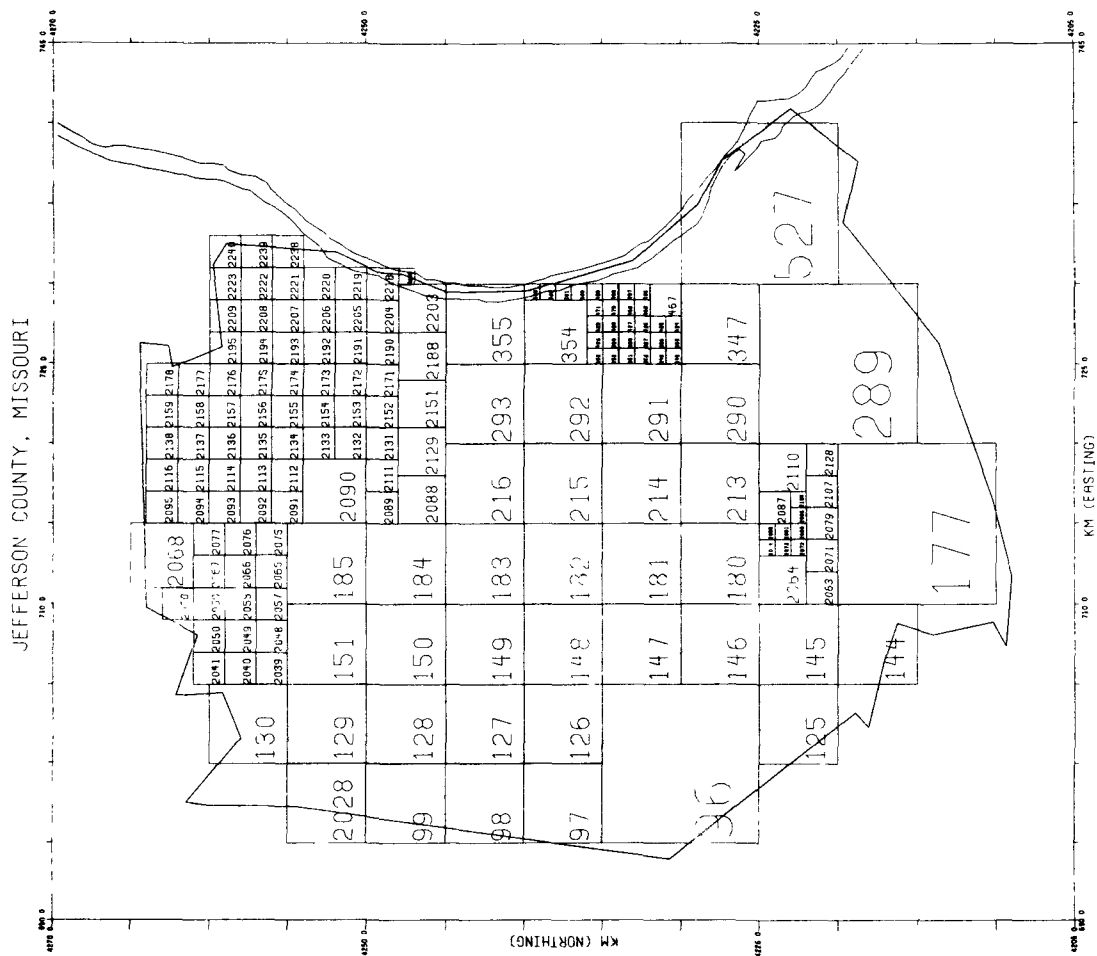


Figure 2: Grid Display of Jefferson County, Missouri

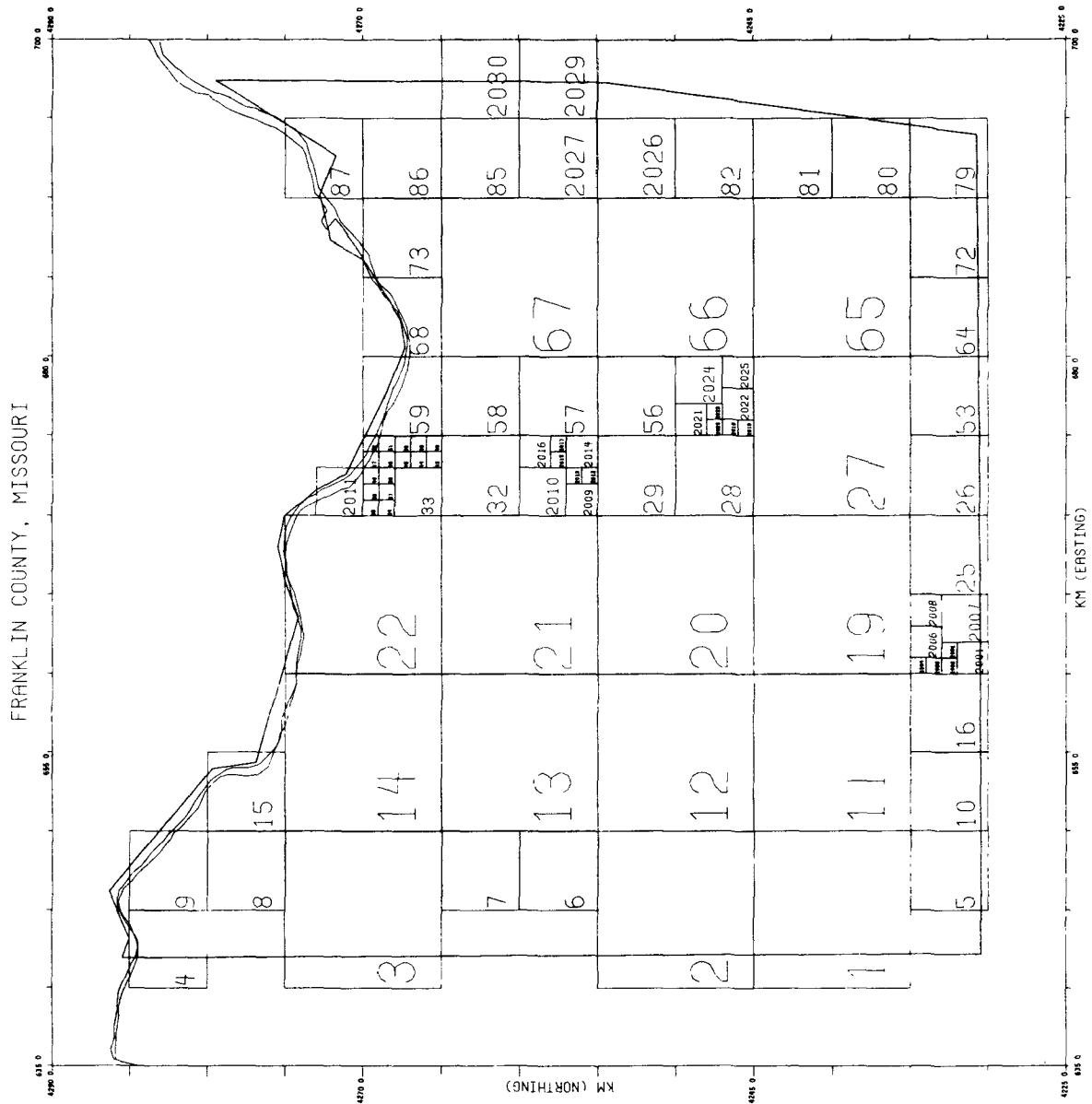


Figure 3: Grid Display of Franklin County, Missouri

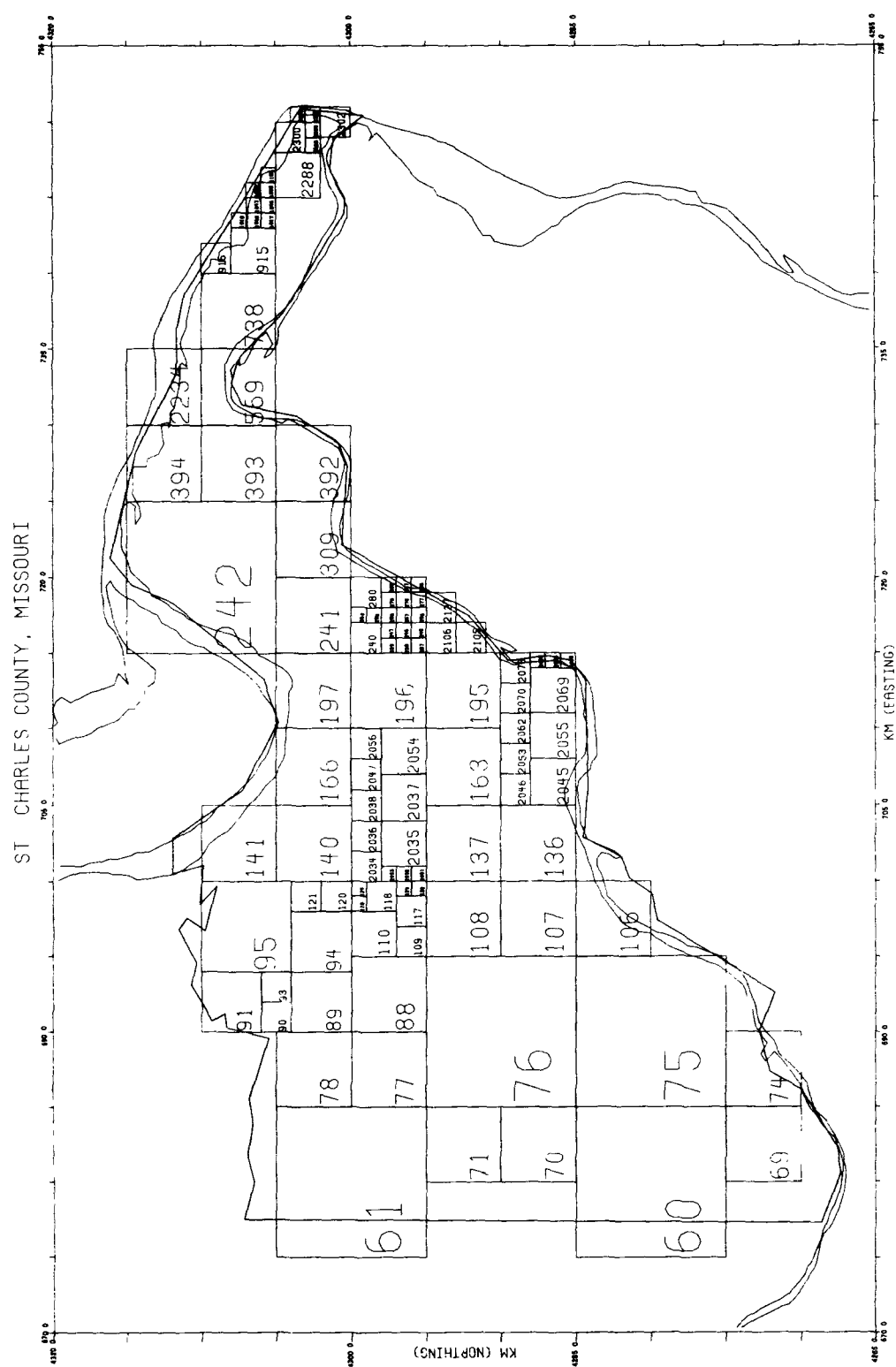


Figure 4: Grid Display of St. Charles County, Missouri

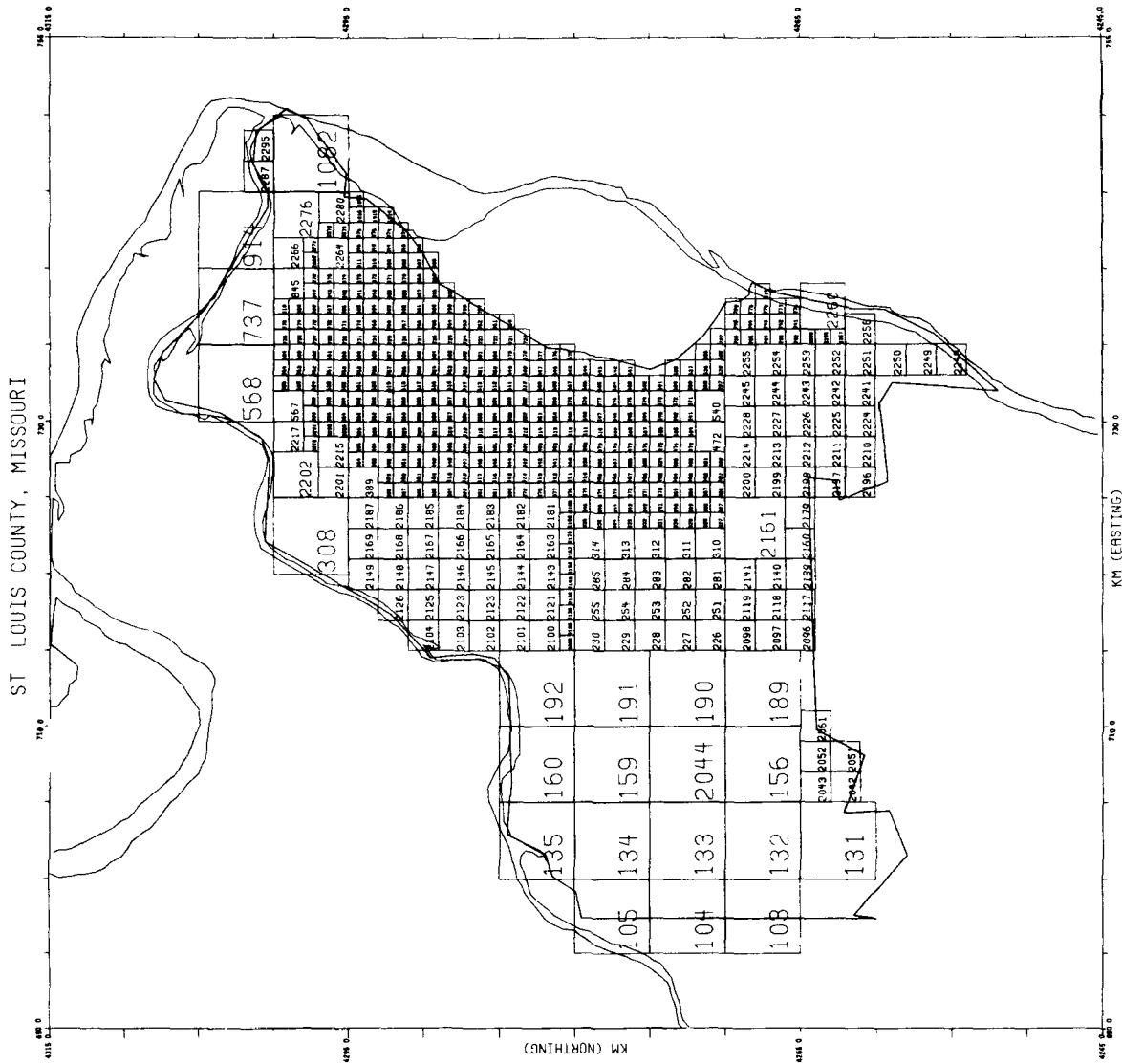


Figure 5: Grid Display of St. Louis County, Missouri

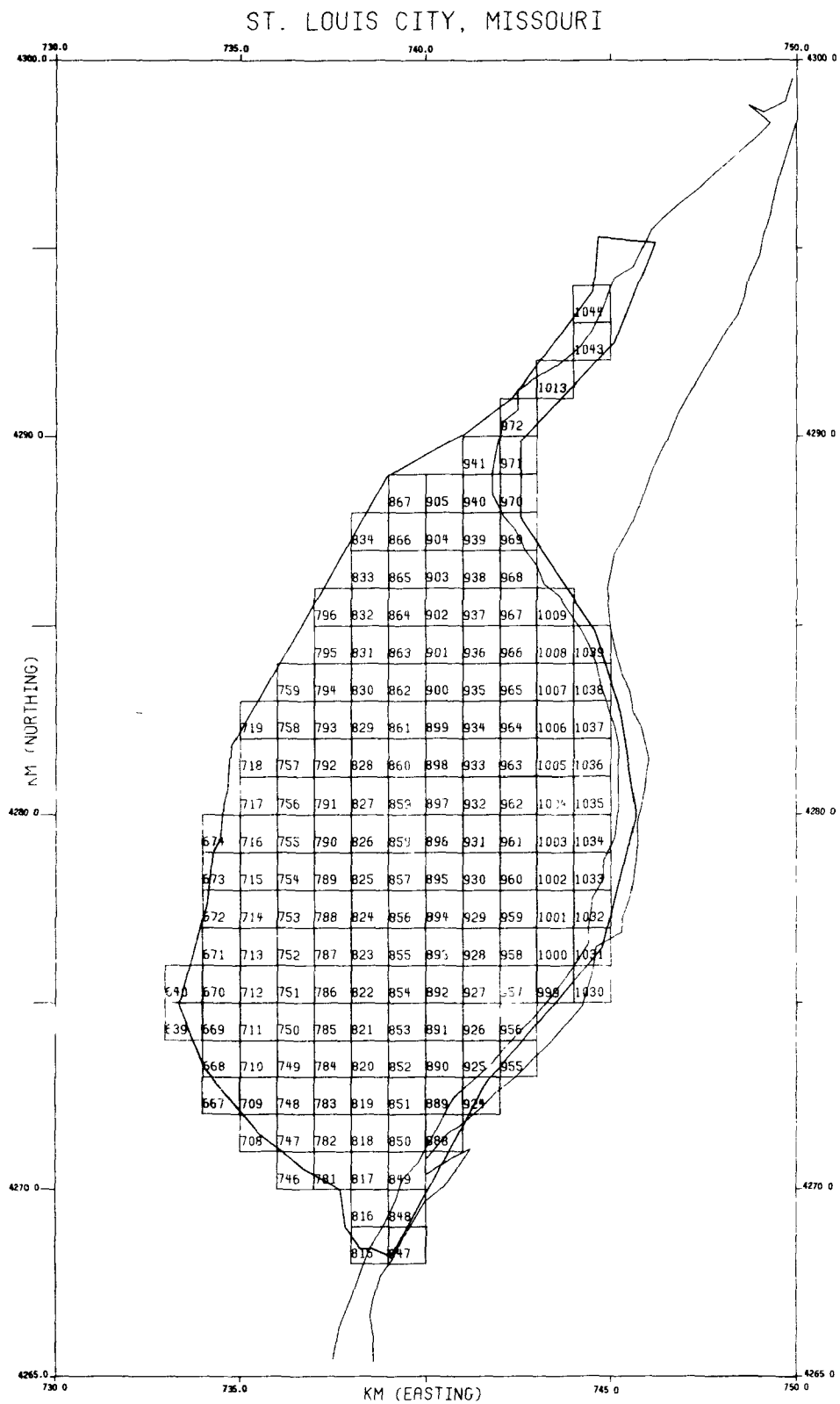


Figure 6: Grid Display of St. Louis City, Missouri
27

MADISON COUNTY, ILLINOIS

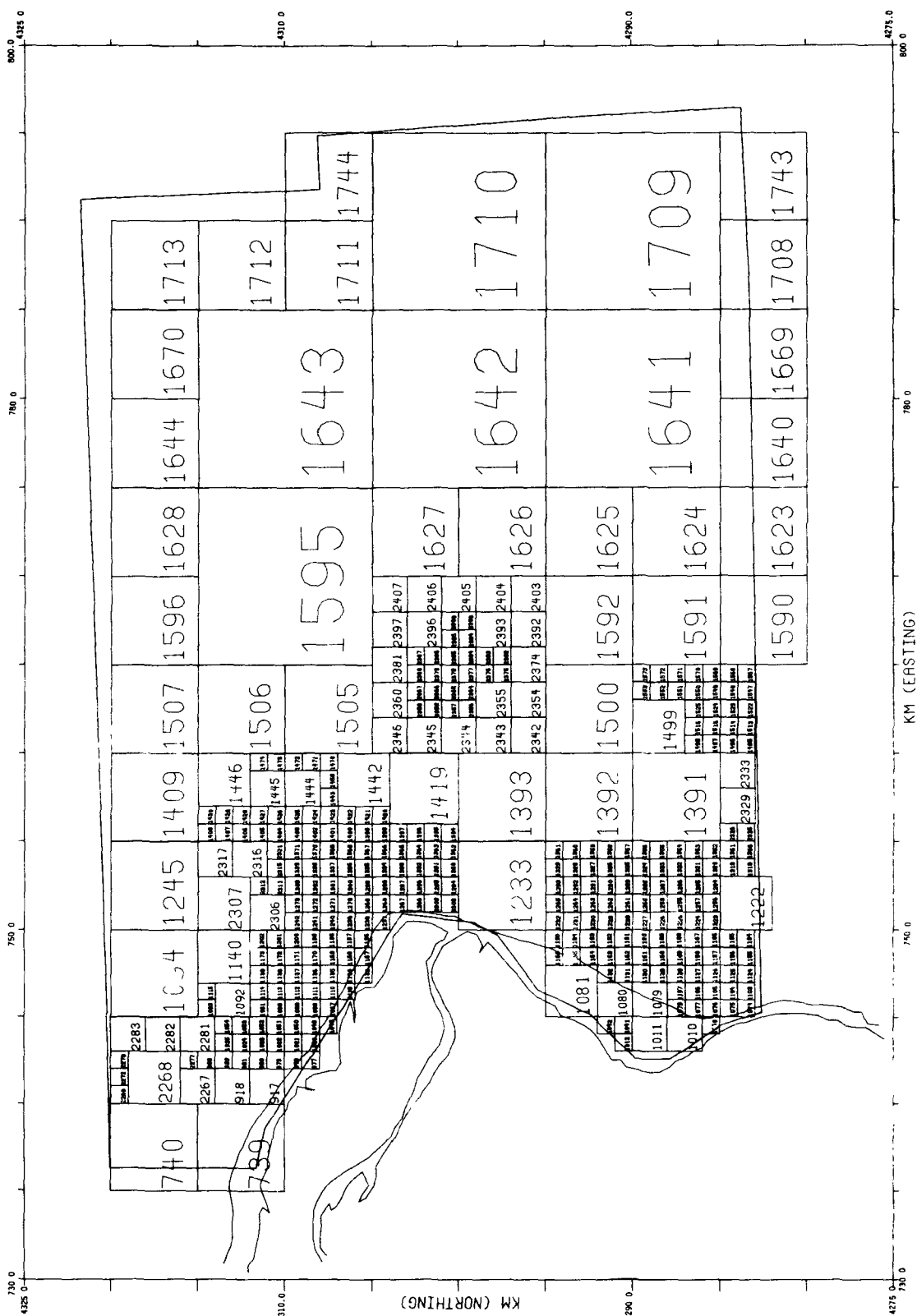


Figure 7: Grid Display of Madison County, Illinois

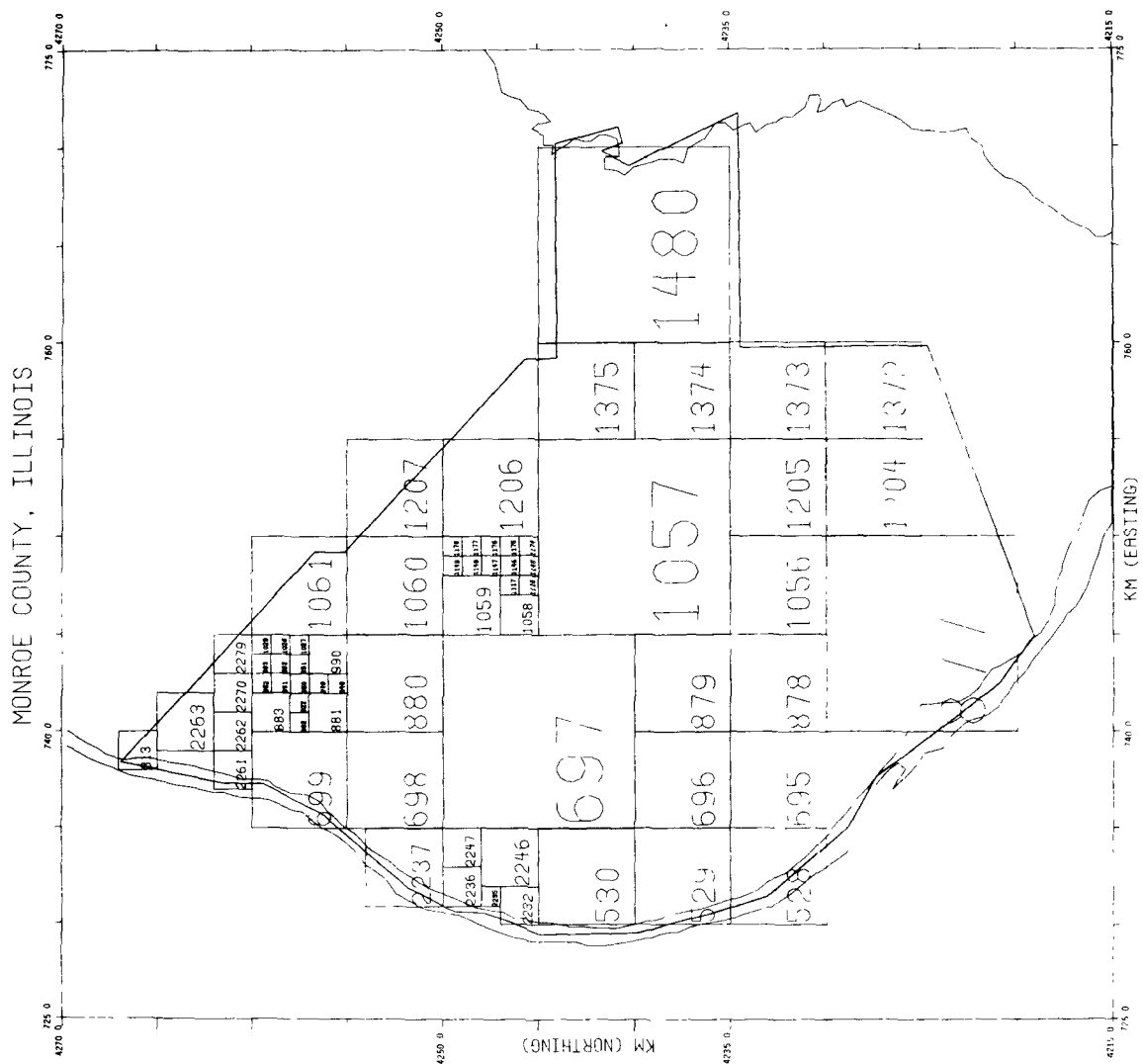


Figure 8: Grid Display of Monroe County, Illinois

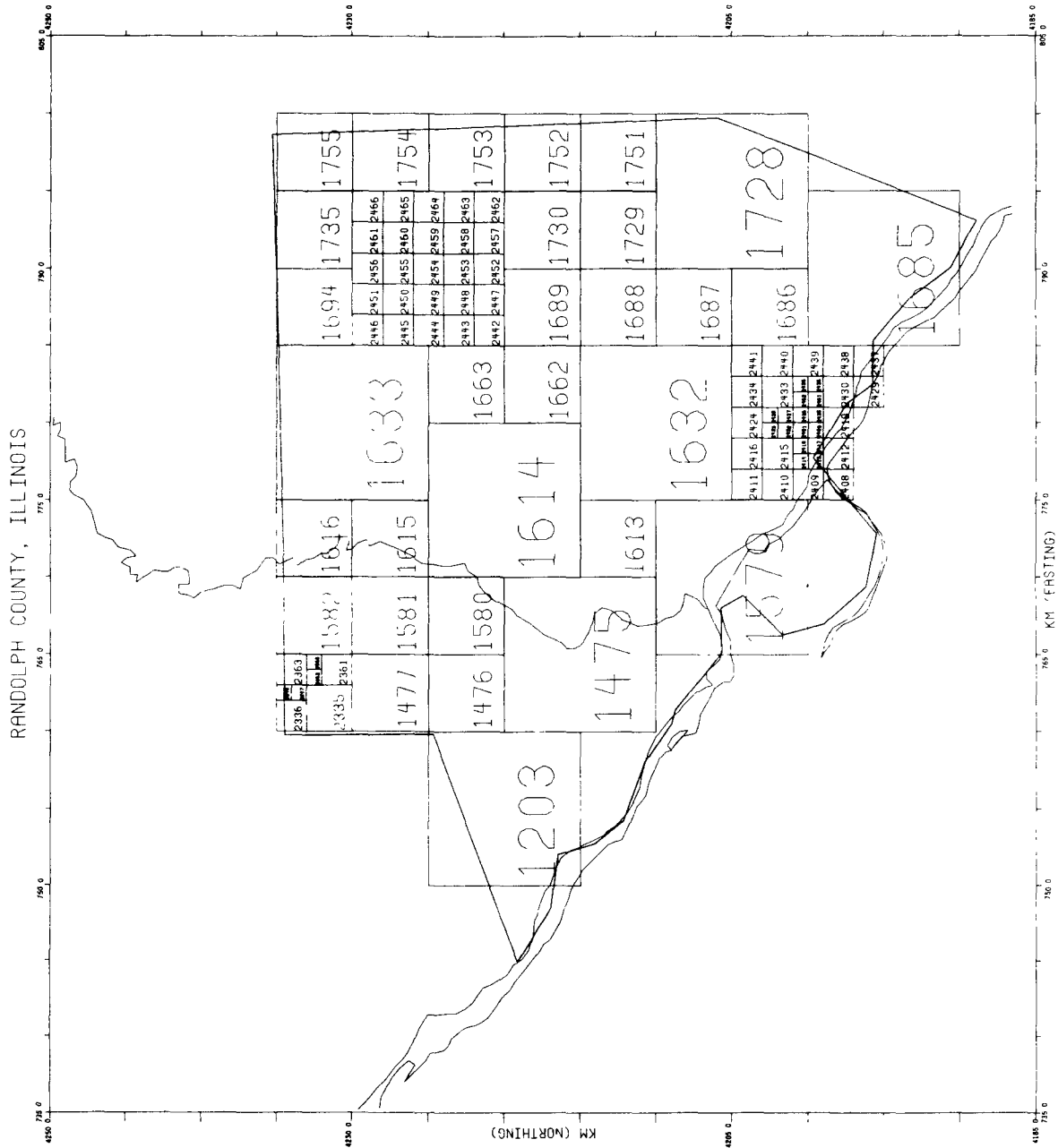


Figure 9: Grid Display of Randolph County, Illinois

CLINTON COUNTY, ILLINOIS

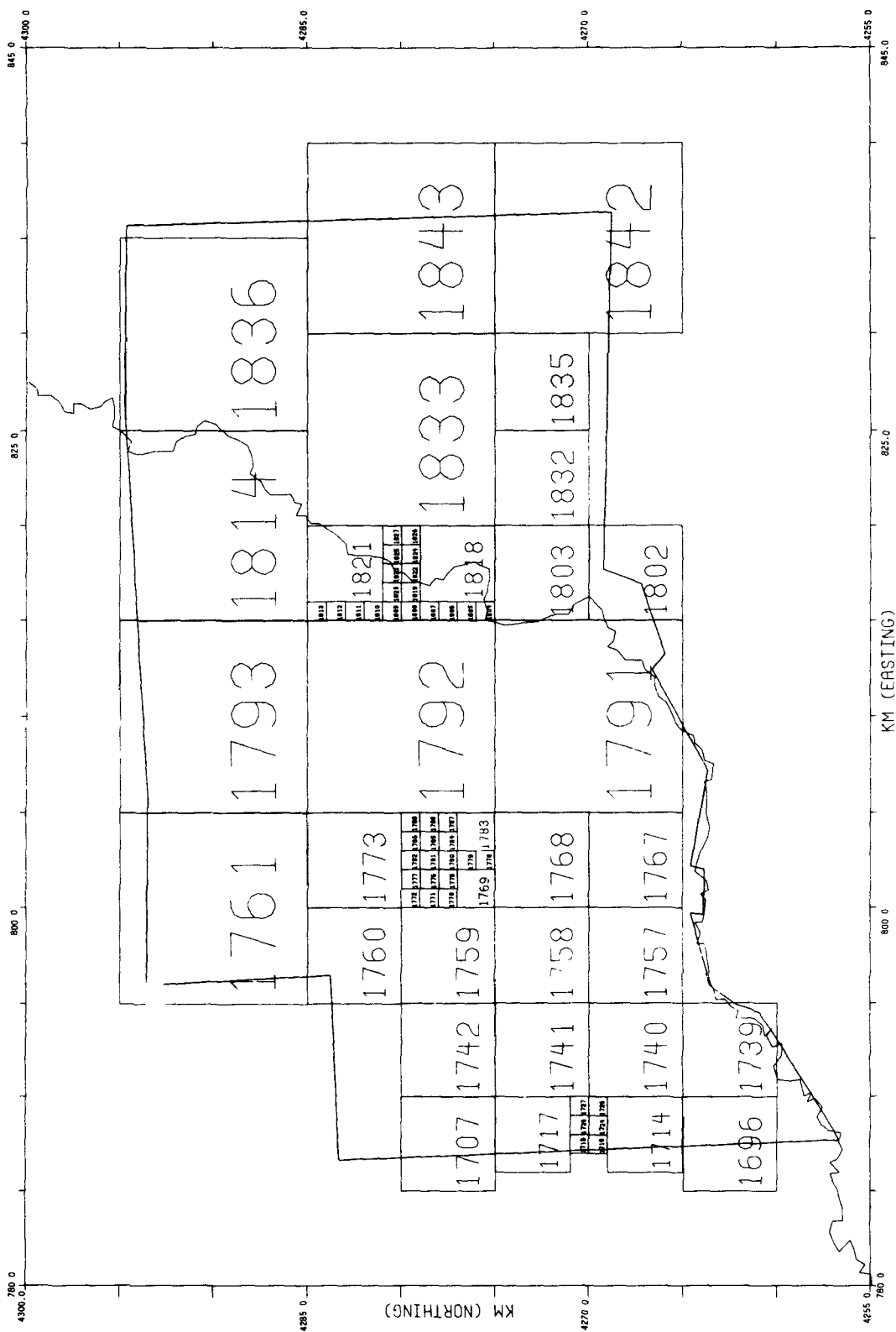


Figure 10: Grid Display of Clinton County, Illinois

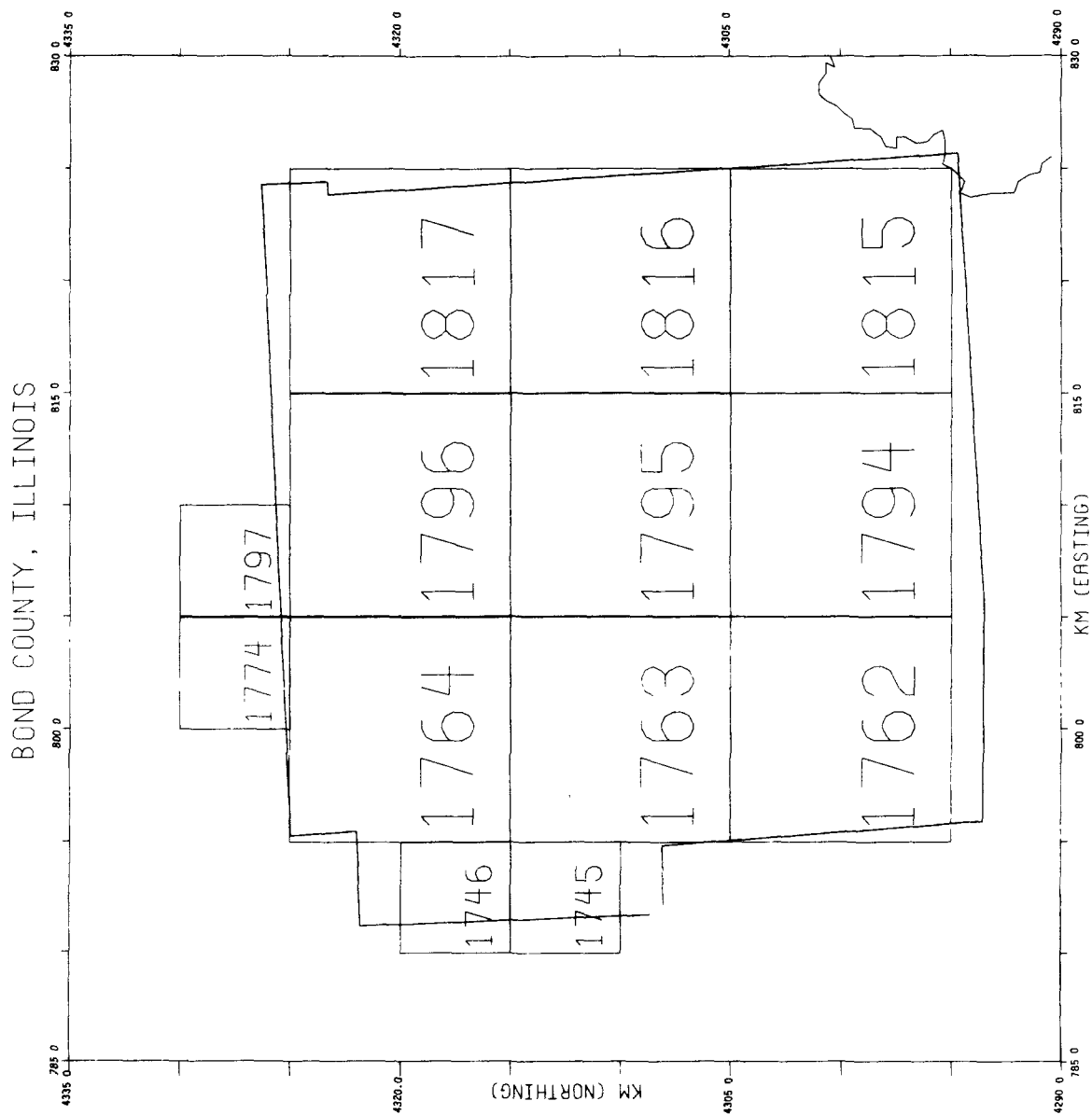


Figure 11: Grid Display of Bond County, Illinois

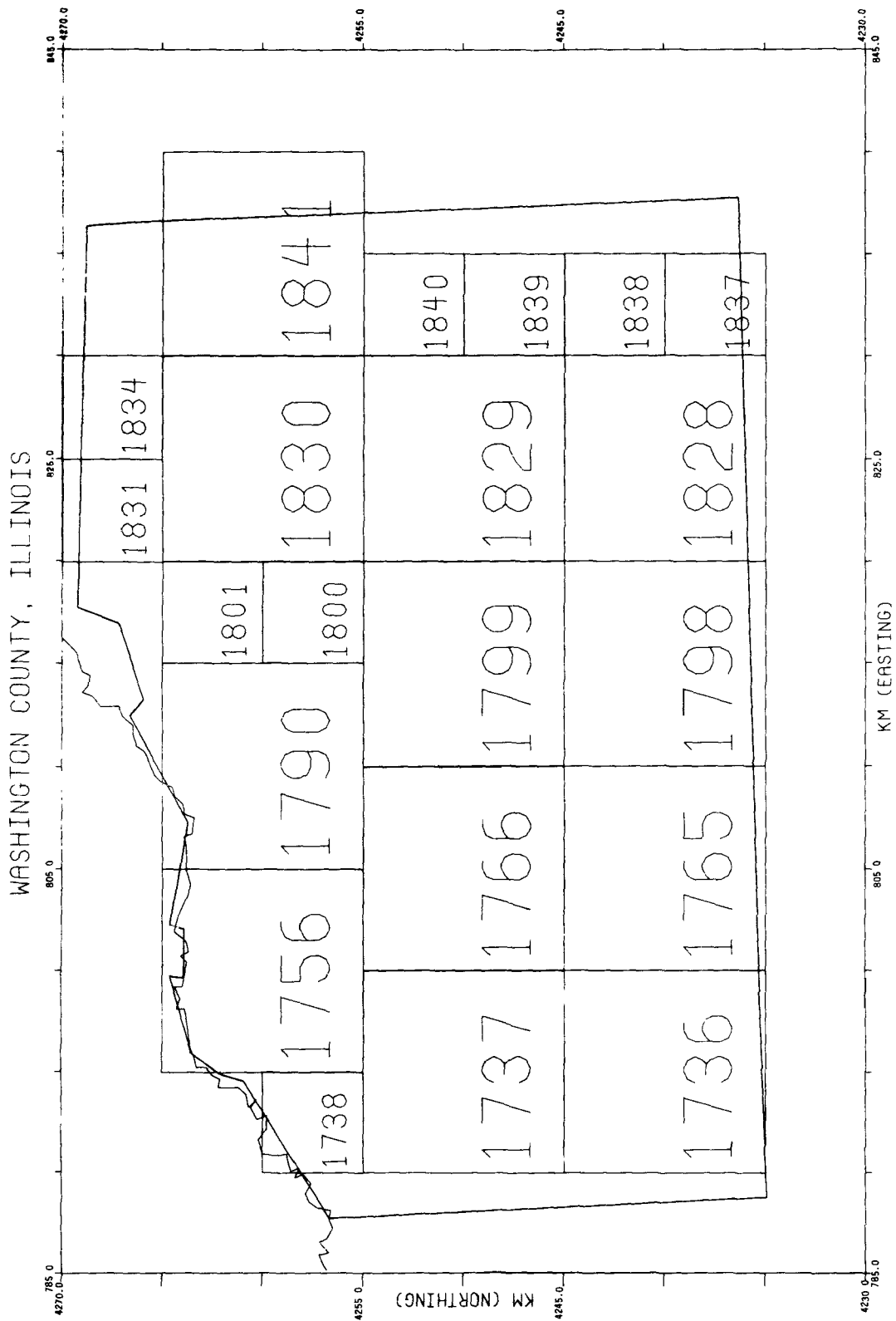


Figure 12: Grid Display of Washington County, Illinois

Table I: List of the Regional Air Pollution Study Grid Squares

ID	ST LOUIS AQCR GRID SQUARE COORDINATES (KM)										STATE	COUNTY
	***** UTM ZONE 15 *****					***** UTM ZONE 16 *****						
1745	E	790.0	790.0	795.0	795.0	269.60	269.93	274.92	274.59	IL	BOND	
	N	4310.0	4315.0	4310.0	4310.0	4308.04	4313.02	4312.70	4307.71			
1746	E	790.0	790.0	795.0	795.0	269.93	270.26	275.25	274.92	IL	BOND	
	N	4315.0	4320.0	4320.0	4315.0	4313.02	4318.01	4317.68	4312.70			
1762	E	795.0	795.0	805.0	805.0	273.60	274.26	284.23	283.58	IL	BOND	
	N	4295.0	4305.0	4305.0	4295.0	4292.75	4302.72	4302.07	4292.09			
1763	E	795.0	795.0	805.0	805.0	274.26	274.92	284.89	284.23	IL	BOND	
	N	4305.0	4315.0	4315.0	4305.0	4302.72	4312.70	4312.04	4302.07			
1764	E	795.0	795.0	805.0	805.0	274.92	275.58	285.55	284.89	IL	BOND	
	N	4315.0	4325.0	4325.0	4315.0	4312.70	4322.67	4322.01	4312.04			
1774	E	800.0	800.0	805.0	805.0	280.56	280.89	285.88	285.55	IL	BOND	
	N	4325.0	4330.0	4330.0	4325.0	4322.34	4327.32	4327.00	4322.01			
1794	E	805.0	805.0	815.0	815.0	283.58	284.23	294.21	293.55	IL	BOND	
	N	4295.0	4305.0	4305.0	4295.0	4292.09	4302.07	4301.41	4291.44			
1795	E	805.0	805.0	815.0	815.0	284.23	284.89	294.86	294.21	IL	BOND	
	N	4305.0	4315.0	4315.0	4305.0	4302.07	4312.04	4311.38	4301.41			
1796	E	805.0	805.0	815.0	815.0	284.89	285.55	295.52	294.86	IL	BOND	
	N	4315.0	4325.0	4325.0	4315.0	4312.04	4322.01	4321.35	4311.38			
1797	E	805.0	805.0	810.0	810.0	285.55	285.88	290.86	290.53	IL	BOND	
	N	4325.0	4330.0	4330.0	4325.0	4322.01	4327.00	4326.67	4321.68			
1815	E	815.0	815.0	825.0	825.0	293.55	294.21	304.18	303.52	IL	BOND	
	N	4295.0	4305.0	4305.0	4295.0	4291.44	4301.41	4300.75	4290.78			
1816	E	815.0	815.0	825.0	825.0	294.21	294.86	304.83	304.18	IL	BOND	
	N	4305.0	4315.0	4315.0	4305.0	4301.41	4311.38	4310.72	4300.75			
1817	E	815.0	815.0	825.0	825.0	294.86	295.52	305.49	304.83	IL	BOND	
	N	4315.0	4325.0	4325.0	4315.0	4311.38	4321.35	4320.69	4310.72			
1696	E	785.0	785.0	790.0	790.0	261.34	261.67	266.66	266.33	IL	CLINTON	
	N	4260.0	4265.0	4265.0	4260.0	4258.49	4263.48	4263.15	4258.16			
1707	E	785.0	785.0	790.0	790.0	262.32	262.65	267.64	267.31	IL	CLINTON	
	N	4275.0	4280.0	4280.0	4275.0	4273.45	4278.44	4278.11	4273.13			

TABLE 1. (CONTINUED)

ST LOUIS ABER GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY	
1714	E	786.0	786.0	790.0	790.0	262.67	262.93	266.92	IL	CLINTON	
	N	4265.0	4269.0	4269.0	4265.0	4263.41	4267.40	4267.14			266.66	4263.15
1717	E	786.0	786.0	790.0	790.0	263.06	263.32	267.31	IL	CLINTON	
	N	4271.0	4275.0	4275.0	4271.0	4269.39	4273.39	4273.13			267.05	4269.14
1718	E	787.0	787.0	788.0	788.0	263.92	263.99	264.99	IL	CLINTON	
	N	4269.0	4270.0	4270.0	4269.0	4267.34	4268.33	4268.27			264.92	4267.27
1719	E	787.0	787.0	788.0	788.0	263.99	264.06	265.05	IL	CLINTON	
	N	4270.0	4271.0	4271.0	4270.0	4268.33	4269.33	4269.27			264.99	4268.27
1724	E	788.0	788.0	789.0	789.0	264.92	264.99	265.98	IL	CLINTON	
	N	4269.0	4270.0	4270.0	4269.0	4267.27	4268.27	4268.20			265.92	4267.21
1725	E	788.0	788.0	789.0	789.0	264.99	265.05	266.05	IL	CLINTON	
	N	4270.0	4271.0	4271.0	4270.0	4268.27	4269.27	4269.20			265.98	4268.20
1726	E	789.0	789.0	790.0	790.0	265.92	265.98	266.98	IL	CLINTON	
	N	4269.0	4270.0	4270.0	4269.0	4267.21	4268.20	4268.14			266.92	4267.14
1727	E	789.0	789.0	790.0	790.0	265.98	266.05	267.05	IL	CLINTON	
	N	4270.0	4271.0	4271.0	4270.0	4268.20	4269.20	4269.14			266.98	4268.14
1739	E	790.0	790.0	795.0	795.0	266.33	266.66	271.64	IL	CLINTON	
	N	4260.0	4265.0	4265.0	4260.0	4258.16	4263.15	4262.82			271.32	4257.84
1740	E	790.0	790.0	795.0	795.0	266.66	266.98	271.97	IL	CLINTON	
	N	4265.0	4270.0	4270.0	4265.0	4263.15	4268.14	4267.81			271.64	4262.82
1741	E	790.0	790.0	795.0	795.0	266.98	267.31	272.30	IL	CLINTON	
	N	4270.0	4275.0	4275.0	4270.0	4268.14	4273.13	4272.80			271.97	4267.81
1742	E	790.0	790.0	795.0	795.0	267.31	267.64	272.62	IL	CLINTON	
	N	4275.0	4280.0	4280.0	4275.0	4273.13	4278.11	4277.19			272.30	4272.80
1743	E	790.0	790.0	795.0	795.0	267.64	267.96	272.95	IL	CLINTON	
	N	4280.0	4285.0	4285.0	4280.0	4278.11	4283.10	4282.77			272.62	4277.79
1757	E	795.0	795.0	800.0	800.0	271.64	271.97	276.96	IL	CLINTON	
	N	4265.0	4270.0	4270.0	4265.0	4262.82	4267.81	4267.48			276.63	4262.50
1758	E	795.0	795.0	800.0	800.0	271.97	272.30	277.28	IL	CLINTON	
	N	4270.0	4275.0	4275.0	4270.0	4267.81	4272.80	4272.47			276.96	4267.48

TABLE 1. (CONTINUED)

ST OUIS AQCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****					***** UTM ZONE 16 *****					STATE	COUNTY
1759	E	795.0	795.0	800.0	800.0	272.30	272.62	277.61	277.28	IL	CLINTON	
	N	4275.0	4280.0	4280.0	4275.0	4272.80	4277.79	4277.46	4272.47			
1760	E	795.0	795.0	800.0	800.0	272.62	272.95	277.94	277.61	IL	CLINTON	
	N	4280.0	4285.0	4285.0	4280.0	4277.79	4282.77	4282.45	4277.46			
1761	E	795.0	795.0	805.0	805.0	272.95	273.60	283.58	282.92	IL	CLINTON	
	N	4285.0	4295.0	4295.0	4285.0	4282.77	4292.75	4292.09	4282.12			
1767	E	800.0	800.0	805.0	805.0	276.63	276.96	281.94	281.62	IL	CLINTON	
	N	4265.0	4270.0	4270.0	4265.0	4262.50	4267.48	4267.16	4262.17			
1768	E	800.0	800.0	805.0	805.0	276.96	277.28	282.27	281.94	IL	CLINTON	
	N	4270.0	4275.0	4275.0	4270.0	4267.48	4272.47	4272.14	4267.16			
1769	E	800.0	800.0	802.0	802.0	277.28	277.41	279.41	279.28	IL	CLINTON	
	N	4275.0	4277.0	4277.0	4275.0	4272.47	4274.47	4274.34	4272.34			
1770	E	800.0	800.0	801.0	801.0	277.41	277.48	278.48	278.41	IL	CLINTON	
	N	4277.0	4278.0	4278.0	4277.0	4274.47	4275.46	4275.40	4274.40			
1771	E	800.0	800.0	801.0	801.0	277.48	277.54	278.54	278.48	IL	CLINTON	
	N	4278.0	4279.0	4279.0	4278.0	4275.46	4276.46	4276.40	4275.40			
1772	E	800.0	800.0	801.0	801.0	277.54	277.61	278.61	278.54	IL	CLINTON	
	N	4279.0	4280.0	4280.0	4279.0	4276.46	4277.46	4277.39	4276.40			
1773	E	800.0	800.0	805.0	805.0	277.61	277.94	282.92	282.60	IL	CLINTON	
	N	4280.0	4285.0	4285.0	4280.0	4277.46	4282.45	4282.12	4277.13			
1775	E	801.0	801.0	802.0	802.0	278.41	278.48	279.47	279.41	IL	CLINTON	
	N	4277.0	4278.0	4278.0	4277.0	4274.40	4275.40	4275.34	4274.34			
1776	E	801.0	801.0	802.0	802.0	278.48	278.54	279.54	279.47	IL	CLINTON	
	N	4278.0	4279.0	4279.0	4278.0	4275.40	4276.40	4276.33	4275.34			
1777	E	801.0	801.0	802.0	802.0	278.54	278.61	279.60	279.54	IL	CLINTON	
	N	4279.0	4280.0	4280.0	4279.0	4276.40	4277.39	4277.33	4276.33			
1778	E	802.0	802.0	803.0	803.0	279.28	279.34	280.34	280.28	IL	CLINTON	
	N	4275.0	4276.0	4276.0	4275.0	4272.34	4273.34	4273.27	4272.28			
1779	E	802.0	802.0	803.0	803.0	279.34	279.41	280.41	280.34	IL	CLINTON	
	N	4276.0	4277.0	4277.0	4276.0	4273.34	4274.34	4274.27	4273.27			

TABLE 1. (CONTINUED)

ST LOUIS AUCK GRID SQUARE COORDINATES (KM)												
ID		***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY	
1780	E	802.0	802.0	803.0	803.0	279.41	279.47	280.47	280.41	IL	CLINTON	
	N	4277.0	4278.0	4278.0	4277.0	4274.34	4275.34	4275.27	4274.27			
1781	E	802.0	802.0	803.0	803.0	279.47	279.54	280.54	280.47	IL	CLINTON	
	N	4278.0	4279.0	4279.0	4278.0	4275.34	4276.33	4276.27	4275.27			
1782	E	802.0	802.0	803.0	803.0	279.54	279.60	280.60	280.54	IL	CLINTON	
	N	4279.0	4280.0	4280.0	4279.0	4276.33	4277.33	4277.26	4276.27			
1783	E	803.0	803.0	805.0	805.0	280.28	280.41	282.40	282.27	IL	CLINTON	
	N	4275.0	4277.0	4277.0	4275.0	4272.28	4274.27	4274.14	4272.14			
1784	E	803.0	803.0	804.0	804.0	280.41	280.47	281.47	281.40	IL	CLINTON	
	N	4277.0	4278.0	4278.0	4277.0	4274.27	4275.27	4275.20	4274.21			
1785	E	803.0	803.0	804.0	804.0	280.47	280.54	281.53	281.47	IL	CLINTON	
	N	4278.0	4279.0	4279.0	4278.0	4275.27	4276.27	4276.20	4275.20			
1786	E	803.0	803.0	804.0	804.0	280.54	280.60	281.60	281.53	IL	CLINTON	
	N	4279.0	4280.0	4280.0	4279.0	4276.27	4277.26	4277.20	4276.20			
1787	E	804.0	804.0	805.0	805.0	281.40	281.47	282.47	282.40	IL	CLINTON	
	N	4277.0	4278.0	4278.0	4277.0	4274.21	4275.20	4275.14	4274.14			
1788	E	804.0	804.0	805.0	805.0	281.47	281.53	282.53	282.47	IL	CLINTON	
	N	4278.0	4279.0	4279.0	4278.0	4275.20	4276.20	4276.14	4275.14			
1789	E	804.0	804.0	805.0	805.0	281.53	281.60	282.60	282.53	IL	CLINTON	
	N	4279.0	4280.0	4280.0	4279.0	4276.20	4277.20	4277.13	4276.14			
1791	E	805.0	805.0	815.0	815.0	281.62	282.27	292.24	291.59	IL	CLINTON	
	N	4265.0	4275.0	4275.0	4265.0	4262.17	4272.14	4271.49	4261.52			
1792	E	805.0	805.0	815.0	815.0	282.27	282.92	292.90	292.24	IL	CLINTON	
	N	4275.0	4285.0	4285.0	4275.0	4272.14	4282.12	4281.46	4271.49			
1793	E	805.0	805.0	815.0	815.0	282.92	283.58	293.55	292.90	IL	CLINTON	
	N	4285.0	4295.0	4295.0	4285.0	4282.12	4292.09	4291.44	4281.46			
1802	E	815.0	815.0	820.0	820.0	291.59	291.92	296.90	296.58	IL	CLINTON	
	N	4265.0	4270.0	4270.0	4265.0	4261.52	4266.51	4266.18	4261.20			
1803	E	815.0	815.0	820.0	820.0	291.92	292.24	297.23	296.90	IL	CLINTON	
	N	4270.0	4275.0	4275.0	4270.0	4266.51	4271.49	4271.17	4266.18			

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)										
ID	***** UTM ZONE 14 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY
1804	E	815.0 4275.0	816.0 4276.0	816.0 4275.0	292.24 4271.49	292.31 4272.49	293.30 4272.43	293.24 4271.43	IL	CLINTON
1805	E	815.0 4276.0	816.0 4277.0	816.0 4276.0	292.31 4272.49	292.37 4273.49	293.37 4273.42	293.30 4272.43	IL	CLINTON
1806	E	815.0 4277.0	816.0 4278.0	816.0 4277.0	292.37 4273.49	292.44 4274.48	293.44 4274.42	293.37 4273.42	IL	CLINTON
1807	E	815.0 4278.0	816.0 4279.0	816.0 4278.0	292.44 4274.48	292.50 4275.48	293.50 4275.42	293.44 4274.42	IL	CLINTON
1808	E	815.0 4279.0	816.0 4280.0	816.0 4279.0	292.50 4275.48	292.57 4276.48	293.57 4276.41	293.50 4275.42	IL	CLINTON
1809	E	815.0 4280.0	816.0 4281.0	816.0 4280.0	292.57 4276.48	292.63 4277.48	293.63 4277.41	293.57 4276.41	IL	CLINTON
1810	E	815.0 4281.0	816.0 4282.0	816.0 4281.0	292.63 4277.48	292.70 4278.47	293.70 4278.41	293.63 4277.41	IL	CLINTON
1811	E	815.0 4282.0	816.0 4283.0	816.0 4282.0	292.70 4278.47	292.76 4279.47	293.76 4279.41	293.70 4278.41	IL	CLINTON
1812	E	815.0 4283.0	816.0 4284.0	816.0 4283.0	292.76 4279.47	292.83 4280.47	293.83 4280.40	293.76 4279.41	IL	CLINTON
1813	E	815.0 4284.0	816.0 4285.0	816.0 4284.0	292.83 4280.47	292.90 4281.46	293.89 4281.40	293.83 4280.40	IL	CLINTON
1814	E	815.0 4285.0	825.0 4295.0	825.0 4285.0	292.90 4281.46	293.55 4291.44	303.52 4290.78	302.87 4280.81	IL	CLINTON
1818	E	816.0 4275.0	820.0 4279.0	820.0 4275.0	293.24 4271.43	293.50 4275.42	297.49 4275.16	297.23 4271.17	IL	CLINTON
1819	E	816.0 4279.0	817.0 4280.0	817.0 4279.0	293.50 4275.42	293.57 4276.41	294.56 4276.35	294.50 4275.35	IL	CLINTON
1820	E	816.0 4280.0	817.0 4281.0	817.0 4280.0	293.57 4276.41	293.63 4277.41	294.63 4277.35	294.56 4276.35	IL	CLINTON
1821	E	816.0 4281.0	820.0 4285.0	820.0 4281.0	293.63 4277.41	293.89 4281.40	297.88 4281.14	297.62 4277.15	IL	CLINTON

TABLE 1. (CONTINUED)

ST LOUIS AQCH GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY
1822	E	817.0	817.0	818.0	818.0	294.50	294.56	295.56	295.49	295.49	IL	CLINTON
	N	4279.0	4280.0	4280.0	4279.0	4275.35	4276.35	4276.29	4275.29	4275.29		
1823	E	817.0	817.0	818.0	818.0	294.56	294.63	295.63	295.56	295.56	IL	CLINTON
	N	4280.0	4281.0	4280.0	4280.0	4276.35	4277.35	4277.28	4276.29	4276.29		
1824	E	818.0	818.0	819.0	819.0	295.49	295.56	296.56	296.49	296.49	IL	CLINTON
	N	4279.0	4280.0	4280.0	4279.0	4275.29	4276.29	4276.22	4275.22	4275.22		
1825	E	818.0	818.0	819.0	819.0	295.56	295.63	296.62	296.56	296.56	IL	CLINTON
	N	4280.0	4281.0	4280.0	4280.0	4276.29	4277.28	4277.21	4276.22	4276.22		
1826	E	819.0	819.0	820.0	820.0	296.49	296.56	297.55	297.49	297.49	IL	CLINTON
	N	4279.0	4280.0	4280.0	4279.0	4275.22	4276.22	4276.15	4275.16	4275.16		
1827	E	819.0	819.0	820.0	820.0	296.56	296.62	297.62	297.55	297.55	IL	CLINTON
	N	4280.0	4281.0	4280.0	4280.0	4276.22	4277.21	4277.15	4276.15	4276.15		
1832	E	820.0	820.0	825.0	825.0	296.90	297.23	302.21	301.89	301.89	IL	CLINTON
	N	4270.0	4275.0	4270.0	4270.0	4266.18	4271.17	4270.84	4265.86	4265.86		
1833	E	820.0	820.0	830.0	830.0	297.23	297.88	307.85	307.20	307.20	IL	CLINTON
	N	4275.0	4285.0	4285.0	4275.0	4271.17	4281.14	4280.48	4270.52	4270.52		
1835	E	825.0	825.0	830.0	830.0	301.89	302.21	307.20	306.87	306.87	IL	CLINTON
	N	4270.0	4275.0	4275.0	4270.0	4265.86	4270.84	4270.52	4265.53	4265.53		
1836	E	825.0	825.0	835.0	835.0	302.87	303.52	313.49	312.84	312.84	IL	CLINTON
	N	4285.0	4295.0	4295.0	4285.0	4280.81	4290.78	4290.13	4280.16	4280.16		
1842	E	830.0	830.0	840.0	840.0	306.55	307.20	317.17	316.52	316.52	IL	CLINTON
	N	4265.0	4275.0	4275.0	4265.0	4260.55	4270.52	4269.86	4259.89	4259.89		
1843	E	830.0	830.0	840.0	840.0	307.20	307.85	317.82	317.17	317.17	IL	CLINTON
	N	4275.0	4285.0	4285.0	4275.0	4270.52	4280.48	4279.83	4269.86	4269.86		
739	E	735.0	735.0	740.0	740.0	214.72	215.05	220.04	219.71	219.71	IL	MADISON
	N	4310.0	4315.0	4315.0	4310.0	4311.65	4316.64	4316.52	4311.52	4311.52		
740	E	735.0	735.0	740.0	740.0	215.05	215.38	220.37	220.04	220.04	IL	MADISON
	N	4315.0	4320.0	4320.0	4315.0	4316.64	4321.63	4321.30	4316.52	4316.52		
917	E	740.0	740.0	742.0	742.0	219.71	219.84	221.84	221.71	221.71	IL	MADISON
	N	4310.0	4312.0	4312.0	4310.0	4311.52	4313.52	4313.19	4311.19	4311.19		

TABLE 1: (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 18 *****		***** UTM ZONE 19 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY	
918	E	740.0 4312.0	740.0 4314.0	742.0 4312.0	219.84 4313.32	219.98 4315.32	221.97 4315.18	221.84 4313.19	IL	MADISON	
	N										
2267	E	740.0 4314.0	740.0 4316.0	742.0 4316.0	219.98 4315.32	220.11 4317.31	222.10 4317.18	221.97 4315.18	IL	MADISON	
	N										
2268	E	740.0 4316.0	740.0 4319.0	743.0 4319.0	220.11 4317.31	220.30 4320.31	223.30 4320.11	223.10 4317.11	IL	MADISON	
	N										
2269	E	740.0 4319.0	740.0 4320.0	741.0 4320.0	220.30 4320.31	220.37 4321.30	221.37 4321.24	221.30 4320.24	IL	MADISON	
	N										
2272	E	741.0 4319.0	741.0 4320.0	742.0 4320.0	221.30 4320.24	221.37 4321.24	222.37 4321.17	222.30 4320.18	IL	MADISON	
	N										
977	E	742.0 4308.0	742.0 4309.0	743.0 4309.0	221.58 4309.20	221.64 4310.20	222.64 4310.13	222.57 4309.13	IL	MADISON	
	N										
978	E	742.0 4309.0	742.0 4310.0	743.0 4310.0	221.64 4310.20	221.71 4311.19	222.71 4311.13	222.64 4310.13	IL	MADISON	
	N										
979	E	742.0 4310.0	742.0 4311.0	743.0 4311.0	221.71 4311.19	221.77 4312.19	222.77 4312.13	222.71 4311.13	IL	MADISON	
	N										
980	E	742.0 4311.0	742.0 4312.0	743.0 4312.0	221.77 4312.19	221.84 4313.19	222.84 4313.12	222.77 4312.13	IL	MADISON	
	N										
981	E	742.0 4312.0	742.0 4313.0	743.0 4313.0	221.84 4313.19	221.91 4314.19	222.90 4314.12	222.84 4313.12	IL	MADISON	
	N										
982	E	742.0 4313.0	742.0 4314.0	743.0 4314.0	221.91 4314.19	221.97 4315.18	222.97 4315.12	222.90 4314.12	IL	MADISON	
	N										
983	E	742.0 4314.0	742.0 4315.0	743.0 4315.0	221.97 4315.18	222.04 4316.18	223.04 4316.12	222.97 4315.12	IL	MADISON	
	N										
2277	E	742.0 4315.0	742.0 4316.0	743.0 4316.0	222.04 4316.18	222.10 4317.18	223.10 4317.11	223.04 4316.12	IL	MADISON	
	N										
2278	E	742.0 4319.0	742.0 4320.0	743.0 4320.0	222.30 4320.18	222.37 4321.17	223.36 4321.11	223.30 4320.11	IL	MADISON	
	N										
1010	E	743.0 4286.0	743.0 4288.0	745.0 4288.0	221.13 4287.17	221.26 4289.17	223.26 4289.04	223.13 4287.04	IL	MADISON	
	N										

TABLE 1. (CONTINUED)

ST LOUIS AOCR GRID SQUARE COORDINATES (KM)											
ID		***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY
1011	E N	743.0 4288.0	743.0 4290.0	745.0 4290.0	745.0 4288.0	221.26 4289.17	221.39 4291.16	223.39 4291.04	223.26 4289.04	IL	MADISON
1012	E N	743.0 4290.0	743.0 4291.0	744.0 4291.0	744.0 4290.0	221.39 4291.16	221.46 4292.16	222.46 4292.10	222.39 4291.10	IL	MADISON
1020	E N	743.0 4308.0	743.0 4309.0	744.0 4309.0	744.0 4308.0	222.57 4309.13	222.64 4310.13	223.64 4310.06	223.57 4309.07	IL	MADISON
1021	E N	743.0 4309.0	743.0 4310.0	744.0 4310.0	744.0 4309.0	222.64 4310.13	222.71 4311.13	223.70 4311.06	223.64 4310.06	IL	MADISON
1022	E N	743.0 4310.0	743.0 4311.0	744.0 4311.0	744.0 4310.0	222.71 4311.13	222.77 4312.13	223.77 4312.06	223.70 4311.06	IL	MADISON
1023	E N	743.0 4311.0	743.0 4312.0	744.0 4312.0	744.0 4311.0	222.77 4312.13	222.84 4313.12	223.84 4313.06	223.77 4312.06	IL	MADISON
1024	E N	743.0 4312.0	743.0 4313.0	744.0 4313.0	744.0 4312.0	222.84 4313.12	222.90 4314.12	223.90 4314.05	223.84 4313.06	IL	MADISON
1025	E N	743.0 4313.0	743.0 4314.0	744.0 4314.0	744.0 4313.0	222.90 4314.12	222.97 4315.12	223.97 4315.05	223.90 4314.05	IL	MADISON
2281	E N	743.0 4314.0	743.0 4315.0	745.0 4315.0	745.0 4314.0	222.97 4315.12	223.10 4317.11	225.10 4316.98	224.97 4314.99	IL	MADISON
2282	E N	743.0 4315.0	743.0 4316.0	745.0 4316.0	745.0 4315.0	223.10 4317.11	223.23 4319.11	225.23 4318.98	225.10 4316.98	IL	MADISON
2283	E N	743.0 4316.0	743.0 4320.0	745.0 4320.0	745.0 4316.0	223.23 4319.11	223.36 4321.11	225.36 4320.98	225.23 4318.98	IL	MADISON
1040	E N	744.0 4285.0	744.0 4286.0	745.0 4286.0	745.0 4285.0	222.06 4286.11	222.13 4287.11	223.13 4287.04	223.06 4286.04	IL	MADISON
1041	E N	744.0 4290.0	744.0 4291.0	745.0 4291.0	745.0 4290.0	222.39 4291.10	222.46 4292.10	223.46 4292.03	223.39 4291.04	IL	MADISON
1042	E N	744.0 4291.0	744.0 4292.0	745.0 4292.0	745.0 4291.0	222.46 4292.10	222.52 4293.10	223.52 4293.03	223.46 4292.03	IL	MADISON
1048	E N	744.0 4307.0	744.0 4308.0	745.0 4308.0	745.0 4307.0	223.51 4308.07	223.57 4309.07	224.57 4309.00	224.51 4308.00	IL	MADISON

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		COUNTY
1049	E	744.0	744.0	745.0	745.0	223.57	223.64	224.64	224.57	IL	MADISON
	N	4308.0	4309.0	4309.0	4308.0	4309.07	4310.06	4310.00	4309.00		
1050	E	744.0	744.0	745.0	745.0	223.64	223.70	224.70	224.64	IL	MADISON
	N	4309.0	4310.0	4310.0	4309.0	4310.06	4311.06	4311.00	4310.00		
1051	E	744.0	744.0	745.0	745.0	223.70	223.77	224.77	224.70	IL	MADISON
	N	4310.0	4311.0	4311.0	4310.0	4311.06	4312.06	4311.99	4311.00		
1052	E	744.0	744.0	745.0	745.0	223.77	223.84	224.83	224.77	IL	MADISON
	N	4311.0	4312.0	4312.0	4311.0	4312.06	4313.06	4312.99	4311.99		
1053	E	744.0	744.0	745.0	745.0	223.84	223.90	224.90	224.83	IL	MADISON
	N	4312.0	4313.0	4313.0	4312.0	4313.06	4314.05	4313.99	4312.99		
1054	E	744.0	744.0	745.0	745.0	223.90	223.97	224.97	224.90	IL	MADISON
	N	4313.0	4314.0	4314.0	4313.0	4314.05	4315.05	4314.99	4313.99		
1074	E	745.0	745.0	746.0	746.0	222.93	223.00	223.99	223.93	IL	MADISON
	N	4283.0	4284.0	4284.0	4283.0	4284.05	4285.05	4284.98	4283.98		
1075	E	745.0	745.0	746.0	746.0	223.00	223.06	224.06	223.99	IL	MADISON
	N	4284.0	4285.0	4285.0	4284.0	4285.05	4286.04	4285.98	4284.98		
1076	E	745.0	745.0	746.0	746.0	223.06	223.13	224.13	224.06	IL	MADISON
	N	4285.0	4286.0	4286.0	4285.0	4286.04	4287.04	4286.98	4285.98		
1077	E	745.0	745.0	746.0	746.0	223.13	223.19	224.19	224.13	IL	MADISON
	N	4286.0	4287.0	4287.0	4286.0	4287.04	4288.04	4287.98	4286.98		
1078	E	745.0	745.0	746.0	746.0	223.19	223.26	224.26	224.19	IL	MADISON
	N	4287.0	4288.0	4288.0	4287.0	4288.04	4289.04	4288.97	4287.98		
1079	E	745.0	745.0	747.0	747.0	223.26	223.39	225.39	225.25	IL	MADISON
	N	4288.0	4290.0	4290.0	4288.0	4289.04	4291.04	4290.90	4288.91		
1080	E	745.0	745.0	747.0	747.0	223.39	223.52	225.52	225.39	IL	MADISON
	N	4290.0	4292.0	4292.0	4290.0	4291.04	4293.03	4292.90	4290.90		
1081	E	745.0	745.0	748.0	748.0	223.52	223.72	226.71	226.51	IL	MADISON
	N	4292.0	4295.0	4295.0	4292.0	4293.03	4296.02	4295.83	4292.83		
1087	E	745.0	745.0	746.0	746.0	224.51	224.57	225.57	225.50	IL	MADISON
	N	4307.0	4308.0	4308.0	4307.0	4308.00	4309.00	4308.93	4307.93		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY
1088	E	745.0 4308.0	745.0 4309.0	746.0 4309.0	746.0 4308.0	224.57 4309.00	224.64 4310.00	225.63 4309.93	225.57 4308.93	225.57 4308.93	IL	MADISON
1089	E	745.0 4309.0	745.0 4310.0	746.0 4310.0	746.0 4309.0	224.64 4310.00	224.70 4311.00	225.70 4310.93	225.63 4309.93	225.63 4309.93	IL	MADISON
1090	E	745.0 4310.0	745.0 4311.0	746.0 4311.0	746.0 4310.0	224.70 4311.00	224.77 4311.99	225.77 4311.93	225.70 4310.93	225.70 4310.93	IL	MADISON
1091	E	745.0 4311.0	745.0 4312.0	746.0 4312.0	746.0 4311.0	224.77 4311.99	224.83 4312.99	225.83 4312.93	225.77 4311.93	225.77 4311.93	IL	MADISON
1092	E	745.0 4312.0	745.0 4314.0	747.0 4314.0	747.0 4312.0	224.83 4312.99	224.97 4314.99	226.96 4314.86	226.83 4312.86	226.83 4312.86	IL	MADISON
1093	E	745.0 4314.0	745.0 4315.0	746.0 4315.0	746.0 4314.0	224.97 4314.99	225.03 4315.98	226.03 4315.92	225.96 4314.92	225.96 4314.92	IL	MADISON
1094	E	745.0 4315.0	745.0 4320.0	750.0 4320.0	750.0 4315.0	225.03 4315.98	225.36 4320.98	230.35 4320.84	230.02 4315.66	230.02 4315.66	IL	MADISON
1103	E	746.0 4283.0	746.0 4284.0	747.0 4284.0	747.0 4283.0	223.93 4283.98	223.99 4284.98	224.99 4284.91	224.93 4283.92	224.93 4283.92	IL	MADISON
1104	E	746.0 4284.0	746.0 4285.0	747.0 4285.0	747.0 4284.0	223.99 4284.98	224.06 4285.98	225.06 4285.91	224.99 4284.91	224.99 4284.91	IL	MADISON
1105	E	746.0 4285.0	746.0 4286.0	747.0 4286.0	747.0 4285.0	224.06 4285.98	224.13 4286.98	225.12 4286.91	225.06 4285.91	225.06 4285.91	IL	MADISON
1106	E	746.0 4286.0	746.0 4287.0	747.0 4287.0	747.0 4286.0	224.13 4286.98	224.19 4287.98	225.19 4287.91	225.12 4286.91	225.12 4286.91	IL	MADISON
1107	E	746.0 4287.0	746.0 4288.0	747.0 4288.0	747.0 4287.0	224.19 4287.98	224.26 4288.97	225.25 4288.91	225.19 4287.91	225.19 4287.91	IL	MADISON
1109	E	746.0 4306.0	746.0 4307.0	747.0 4307.0	747.0 4306.0	225.44 4306.94	225.50 4307.93	226.50 4307.87	226.44 4306.87	226.44 4306.87	IL	MADISON
1110	E	746.0 4307.0	746.0 4308.0	747.0 4308.0	747.0 4307.0	225.50 4307.93	225.57 4308.93	226.57 4308.87	226.50 4307.87	226.50 4307.87	IL	MADISON
1111	E	746.0 4308.0	746.0 4309.0	747.0 4309.0	747.0 4308.0	225.57 4308.93	225.63 4309.93	226.63 4309.87	226.57 4308.87	226.57 4308.87	IL	MADISON

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE		***** UTM ZONE		***** UTM ZONE		***** UTM ZONE		***** UTM ZONE		STATE COUNTY
1112 E	746.0	746.0	747.0	747.0	225.63	225.70	226.70	226.63	226.63	226.63	IL MADISON
1112 N	4309.0	4310.0	4310.0	4309.0	4309.93	4310.93	4310.86	4309.87	4309.87	4309.87	
1113 E	746.0	746.0	747.0	747.0	225.70	225.77	226.76	226.70	226.70	226.70	IL MADISON
1113 N	4310.0	4311.0	4311.0	4310.0	4310.93	4311.93	4311.86	4310.86	4310.86	4310.86	
1114 E	746.0	746.0	747.0	747.0	225.77	225.83	226.83	226.76	226.76	226.76	IL MADISON
1114 N	4311.0	4312.0	4312.0	4311.0	4311.93	4312.93	4312.86	4311.86	4311.86	4311.86	
1115 E	746.0	746.0	747.0	747.0	225.96	226.03	227.03	226.96	226.96	226.96	IL MADISON
1115 N	4314.0	4315.0	4315.0	4314.0	4314.92	4315.92	4315.86	4314.86	4314.86	4314.86	
1124 E	747.0	747.0	748.0	748.0	224.93	224.99	225.99	225.93	225.93	225.93	IL MADISON
1124 N	4283.0	4284.0	4284.0	4283.0	4283.92	4284.91	4284.85	4283.85	4283.85	4283.85	
1125 E	747.0	747.0	748.0	748.0	224.99	225.06	226.06	225.99	225.99	225.99	IL MADISON
1125 N	4284.0	4285.0	4285.0	4284.0	4284.91	4285.91	4285.85	4284.85	4284.85	4284.85	
1126 E	747.0	747.0	748.0	748.0	225.06	225.12	226.12	226.06	226.06	226.06	IL MADISON
1126 N	4285.0	4286.0	4286.0	4285.0	4285.91	4286.91	4286.85	4285.85	4285.85	4285.85	
1127 E	747.0	747.0	748.0	748.0	225.12	225.19	226.19	226.12	226.12	226.12	IL MADISON
1127 N	4286.0	4287.0	4287.0	4286.0	4286.91	4287.91	4287.84	4286.85	4286.85	4286.85	
1128 E	747.0	747.0	748.0	748.0	225.19	225.25	226.25	226.19	226.19	226.19	IL MADISON
1128 N	4287.0	4288.0	4288.0	4287.0	4287.91	4288.91	4288.84	4287.84	4287.84	4287.84	
1129 E	747.0	747.0	748.0	748.0	225.25	225.32	226.32	226.25	226.25	226.25	IL MADISON
1129 N	4288.0	4289.0	4289.0	4288.0	4288.91	4289.91	4289.84	4288.84	4288.84	4288.84	
1130 E	747.0	747.0	748.0	748.0	225.32	225.39	226.38	226.32	226.32	226.32	IL MADISON
1130 N	4289.0	4290.0	4290.0	4289.0	4289.91	4290.90	4290.84	4289.84	4289.84	4289.84	
1131 E	747.0	747.0	748.0	748.0	225.39	225.45	226.45	226.38	226.38	226.38	IL MADISON
1131 N	4290.0	4291.0	4291.0	4290.0	4290.90	4291.90	4291.84	4290.84	4290.84	4290.84	
1132 E	747.0	747.0	748.0	748.0	225.45	225.52	226.51	226.45	226.45	226.45	IL MADISON
1132 N	4291.0	4292.0	4292.0	4291.0	4291.90	4292.90	4292.83	4291.84	4291.84	4291.84	
1133 E	747.0	747.0	748.0	748.0	226.37	226.44	227.43	227.37	227.37	227.37	IL MADISON
1133 N	4305.0	4306.0	4306.0	4305.0	4305.88	4306.87	4306.80	4305.81	4305.81	4305.81	
1134 E	747.0	747.0	748.0	748.0	226.44	226.50	227.50	227.43	227.43	227.43	IL MADISON
1134 N	4306.0	4307.0	4307.0	4306.0	4306.87	4307.87	4307.80	4306.80	4306.80	4306.80	

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY	
1135	E	747.0	747.0	748.0	748.0	226.50	226.57	227.57	227.50	IL	MADISON
	N	4307.0	4308.0	4308.0	4307.0	4307.87	4308.87	4308.80	4307.80		
1136	E	747.0	747.0	748.0	748.0	226.57	226.63	227.63	227.57	IL	MADISON
	N	4308.0	4309.0	4309.0	4308.0	4308.87	4309.87	4309.80	4308.80		
1137	E	747.0	747.0	748.0	748.0	226.63	226.70	227.70	227.63	IL	MADISON
	N	4309.0	4310.0	4310.0	4309.0	4309.87	4310.86	4310.80	4309.80		
1138	E	747.0	747.0	748.0	748.0	226.70	226.76	227.76	227.70	IL	MADISON
	N	4310.0	4311.0	4311.0	4310.0	4310.86	4311.86	4311.80	4310.80		
1139	E	747.0	747.0	748.0	748.0	226.76	226.83	227.83	227.76	IL	MADISON
	N	4311.0	4312.0	4312.0	4311.0	4311.86	4312.86	4312.79	4311.80		
1140	E	747.0	747.0	750.0	750.0	226.83	227.03	230.02	229.82	IL	MADISON
	N	4312.0	4315.0	4315.0	4312.0	4312.86	4315.86	4315.66	4312.66		
1155	E	748.0	748.0	749.0	749.0	225.93	225.99	226.99	226.92	IL	MADISON
	N	4283.0	4284.0	4284.0	4283.0	4283.85	4284.85	4284.79	4283.79		
1156	E	748.0	748.0	749.0	749.0	225.99	226.06	227.05	226.99	IL	MADISON
	N	4284.0	4285.0	4285.0	4284.0	4284.85	4285.85	4285.78	4284.79		
1157	E	748.0	748.0	749.0	749.0	226.06	226.12	227.12	227.05	IL	MADISON
	N	4285.0	4286.0	4286.0	4285.0	4285.85	4286.85	4286.78	4285.78		
1158	E	748.0	748.0	749.0	749.0	226.12	226.19	227.19	227.12	IL	MADISON
	N	4286.0	4287.0	4287.0	4286.0	4286.85	4287.84	4287.78	4286.78		
1159	E	748.0	748.0	749.0	749.0	226.19	226.25	227.25	227.19	IL	MADISON
	N	4287.0	4288.0	4288.0	4287.0	4287.84	4288.84	4288.78	4287.78		
1160	E	748.0	748.0	749.0	749.0	226.25	226.32	227.32	227.25	IL	MADISON
	N	4288.0	4289.0	4289.0	4288.0	4288.84	4289.84	4289.77	4288.78		
1161	E	748.0	748.0	749.0	749.0	226.32	226.38	227.38	227.32	IL	MADISON
	N	4289.0	4290.0	4290.0	4289.0	4289.84	4290.84	4290.77	4289.77		
1162	E	748.0	748.0	749.0	749.0	226.38	226.45	227.45	227.38	IL	MADISON
	N	4290.0	4291.0	4291.0	4290.0	4290.84	4291.84	4291.77	4290.77		
1163	E	748.0	748.0	749.0	749.0	226.45	226.51	227.51	227.45	IL	MADISON
	N	4291.0	4292.0	4292.0	4291.0	4291.84	4292.83	4292.77	4291.77		

TABLE 1- (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 1'		***** UTM ZONE 16		***** UTM ZONE 16		***** UTM ZONE 16		***** UTM ZONE 16		COUNTY
1164	E	748.0	748.0	749.0	749.0	226.51	226.58	227.58	227.51	IL	MADISON
	N	4292.0	4293.0	4293.0	4292.0	4292.83	4293.83	4293.77	4292.77		
1165	E	748.0	748.0	749.0	749.0	226.58	226.65	227.64	227.58	IL	MADISON
	N	4293.0	4294.0	4294.0	4293.0	4293.83	4294.83	4294.77	4293.77		
1166	E	748.0	748.0	749.0	749.0	226.65	226.71	227.71	227.64	IL	MADISON
	N	4294.0	4295.0	4295.0	4294.0	4294.83	4295.83	4295.76	4294.77		
1167	E	748.0	748.0	749.0	749.0	227.37	227.43	228.43	228.37	IL	MADISON
	N	4305.0	4306.0	4306.0	4305.0	4305.81	4306.80	4306.74	4305.74		
1168	E	748.0	748.0	749.0	749.0	227.43	227.50	228.50	228.43	IL	MADISON
	N	4306.0	4307.0	4307.0	4306.0	4306.80	4307.80	4307.74	4306.74		
1169	E	748.0	748.0	749.0	749.0	227.50	227.57	228.56	228.50	IL	MADISON
	N	4307.0	4308.0	4308.0	4307.0	4307.80	4308.80	4308.73	4307.74		
1170	E	748.0	748.0	749.0	749.0	227.57	227.63	228.63	228.56	IL	MADISON
	N	4308.0	4309.0	4309.0	4308.0	4308.80	4309.80	4309.73	4308.73		
1171	E	748.0	748.0	749.0	749.0	227.63	227.70	228.69	228.63	IL	MADISON
	N	4309.0	4310.0	4310.0	4309.0	4309.80	4310.80	4310.73	4309.73		
1172	E	748.0	748.0	749.0	749.0	227.70	227.76	228.76	228.69	IL	MADISON
	N	4310.0	4311.0	4311.0	4310.0	4310.80	4311.80	4311.73	4310.73		
1173	E	748.0	748.0	749.0	749.0	227.76	227.83	228.83	228.76	IL	MADISON
	N	4311.0	4312.0	4312.0	4311.0	4311.80	4312.79	4312.73	4311.73		
1184	E	749.0	749.0	750.0	750.0	226.92	226.99	227.99	227.92	IL	MADISON
	N	4283.0	4284.0	4284.0	4283.0	4283.79	4284.79	4284.72	4283.72		
1185	E	749.0	749.0	750.0	750.0	226.99	227.05	228.05	227.99	IL	MADISON
	N	4284.0	4285.0	4285.0	4284.0	4284.79	4285.78	4285.72	4284.72		
1186	E	749.0	749.0	750.0	750.0	227.05	227.12	228.12	228.05	IL	MADISON
	N	4285.0	4286.0	4286.0	4285.0	4285.78	4286.78	4286.71	4285.72		
1187	E	749.0	749.0	750.0	750.0	227.12	227.19	228.18	228.12	IL	MADISON
	N	4286.0	4287.0	4287.0	4286.0	4286.78	4287.78	4287.71	4286.71		
1188	E	749.0	749.0	750.0	750.0	227.19	227.25	228.25	228.18	IL	MADISON
	N	4287.0	4288.0	4288.0	4287.0	4287.78	4288.78	4288.71	4287.71		

TABLE 1. (CONTINUED)

ST LOUIS AQCK GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY	
1189	E	749.0	750.0	750.0	227.25	227.32	228.31	228.25	IL	MADISON	
	N	4288.0	4289.0	4288.0	4288.78	4289.77	4289.71	4288.71			
1190	E	749.0	750.0	750.0	227.32	227.38	228.38	228.31	IL	MADISON	
	N	4289.0	4290.0	4289.0	4289.77	4290.77	4290.71	4289.71			
1191	E	749.0	750.0	750.0	227.38	227.45	228.45	228.38	IL	MADISON	
	N	4290.0	4291.0	4290.0	4290.77	4291.77	4291.70	4290.71			
1192	E	749.0	750.0	750.0	227.45	227.51	228.51	228.45	IL	MADISON	
	N	4291.0	4292.0	4291.0	4291.77	4292.77	4292.70	4291.70			
1193	E	749.0	750.0	750.0	227.51	227.58	228.58	228.51	IL	MADISON	
	N	4292.0	4293.0	4292.0	4292.77	4293.77	4293.70	4292.70			
1194	E	749.0	750.0	750.0	227.58	227.64	228.64	228.58	IL	MADISON	
	N	4293.0	4294.0	4293.0	4293.77	4294.77	4294.70	4293.70			
1195	E	749.0	750.0	750.0	227.64	227.71	228.71	228.64	IL	MADISON	
	N	4294.0	4295.0	4294.0	4294.77	4295.76	4295.70	4294.70			
1196	E	749.0	750.0	750.0	228.37	228.43	229.43	229.36	IL	MADISON	
	N	4305.0	4306.0	4305.0	4305.74	4306.74	4306.68	4305.68			
1197	E	749.0	750.0	750.0	228.43	228.50	229.50	229.43	IL	MADISON	
	N	4306.0	4307.0	4306.0	4306.74	4307.74	4307.67	4306.68			
1198	E	749.0	750.0	750.0	228.50	228.56	229.56	229.50	IL	MADISON	
	N	4307.0	4308.0	4307.0	4307.74	4308.73	4308.67	4307.67			
1199	E	749.0	750.0	750.0	228.56	228.63	229.63	229.56	IL	MADISON	
	N	4308.0	4309.0	4308.0	4308.73	4309.73	4309.67	4308.67			
1200	E	749.0	750.0	750.0	228.63	228.69	229.69	229.63	IL	MADISON	
	N	4309.0	4310.0	4309.0	4309.73	4310.73	4310.67	4309.67			
1201	E	749.0	750.0	750.0	228.69	228.76	229.76	229.69	IL	MADISON	
	N	4310.0	4311.0	4310.0	4310.73	4311.73	4311.66	4310.67			
1202	E	749.0	750.0	750.0	228.76	228.83	229.82	229.76	IL	MADISON	
	N	4311.0	4312.0	4311.0	4311.73	4312.73	4312.66	4311.66			
1222	E	750.0	750.0	753.0	227.86	228.05	231.05	230.85	IL	MADISON	
	N	4282.0	4285.0	4282.0	4282.72	4285.72	4285.52	4282.53			

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 18 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		COUNTY
1223	E	750.0	750.0	751.0	751.0	4285.0	4286.0	228.05	228.12	229.12	IL MADISON
	N	4285.0	4286.0	4285.0	4286.0	4285.72	4286.71	4285.65	4286.65	4287.65	
1224	E	750.0	750.0	751.0	751.0	4286.0	4287.0	228.12	228.18	229.18	IL MADISON
	N	4286.0	4287.0	4286.0	4287.0	4286.71	4287.71	4286.65	4287.65	4288.65	
1225	E	750.0	750.0	751.0	751.0	4287.0	4288.0	228.18	228.25	229.25	IL MADISON
	N	4287.0	4288.0	4288.0	4289.0	4287.71	4288.71	4287.65	4288.65	4289.65	
1226	E	750.0	750.0	751.0	751.0	4288.0	4289.0	228.25	228.31	229.31	IL MADISON
	N	4288.0	4289.0	4289.0	4290.0	4288.71	4289.71	4288.64	4289.64	4290.64	
1227	E	750.0	750.0	751.0	751.0	4289.0	4290.0	228.31	228.38	229.38	IL MADISON
	N	4289.0	4290.0	4290.0	4291.0	4289.71	4290.71	4289.64	4290.64	4291.64	
1228	E	750.0	750.0	751.0	751.0	4290.0	4291.0	228.38	228.45	229.44	IL MADISON
	N	4290.0	4291.0	4291.0	4292.0	4290.71	4291.71	4290.64	4291.64	4292.64	
1229	E	750.0	750.0	751.0	751.0	4291.0	4292.0	228.45	228.51	229.51	IL MADISON
	N	4291.0	4292.0	4292.0	4293.0	4291.71	4292.71	4291.64	4292.64	4293.64	
1230	E	750.0	750.0	751.0	751.0	4292.0	4293.0	228.51	228.58	229.57	IL MADISON
	N	4292.0	4293.0	4293.0	4294.0	4292.71	4293.71	4292.64	4293.64	4294.64	
1231	E	750.0	750.0	751.0	751.0	4293.0	4294.0	228.58	228.64	229.64	IL MADISON
	N	4293.0	4294.0	4294.0	4295.0	4293.71	4294.71	4293.64	4294.64	4295.64	
1232	E	750.0	750.0	751.0	751.0	4294.0	4295.0	228.64	228.71	229.71	IL MADISON
	N	4294.0	4295.0	4295.0	4296.0	4294.71	4295.71	4294.63	4295.63	4296.63	
1233	E	750.0	750.0	751.0	751.0	4295.0	4296.0	228.71	229.04	234.03	IL MADISON
	N	4295.0	4296.0	4296.0	4297.0	4295.71	4296.71	4295.63	4296.63	4297.63	
1237	E	750.0	750.0	751.0	751.0	4304.0	4305.0	229.30	229.36	230.36	IL MADISON
	N	4304.0	4305.0	4305.0	4306.0	4304.68	4305.68	4304.61	4305.61	4306.61	
1238	E	750.0	750.0	751.0	751.0	4305.0	4306.0	229.36	229.43	230.43	IL MADISON
	N	4305.0	4306.0	4306.0	4307.0	4305.68	4306.68	4305.61	4306.61	4307.61	
1239	E	750.0	750.0	751.0	751.0	4306.0	4307.0	229.43	229.50	230.49	IL MADISON
	N	4306.0	4307.0	4307.0	4308.0	4306.68	4307.68	4306.61	4307.61	4308.61	
1240	E	750.0	750.0	751.0	751.0	4307.0	4308.0	229.50	229.56	230.56	IL MADISON
	N	4307.0	4308.0	4308.0	4309.0	4307.68	4308.68	4307.61	4308.61	4309.61	

TABLE 1. (CONTINUED)

ST LOUIS AUCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 17 *****		***** UTM ZONE 18 *****		STATE	COUNTY	
1241	E	750.0 4308.0	751.0 4309.0	751.0 4308.0	229.56 4308.67	229.63 4309.67	230.62 4309.60	230.56 4308.61	IL	MADISON	
	N										
1242	E	750.0 4309.0	751.0 4310.0	751.0 4309.0	229.63 4309.67	229.69 4310.67	230.69 4310.60	230.62 4309.60	IL	MADISON	
	N										
2306	E	750.0 4310.0	750.0 4312.0	752.0 4310.0	229.64 4310.67	229.82 4312.66	231.82 4312.53	231.69 4310.54	IL	MADISON	
	N										
2307	E	750.0 4312.0	750.0 4315.0	753.0 4315.0	229.82 4312.66	230.02 4315.66	233.02 4315.46	232.82 4312.46	IL	MADISON	
	N										
1245	E	750.0 4315.0	750.0 4320.0	755.0 4320.0	230.02 4315.66	230.35 4320.64	235.34 4320.32	235.01 4315.33	IL	MADISON	
	N										
1256	E	751.0 4285.0	751.0 4286.0	752.0 4286.0	229.05 4285.65	229.12 4286.65	230.11 4286.59	230.05 4285.59	IL	MADISON	
	N										
1257	E	751.0 4286.0	751.0 4287.0	752.0 4287.0	229.12 4286.65	229.18 4287.65	230.18 4287.58	230.11 4286.59	IL	MADISON	
	N										
1258	E	751.0 4287.0	751.0 4288.0	752.0 4288.0	229.18 4287.65	229.25 4288.64	230.24 4288.58	230.18 4287.58	IL	MADISON	
	N										
1259	E	751.0 4288.0	751.0 4289.0	752.0 4289.0	229.25 4288.64	229.31 4289.64	230.31 4289.58	230.24 4288.58	IL	MADISON	
	N										
1260	E	751.0 4289.0	751.0 4290.0	752.0 4290.0	229.31 4289.64	229.38 4290.64	230.38 4290.57	230.31 4289.58	IL	MADISON	
	N										
1261	E	751.0 4290.0	751.0 4291.0	752.0 4291.0	229.38 4290.64	229.44 4291.64	230.44 4291.57	230.38 4290.57	IL	MADISON	
	N										
1262	E	751.0 4291.0	751.0 4292.0	752.0 4292.0	229.44 4291.64	229.51 4292.64	230.51 4292.57	230.44 4291.57	IL	MADISON	
	N										
1263	E	751.0 4292.0	751.0 4293.0	752.0 4293.0	229.51 4292.64	229.57 4293.64	230.57 4293.57	230.51 4292.57	IL	MADISON	
	N										
1264	E	751.0 4293.0	751.0 4294.0	752.0 4294.0	229.57 4293.64	229.64 4294.63	230.64 4294.57	230.57 4293.57	IL	MADISON	
	N										
1265	E	751.0 4294.0	751.0 4295.0	752.0 4295.0	229.64 4294.63	229.71 4295.63	230.70 4295.57	230.64 4294.57	IL	MADISON	
	N										

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 14 *****		***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 17 *****		***** UTM ZONE 18 *****		STATE COUNTY
2308	E	751.0	751.0	752.0	752.0	752.0	230.03	230.10	231.10	231.03	IL MADISON
	N	4300.0	4301.0	4301.0	4300.0	4300.0	4300.62	4301.62	4301.55	4300.55	
2309	E	751.0	751.0	752.0	752.0	752.0	230.10	230.16	231.16	231.10	IL MADISON
	N	4301.0	4302.0	4302.0	4301.0	4301.0	4301.62	4302.62	4302.55	4301.55	
1266	E	751.0	751.0	752.0	752.0	752.0	230.16	230.23	231.23	231.16	IL MADISON
	N	4302.0	4303.0	4303.0	4302.0	4302.0	4302.62	4303.61	4303.55	4302.55	
1267	E	751.0	751.0	752.0	752.0	752.0	230.23	230.30	231.29	231.23	IL MADISON
	N	4303.0	4304.0	4304.0	4303.0	4303.0	4303.61	4304.61	4304.55	4303.55	
1268	E	751.0	751.0	752.0	752.0	752.0	230.30	230.36	231.36	231.29	IL MADISON
	N	4304.0	4305.0	4305.0	4304.0	4304.0	4304.61	4305.61	4305.55	4304.55	
1269	E	751.0	751.0	752.0	752.0	752.0	230.36	230.43	231.43	231.36	IL MADISON
	N	4305.0	4306.0	4306.0	4305.0	4305.0	4305.61	4306.61	4306.54	4305.55	
1270	E	751.0	751.0	752.0	752.0	752.0	230.43	230.49	231.49	231.43	IL MADISON
	N	4306.0	4307.0	4307.0	4306.0	4306.0	4306.61	4307.61	4307.54	4306.54	
1271	E	751.0	751.0	752.0	752.0	752.0	230.49	230.56	231.56	231.49	IL MADISON
	N	4307.0	4308.0	4308.0	4307.0	4307.0	4307.61	4308.61	4308.54	4307.54	
1272	E	751.0	751.0	752.0	752.0	752.0	230.56	230.62	231.62	231.56	IL MADISON
	N	4308.0	4309.0	4309.0	4308.0	4308.0	4308.61	4309.60	4309.54	4308.54	
1273	E	751.0	751.0	752.0	752.0	752.0	230.62	230.69	231.69	231.62	IL MADISON
	N	4309.0	4310.0	4310.0	4309.0	4309.0	4309.60	4310.60	4310.54	4309.54	
1284	E	752.0	752.0	753.0	753.0	753.0	230.05	230.11	231.11	231.05	IL MADISON
	N	4285.0	4286.0	4286.0	4285.0	4285.0	4285.59	4286.59	4286.52	4285.52	
1285	E	752.0	752.0	753.0	753.0	753.0	230.11	230.18	231.18	231.11	IL MADISON
	N	4286.0	4287.0	4287.0	4286.0	4286.0	4286.59	4287.58	4287.52	4286.52	
1286	E	752.0	752.0	753.0	753.0	753.0	230.18	230.24	231.24	231.18	IL MADISON
	N	4287.0	4288.0	4288.0	4287.0	4287.0	4287.58	4288.58	4288.52	4287.52	
1287	E	752.0	752.0	753.0	753.0	753.0	230.24	230.31	231.31	231.24	IL MADISON
	N	4288.0	4289.0	4289.0	4288.0	4288.0	4288.58	4289.58	4289.51	4288.52	
1288	E	752.0	752.0	753.0	753.0	753.0	230.31	230.38	231.37	231.31	IL MADISON
	N	4289.0	4290.0	4290.0	4289.0	4289.0	4289.58	4290.57	4290.51	4289.51	

TABLE 1. (CONTINUED)

ST LOUIS ADCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY				
1289	E	752.0 4290.0	753.0 4291.0	753.0 4290.0	230.38 4290.57	230.44 4291.57	231.44 4291.51	231.37 4290.51	IL	MADISON		
1290	E	752.0 4291.0	753.0 4292.0	753.0 4291.0	230.44 4291.57	230.51 4292.57	231.50 4292.51	231.44 4291.51	IL	MADISON		
1291	E	752.0 4292.0	753.0 4293.0	753.0 4292.0	230.51 4292.57	230.57 4293.57	231.57 4293.50	231.50 4292.51	IL	MADISON		
1292	E	752.0 4293.0	753.0 4294.0	753.0 4293.0	230.57 4293.57	230.64 4294.57	231.64 4294.50	231.57 4293.50	IL	MADISON		
1293	E	752.0 4294.0	753.0 4295.0	753.0 4294.0	230.64 4294.57	230.70 4295.57	231.70 4295.50	231.64 4294.50	IL	MADISON		
1294	E	752.0 4300.0	753.0 4301.0	753.0 4300.0	231.03 4300.55	231.10 4301.55	232.10 4301.49	232.03 4300.49	IL	MADISON		
1295	E	752.0 4301.0	753.0 4302.0	753.0 4301.0	231.10 4301.55	231.16 4302.55	232.16 4302.48	232.10 4301.49	IL	MADISON		
1296	E	752.0 4302.0	753.0 4303.0	753.0 4302.0	231.16 4302.55	231.23 4303.55	232.23 4303.48	232.16 4302.48	IL	MADISON		
1297	E	752.0 4303.0	753.0 4304.0	753.0 4303.0	231.23 4303.55	231.29 4304.55	232.29 4304.48	232.23 4303.48	IL	MADISON		
1298	E	752.0 4304.0	753.0 4305.0	753.0 4304.0	231.29 4304.55	231.36 4305.55	232.36 4305.48	232.29 4304.48	IL	MADISON		
1299	E	752.0 4305.0	753.0 4306.0	753.0 4305.0	231.36 4305.55	231.43 4306.54	232.42 4306.48	232.36 4305.48	IL	MADISON		
1300	E	752.0 4306.0	753.0 4307.0	753.0 4306.0	231.43 4306.54	231.49 4307.54	232.49 4307.48	232.42 4306.48	IL	MADISON		
1301	E	752.0 4307.0	753.0 4308.0	753.0 4307.0	231.49 4307.54	231.56 4308.54	232.55 4308.47	232.49 4307.48	IL	MADISON		
1302	E	752.0 4308.0	753.0 4309.0	753.0 4308.0	231.56 4308.54	231.62 4309.54	232.62 4309.47	232.55 4308.47	IL	MADISON		
1303	E	752.0 4309.0	753.0 4310.0	753.0 4309.0	231.62 4309.54	231.69 4310.54	232.69 4310.47	232.62 4309.47	IL	MADISON		

TABLE 1. (CONTINUED)

ST LOUIS AQCH GRID SQUARE COORDINATES (KM)										
ID	***** UTM ZONE 16 *****				***** UTM ZONE 16 *****				STATE	COUNTY
2311	E	752.0	752.0	753.0	753.0	231.69	231.75	232.75	IL	MADISON
	N	4310.0	4311.0	4310.0	4310.0	4310.54	4311.53	4311.47		
2312	E	752.0	752.0	753.0	753.0	231.75	231.82	232.82	IL	MADISON
	N	4311.0	4312.0	4311.0	4311.0	4311.53	4312.53	4312.46		
1318	E	753.0	753.0	754.0	754.0	230.92	230.98	231.98	IL	MADISON
	N	4283.0	4284.0	4283.0	4283.0	4283.52	4284.52	4284.46		
1319	E	753.0	753.0	754.0	754.0	230.98	231.05	232.04	IL	MADISON
	N	4284.0	4285.0	4284.0	4284.0	4284.52	4285.52	4285.46		
1320	E	753.0	753.0	754.0	754.0	231.05	231.11	232.11	IL	MADISON
	N	4285.0	4286.0	4285.0	4285.0	4285.52	4286.52	4286.45		
1321	E	753.0	753.0	754.0	754.0	231.11	231.18	232.18	IL	MADISON
	N	4286.0	4287.0	4286.0	4286.0	4286.52	4287.52	4287.45		
1322	E	753.0	753.0	754.0	754.0	231.18	231.24	232.24	IL	MADISON
	N	4287.0	4288.0	4287.0	4287.0	4287.52	4288.52	4288.45		
1323	E	753.0	753.0	754.0	754.0	231.24	231.31	232.31	IL	MADISON
	N	4288.0	4289.0	4288.0	4288.0	4288.52	4289.51	4289.45		
1324	E	753.0	753.0	754.0	754.0	231.31	231.37	232.37	IL	MADISON
	N	4289.0	4290.0	4289.0	4289.0	4289.51	4290.51	4290.45		
1325	E	753.0	753.0	754.0	754.0	231.37	231.44	232.44	IL	MADISON
	N	4290.0	4291.0	4290.0	4290.0	4290.51	4291.51	4291.44		
1326	E	753.0	753.0	754.0	754.0	231.44	231.50	232.50	IL	MADISON
	N	4291.0	4292.0	4291.0	4291.0	4291.51	4292.51	4292.44		
1327	E	753.0	753.0	754.0	754.0	231.50	231.57	232.57	IL	MADISON
	N	4292.0	4293.0	4292.0	4292.0	4292.51	4293.50	4293.44		
1328	E	753.0	753.0	754.0	754.0	231.57	231.64	232.63	IL	MADISON
	N	4293.0	4294.0	4293.0	4293.0	4293.50	4294.50	4294.44		
1329	E	753.0	753.0	754.0	754.0	231.64	231.70	232.70	IL	MADISON
	N	4294.0	4295.0	4294.0	4294.0	4294.50	4295.50	4295.43		
1330	E	753.0	753.0	754.0	754.0	232.03	232.10	233.09	IL	MADISON
	N	4300.0	4301.0	4300.0	4300.0	4300.49	4301.49	4301.42		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)										
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY
1331	E	753.0	753.0	754.0	754.0	232.10	232.16	233.16	233.09	IL MADISON
	N	4301.0	4302.0	4302.0	4301.0	4301.49	4302.48	4302.42	4301.42	
1332	E	753.0	753.0	754.0	754.0	232.16	232.23	233.22	233.16	IL MADISON
	N	4302.0	4303.0	4303.0	4302.0	4302.48	4303.48	4303.42	4302.42	
1333	E	753.0	753.0	754.0	754.0	232.23	232.29	233.29	233.22	IL MADISON
	N	4303.0	4304.0	4304.0	4303.0	4303.48	4304.48	4304.41	4303.42	
1334	E	753.0	753.0	754.0	754.0	232.29	232.36	233.36	233.29	IL MADISON
	N	4304.0	4305.0	4305.0	4304.0	4304.48	4305.48	4305.41	4304.41	
1335	E	753.0	753.0	754.0	754.0	232.36	232.42	233.42	233.36	IL MADISON
	N	4305.0	4306.0	4306.0	4305.0	4305.48	4306.48	4306.41	4305.41	
1336	E	753.0	753.0	754.0	754.0	232.42	232.49	233.49	233.42	IL MADISON
	N	4306.0	4307.0	4307.0	4306.0	4306.48	4307.48	4307.41	4306.41	
1337	E	753.0	753.0	754.0	754.0	232.49	232.55	233.55	233.49	IL MADISON
	N	4307.0	4308.0	4308.0	4307.0	4307.48	4308.47	4308.41	4307.41	
1338	E	753.0	753.0	754.0	754.0	232.55	232.62	233.62	233.55	IL MADISON
	N	4308.0	4309.0	4309.0	4308.0	4308.47	4309.47	4309.41	4308.41	
1339	E	753.0	753.0	754.0	754.0	232.62	232.69	233.68	233.62	IL MADISON
	N	4309.0	4310.0	4310.0	4309.0	4309.47	4310.47	4310.40	4309.41	
2315	E	753.0	753.0	754.0	754.0	232.69	232.75	233.75	233.68	IL MADISON
	N	4310.0	4311.0	4311.0	4310.0	4310.47	4311.47	4311.40	4310.40	
2316	E	753.0	753.0	755.0	755.0	232.75	232.88	234.88	234.75	IL MADISON
	N	4311.0	4313.0	4313.0	4311.0	4311.47	4313.46	4313.33	4311.34	
2317	E	753.0	753.0	755.0	755.0	232.88	233.02	235.01	234.88	IL MADISON
	N	4313.0	4315.0	4315.0	4313.0	4313.46	4315.46	4315.33	4313.33	
1350	E	754.0	754.0	755.0	755.0	231.91	231.98	232.98	232.91	IL MADISON
	N	4283.0	4284.0	4284.0	4283.0	4283.46	4284.46	4284.39	4283.39	
1351	E	754.0	754.0	755.0	755.0	231.98	232.04	233.04	232.98	IL MADISON
	N	4284.0	4285.0	4285.0	4284.0	4284.46	4285.46	4285.39	4284.39	
1352	E	754.0	754.0	755.0	755.0	232.04	232.11	233.11	233.04	IL MADISON
	N	4285.0	4286.0	4286.0	4285.0	4285.46	4286.45	4286.39	4285.39	

TABLE 1. (CONTINUED)

ST LOUIS AGCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		COUNTY
1353	E	754.0	754.0	755.0	755.0	232.11	232.18	233.17	233.11	IL	MADISON
	N	4286.0	4287.0	4287.0	4286.0	4286.45	4287.45	4287.39	4286.39		
1354	E	754.0	754.0	755.0	755.0	232.18	232.24	233.24	233.17	IL	MADISON
	N	4287.0	4288.0	4288.0	4287.0	4287.45	4288.45	4288.38	4287.39		
1355	E	754.0	754.0	755.0	755.0	232.24	232.31	233.30	233.24	IL	MADISON
	N	4288.0	4289.0	4289.0	4288.0	4288.45	4289.45	4289.38	4288.38		
1356	E	754.0	754.0	755.0	755.0	232.31	232.37	233.37	233.30	IL	MADISON
	N	4289.0	4290.0	4290.0	4289.0	4289.45	4290.45	4290.38	4289.38		
1357	E	754.0	754.0	755.0	755.0	232.37	232.44	233.44	233.37	IL	MADISON
	N	4290.0	4291.0	4291.0	4290.0	4290.45	4291.44	4291.38	4290.38		
1358	E	754.0	754.0	755.0	755.0	232.44	232.50	233.50	233.44	IL	MADISON
	N	4291.0	4292.0	4292.0	4291.0	4291.44	4292.44	4292.38	4291.38		
1359	E	754.0	754.0	755.0	755.0	232.50	232.57	233.57	233.50	IL	MADISON
	N	4292.0	4293.0	4293.0	4292.0	4292.44	4293.44	4293.38	4292.38		
1360	E	754.0	754.0	755.0	755.0	232.57	232.63	233.63	233.57	IL	MADISON
	N	4293.0	4294.0	4294.0	4293.0	4293.44	4294.44	4294.37	4293.38		
1361	E	754.0	754.0	755.0	755.0	232.63	232.70	233.70	233.63	IL	MADISON
	N	4294.0	4295.0	4295.0	4294.0	4294.44	4295.43	4295.37	4294.37		
1362	E	754.0	754.0	755.0	755.0	233.03	233.09	234.09	234.03	IL	MADISON
	N	4300.0	4301.0	4301.0	4300.0	4300.43	4301.42	4301.36	4300.36		
1363	E	754.0	754.0	755.0	755.0	233.09	233.16	234.16	234.09	IL	MADISON
	N	4301.0	4302.0	4302.0	4301.0	4301.42	4302.42	4302.36	4301.36		
1364	E	754.0	754.0	755.0	755.0	233.16	233.22	234.22	234.16	IL	MADISON
	N	4302.0	4303.0	4303.0	4302.0	4302.42	4303.42	4303.35	4302.36		
1365	E	754.0	754.0	755.0	755.0	233.22	233.29	234.29	234.22	IL	MADISON
	N	4303.0	4304.0	4304.0	4303.0	4303.42	4304.41	4304.35	4303.35		
1366	E	754.0	754.0	755.0	755.0	233.29	233.36	234.35	234.29	IL	MADISON
	N	4304.0	4305.0	4305.0	4304.0	4304.41	4305.41	4305.35	4304.35		
1367	E	754.0	754.0	755.0	755.0	233.36	233.42	234.42	234.35	IL	MADISON
	N	4305.0	4306.0	4306.0	4305.0	4305.41	4306.41	4306.35	4305.35		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)

ID	*****	UTM ZONE 15	*****	*****	UTM ZONE 16	*****	STATE	COUNTY
1368	E	754.0	755.0	755.0	233.42	233.49	IL	MADISON
	N	4306.0	4307.0	4306.0	4306.41	4307.41		
1369	E	754.0	755.0	755.0	233.49	233.55	IL	MADISON
	N	4307.0	4308.0	4307.0	4307.41	4308.41		
1370	E	754.0	755.0	755.0	233.55	233.62	IL	MADISON
	N	4308.0	4309.0	4308.0	4308.41	4309.41		
1371	E	754.0	755.0	755.0	233.62	233.68	IL	MADISON
	N	4309.0	4310.0	4309.0	4309.41	4310.40		
2321	E	754.0	755.0	755.0	233.68	233.75	IL	MADISON
	N	4310.0	4311.0	4310.0	4310.40	4311.40		
2325	E	755.0	756.0	756.0	232.91	232.98	IL	MADISON
	N	4283.0	4284.0	4283.0	4283.39	4284.39		
2326	E	755.0	756.0	756.0	232.98	233.04	IL	MADISON
	N	4284.0	4285.0	4284.0	4284.39	4285.39		
1391	E	755.0	760.0	760.0	233.04	233.37	IL	MADISON
	N	4285.0	4290.0	4285.0	4285.39	4290.38		
1392	E	755.0	760.0	760.0	233.37	233.70	IL	MADISON
	N	4290.0	4295.0	4290.0	4290.38	4295.37		
1393	E	755.0	760.0	760.0	233.70	234.03	IL	MADISON
	N	4295.0	4300.0	4295.0	4295.37	4300.36		
1394	E	755.0	756.0	756.0	234.03	234.09	IL	MADISON
	N	4300.0	4301.0	4300.0	4300.36	4301.36		
1395	E	755.0	756.0	756.0	234.09	234.16	IL	MADISON
	N	4301.0	4302.0	4301.0	4301.36	4302.36		
1396	E	755.0	756.0	756.0	234.16	234.22	IL	MADISON
	N	4302.0	4303.0	4302.0	4302.36	4303.35		
1397	E	755.0	756.0	756.0	234.22	234.29	IL	MADISON
	N	4303.0	4304.0	4303.0	4303.35	4304.35		
1398	E	755.0	756.0	756.0	234.29	234.35	IL	MADISON
	N	4304.0	4305.0	4304.0	4304.35	4305.35		

TABLE 4. (CONTINUED)

ST LOUIS AUCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		COUNTY
1399	E	755.0	755.0	756.0	756.0	756.0	234.35	234.42	235.42	235.35	IL
	N	4305.0	4306.0	4306.0	4305.0	4305.0	4305.35	4306.35	4306.28	4305.28	MADISON
1400	E	755.0	755.0	756.0	756.0	756.0	234.42	234.49	235.48	235.42	IL
	N	4306.0	4307.0	4307.0	4306.0	4306.0	4306.35	4307.34	4307.28	4306.28	MADISON
1401	E	755.0	755.0	756.0	756.0	756.0	234.49	234.55	235.55	235.48	IL
	N	4307.0	4308.0	4308.0	4307.0	4307.0	4307.34	4308.34	4308.28	4307.28	MADISON
1402	E	755.0	755.0	756.0	756.0	756.0	234.55	234.62	235.61	235.55	IL
	N	4308.0	4309.0	4309.0	4308.0	4308.0	4308.34	4309.34	4309.27	4308.28	MADISON
1403	E	755.0	755.0	756.0	756.0	756.0	234.62	234.68	235.68	235.61	IL
	N	4309.0	4310.0	4310.0	4309.0	4309.0	4309.34	4310.34	4310.27	4309.27	MADISON
1404	E	755.0	755.0	756.0	756.0	756.0	234.68	234.75	235.75	235.68	IL
	N	4310.0	4311.0	4311.0	4310.0	4310.0	4310.34	4311.34	4311.27	4310.27	MADISON
1405	E	755.0	755.0	756.0	756.0	756.0	234.75	234.81	235.81	235.75	IL
	N	4311.0	4312.0	4312.0	4311.0	4311.0	4311.34	4312.33	4312.27	4311.27	MADISON
1406	E	755.0	755.0	756.0	756.0	756.0	234.81	234.88	235.88	235.81	IL
	N	4312.0	4313.0	4313.0	4312.0	4312.0	4312.33	4313.33	4313.27	4312.27	MADISON
1407	E	755.0	755.0	756.0	756.0	756.0	234.88	234.95	235.94	235.88	IL
	N	4313.0	4314.0	4314.0	4313.0	4313.0	4313.33	4314.33	4314.26	4313.27	MADISON
1408	E	755.0	755.0	756.0	756.0	756.0	234.95	235.01	236.01	235.94	IL
	N	4314.0	4315.0	4315.0	4314.0	4314.0	4314.33	4315.33	4315.26	4314.26	MADISON
1409	E	755.0	755.0	760.0	760.0	760.0	235.01	235.34	240.33	240.00	IL
	N	4315.0	4320.0	4320.0	4315.0	4315.0	4315.33	4320.32	4319.99	4315.00	MADISON
2329	E	756.0	756.0	758.0	758.0	758.0	235.91	234.04	236.04	235.91	IL
	N	4283.0	4285.0	4285.0	4283.0	4283.0	4283.33	4285.32	4285.20	4283.20	MADISON
1419	E	756.0	756.0	760.0	760.0	760.0	235.02	235.29	239.28	239.01	IL
	N	4300.0	4304.0	4304.0	4300.0	4300.0	4300.29	4304.29	4304.02	4300.03	MADISON
1420	E	756.0	756.0	757.0	757.0	757.0	235.29	235.35	236.35	236.28	IL
	N	4304.0	4305.0	4305.0	4304.0	4304.0	4304.29	4305.28	4305.21	4304.22	MADISON
1421	E	756.0	756.0	757.0	757.0	757.0	235.35	235.42	236.42	236.35	IL
	N	4305.0	4306.0	4306.0	4305.0	4305.0	4305.28	4306.28	4306.21	4305.21	MADISON

TABLE 1. (CONTINUED)

ST LOUIS AQCR GK10 SQUARE COORDINATES (KM)									
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY	
1422	E	756.0	756.0	757.0	757.0	235.42	236.48	IL	MADISON
	N	4306.0	4307.0	4307.0	4306.0	4306.28	4307.21		
1423	E	756.0	756.0	757.0	757.0	235.48	236.55	IL	MADISON
	N	4307.0	4308.0	4308.0	4307.0	4307.28	4308.21		
1424	E	756.0	756.0	757.0	757.0	235.55	236.61	IL	MADISON
	N	4308.0	4309.0	4309.0	4308.0	4308.28	4309.21		
1425	E	756.0	756.0	757.0	757.0	235.61	236.68	IL	MADISON
	N	4309.0	4310.0	4310.0	4309.0	4309.27	4310.21		
1426	E	756.0	756.0	757.0	757.0	235.68	236.74	IL	MADISON
	N	4310.0	4311.0	4311.0	4310.0	4310.27	4311.20		
1427	E	756.0	756.0	757.0	757.0	235.75	236.81	IL	MADISON
	N	4311.0	4312.0	4312.0	4311.0	4311.27	4312.20		
1428	E	756.0	756.0	757.0	757.0	235.81	236.88	IL	MADISON
	N	4312.0	4313.0	4313.0	4312.0	4312.27	4313.20		
1429	E	756.0	756.0	757.0	757.0	235.88	236.94	IL	MADISON
	N	4313.0	4314.0	4314.0	4313.0	4313.27	4314.20		
1430	E	756.0	756.0	757.0	757.0	235.94	237.01	IL	MADISON
	N	4314.0	4315.0	4315.0	4314.0	4314.26	4315.20		
1442	E	757.0	757.0	760.0	760.0	236.28	239.47	IL	MADISON
	N	4304.0	4307.0	4307.0	4304.0	4304.22	4307.02		
1443	E	757.0	757.0	758.0	758.0	236.48	237.54	IL	MADISON
	N	4307.0	4308.0	4308.0	4307.0	4307.21	4308.14		
1444	E	757.0	757.0	759.0	759.0	236.55	238.67	IL	MADISON
	N	4308.0	4310.0	4310.0	4308.0	4308.21	4310.07		
1445	E	757.0	757.0	759.0	759.0	236.68	238.81	IL	MADISON
	N	4310.0	4312.0	4312.0	4310.0	4310.21	4312.07		
1446	E	757.0	757.0	760.0	760.0	236.81	240.00	IL	MADISON
	N	4312.0	4315.0	4315.0	4312.0	4312.20	4315.00		
2333	E	758.0	758.0	760.0	760.0	235.91	238.03	IL	MADISON
	N	4283.0	4285.0	4285.0	4283.0	4283.20	4285.06		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		COUNTY
1450 E	758.0	759.0	759.0	759.0	237.48	237.54	238.54	238.48	238.48	238.48	MADISON
1450 N	4307.0	4308.0	4308.0	4307.0	4307.15	4308.14	4308.08	4307.08	4307.08	4307.08	IL
1470 E	759.0	760.0	760.0	760.0	238.48	238.54	239.54	239.47	239.47	239.47	MADISON
1470 N	4307.0	4308.0	4308.0	4307.0	4307.08	4308.08	4308.01	4307.02	4307.02	4307.02	IL
1471 E	759.0	760.0	760.0	760.0	238.54	238.61	239.61	239.54	239.54	239.54	MADISON
1471 N	4308.0	4309.0	4309.0	4308.0	4308.08	4309.08	4309.01	4308.01	4308.01	4308.01	IL
1472 E	759.0	760.0	760.0	760.0	238.61	238.67	239.67	239.61	239.61	239.61	MADISON
1472 N	4309.0	4310.0	4310.0	4309.0	4309.08	4310.07	4310.01	4309.01	4309.01	4309.01	IL
1473 E	759.0	760.0	760.0	760.0	238.67	238.74	239.74	239.67	239.67	239.67	MADISON
1473 N	4310.0	4311.0	4311.0	4310.0	4310.07	4311.07	4311.01	4310.01	4310.01	4310.01	IL
1474 E	759.0	760.0	760.0	760.0	238.74	238.81	239.80	239.74	239.74	239.74	MADISON
1474 N	4311.0	4312.0	4312.0	4311.0	4311.07	4312.07	4312.00	4311.01	4311.01	4311.01	IL
1495 E	760.0	761.0	761.0	761.0	237.90	237.97	238.96	238.90	238.90	238.90	MADISON
1495 N	4283.0	4284.0	4284.0	4283.0	4283.07	4284.07	4284.00	4283.00	4283.00	4283.00	IL
1496 E	760.0	761.0	761.0	761.0	237.97	238.03	239.03	238.96	238.96	238.96	MADISON
1496 N	4284.0	4285.0	4285.0	4284.0	4284.07	4285.06	4285.00	4284.00	4284.00	4284.00	IL
1497 E	760.0	761.0	761.0	761.0	238.03	238.10	239.10	239.03	239.03	239.03	MADISON
1497 N	4285.0	4286.0	4286.0	4285.0	4285.06	4286.06	4286.00	4285.00	4285.00	4285.00	IL
1498 E	760.0	761.0	761.0	761.0	238.10	238.16	239.16	239.10	239.10	239.10	MADISON
1498 N	4286.0	4287.0	4287.0	4286.0	4286.06	4287.06	4286.99	4286.00	4286.00	4286.00	IL
1499 E	760.0	761.0	761.0	761.0	238.16	238.23	241.23	241.16	241.16	241.16	MADISON
1499 N	4287.0	4288.0	4288.0	4287.0	4287.06	4288.05	4287.98	4286.86	4286.86	4286.86	IL
1500 E	760.0	761.0	761.0	761.0	238.36	238.43	243.43	243.35	243.35	243.35	MADISON
1500 N	4290.0	4291.0	4291.0	4290.0	4290.05	4291.04	4290.97	4289.72	4289.72	4289.72	IL
2342 E	760.0	761.0	761.0	761.0	238.69	238.76	240.76	240.68	240.68	240.68	MADISON
2342 N	4295.0	4296.0	4296.0	4295.0	4295.04	4296.04	4295.97	4294.91	4294.91	4294.91	IL
2343 E	760.0	761.0	761.0	761.0	238.82	238.89	240.89	240.81	240.81	240.81	MADISON
2343 N	4297.0	4298.0	4298.0	4297.0	4297.04	4298.03	4297.96	4296.91	4296.91	4296.91	IL
2344 E	760.0	761.0	761.0	761.0	238.95	239.02	241.02	240.94	240.94	240.94	MADISON
2344 N	4299.0	4300.0	4300.0	4299.0	4299.03	4300.03	4300.90	4298.90	4298.90	4298.90	IL

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)										
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY
2345	E	760.0	762.0	762.0	239.08	239.21	241.21	241.08	IL	MADISON
	N	4301.0	4303.0	4301.0	4301.03	4303.02	4302.89	4300.90		
2346	E	760.0	762.0	762.0	239.21	239.34	241.34	241.21	IL	MADISON
	N	4303.0	4305.0	4303.0	4303.02	4305.02	4304.89	4302.89		
1505	E	760.0	765.0	765.0	239.34	239.67	244.66	244.33	IL	MADISON
	N	4305.0	4310.0	4305.0	4305.02	4310.01	4309.68	4304.69		
1506	E	760.0	765.0	765.0	239.67	240.00	244.99	244.66	IL	MADISON
	N	4310.0	4315.0	4310.0	4310.01	4315.00	4314.67	4309.68		
1507	E	760.0	765.0	765.0	240.00	240.33	245.32	244.99	IL	MADISON
	N	4315.0	4320.0	4315.0	4315.00	4319.99	4319.66	4314.67		
1513	E	761.0	762.0	762.0	238.90	238.96	239.96	239.90	IL	MADISON
	N	4283.0	4284.0	4283.0	4283.00	4284.00	4283.93	4282.94		
1514	E	761.0	762.0	762.0	238.96	239.03	240.03	239.96	IL	MADISON
	N	4284.0	4285.0	4284.0	4284.00	4285.00	4284.93	4283.93		
1515	E	761.0	762.0	762.0	239.03	239.10	240.09	240.03	IL	MADISON
	N	4285.0	4286.0	4285.0	4285.00	4286.00	4285.93	4284.93		
1516	E	761.0	762.0	762.0	239.10	239.16	240.16	240.09	IL	MADISON
	N	4286.0	4287.0	4286.0	4286.00	4286.99	4286.93	4285.93		
1522	E	762.0	763.0	763.0	239.90	239.96	240.96	240.89	IL	MADISON
	N	4283.0	4284.0	4283.0	4282.94	4283.93	4283.87	4282.87		
1523	E	762.0	763.0	763.0	239.96	240.03	241.03	240.96	IL	MADISON
	N	4284.0	4285.0	4284.0	4283.93	4284.93	4284.87	4283.87		
1524	E	762.0	763.0	763.0	240.03	240.09	241.09	241.03	IL	MADISON
	N	4285.0	4286.0	4285.0	4284.93	4285.93	4285.86	4284.87		
1525	E	762.0	763.0	763.0	240.09	240.16	241.16	241.09	IL	MADISON
	N	4286.0	4287.0	4286.0	4285.93	4286.93	4286.86	4285.86		
2354	E	762.0	764.0	764.0	240.68	240.81	242.81	242.68	IL	MADISON
	N	4295.0	4297.0	4295.0	4294.91	4296.91	4296.77	4294.78		
2355	E	762.0	764.0	764.0	240.81	240.94	242.94	242.81	IL	MADISON
	N	4297.0	4299.0	4297.0	4296.91	4298.90	4298.77	4296.77		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		STATE		COUNTY				
2356	E	762.0	763.0	763.0	240.94	241.01	242.01	241.94	IL	MADISON	
	N	4299.0	4300.0	4299.0	4298.90	4299.90	4298.83	4298.84			
2357	E	762.0	763.0	763.0	241.01	241.08	242.07	242.01	IL	MADISON	
	N	4300.0	4301.0	4300.0	4299.90	4300.90	4300.83	4299.83			
2358	E	762.0	763.0	763.0	241.08	241.14	242.14	242.07	IL	MADISON	
	N	4301.0	4302.0	4301.0	4300.90	4301.89	4301.83	4300.83			
2359	E	762.0	763.0	763.0	241.14	241.21	242.21	242.14	IL	MADISON	
	N	4302.0	4303.0	4302.0	4301.89	4302.89	4302.83	4301.83			
2360	E	762.0	764.0	764.0	241.21	241.34	243.33	243.20	IL	MADISON	
	N	4303.0	4305.0	4303.0	4302.89	4304.89	4304.76	4302.76			
1547	E	763.0	764.0	764.0	240.89	240.96	241.96	241.89	IL	MADISON	
	N	4283.0	4284.0	4283.0	4282.87	4283.87	4283.80	4282.80			
1548	E	763.0	764.0	764.0	240.96	241.03	242.02	241.96	IL	MADISON	
	N	4284.0	4285.0	4284.0	4283.87	4284.87	4284.80	4283.80			
1549	E	763.0	764.0	764.0	241.03	241.09	242.09	242.02	IL	MADISON	
	N	4285.0	4286.0	4285.0	4284.87	4285.86	4285.80	4284.80			
1550	E	763.0	764.0	764.0	241.09	241.16	242.15	242.09	IL	MADISON	
	N	4286.0	4287.0	4286.0	4285.86	4286.86	4286.80	4285.80			
1551	E	763.0	764.0	764.0	241.16	241.22	242.22	242.15	IL	MADISON	
	N	4287.0	4288.0	4287.0	4286.86	4287.86	4287.79	4286.80			
1552	E	763.0	764.0	764.0	241.22	241.29	242.28	242.22	IL	MADISON	
	N	4288.0	4289.0	4288.0	4287.86	4288.86	4288.79	4287.79			
1553	E	763.0	764.0	764.0	241.29	241.35	242.35	242.28	IL	MADISON	
	N	4289.0	4290.0	4289.0	4288.86	4289.86	4289.79	4288.79			
2364	E	763.0	764.0	764.0	241.94	242.01	243.01	242.94	IL	MADISON	
	N	4299.0	4300.0	4299.0	4298.84	4299.83	4299.77	4298.77			
2365	E	763.0	764.0	764.0	242.01	242.07	243.07	243.01	IL	MADISON	
	N	4300.0	4301.0	4300.0	4299.83	4300.83	4300.77	4299.77			
2366	E	763.0	764.0	764.0	242.07	242.14	243.14	243.07	IL	MADISON	
	N	4301.0	4302.0	4301.0	4300.83	4301.83	4301.76	4300.76			

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID		*****	UTM ZONE 15	*****	*****	*****	*****	UTM ZONE 16	*****	STATE	COUNTY
2367	E	763.0	763.0	764.0	764.0	242.14	242.21	243.20	243.14	IL	MADISON
	N	4302.0	4303.0	4303.0	4302.0	4301.83	4302.83	4302.76	4301.76		
1567	E	764.0	764.0	765.0	765.0	241.89	241.96	242.96	242.89	IL	MADISON
	N	4283.0	4284.0	4284.0	4283.0	4282.80	4283.80	4283.74	4282.74		
1568	E	764.0	764.0	765.0	765.0	241.96	242.02	243.02	242.96	IL	MADISON
	N	4284.0	4285.0	4285.0	4284.0	4283.80	4284.80	4284.73	4283.74		
1569	E	764.0	764.0	765.0	765.0	242.02	242.09	243.09	243.02	IL	MADISON
	N	4285.0	4286.0	4286.0	4285.0	4284.80	4285.80	4285.73	4284.73		
1570	E	764.0	764.0	765.0	765.0	242.09	242.15	243.15	243.09	IL	MADISON
	N	4286.0	4287.0	4287.0	4286.0	4285.80	4286.80	4286.73	4285.73		
1571	E	764.0	764.0	765.0	765.0	242.15	242.22	243.22	243.15	IL	MADISON
	N	4287.0	4288.0	4288.0	4287.0	4286.80	4287.79	4287.73	4286.73		
1572	E	764.0	764.0	765.0	765.0	242.22	242.28	243.28	243.22	IL	MADISON
	N	4288.0	4289.0	4289.0	4288.0	4287.79	4288.79	4288.73	4287.73		
2374	E	764.0	764.0	766.0	766.0	242.68	242.81	244.80	244.67	IL	MADISON
	N	4295.0	4297.0	4297.0	4295.0	4294.78	4296.77	4296.64	4294.65		
2375	E	764.0	764.0	765.0	765.0	242.81	242.87	243.87	243.81	IL	MADISON
	N	4297.0	4298.0	4298.0	4297.0	4296.77	4297.77	4297.71	4296.71		
2376	E	764.0	764.0	765.0	765.0	242.87	242.94	243.94	243.87	IL	MADISON
	N	4298.0	4299.0	4299.0	4298.0	4297.77	4298.77	4298.70	4297.71		
2377	E	764.0	764.0	765.0	765.0	242.94	243.01	244.00	243.94	IL	MADISON
	N	4299.0	4300.0	4300.0	4299.0	4298.77	4299.77	4299.70	4298.70		
2378	E	764.0	764.0	765.0	765.0	243.01	243.07	244.07	244.00	IL	MADISON
	N	4300.0	4301.0	4301.0	4300.0	4299.77	4300.77	4300.70	4299.70		
2379	E	764.0	764.0	765.0	765.0	243.07	243.14	244.14	244.07	IL	MADISON
	N	4301.0	4302.0	4302.0	4301.0	4300.77	4301.76	4301.70	4300.70		
2380	E	764.0	764.0	765.0	765.0	243.14	243.20	244.20	244.14	IL	MADISON
	N	4302.0	4303.0	4303.0	4302.0	4301.76	4302.76	4302.70	4301.70		
2381	E	764.0	764.0	766.0	766.0	243.20	243.33	245.33	245.20	IL	MADISON
	N	4303.0	4305.0	4305.0	4303.0	4302.76	4304.76	4304.63	4302.63		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY
1590	E	765.0	765.0	770.0	770.0	242.69	243.02	248.01	247.68	IL	MADISON	
	N	4280.0	4285.0	4285.0	4280.0	4279.75	4284.73	4284.41	4279.42			
1591	E	765.0	765.0	770.0	770.0	243.02	243.35	248.34	248.01	IL	MADISON	
	N	4285.0	4290.0	4290.0	4285.0	4284.73	4289.72	4289.40	4284.41			
1592	E	765.0	765.0	770.0	770.0	243.35	243.68	248.66	248.34	IL	MADISON	
	N	4290.0	4295.0	4295.0	4290.0	4289.72	4294.71	4294.39	4289.40			
2382	E	765.0	765.0	766.0	766.0	243.81	243.87	244.87	244.80	IL	MADISON	
	N	4297.0	4298.0	4298.0	4297.0	4296.71	4297.71	4297.64	4296.64			
2383	E	765.0	765.0	766.0	766.0	243.87	243.94	244.94	244.87	IL	MADISON	
	N	4298.0	4299.0	4299.0	4298.0	4297.71	4298.70	4298.64	4297.64			
2384	E	765.0	765.0	766.0	766.0	243.94	244.00	245.00	244.94	IL	MADISON	
	N	4299.0	4300.0	4300.0	4299.0	4298.70	4299.70	4299.64	4298.64			
2385	E	765.0	765.0	766.0	766.0	244.00	244.07	245.07	245.00	IL	MADISON	
	N	4300.0	4301.0	4301.0	4300.0	4299.70	4300.70	4300.63	4299.64			
2386	E	765.0	765.0	766.0	766.0	244.07	244.14	245.13	245.07	IL	MADISON	
	N	4301.0	4302.0	4302.0	4301.0	4300.70	4301.70	4301.63	4300.63			
2387	E	765.0	765.0	766.0	766.0	244.14	244.20	245.20	245.13	IL	MADISON	
	N	4302.0	4303.0	4303.0	4302.0	4301.70	4302.70	4302.63	4301.63			
1595	E	765.0	765.0	775.0	775.0	244.33	244.99	254.97	254.31	IL	MADISON	
	N	4305.0	4315.0	4315.0	4305.0	4304.69	4314.67	4314.01	4304.04			
1596	E	765.0	765.0	770.0	770.0	244.99	245.32	250.31	249.98	IL	MADISON	
	N	4315.0	4320.0	4320.0	4315.0	4314.67	4319.66	4319.53	4314.34			
2392	E	766.0	766.0	768.0	768.0	244.67	244.80	246.80	246.67	IL	MADISON	
	N	4295.0	4297.0	4297.0	4295.0	4294.65	4296.64	4296.51	4294.52			
2393	E	766.0	766.0	768.0	768.0	244.80	244.94	246.93	246.80	IL	MADISON	
	N	4297.0	4299.0	4299.0	4297.0	4296.64	4298.64	4298.51	4296.51			
2394	E	766.0	766.0	767.0	767.0	244.94	245.00	246.00	245.93	IL	MADISON	
	N	4299.0	4300.0	4300.0	4299.0	4298.64	4299.64	4299.57	4298.57			
2395	E	766.0	766.0	767.0	767.0	245.00	245.07	246.06	246.00	IL	MADISON	
	N	4300.0	4301.0	4301.0	4300.0	4299.64	4300.63	4300.57	4299.57			

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	*****		COUNTY	
2396	E	766.0 4301.0	768.0 4303.0	768.0 4301.0	245.07 4300.63	245.20 4302.63	IL	247.19 4302.50	247.06 4300.50	MADISON	
2397	E	766.0 4303.0	768.0 4305.0	768.0 4303.0	245.20 4302.63	245.33 4304.63	IL	247.19 4304.50	247.19 4302.50	MADISON	
2398	E	767.0 4299.0	768.0 4300.0	768.0 4299.0	245.93 4298.57	246.00 4299.57	IL	247.00 4299.50	246.93 4298.51	MADISON	
2399	E	767.0 4300.0	768.0 4301.0	768.0 4300.0	246.00 4299.57	246.06 4300.57	IL	247.06 4300.50	247.00 4299.50	MADISON	
2403	E	768.0 4295.0	770.0 4297.0	770.0 4295.0	246.67 4294.52	246.80 4296.51	IL	248.80 4296.38	248.66 4294.59	MADISON	
2404	E	768.0 4297.0	770.0 4299.0	770.0 4297.0	246.80 4296.51	246.93 4298.51	IL	248.93 4298.38	248.80 4296.38	MADISON	
2405	E	768.0 4299.0	770.0 4301.0	770.0 4299.0	246.93 4298.51	247.06 4300.50	IL	249.06 4300.37	248.93 4298.38	MADISON	
2406	E	768.0 4301.0	770.0 4303.0	770.0 4301.0	247.06 4300.50	247.19 4302.50	IL	249.19 4302.37	249.06 4300.37	MADISON	
2407	E	768.0 4303.0	770.0 4305.0	770.0 4303.0	247.19 4302.50	247.33 4304.50	IL	249.32 4304.36	249.19 4302.37	MADISON	
1623	E	770.0 4280.0	775.0 4285.0	775.0 4280.0	247.68 4279.42	248.01 4284.41	IL	253.00 4284.08	252.67 4279.09	MADISON	
1624	E	770.0 4285.0	775.0 4290.0	775.0 4285.0	248.01 4284.41	248.34 4289.40	IL	253.33 4289.07	253.00 4284.08	MADISON	
1625	E	770.0 4290.0	775.0 4295.0	775.0 4290.0	248.34 4289.40	248.66 4294.39	IL	253.65 4294.06	253.33 4289.07	MADISON	
1626	E	770.0 4295.0	775.0 4300.0	775.0 4295.0	248.66 4294.39	248.99 4299.38	IL	253.98 4299.05	253.65 4294.06	MADISON	
1627	E	770.0 4300.0	775.0 4305.0	775.0 4300.0	248.99 4299.38	249.32 4304.36	IL	254.31 4304.04	253.98 4299.05	MADISON	
1628	E	770.0 4315.0	775.0 4320.0	775.0 4315.0	249.98 4314.34	250.31 4319.33	IL	255.30 4319.00	254.97 4314.01	MADISON	

TABLE 1. (CONTINUED)

ST LOUIS AUCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		COUNTY
1640	E	775.0	775.0	780.0	780.0	252.67	253.00	257.99	257.66	IL	MADISON
	N	4280.0	4285.0	4285.0	4280.0	4279.09	4284.08	4285.75	4278.77		
1641	E	775.0	775.0	785.0	785.0	253.00	253.65	263.63	262.97	IL	MADISON
	N	4285.0	4295.0	4295.0	4285.0	4284.08	4294.06	4293.40	4283.43		
1642	E	775.0	775.0	785.0	785.0	253.65	254.31	264.28	263.63	IL	MADISON
	N	4295.0	4305.0	4305.0	4295.0	4294.06	4304.04	4303.38	4293.40		
1643	E	775.0	775.0	785.0	785.0	254.31	254.97	264.94	264.28	IL	MADISON
	N	4305.0	4315.0	4315.0	4305.0	4304.04	4314.01	4313.35	4303.38		
1644	E	775.0	775.0	780.0	780.0	254.97	255.30	260.28	259.95	IL	MADISON
	N	4315.0	4320.0	4320.0	4315.0	4314.01	4319.00	4318.67	4313.68		
1669	E	780.0	780.0	785.0	785.0	257.66	257.99	262.97	262.65	IL	MADISON
	N	4280.0	4285.0	4285.0	4280.0	4278.77	4283.75	4283.43	4278.44		
1670	E	780.0	780.0	785.0	785.0	259.95	260.28	265.27	264.94	IL	MADISON
	N	4315.0	4320.0	4320.0	4315.0	4313.68	4318.67	4318.34	4313.35		
1708	E	785.0	785.0	790.0	790.0	262.65	262.97	267.96	267.64	IL	MADISON
	N	4280.0	4285.0	4285.0	4280.0	4278.44	4283.43	4283.10	4278.11		
1709	E	785.0	785.0	795.0	795.0	262.97	263.63	273.60	272.95	IL	MADISON
	N	4285.0	4295.0	4295.0	4285.0	4283.43	4293.40	4292.75	4282.77		
1710	E	785.0	785.0	795.0	795.0	263.63	264.28	274.26	273.60	IL	MADISON
	N	4295.0	4305.0	4305.0	4295.0	4293.40	4303.38	4302.72	4292.75		
1711	E	785.0	785.0	790.0	790.0	264.28	264.61	269.60	269.27	IL	MADISON
	N	4305.0	4310.0	4310.0	4305.0	4303.38	4308.37	4308.04	4303.05		
1712	E	785.0	785.0	790.0	790.0	264.61	264.94	269.93	269.60	IL	MADISON
	N	4310.0	4315.0	4315.0	4310.0	4308.37	4313.35	4313.02	4308.04		
1713	E	785.0	785.0	790.0	790.0	264.94	265.27	270.26	269.93	IL	MADISON
	N	4315.0	4320.0	4320.0	4315.0	4313.35	4318.34	4318.01	4313.02		
1744	E	790.0	790.0	795.0	795.0	269.27	269.60	274.59	274.26	IL	MADISON
	N	4305.0	4310.0	4310.0	4305.0	4303.05	4308.04	4307.71	4302.72		
528	E	730.0	730.0	735.0	735.0	204.51	204.83	209.82	209.50	IL	MJNRUE
	N	4230.0	4235.0	4235.0	4230.0	4232.12	4237.11	4236.79	4231.80		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY				
529	E	730.0 4235.0	735.0 4240.0	735.0 4235.0	204.83 4237.11	205.16 4242.10	210.15 4241.78	209.82 4236.79	IL	MUNROE		
	N											
530	E	730.0 4240.0	730.0 4245.0	735.0 4240.0	205.16 4242.10	205.48 4247.09	210.47 4246.77	210.15 4241.78	IL	MUNROE		
	N											
2232	E	730.0 4245.0	730.0 4247.0	732.0 4245.0	205.48 4247.09	205.61 4249.09	207.61 4248.96	207.48 4246.96	IL	MUNROE		
	N											
2235	E	731.0 4247.0	731.0 4248.0	732.0 4247.0	206.61 4249.03	206.67 4250.02	207.67 4249.96	207.61 4248.96	IL	MUNROE		
	N											
2236	E	731.0 4248.0	731.0 4250.0	733.0 4248.0	206.67 4250.02	206.80 4252.02	208.80 4251.89	208.67 4249.89	IL	MUNROE		
	N											
2237	E	731.0 4250.0	731.0 4254.0	735.0 4250.0	206.80 4252.02	207.06 4256.02	211.06 4255.75	210.80 4251.76	IL	MUNROE		
	N											
2246	E	732.0 4245.0	732.0 4248.0	735.0 4245.0	207.48 4246.96	207.67 4249.96	210.67 4249.77	210.47 4246.77	IL	MUNROE		
	N											
2247	E	733.0 4248.0	733.0 4250.0	735.0 4248.0	208.67 4249.89	208.80 4251.89	210.80 4251.76	210.67 4249.77	IL	MUNROE		
	N											
695	E	735.0 4230.0	735.0 4235.0	740.0 4230.0	209.50 4231.80	209.82 4236.79	214.81 4236.46	214.49 4231.47	IL	MUNROE		
	N											
696	E	735.0 4235.0	735.0 4240.0	740.0 4235.0	209.82 4236.79	210.15 4241.78	215.14 4241.45	214.81 4236.46	IL	MUNROE		
	N											
697	E	735.0 4240.0	735.0 4250.0	745.0 4240.0	210.15 4241.78	210.80 4251.76	220.78 4251.11	220.13 4241.13	IL	MUNROE		
	N											
698	E	735.0 4250.0	735.0 4255.0	740.0 4250.0	210.80 4251.76	211.12 4256.75	216.11 4256.43	215.79 4251.44	IL	MUNROE		
	N											
699	E	735.0 4255.0	735.0 4260.0	740.0 4255.0	211.12 4256.75	211.45 4261.74	216.44 4261.42	216.11 4256.43	IL	MUNROE		
	N											
2261	E	737.0 4260.0	737.0 4262.0	739.0 4260.0	213.44 4261.61	213.58 4263.61	215.57 4263.48	215.44 4261.48	IL	MUNROE		
	N											
813	E	738.0 4265.0	738.0 4267.0	740.0 4265.0	214.77 4266.54	214.90 4268.54	216.90 4268.41	216.77 4266.41	IL	MUNROE		
	N											

TABLE 1. (CONTINUED)

ST LOUIS ROCK GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 17 *****		***** UTM ZONE 18 *****		***** UTM ZONE 19 *****		COUNTY
2262	E	739.0	739.0	741.0	741.0	741.0	215.44	215.57	217.57	217.44	IL
	N	4260.0	4262.0	4262.0	4260.0	4260.0	4261.48	4263.48	4263.35	4261.35	MONROE
2263	E	739.0	739.0	742.0	742.0	742.0	215.57	215.77	218.76	218.57	IL
	N	4262.0	4265.0	4265.0	4262.0	4262.0	4263.48	4266.47	4266.28	4263.29	MONROE
877	E	740.0	740.0	750.0	750.0	750.0	213.84	214.49	224.47	223.83	IL
	N	4220.0	4230.0	4230.0	4220.0	4220.0	4221.49	4231.47	4230.82	4220.84	MONROE
878	E	740.0	740.0	745.0	745.0	745.0	214.49	214.81	219.81	219.48	IL
	N	4230.0	4235.0	4235.0	4230.0	4230.0	4231.47	4236.46	4236.14	4231.15	MONROE
879	E	740.0	740.0	745.0	745.0	745.0	214.81	215.14	220.13	219.81	IL
	N	4235.0	4240.0	4240.0	4235.0	4235.0	4236.46	4241.45	4241.13	4236.14	MONROE
880	E	740.0	740.0	745.0	745.0	745.0	215.79	216.11	221.10	220.78	IL
	N	4250.0	4255.0	4255.0	4250.0	4250.0	4251.44	4256.43	4256.10	4251.11	MONROE
881	E	740.0	740.0	742.0	742.0	742.0	216.11	216.24	218.24	218.11	IL
	N	4255.0	4257.0	4257.0	4255.0	4255.0	4256.43	4258.42	4258.29	4256.30	MONROE
882	E	740.0	740.0	741.0	741.0	741.0	216.24	216.31	217.31	217.24	IL
	N	4257.0	4258.0	4258.0	4257.0	4257.0	4258.42	4259.42	4259.36	4258.36	MONROE
883	E	740.0	740.0	742.0	742.0	742.0	216.31	216.44	218.44	218.31	IL
	N	4258.0	4260.0	4260.0	4258.0	4258.0	4259.42	4261.42	4261.29	4259.29	MONROE
922	E	741.0	741.0	742.0	742.0	742.0	217.24	217.31	218.31	218.24	IL
	N	4257.0	4258.0	4258.0	4257.0	4257.0	4258.36	4259.36	4259.29	4258.29	MONROE
2270	E	741.0	741.0	743.0	743.0	743.0	217.44	217.57	219.56	219.43	IL
	N	4260.0	4262.0	4262.0	4260.0	4260.0	4261.35	4263.35	4263.22	4261.22	MONROE
948	E	742.0	742.0	743.0	743.0	743.0	218.11	218.18	219.17	219.11	IL
	N	4255.0	4256.0	4256.0	4255.0	4255.0	4256.30	4257.30	4257.23	4256.23	MONROE
949	E	742.0	742.0	743.0	743.0	743.0	218.18	218.24	219.24	219.17	IL
	N	4256.0	4257.0	4257.0	4256.0	4256.0	4257.30	4258.29	4258.23	4257.23	MONROE
950	E	742.0	742.0	743.0	743.0	743.0	218.24	218.31	219.30	219.24	IL
	N	4257.0	4258.0	4258.0	4257.0	4257.0	4258.29	4259.29	4259.23	4258.23	MONROE
951	E	742.0	742.0	743.0	743.0	743.0	218.31	218.37	219.37	219.30	IL
	N	4258.0	4259.0	4259.0	4258.0	4258.0	4259.29	4260.29	4260.22	4259.23	MONROE

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY	
952	E	742.0	742.0	743.0	743.0	218.37	218.44	219.43	219.37	IL	MONROE
	N	4259.0	4260.0	4260.0	4259.0	4260.29	4261.29	4261.22	4260.22		
990	E	743.0	743.0	745.0	745.0	219.11	219.24	221.23	221.10	IL	MONROE
	N	4255.0	4257.0	4257.0	4255.0	4256.23	4258.23	4258.10	4256.10		
991	E	743.0	743.0	744.0	744.0	219.24	219.30	220.30	220.24	IL	MONROE
	N	4257.0	4258.0	4258.0	4257.0	4258.23	4259.23	4259.16	4258.16		
992	E	743.0	743.0	744.0	744.0	219.30	219.37	220.37	220.30	IL	MONROE
	N	4258.0	4259.0	4259.0	4258.0	4259.23	4260.22	4260.16	4259.16		
993	E	743.0	743.0	744.0	744.0	219.37	219.43	220.43	220.37	IL	MONROE
	N	4259.0	4260.0	4260.0	4259.0	4260.22	4261.22	4261.16	4260.16		
2279	E	743.0	743.0	745.0	745.0	219.43	219.56	221.56	221.43	IL	MONROE
	N	4260.0	4262.0	4262.0	4260.0	4261.22	4263.22	4263.09	4261.09		
1027	E	744.0	744.0	745.0	745.0	220.24	220.30	221.30	221.23	IL	MONROE
	N	4257.0	4258.0	4258.0	4257.0	4258.16	4259.16	4259.10	4258.10		
1028	E	744.0	744.0	745.0	745.0	220.30	220.37	221.36	221.30	IL	MONROE
	N	4258.0	4259.0	4259.0	4258.0	4259.16	4260.16	4260.09	4259.10		
1029	E	744.0	744.0	745.0	745.0	220.37	220.43	221.43	221.36	IL	MONROE
	N	4259.0	4260.0	4260.0	4259.0	4260.16	4261.16	4261.09	4260.09		
1056	E	745.0	745.0	750.0	750.0	219.48	219.81	224.80	224.47	IL	MONROE
	N	4230.0	4235.0	4235.0	4230.0	4231.15	4236.14	4235.82	4230.82		
1057	E	745.0	745.0	755.0	755.0	219.81	220.45	230.43	229.79	IL	MONROE
	N	4235.0	4245.0	4245.0	4235.0	4236.14	4246.12	4245.47	4235.49		
1058	E	745.0	745.0	747.0	747.0	220.45	220.58	222.58	222.45	IL	MONROE
	N	4245.0	4247.0	4247.0	4245.0	4246.12	4248.12	4247.99	4245.99		
1059	E	745.0	745.0	748.0	748.0	220.58	220.78	223.77	223.58	IL	MONROE
	N	4247.0	4250.0	4250.0	4247.0	4248.12	4251.11	4250.92	4247.92		
1060	E	745.0	745.0	750.0	750.0	220.78	221.10	226.09	225.77	IL	MONROE
	N	4250.0	4255.0	4255.0	4250.0	4251.11	4256.10	4255.78	4250.79		
1061	E	745.0	745.0	750.0	750.0	221.10	221.43	226.42	226.09	IL	MONROE
	N	4255.0	4260.0	4260.0	4255.0	4256.10	4261.09	4260.77	4255.78		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 1 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY	
1116	E	747.0	748.0	748.0	222.45	222.52	223.51	223.45	IL	MONROE	
	N	4245.0	4246.0	4245.0	4245.99	4246.99	4246.93	4245.93			
1117	E	747.0	748.0	748.0	222.52	222.58	223.58	223.51	IL	MONROE	
	N	4246.0	4247.0	4246.0	4246.99	4247.99	4247.92	4246.93			
1145	E	748.0	748.0	749.0	223.45	223.51	224.51	224.45	IL	MONROE	
	N	4245.0	4246.0	4245.0	4245.93	4246.93	4246.86	4245.86			
1146	E	748.0	748.0	749.0	223.51	223.58	224.58	224.51	IL	MONROE	
	N	4246.0	4247.0	4246.0	4246.93	4247.92	4247.86	4246.86			
1147	E	748.0	748.0	749.0	223.58	223.64	224.64	224.58	IL	MONROE	
	N	4247.0	4248.0	4247.0	4247.92	4248.92	4248.86	4247.86			
1148	E	748.0	748.0	749.0	223.64	223.71	224.71	224.64	IL	MONROE	
	N	4248.0	4249.0	4248.0	4248.92	4249.92	4249.85	4248.86			
1149	E	748.0	748.0	749.0	223.71	223.77	224.77	224.71	IL	MONROE	
	N	4249.0	4250.0	4249.0	4249.92	4250.92	4250.85	4249.85			
1174	E	749.0	749.0	750.0	224.45	224.51	225.51	225.44	IL	MONROE	
	N	4245.0	4246.0	4245.0	4245.86	4246.86	4246.79	4245.80			
1175	E	749.0	749.0	750.0	224.51	224.58	225.57	225.51	IL	MONROE	
	N	4246.0	4247.0	4246.0	4246.86	4247.86	4247.79	4246.79			
1176	E	749.0	749.0	750.0	224.58	224.64	225.64	225.57	IL	MONROE	
	N	4247.0	4248.0	4247.0	4247.86	4248.86	4248.79	4247.79			
1177	E	749.0	749.0	750.0	224.64	224.71	225.70	225.64	IL	MONROE	
	N	4248.0	4249.0	4248.0	4248.86	4249.85	4249.79	4248.79			
1178	E	749.0	749.0	750.0	224.71	224.77	225.77	225.70	IL	MONROE	
	N	4249.0	4250.0	4249.0	4249.85	4250.85	4250.79	4249.79			
1204	E	750.0	750.0	755.0	224.15	224.47	229.46	229.14	IL	MONROE	
	N	4225.0	4230.0	4225.0	4225.84	4230.82	4230.50	4225.51			
1205	E	750.0	750.0	755.0	224.47	224.80	229.79	229.46	IL	MONROE	
	N	4230.0	4235.0	4230.0	4230.82	4235.82	4235.49	4230.50			
1206	E	750.0	750.0	755.0	225.44	225.77	230.76	230.43	IL	MONROE	
	N	4245.0	4250.0	4245.0	4245.80	4250.79	4250.46	4245.47			

TABLE 1. (CONTINUED)

ST LOUIS AWCN GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** STATE *****		***** COUNTY *****					
1207	E	750.0	750.0	755.0	755.0	225.77	226.09	231.08	230.76	IL	MONROE	4250.46
	N	4250.0	4255.0	4255.0	4250.0	4250.79	4255.78	4255.45	4250.46			
1372	E	755.0	755.0	760.0	760.0	229.14	229.46	234.45	234.13	IL	MONROE	4225.19
	N	4225.0	4230.0	4230.0	4225.0	4225.51	4230.50	4230.18	4225.19			
1373	E	755.0	755.0	760.0	760.0	229.46	229.79	234.78	234.45	IL	MONROE	4230.18
	N	4230.0	4235.0	4235.0	4230.0	4230.50	4235.49	4235.17	4230.18			
1374	E	755.0	755.0	760.0	760.0	229.79	230.11	235.10	234.78	IL	MONROE	4235.17
	N	4235.0	4240.0	4240.0	4235.0	4235.49	4240.48	4240.16	4235.17			
1375	E	755.0	755.0	760.0	760.0	230.11	230.43	235.42	235.10	IL	MONROE	4240.16
	N	4240.0	4245.0	4245.0	4240.0	4240.48	4245.47	4245.15	4240.16			
1480	E	760.0	760.0	770.0	770.0	234.78	235.42	245.40	244.75	IL	MONROE	4234.52
	N	4235.0	4240.0	4245.0	4235.0	4235.17	4240.15	4244.50	4234.52			
1203	E	750.0	750.0	760.0	760.0	223.50	224.15	234.13	233.48	IL	RANDOLPH	4215.21
	N	4215.0	4220.0	4225.0	4215.0	4215.86	4220.84	4225.19	4215.21			
1475	E	760.0	760.0	770.0	770.0	233.16	233.81	243.78	243.14	IL	RANDOLPH	4209.57
	N	4210.0	4220.0	4220.0	4210.0	4210.22	4220.20	4219.55	4209.57			
1476	E	760.0	760.0	765.0	765.0	233.81	234.13	239.12	238.80	IL	RANDOLPH	4219.88
	N	4220.0	4225.0	4225.0	4220.0	4220.20	4225.19	4224.86	4219.88			
1477	E	760.0	760.0	765.0	765.0	234.13	234.45	239.44	239.12	IL	RANDOLPH	4224.86
	N	4225.0	4230.0	4230.0	4225.0	4225.19	4230.18	4229.86	4224.86			
2335	E	760.0	760.0	763.0	763.0	234.45	234.65	237.64	237.45	IL	RANDOLPH	4229.98
	N	4230.0	4233.0	4233.0	4230.0	4230.18	4233.17	4232.98	4229.98			
2336	E	760.0	760.0	762.0	762.0	234.65	234.78	236.77	236.64	IL	RANDOLPH	4233.04
	N	4233.0	4235.0	4235.0	4233.0	4233.17	4235.17	4235.04	4233.04			
2347	E	762.0	762.0	763.0	763.0	236.64	236.71	237.71	237.64	IL	RANDOLPH	4232.98
	N	4233.0	4234.0	4234.0	4233.0	4233.04	4234.04	4233.98	4232.98			
2348	E	762.0	762.0	763.0	763.0	236.71	236.77	237.77	237.71	IL	RANDOLPH	4233.98
	N	4234.0	4235.0	4235.0	4234.0	4234.04	4235.04	4234.97	4233.98			
2361	E	763.0	763.0	765.0	765.0	237.45	237.58	239.57	239.44	IL	RANDOLPH	4229.86
	N	4230.0	4232.0	4232.0	4230.0	4229.98	4231.98	4231.85	4229.86			

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY	
2362	E	763.0	763.0	764.0	764.0	237.58	237.64	238.64	238.57	IL	HANDULPH
	N	4232.0	4233.0	4233.0	4232.0	4231.98	4232.98	4232.91	4231.91		
2363	E	763.0	763.0	765.0	765.0	237.64	237.77	239.77	239.64	IL	RANDOLPH
	N	4233.0	4235.0	4235.0	4233.0	4232.98	4234.97	4234.84	4232.85		
2368	E	764.0	764.0	765.0	765.0	238.57	238.64	239.64	239.57	IL	RANDOLPH
	N	4232.0	4233.0	4233.0	4232.0	4231.91	4232.91	4232.85	4231.85		
1579	E	765.0	765.0	775.0	775.0	237.51	238.15	248.13	247.48	IL	RANDOLPH
	N	4200.0	4210.0	4210.0	4200.0	4199.92	4209.89	4209.25	4199.27		
1580	E	765.0	765.0	770.0	770.0	238.80	239.12	244.11	243.78	IL	RANDOLPH
	N	4220.0	4225.0	4225.0	4220.0	4219.88	4224.86	4224.54	4219.55		
1581	E	765.0	765.0	770.0	770.0	239.12	239.44	244.43	244.11	IL	RANDOLPH
	N	4225.0	4230.0	4230.0	4225.0	4224.86	4229.86	4229.53	4224.54		
1582	E	765.0	765.0	770.0	770.0	239.44	239.77	244.75	244.43	IL	RANDOLPH
	N	4230.0	4235.0	4235.0	4230.0	4229.86	4234.84	4234.52	4229.53		
1613	E	770.0	770.0	775.0	775.0	243.14	243.46	248.45	248.13	IL	RANDOLPH
	N	4210.0	4215.0	4215.0	4210.0	4209.57	4214.56	4214.24	4209.25		
1614	E	770.0	770.0	780.0	780.0	243.46	244.11	254.09	253.44	IL	RANDOLPH
	N	4215.0	4225.0	4225.0	4215.0	4214.56	4224.54	4223.89	4213.92		
1615	E	770.0	770.0	775.0	775.0	244.11	244.43	249.42	249.10	IL	RANDOLPH
	N	4225.0	4230.0	4230.0	4225.0	4224.54	4229.53	4229.21	4224.22		
1616	E	770.0	770.0	775.0	775.0	244.43	244.75	249.74	249.42	IL	RANDOLPH
	N	4230.0	4235.0	4235.0	4230.0	4229.53	4234.52	4234.20	4229.21		
2408	E	775.0	775.0	777.0	777.0	247.29	247.42	249.42	249.29	IL	HANDULPH
	N	4197.0	4199.0	4199.0	4197.0	4196.28	4198.28	4198.15	4196.15		
2409	E	775.0	775.0	777.0	777.0	247.42	247.55	249.54	249.42	IL	HANDULPH
	N	4199.0	4201.0	4201.0	4199.0	4198.28	4200.27	4200.14	4198.15		
2410	E	775.0	775.0	777.0	777.0	247.55	247.68	249.67	249.54	IL	RANDOLPH
	N	4201.0	4203.0	4203.0	4201.0	4200.27	4202.27	4202.14	4200.14		
2411	E	775.0	775.0	777.0	777.0	247.68	247.81	249.80	249.67	IL	HANDULPH
	N	4203.0	4205.0	4205.0	4203.0	4202.27	4204.26	4204.13	4202.14		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID		*****	UTM ZONE 15	*****	*****	*****	UTM ZONE 16	*****	STATE	COUNTY	
1632	E N	775.0 4205.0	775.0 4215.0	785.0 4215.0	785.0 4205.0	247.81 4204.26	248.45 4214.24	258.43 4213.59	257.78 4203.62	IL	RANDOLPH
1633	E N	775.0 4225.0	775.0 4235.0	785.0 4235.0	785.0 4225.0	249.10 4224.22	249.74 4234.20	259.72 4233.55	259.07 4223.57	IL	RANDOLPH
2412	E N	777.0 4197.0	777.0 4199.0	779.0 4199.0	779.0 4197.0	249.29 4196.15	249.42 4198.15	251.41 4198.02	251.28 4196.02	IL	RANDOLPH
2413	E N	777.0 4199.0	777.0 4200.0	778.0 4200.0	778.0 4199.0	249.42 4198.15	249.48 4199.14	250.48 4199.08	250.41 4198.08	IL	RANDOLPH
2414	E N	777.0 4200.0	777.0 4201.0	778.0 4201.0	778.0 4200.0	249.48 4199.14	249.54 4200.14	250.54 4200.08	250.48 4199.08	IL	RANDOLPH
2415	E N	777.0 4201.0	777.0 4203.0	779.0 4203.0	779.0 4201.0	249.54 4200.14	249.67 4202.14	251.67 4202.01	251.54 4200.02	IL	RANDOLPH
2416	E N	777.0 4203.0	777.0 4205.0	779.0 4205.0	779.0 4203.0	249.67 4202.14	249.80 4204.13	251.80 4204.00	251.67 4202.01	IL	RANDOLPH
2417	E N	778.0 4199.0	778.0 4200.0	779.0 4200.0	779.0 4199.0	250.41 4198.08	250.48 4199.08	251.48 4199.02	251.41 4198.02	IL	RANDOLPH
2418	E N	778.0 4200.0	778.0 4201.0	779.0 4201.0	779.0 4200.0	250.48 4199.08	250.54 4200.08	251.54 4200.02	251.48 4199.02	IL	RANDOLPH
2419	E N	779.0 4197.0	779.0 4199.0	781.0 4199.0	781.0 4197.0	251.28 4196.02	251.41 4198.02	253.41 4197.89	253.28 4195.89	IL	RANDOLPH
2420	E N	779.0 4199.0	779.0 4200.0	780.0 4200.0	780.0 4199.0	251.41 4198.02	251.48 4199.02	252.47 4198.95	252.41 4197.95	IL	RANDOLPH
2421	E N	779.0 4200.0	779.0 4201.0	780.0 4201.0	780.0 4200.0	251.48 4199.02	251.54 4200.02	252.54 4199.95	252.47 4198.95	IL	RANDOLPH
2422	E N	779.0 4201.0	779.0 4202.0	780.0 4202.0	780.0 4201.0	251.54 4200.02	251.60 4201.01	252.60 4200.95	252.54 4199.95	IL	RANDOLPH
2423	E N	779.0 4202.0	779.0 4203.0	780.0 4203.0	780.0 4202.0	251.60 4201.01	251.67 4202.01	252.67 4201.95	252.60 4200.95	IL	RANDOLPH
2424	E N	779.0 4203.0	779.0 4205.0	781.0 4205.0	781.0 4203.0	251.67 4202.01	251.80 4204.00	253.79 4203.88	253.66 4201.88	IL	RANDOLPH

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)												
ID		***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY	
2425	E	780.0	780.0	781.0	781.0	252.41	252.47	253.47	253.41	IL	RANDOLPH	
	N	4199.0	4200.0	4200.0	4199.0	4197.95	4198.95	4198.89	4197.89			
2426	E	780.0	780.0	781.0	781.0	252.47	252.54	253.54	253.47	IL	RANDOLPH	
	N	4200.0	4201.0	4201.0	4200.0	4198.95	4199.95	4199.89	4198.89			
2427	E	780.0	780.0	781.0	781.0	252.54	252.60	253.60	253.54	IL	RANDOLPH	
	N	4201.0	4202.0	4202.0	4201.0	4199.95	4200.95	4200.88	4199.89			
2428	E	780.0	780.0	781.0	781.0	252.60	252.67	253.66	253.60	IL	RANDOLPH	
	N	4202.0	4203.0	4203.0	4202.0	4200.95	4201.95	4201.88	4200.88			
1662	E	780.0	780.0	785.0	785.0	253.44	253.76	258.75	258.43	IL	RANDOLPH	
	N	4215.0	4220.0	4220.0	4215.0	4213.92	4218.91	4218.58	4213.59			
1663	E	780.0	780.0	785.0	785.0	253.76	254.09	259.07	258.75	IL	RANDOLPH	
	N	4220.0	4225.0	4225.0	4220.0	4218.91	4223.89	4223.57	4218.58			
2429	E	781.0	781.0	783.0	783.0	253.15	253.28	255.27	255.14	IL	RANDOLPH	
	N	4195.0	4197.0	4197.0	4195.0	4193.90	4195.89	4195.77	4193.77			
2430	E	781.0	781.0	783.0	783.0	253.28	253.41	255.40	255.27	IL	RANDOLPH	
	N	4197.0	4199.0	4199.0	4197.0	4195.89	4197.89	4197.76	4195.77			
2431	E	781.0	781.0	782.0	782.0	253.41	253.47	254.47	254.40	IL	RANDOLPH	
	N	4199.0	4200.0	4200.0	4199.0	4197.89	4198.89	4198.82	4197.82			
2432	E	781.0	781.0	782.0	782.0	253.47	253.54	254.53	254.47	IL	RANDOLPH	
	N	4200.0	4201.0	4201.0	4200.0	4198.89	4199.89	4199.82	4198.82			
2433	E	781.0	781.0	783.0	783.0	253.54	253.66	255.66	255.53	IL	RANDOLPH	
	N	4201.0	4203.0	4203.0	4201.0	4199.89	4201.88	4201.75	4199.76			
2434	E	781.0	781.0	783.0	783.0	253.66	253.79	255.79	255.66	IL	RANDOLPH	
	N	4203.0	4205.0	4205.0	4203.0	4201.88	4203.88	4203.75	4201.75			
2435	E	782.0	782.0	783.0	783.0	254.40	254.47	255.47	255.40	IL	RANDOLPH	
	N	4199.0	4200.0	4200.0	4199.0	4197.82	4198.82	4198.76	4197.76			
2436	E	782.0	782.0	783.0	783.0	254.47	254.53	255.53	255.47	IL	RANDOLPH	
	N	4200.0	4201.0	4201.0	4200.0	4198.82	4199.82	4199.76	4198.76			
2437	E	783.0	783.0	785.0	785.0	255.14	255.27	257.27	257.14	IL	RANDOLPH	
	N	4195.0	4197.0	4197.0	4195.0	4193.77	4195.77	4195.64	4193.64			

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		COUNTY
2438 E N	783.0	783.0	785.0	785.0	255.27	255.40	257.40	257.27	4195.64	4195.64	IL RANDOLPH
	4197.0	4199.0	4197.0	4197.0	4195.77	4197.76	4197.63				
2439 E N	783.0	783.0	785.0	785.0	255.40	255.53	257.53	257.40	4197.63	4197.63	IL RANDOLPH
	4199.0	4201.0	4199.0	4199.0	4197.76	4199.76	4199.63				
2440 E N	783.0	783.0	785.0	785.0	255.53	255.66	257.65	257.53	4199.63	4199.63	IL RANDOLPH
	4201.0	4203.0	4201.0	4201.0	4199.76	4201.75	4201.63				
2441 E N	783.0	783.0	785.0	785.0	255.66	255.79	257.78	257.65	4201.63	4201.63	IL RANDOLPH
	4203.0	4205.0	4203.0	4203.0	4201.75	4203.75	4203.62				
1685 E N	785.0	785.0	795.0	795.0	256.82	257.46	267.44	266.80	4188.01	4188.01	IL RANDOLPH
	4190.0	4200.0	4190.0	4190.0	4188.66	4198.63	4197.99				
1686 E N	785.0	785.0	790.0	790.0	257.46	257.78	262.77	262.45	4198.31	4198.31	IL RANDOLPH
	4200.0	4205.0	4200.0	4200.0	4198.63	4203.62	4203.30				
1687 E N	785.0	785.0	790.0	790.0	257.78	258.11	263.09	262.77	4203.30	4203.30	IL RANDOLPH
	4205.0	4210.0	4205.0	4205.0	4203.62	4208.61	4208.29				
1688 E N	785.0	785.0	790.0	790.0	258.11	258.43	263.42	263.09	4208.29	4208.29	IL RANDOLPH
	4210.0	4215.0	4210.0	4210.0	4208.61	4213.59	4213.27				
1689 E N	785.0	785.0	790.0	790.0	258.43	258.75	263.74	263.42	4213.27	4213.27	IL RANDOLPH
	4215.0	4220.0	4215.0	4215.0	4213.59	4218.58	4218.26				
2442 E N	785.0	785.0	787.0	787.0	258.75	258.88	260.87	260.75	4218.45	4218.45	IL RANDOLPH
	4220.0	4222.0	4220.0	4220.0	4218.58	4220.58	4220.45				
2443 E N	785.0	785.0	787.0	787.0	258.88	259.01	261.00	260.87	4220.45	4220.45	IL RANDOLPH
	4222.0	4224.0	4222.0	4222.0	4220.58	4222.57	4222.45				
2444 E N	785.0	785.0	787.0	787.0	259.01	259.14	261.13	261.00	4222.45	4222.45	IL RANDOLPH
	4224.0	4226.0	4224.0	4224.0	4222.57	4224.57	4224.44				
2445 E N	785.0	785.0	787.0	787.0	259.14	259.27	261.26	261.13	4224.44	4224.44	IL RANDOLPH
	4226.0	4228.0	4226.0	4226.0	4224.57	4226.57	4226.43				
2446 E N	785.0	785.0	787.0	787.0	259.27	259.40	261.39	261.26	4226.43	4226.43	IL RANDOLPH
	4228.0	4230.0	4228.0	4228.0	4226.57	4228.56	4228.43				
1694 E N	785.0	785.0	790.0	790.0	259.40	259.72	264.71	264.38	4228.43	4228.43	IL RANDOLPH
	4230.0	4235.0	4230.0	4230.0	4228.56	4233.55	4233.22				

TABLE 1. (CONTINUED)

ST LOUIS AQCK GRID SQUARE COORDINATES (KM)													
ID		***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY		
2447	E	787.0	787.0	789.0	789.0	260.75	260.87	262.87	262.74	IL	RANDOLPH		
	N	4220.0	4222.0	4222.0	4220.0	4218.45	4220.45	4220.32	4218.32				
2448	E	787.0	787.0	789.0	789.0	260.87	261.00	263.00	262.87	IL	RANDOLPH		
	N	4222.0	4224.0	4224.0	4222.0	4220.45	4222.45	4222.32	4220.32				
2449	E	787.0	787.0	789.0	789.0	261.00	261.13	263.13	263.00	IL	RANDOLPH		
	N	4224.0	4226.0	4226.0	4224.0	4222.45	4224.44	4224.31	4222.32				
2450	E	787.0	787.0	789.0	789.0	261.13	261.26	263.26	263.13	IL	RANDOLPH		
	N	4226.0	4228.0	4228.0	4226.0	4224.44	4226.43	4226.30	4224.31				
2451	E	787.0	787.0	789.0	789.0	261.26	261.39	263.39	263.26	IL	RANDOLPH		
	N	4228.0	4230.0	4230.0	4228.0	4226.43	4228.43	4228.30	4226.30				
2452	E	789.0	789.0	791.0	791.0	262.74	262.87	264.86	264.74	IL	RANDOLPH		
	N	4220.0	4222.0	4222.0	4220.0	4218.32	4220.32	4220.19	4218.20				
2453	E	789.0	789.0	791.0	791.0	262.87	263.00	264.99	264.86	IL	RANDOLPH		
	N	4222.0	4224.0	4224.0	4222.0	4220.32	4222.32	4222.19	4220.19				
2454	E	789.0	789.0	791.0	791.0	263.00	263.13	265.12	264.99	IL	RANDOLPH		
	N	4224.0	4226.0	4226.0	4224.0	4222.32	4224.31	4224.18	4222.19				
2455	E	789.0	789.0	791.0	791.0	263.13	263.26	265.25	265.12	IL	RANDOLPH		
	N	4226.0	4228.0	4228.0	4226.0	4224.31	4226.30	4226.18	4224.18				
2456	E	789.0	789.0	791.0	791.0	263.26	263.39	265.38	265.25	IL	RANDOLPH		
	N	4228.0	4230.0	4230.0	4228.0	4226.30	4228.30	4228.17	4226.18				
1728	E	790.0	790.0	800.0	800.0	262.45	263.09	273.07	272.42	IL	RANDOLPH		
	N	4200.0	4210.0	4210.0	4200.0	4198.31	4208.29	4207.64	4197.67				
1729	E	790.0	790.0	795.0	795.0	263.09	263.42	268.40	268.08	IL	RANDOLPH		
	N	4210.0	4215.0	4215.0	4210.0	4208.29	4213.27	4212.95	4207.96				
1730	E	790.0	790.0	795.0	795.0	263.42	263.74	268.73	268.40	IL	RANDOLPH		
	N	4215.0	4220.0	4220.0	4215.0	4213.27	4218.26	4217.94	4212.95				
1735	E	790.0	790.0	795.0	795.0	264.38	264.71	269.70	269.37	IL	RANDOLPH		
	N	4230.0	4235.0	4235.0	4230.0	4228.24	4233.22	4232.90	4227.91				
2457	E	791.0	791.0	793.0	793.0	264.74	264.86	266.86	266.73	IL	RANDOLPH		
	N	4220.0	4222.0	4222.0	4220.0	4218.20	4220.19	4220.06	4218.07				

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY
2458 E	791.0	791.0	793.0	793.0	264.86	264.99	266.99	266.86	266.99	266.86	IL	RANDOLPH
N	4222.0	4224.0	4222.0	4222.0	4220.19	4222.19	4222.06	4220.06	4222.06	4220.06		
2459 E	791.0	791.0	793.0	793.0	264.99	265.12	267.12	266.99	267.12	266.99	IL	RANDOLPH
N	4224.0	4226.0	4224.0	4224.0	4222.19	4224.18	4224.05	4222.06	4224.05	4222.06		
2460 E	791.0	791.0	793.0	793.0	265.12	265.25	267.25	267.12	267.25	267.12	IL	RANDOLPH
N	4226.0	4228.0	4226.0	4226.0	4224.18	4226.18	4226.05	4224.05	4226.05	4224.05		
2461 E	791.0	791.0	793.0	793.0	265.25	265.38	267.38	267.25	267.38	267.25	IL	RANDOLPH
N	4228.0	4230.0	4228.0	4228.0	4226.18	4228.17	4228.04	4226.05	4228.04	4226.05		
2462 E	793.0	793.0	795.0	795.0	266.73	266.86	268.85	268.73	268.85	268.73	IL	RANDOLPH
N	4220.0	4222.0	4220.0	4220.0	4218.07	4220.06	4219.93	4217.94	4219.93	4217.94		
2463 E	793.0	793.0	795.0	795.0	266.86	266.99	268.98	268.85	268.98	268.85	IL	RANDOLPH
N	4222.0	4224.0	4222.0	4222.0	4220.06	4222.06	4221.93	4219.93	4221.93	4219.93		
2464 E	793.0	793.0	795.0	795.0	266.99	267.12	269.11	268.98	269.11	268.98	IL	RANDOLPH
N	4224.0	4226.0	4224.0	4224.0	4222.06	4224.05	4223.92	4221.93	4223.92	4221.93		
2465 E	793.0	793.0	795.0	795.0	267.12	267.25	269.24	269.11	269.24	269.11	IL	RANDOLPH
N	4226.0	4228.0	4226.0	4226.0	4224.05	4226.05	4225.92	4223.92	4225.92	4223.92		
2466 E	793.0	793.0	795.0	795.0	267.25	267.38	269.37	269.24	269.37	269.24	IL	RANDOLPH
N	4228.0	4230.0	4228.0	4228.0	4226.05	4228.04	4227.91	4225.92	4227.91	4225.92		
1751 E	795.0	795.0	800.0	800.0	268.08	268.40	273.39	273.07	273.39	273.07	IL	RANDOLPH
N	4210.0	4215.0	4210.0	4210.0	4207.96	4212.95	4212.63	4207.64	4212.63	4207.64		
1752 E	795.0	795.0	800.0	800.0	268.40	268.73	273.71	273.39	273.71	273.39	IL	RANDOLPH
N	4215.0	4220.0	4215.0	4215.0	4212.95	4217.94	4217.62	4212.63	4217.62	4212.63		
1753 E	795.0	795.0	800.0	800.0	268.73	269.05	274.04	273.71	274.04	273.71	IL	RANDOLPH
N	4220.0	4225.0	4220.0	4220.0	4217.94	4222.93	4222.60	4217.62	4222.60	4217.62		
1754 E	795.0	795.0	800.0	800.0	269.05	269.37	274.36	274.04	274.36	274.04	IL	RANDOLPH
N	4225.0	4230.0	4225.0	4225.0	4222.93	4227.91	4227.59	4222.60	4227.59	4222.60		
1755 E	795.0	795.0	800.0	800.0	269.37	269.70	274.68	274.36	274.68	274.36	IL	RANDOLPH
N	4230.0	4235.0	4230.0	4230.0	4227.91	4232.90	4232.58	4227.59	4232.58	4227.59		
846 E	739.0	739.0	740.0	740.0	215.90	215.96	216.96	216.90	216.96	216.90	IL	ST. CLAIR
N	4267.0	4268.0	4267.0	4267.0	4266.47	4269.47	4269.40	4268.41	4269.40	4268.41		

TABLE 1. (CONTINUED)

ST LOUIS AOCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE COUNTY
886	E	740.0	740.0	743.0	743.0	216.77	216.96	219.96	219.96	219.76	IL ST. CLAIR
	N	4265.0	4268.0	4268.0	4265.0	4266.41	4269.40	4269.21	4266.21	4266.21	
887	E	740.0	740.0	743.0	743.0	216.96	217.16	220.15	219.96	219.96	IL ST. CLAIR
	N	4268.0	4271.0	4271.0	4268.0	4269.40	4272.40	4272.20	4269.21	4269.21	
923	E	741.0	741.0	742.0	742.0	218.15	218.22	219.22	219.15	219.15	IL ST. CLAIR
	N	4271.0	4272.0	4272.0	4271.0	4272.33	4273.33	4273.27	4272.27	4272.27	
2273	E	742.0	742.0	745.0	745.0	218.57	218.76	221.76	221.56	221.56	IL ST. CLAIR
	N	4262.0	4265.0	4265.0	4262.0	4263.29	4266.28	4266.08	4263.09	4263.09	
953	E	742.0	742.0	743.0	743.0	219.15	219.22	220.22	220.15	220.15	IL ST. CLAIR
	N	4271.0	4272.0	4272.0	4271.0	4272.27	4273.27	4273.20	4272.20	4272.20	
954	E	742.0	742.0	743.0	743.0	219.22	219.28	220.28	220.22	220.22	IL ST. CLAIR
	N	4272.0	4273.0	4273.0	4272.0	4273.27	4274.26	4274.20	4273.20	4273.20	
994	E	743.0	743.0	745.0	745.0	219.76	219.89	221.89	221.76	221.76	IL ST. CLAIR
	N	4265.0	4267.0	4267.0	4265.0	4266.21	4268.21	4268.08	4266.08	4266.08	
995	E	743.0	743.0	745.0	745.0	219.89	220.02	222.02	221.89	221.89	IL ST. CLAIR
	N	4267.0	4269.0	4269.0	4267.0	4268.21	4270.21	4270.07	4268.08	4268.08	
996	E	743.0	743.0	745.0	745.0	220.02	220.15	222.15	222.02	222.02	IL ST. CLAIR
	N	4269.0	4271.0	4271.0	4269.0	4270.21	4272.20	4272.07	4270.07	4270.07	
997	E	743.0	743.0	745.0	745.0	220.15	220.28	222.28	222.15	222.15	IL ST. CLAIR
	N	4271.0	4273.0	4273.0	4271.0	4272.20	4274.20	4274.07	4272.07	4272.07	
998	E	743.0	743.0	745.0	745.0	220.28	220.41	222.41	222.28	222.28	IL ST. CLAIR
	N	4273.0	4275.0	4275.0	4273.0	4274.20	4276.20	4276.06	4274.07	4274.07	
1062	E	745.0	745.0	750.0	750.0	221.43	221.76	226.75	226.42	226.42	IL ST. CLAIR
	N	4260.0	4265.0	4265.0	4260.0	4261.09	4266.08	4265.76	4260.77	4260.77	
1063	E	745.0	745.0	750.0	750.0	221.76	222.08	227.07	226.75	226.75	IL ST. CLAIR
	N	4265.0	4270.0	4270.0	4265.0	4266.08	4271.07	4270.75	4265.76	4265.76	
2284	E	745.0	745.0	747.0	747.0	222.08	222.21	224.21	224.08	224.08	IL ST. CLAIR
	N	4270.0	4272.0	4272.0	4270.0	4271.07	4273.07	4272.94	4270.94	4270.94	
2285	E	745.0	745.0	746.0	746.0	222.21	222.28	223.28	223.21	223.21	IL ST. CLAIR
	N	4272.0	4273.0	4273.0	4272.0	4273.07	4274.07	4274.00	4273.00	4273.00	

TABLE 1. (CONTINUED)

ST LOUIS AQCH GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY
2286	E	745.0	745.0	747.0	747.0	222.28	222.41	224.40	224.27	223.94	IL	ST. CLAIR
	N	4273.0	4275.0	4275.0	4273.0	4274.07	4276.06	4275.93	4273.94			
1066	E	745.0	745.0	746.0	746.0	222.41	222.47	223.47	223.41	223.41	IL	ST. CLAIR
	N	4275.0	4276.0	4276.0	4275.0	4276.06	4277.06	4277.00	4276.00			
1067	E	745.0	745.0	746.0	746.0	222.47	222.54	223.54	223.47	223.47	IL	ST. CLAIR
	N	4276.0	4277.0	4277.0	4276.0	4277.06	4278.06	4278.00	4277.00			
1068	E	745.0	745.0	746.0	746.0	222.54	222.60	223.60	223.54	223.54	IL	ST. CLAIR
	N	4277.0	4278.0	4278.0	4277.0	4278.06	4279.06	4278.99	4278.00			
1069	E	745.0	745.0	746.0	746.0	222.60	222.67	223.67	223.60	223.60	IL	ST. CLAIR
	N	4278.0	4279.0	4279.0	4278.0	4279.06	4280.05	4279.99	4278.99			
1070	E	745.0	745.0	746.0	746.0	222.67	222.74	223.73	223.67	223.67	IL	ST. CLAIR
	N	4279.0	4280.0	4280.0	4279.0	4280.05	4281.05	4280.99	4279.99			
1071	E	745.0	745.0	746.0	746.0	222.74	222.80	223.80	223.73	223.73	IL	ST. CLAIR
	N	4280.0	4281.0	4281.0	4280.0	4281.05	4282.05	4281.99	4280.99			
1072	E	745.0	745.0	746.0	746.0	222.80	222.87	223.86	223.80	223.80	IL	ST. CLAIR
	N	4281.0	4282.0	4282.0	4281.0	4282.05	4283.05	4282.98	4281.99			
1073	E	745.0	745.0	746.0	746.0	222.87	222.93	223.93	223.86	223.86	IL	ST. CLAIR
	N	4282.0	4283.0	4283.0	4282.0	4283.05	4284.05	4283.98	4282.98			
2289	E	746.0	746.0	747.0	747.0	223.21	223.28	224.27	224.21	224.21	IL	ST. CLAIR
	N	4272.0	4273.0	4273.0	4272.0	4273.00	4274.00	4273.94	4272.94			
1095	E	746.0	746.0	747.0	747.0	223.41	223.47	224.47	224.40	224.40	IL	ST. CLAIR
	N	4275.0	4276.0	4276.0	4275.0	4276.00	4277.00	4276.93	4275.93			
1096	E	746.0	746.0	747.0	747.0	223.47	223.54	224.54	224.47	224.47	IL	ST. CLAIR
	N	4276.0	4277.0	4277.0	4276.0	4277.00	4278.00	4277.93	4276.93			
1097	E	746.0	746.0	747.0	747.0	223.54	223.60	224.60	224.54	224.54	IL	ST. CLAIR
	N	4277.0	4278.0	4278.0	4277.0	4278.00	4279.00	4278.93	4277.93			
1098	E	746.0	746.0	747.0	747.0	223.60	223.67	224.67	224.60	224.60	IL	ST. CLAIR
	N	4278.0	4279.0	4279.0	4278.0	4278.99	4279.99	4279.93	4278.93			
1099	E	746.0	746.0	747.0	747.0	223.67	223.73	224.73	224.67	224.67	IL	ST. CLAIR
	N	4279.0	4280.0	4280.0	4279.0	4279.99	4280.99	4280.92	4279.93			

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY
1100	E	746.0	746.0	747.0	747.0	223.73	223.80	224.80	224.73	IL	ST. CLAIR	
	N	4280.0	4281.0	4280.0	4280.0	4280.99	4281.99	4281.92	4280.92			
1101	E	746.0	746.0	747.0	747.0	223.80	223.86	224.86	224.80	IL	ST. CLAIR	
	N	4281.0	4282.0	4281.0	4281.0	4281.99	4282.98	4282.92	4281.92			
1102	E	746.0	746.0	747.0	747.0	223.86	223.93	224.93	224.86	IL	ST. CLAIR	
	N	4282.0	4283.0	4282.0	4282.0	4282.98	4283.98	4283.92	4282.92			
2290	E	747.0	747.0	748.0	748.0	224.08	224.14	225.14	225.08	IL	ST. CLAIR	
	N	4270.0	4271.0	4270.0	4270.0	4270.94	4271.94	4271.88	4270.88			
2291	E	747.0	747.0	748.0	748.0	224.14	224.21	225.21	225.14	IL	ST. CLAIR	
	N	4271.0	4272.0	4272.0	4271.0	4271.94	4272.94	4272.88	4271.88			
2292	E	747.0	747.0	748.0	748.0	224.21	224.27	225.27	225.21	IL	ST. CLAIR	
	N	4272.0	4273.0	4272.0	4272.0	4272.94	4273.94	4273.87	4272.88			
2293	E	747.0	747.0	748.0	748.0	224.27	224.34	225.34	225.27	IL	ST. CLAIR	
	N	4273.0	4274.0	4273.0	4273.0	4273.94	4274.93	4274.87	4273.87			
2294	E	747.0	747.0	748.0	748.0	224.34	224.40	225.40	225.34	IL	ST. CLAIR	
	N	4274.0	4275.0	4274.0	4274.0	4274.93	4275.93	4275.87	4274.87			
1118	E	747.0	747.0	748.0	748.0	224.40	224.47	225.47	225.40	IL	ST. CLAIR	
	N	4275.0	4276.0	4275.0	4275.0	4275.93	4276.93	4276.87	4275.87			
1119	E	747.0	747.0	748.0	748.0	224.47	224.54	225.53	225.47	IL	ST. CLAIR	
	N	4276.0	4277.0	4276.0	4276.0	4276.93	4277.93	4277.86	4276.87			
1120	E	747.0	747.0	748.0	748.0	224.54	224.60	225.60	225.53	IL	ST. CLAIR	
	N	4277.0	4278.0	4277.0	4277.0	4277.93	4278.93	4278.86	4277.86			
1121	E	747.0	747.0	748.0	748.0	224.60	224.67	225.66	225.60	IL	ST. CLAIR	
	N	4278.0	4279.0	4278.0	4278.0	4278.93	4279.93	4279.86	4278.86			
1122	E	747.0	747.0	748.0	748.0	224.67	224.73	225.73	225.66	IL	ST. CLAIR	
	N	4279.0	4280.0	4280.0	4279.0	4279.93	4280.92	4280.86	4279.86			
1123	E	747.0	747.0	750.0	750.0	224.73	224.93	227.92	227.73	IL	ST. CLAIR	
	N	4280.0	4283.0	4283.0	4280.0	4280.92	4283.92	4283.72	4280.73			
2296	E	748.0	748.0	750.0	750.0	225.08	225.21	227.20	227.07	IL	ST. CLAIR	
	N	4270.0	4272.0	4272.0	4270.0	4270.88	4272.88	4272.74	4270.75			

TABLE 1. (CONTINUED)

ST LOUIS AUCK GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE COUNTY
2297 E	748.0	748.0	749.0	749.0	225.21	225.27	226.27	226.20	226.20	226.20	IL ST. CLAIR
N	4272.0	4273.0	4273.0	4272.0	4272.88	4273.87	4273.80	4272.81	4272.81	4272.81	
2298 E	748.0	748.0	750.0	750.0	225.27	225.40	227.40	227.27	227.27	227.27	IL ST. CLAIR
N	4273.0	4275.0	4275.0	4273.0	4273.87	4275.87	4275.74	4273.74	4273.74	4273.74	
1150 E	748.0	748.0	749.0	749.0	225.40	225.47	226.47	226.40	226.40	226.40	IL ST. CLAIR
N	4275.0	4276.0	4276.0	4275.0	4275.87	4276.87	4276.80	4275.80	4275.80	4275.80	
1151 E	748.0	748.0	749.0	749.0	225.47	225.53	226.53	226.47	226.47	226.47	IL ST. CLAIR
N	4276.0	4277.0	4277.0	4276.0	4276.87	4277.86	4277.80	4276.80	4276.80	4276.80	
1152 E	748.0	748.0	749.0	749.0	225.53	225.60	226.60	226.53	226.53	226.53	IL ST. CLAIR
N	4277.0	4278.0	4278.0	4277.0	4277.86	4278.86	4278.80	4277.80	4277.80	4277.80	
1153 E	748.0	748.0	749.0	749.0	225.60	225.66	226.66	226.60	226.60	226.60	IL ST. CLAIR
N	4278.0	4279.0	4279.0	4278.0	4278.86	4279.86	4279.79	4278.80	4278.80	4278.80	
1154 E	748.0	748.0	749.0	749.0	225.66	225.73	226.73	226.66	226.66	226.66	IL ST. CLAIR
N	4279.0	4280.0	4280.0	4279.0	4279.86	4280.86	4280.79	4279.79	4279.79	4279.79	
2301 E	749.0	749.0	750.0	750.0	226.20	226.27	227.27	227.20	227.20	227.20	IL ST. CLAIR
N	4272.0	4273.0	4273.0	4272.0	4272.81	4273.80	4273.74	4272.74	4272.74	4272.74	
1179 E	749.0	749.0	750.0	750.0	226.40	226.47	227.46	227.40	227.40	227.40	IL ST. CLAIR
N	4275.0	4276.0	4276.0	4275.0	4275.80	4276.80	4276.73	4275.74	4275.74	4275.74	
1180 E	749.0	749.0	750.0	750.0	226.47	226.53	227.53	227.46	227.46	227.46	IL ST. CLAIR
N	4276.0	4277.0	4277.0	4276.0	4276.80	4277.80	4277.73	4276.73	4276.73	4276.73	
1181 E	749.0	749.0	750.0	750.0	226.53	226.60	227.59	227.53	227.53	227.53	IL ST. CLAIR
N	4277.0	4278.0	4278.0	4277.0	4277.80	4278.80	4278.73	4277.73	4277.73	4277.73	
1182 E	749.0	749.0	750.0	750.0	226.60	226.66	227.66	227.59	227.59	227.59	IL ST. CLAIR
N	4278.0	4279.0	4279.0	4278.0	4278.80	4279.79	4279.73	4278.73	4278.73	4278.73	
1183 E	749.0	749.0	750.0	750.0	226.66	226.73	227.73	227.66	227.66	227.66	IL ST. CLAIR
N	4279.0	4280.0	4280.0	4279.0	4279.79	4280.79	4280.73	4279.73	4279.73	4279.73	
1208 E	750.0	750.0	760.0	760.0	226.09	226.15	236.15	236.07	236.07	236.07	IL ST. CLAIR
N	4255.0	4265.0	4265.0	4255.0	4255.78	4265.76	4265.11	4255.13	4255.13	4255.13	
2304 E	750.0	750.0	753.0	753.0	226.75	226.94	229.94	229.74	229.74	229.74	IL ST. CLAIR
N	4265.0	4268.0	4268.0	4265.0	4265.76	4268.75	4268.55	4265.56	4265.56	4265.56	

TABLE 1. (CONTINUED)

ST LOUIS AGCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE ..		***** UTM ZONE 16		***** UTM ZONE 16		***** UTM ZONE 16		***** UTM ZONE 16		STATE COUNTY
2305	E	750.0	750.0	752.0	752.0	4268.0	4270.0	4268.0	4270.0	4268.0	IL ST. CLAIR
	N	4268.0	4270.0	4270.0	4270.0	4268.0	4270.0	4268.0	4270.0	4268.0	
1211	E	750.0	750.0	752.0	752.0	4270.0	4272.0	4270.0	4272.0	4270.0	IL ST. CLAIR
	N	4270.0	4272.0	4272.0	4272.0	4270.0	4272.0	4270.0	4272.0	4270.0	
1212	E	750.0	750.0	751.0	751.0	4272.0	4273.0	4272.0	4273.0	4272.0	IL ST. CLAIR
	N	4272.0	4273.0	4273.0	4273.0	4272.0	4273.0	4272.0	4273.0	4272.0	
1213	E	750.0	750.0	751.0	751.0	4273.0	4274.0	4273.0	4274.0	4273.0	IL ST. CLAIR
	N	4273.0	4274.0	4274.0	4274.0	4273.0	4274.0	4273.0	4274.0	4273.0	
1214	E	750.0	750.0	751.0	751.0	4274.0	4275.0	4274.0	4275.0	4274.0	IL ST. CLAIR
	N	4274.0	4275.0	4275.0	4275.0	4274.0	4275.0	4274.0	4275.0	4274.0	
1215	E	750.0	750.0	751.0	751.0	4275.0	4276.0	4275.0	4276.0	4275.0	IL ST. CLAIR
	N	4275.0	4276.0	4276.0	4276.0	4275.0	4276.0	4275.0	4276.0	4275.0	
1216	E	750.0	750.0	751.0	751.0	4276.0	4277.0	4276.0	4277.0	4276.0	IL ST. CLAIR
	N	4276.0	4277.0	4277.0	4277.0	4276.0	4277.0	4276.0	4277.0	4276.0	
1217	E	750.0	750.0	751.0	751.0	4277.0	4278.0	4277.0	4278.0	4277.0	IL ST. CLAIR
	N	4277.0	4278.0	4278.0	4278.0	4277.0	4278.0	4277.0	4278.0	4277.0	
1218	E	750.0	750.0	751.0	751.0	4278.0	4279.0	4278.0	4279.0	4278.0	IL ST. CLAIR
	N	4278.0	4279.0	4279.0	4279.0	4278.0	4279.0	4278.0	4279.0	4278.0	
1219	E	750.0	750.0	751.0	751.0	4279.0	4280.0	4279.0	4280.0	4279.0	IL ST. CLAIR
	N	4279.0	4280.0	4280.0	4280.0	4279.0	4280.0	4279.0	4280.0	4279.0	
1220	E	750.0	750.0	751.0	751.0	4280.0	4281.0	4280.0	4281.0	4280.0	IL ST. CLAIR
	N	4280.0	4281.0	4281.0	4281.0	4280.0	4281.0	4280.0	4281.0	4280.0	
1221	E	750.0	750.0	751.0	751.0	4281.0	4282.0	4281.0	4282.0	4281.0	IL ST. CLAIR
	N	4281.0	4282.0	4282.0	4282.0	4281.0	4282.0	4281.0	4282.0	4281.0	
1246	E	751.0	751.0	752.0	752.0	4272.0	4273.0	4272.0	4273.0	4272.0	IL ST. CLAIR
	N	4272.0	4273.0	4273.0	4273.0	4272.0	4273.0	4272.0	4273.0	4272.0	
1247	E	751.0	751.0	752.0	752.0	4273.0	4274.0	4273.0	4274.0	4273.0	IL ST. CLAIR
	N	4273.0	4274.0	4274.0	4274.0	4273.0	4274.0	4273.0	4274.0	4273.0	
1248	E	751.0	751.0	752.0	752.0	4274.0	4275.0	4274.0	4275.0	4274.0	IL ST. CLAIR
	N	4274.0	4275.0	4275.0	4275.0	4274.0	4275.0	4274.0	4275.0	4274.0	

TABLE 1. (CONTINUED)

ST LOUIS AQCK GRID SQUARE COORDINATES (KM)										
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY
1249	E	751.0	751.0	752.0	752.0	228.40	228.46	229.46	IL	ST. CLAIR
	N	4275.0	4276.0	4276.0	4275.0	4275.67	4276.67	4276.61			4275.61
1250	E	751.0	751.0	752.0	752.0	228.46	228.53	229.53	IL	ST. CLAIR
	N	4276.0	4277.0	4276.0	4276.0	4276.67	4277.67	4277.60			4276.61
1251	E	751.0	751.0	752.0	752.0	228.53	228.59	229.59	IL	ST. CLAIR
	N	4277.0	4278.0	4278.0	4277.0	4277.67	4278.66	4278.60			4277.60
1252	E	751.0	751.0	752.0	752.0	228.59	228.66	229.66	IL	ST. CLAIR
	N	4278.0	4279.0	4278.0	4278.0	4278.66	4279.66	4279.60			4278.60
1253	E	751.0	751.0	752.0	752.0	228.66	228.72	229.72	IL	ST. CLAIR
	N	4279.0	4280.0	4279.0	4279.0	4279.66	4280.66	4280.60			4279.60
1254	E	751.0	751.0	752.0	752.0	228.72	228.79	229.79	IL	ST. CLAIR
	N	4280.0	4281.0	4280.0	4280.0	4280.66	4281.66	4281.59			4280.60
1255	E	751.0	751.0	752.0	752.0	228.79	228.85	229.85	IL	ST. CLAIR
	N	4281.0	4282.0	4281.0	4281.0	4281.66	4282.66	4282.59			4281.59
2310	E	752.0	752.0	754.0	754.0	228.94	229.07	231.06	IL	ST. CLAIR
	N	4268.0	4270.0	4268.0	4268.0	4268.62	4270.62	4270.48			4268.49
1274	E	752.0	752.0	755.0	755.0	229.07	229.26	232.26	IL	ST. CLAIR
	N	4270.0	4273.0	4270.0	4270.0	4270.62	4273.61	4273.41			4270.42
1275	E	752.0	752.0	753.0	753.0	229.26	229.33	230.33	IL	ST. CLAIR
	N	4273.0	4274.0	4273.0	4273.0	4273.61	4274.61	4274.54			4273.55
1276	E	752.0	752.0	753.0	753.0	229.33	229.39	230.39	IL	ST. CLAIR
	N	4274.0	4275.0	4274.0	4274.0	4274.61	4275.61	4275.54			4274.54
1277	E	752.0	752.0	753.0	753.0	229.39	229.46	230.46	IL	ST. CLAIR
	N	4275.0	4276.0	4275.0	4275.0	4275.61	4276.61	4276.54			4275.54
1278	E	752.0	752.0	753.0	753.0	229.46	229.53	230.52	IL	ST. CLAIR
	N	4276.0	4277.0	4276.0	4276.0	4276.61	4277.60	4277.54			4276.54
1279	E	752.0	752.0	753.0	753.0	229.53	229.59	230.59	IL	ST. CLAIR
	N	4277.0	4278.0	4277.0	4277.0	4277.60	4278.60	4278.54			4277.54
1280	E	752.0	752.0	753.0	753.0	229.59	229.66	230.65	IL	ST. CLAIR
	N	4278.0	4279.0	4278.0	4278.0	4278.60	4279.60	4279.53			4278.54

TABLE 1. (CONTINUED)

ST. LOUIS AQCR GRID SQUARE COORDINATES (KM)

ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		STATE	COUNTY		
1201	E	752.0 4279.0	753.0 4280.0	229.66 4279.60	229.72 4280.60	230.65 4279.53	IL	ST. CLAIR
	N							
1202	E	752.0 4280.0	753.0 4281.0	229.72 4280.60	229.79 4281.59	230.78 4281.53	IL	ST. CLAIR
	N							
1203	E	752.0 4281.0	753.0 4282.0	229.79 4281.59	229.85 4282.59	230.85 4282.53	IL	ST. CLAIR
	N							
2313	E	753.0 4265.0	755.0 4267.0	229.74 4265.56	229.87 4267.56	231.87 4267.43	IL	ST. CLAIR
	N							
2314	E	753.0 4267.0	754.0 4268.0	229.87 4267.56	229.94 4268.55	230.93 4268.49	IL	ST. CLAIR
	N							
1308	E	753.0 4273.0	754.0 4274.0	230.26 4273.55	230.33 4274.54	231.33 4274.48	IL	ST. CLAIR
	N							
1309	E	753.0 4274.0	754.0 4275.0	230.33 4274.54	230.39 4275.54	231.39 4275.48	IL	ST. CLAIR
	N							
1310	E	753.0 4275.0	754.0 4276.0	230.39 4275.54	230.46 4276.54	231.46 4276.47	IL	ST. CLAIR
	N							
1311	E	753.0 4276.0	754.0 4277.0	230.46 4276.54	230.52 4277.54	231.52 4277.47	IL	ST. CLAIR
	N							
1312	E	753.0 4277.0	754.0 4278.0	230.52 4277.54	230.59 4278.54	231.59 4278.47	IL	ST. CLAIR
	N							
1313	E	753.0 4278.0	754.0 4279.0	230.59 4278.54	230.65 4279.53	231.65 4279.47	IL	ST. CLAIR
	N							
1314	E	753.0 4279.0	754.0 4280.0	230.65 4279.53	230.72 4280.53	231.72 4280.46	IL	ST. CLAIR
	N							
1315	E	753.0 4280.0	754.0 4281.0	230.72 4280.53	230.78 4281.53	231.78 4281.46	IL	ST. CLAIR
	N							
1316	E	753.0 4281.0	754.0 4282.0	230.78 4281.53	230.85 4282.53	231.85 4282.46	IL	ST. CLAIR
	N							
1317	E	753.0 4282.0	754.0 4283.0	230.85 4282.53	230.92 4283.52	231.91 4283.46	IL	ST. CLAIR
	N							

TABLE 1. (CONTINUED)

ST LOUIS AOCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****					***** UTM ZONE 16 *****					STATE	COUNTY
2318	E	754.0	754.0	755.0	755.0	230.87	230.93	231.93	231.87	IL	ST. CLAIR	
	N	4267.0	4268.0	4267.0	4267.0	4267.49	4268.49	4268.43	4267.43			
2319	E	754.0	754.0	755.0	755.0	230.93	231.00	232.00	231.93	IL	ST. CLAIR	
	N	4268.0	4269.0	4268.0	4268.0	4268.49	4269.49	4269.42	4268.43			
2320	E	754.0	754.0	755.0	755.0	231.00	231.06	232.06	232.00	IL	ST. CLAIR	
	N	4269.0	4270.0	4269.0	4269.0	4269.49	4270.48	4270.42	4269.42			
1340	E	754.0	754.0	755.0	755.0	231.26	231.33	232.32	232.26	IL	ST. CLAIR	
	N	4273.0	4274.0	4273.0	4273.0	4273.48	4274.48	4274.41	4273.41			
1341	E	754.0	754.0	755.0	755.0	231.33	231.39	232.39	232.32	IL	ST. CLAIR	
	N	4274.0	4275.0	4274.0	4274.0	4274.48	4275.48	4275.41	4274.41			
1342	E	754.0	754.0	755.0	755.0	231.39	231.46	232.45	232.39	IL	ST. CLAIR	
	N	4275.0	4276.0	4275.0	4275.0	4275.48	4276.47	4276.41	4275.41			
1343	E	754.0	754.0	755.0	755.0	231.46	231.52	232.52	232.45	IL	ST. CLAIR	
	N	4276.0	4277.0	4276.0	4276.0	4276.47	4277.47	4277.41	4276.41			
1344	E	754.0	754.0	755.0	755.0	231.52	231.59	232.58	232.52	IL	ST. CLAIR	
	N	4277.0	4278.0	4277.0	4277.0	4277.47	4278.47	4278.40	4277.41			
1345	E	754.0	754.0	755.0	755.0	231.59	231.65	232.65	232.58	IL	ST. CLAIR	
	N	4278.0	4279.0	4278.0	4278.0	4278.47	4279.47	4279.40	4278.40			
1346	E	754.0	754.0	755.0	755.0	231.65	231.72	232.72	232.65	IL	ST. CLAIR	
	N	4279.0	4280.0	4279.0	4279.0	4279.47	4280.46	4280.40	4279.40			
1347	E	754.0	754.0	755.0	755.0	231.72	231.78	232.78	232.72	IL	ST. CLAIR	
	N	4280.0	4281.0	4280.0	4280.0	4280.46	4281.46	4281.40	4280.40			
1348	E	754.0	754.0	755.0	755.0	231.78	231.85	232.85	232.78	IL	ST. CLAIR	
	N	4281.0	4282.0	4281.0	4281.0	4281.46	4282.46	4282.39	4281.40			
1349	E	754.0	754.0	755.0	755.0	231.85	231.91	232.91	232.85	IL	ST. CLAIR	
	N	4282.0	4283.0	4282.0	4282.0	4282.46	4283.46	4283.39	4282.39			
1376	E	755.0	755.0	760.0	760.0	230.43	230.76	235.75	235.42	IL	ST. CLAIR	
	N	4245.0	4250.0	4245.0	4245.0	4245.47	4250.46	4250.14	4245.15			
1377	E	755.0	755.0	760.0	760.0	230.76	231.08	236.07	235.75	IL	ST. CLAIR	
	N	4250.0	4255.0	4250.0	4250.0	4250.46	4255.45	4255.13	4250.14			

TABLE 1. (CONTINUED)

ST LOUIS AOCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE COUNTY
1378	E	755.0	755.0	759.0	759.0	759.0	231.74	232.00	235.99	235.73	IL ST. CLAIR
	N	4265.0	4269.0	4269.0	4265.0	4265.0	4265.43	4269.42	4269.16	4265.17	
1379	E	755.0	755.0	756.0	756.0	756.0	232.00	232.06	233.06	232.99	IL ST. CLAIR
	N	4269.0	4270.0	4270.0	4269.0	4269.0	4269.42	4270.42	4270.36	4269.36	
1380	E	755.0	755.0	756.0	756.0	756.0	232.06	232.13	233.13	233.06	IL ST. CLAIR
	N	4270.0	4271.0	4271.0	4270.0	4270.0	4270.42	4271.42	4271.35	4270.36	
1381	E	755.0	755.0	756.0	756.0	756.0	232.13	232.19	233.19	233.13	IL ST. CLAIR
	N	4271.0	4272.0	4272.0	4271.0	4271.0	4271.42	4272.42	4272.35	4271.35	
1382	E	755.0	755.0	756.0	756.0	756.0	232.19	232.26	233.26	233.19	IL ST. CLAIR
	N	4272.0	4273.0	4273.0	4272.0	4272.0	4272.42	4273.41	4273.35	4272.35	
1383	E	755.0	755.0	756.0	756.0	756.0	232.26	232.32	233.32	233.26	IL ST. CLAIR
	N	4273.0	4274.0	4274.0	4273.0	4273.0	4273.41	4274.41	4274.35	4273.35	
1384	E	755.0	755.0	756.0	756.0	756.0	232.32	232.39	233.39	233.32	IL ST. CLAIR
	N	4274.0	4275.0	4275.0	4274.0	4274.0	4274.41	4275.41	4275.34	4274.35	
1385	E	755.0	755.0	756.0	756.0	756.0	232.39	232.45	233.45	233.39	IL ST. CLAIR
	N	4275.0	4276.0	4276.0	4275.0	4275.0	4275.41	4276.41	4276.34	4275.34	
1386	E	755.0	755.0	756.0	756.0	756.0	232.45	232.52	233.52	233.45	IL ST. CLAIR
	N	4276.0	4277.0	4277.0	4276.0	4276.0	4276.41	4277.41	4277.34	4276.34	
1387	E	755.0	755.0	756.0	756.0	756.0	232.52	232.58	233.58	233.52	IL ST. CLAIR
	N	4277.0	4278.0	4278.0	4277.0	4277.0	4277.41	4278.40	4278.34	4277.34	
1388	E	755.0	755.0	757.0	757.0	757.0	232.58	232.72	234.71	234.58	IL ST. CLAIR
	N	4278.0	4280.0	4280.0	4278.0	4278.0	4278.40	4280.40	4280.27	4278.27	
2322	E	755.0	755.0	756.0	756.0	756.0	232.72	232.78	233.78	233.71	IL ST. CLAIR
	N	4280.0	4281.0	4281.0	4280.0	4280.0	4280.40	4281.40	4281.33	4280.34	
2323	E	755.0	755.0	756.0	756.0	756.0	232.78	232.85	233.84	233.78	IL ST. CLAIR
	N	4281.0	4282.0	4282.0	4281.0	4281.0	4281.40	4282.39	4282.33	4281.33	
2324	E	755.0	755.0	756.0	756.0	756.0	232.85	232.91	233.91	233.84	IL ST. CLAIR
	N	4282.0	4283.0	4283.0	4282.0	4282.0	4282.39	4283.39	4283.33	4282.33	
1410	E	756.0	756.0	757.0	757.0	757.0	232.99	233.06	234.06	233.99	IL ST. CLAIR
	N	4269.0	4270.0	4270.0	4269.0	4269.0	4269.36	4270.36	4270.29	4269.29	

TABLE 1. (CONTINUED)

ST LOUIS AQCK GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE COUNTY
1411 E	756.0	756.0	757.0	757.0	233.06	233.13	234.12	234.06	234.06	234.06	IL ST. CLAIR
N	4270.0	4271.0	4271.0	4270.0	4270.36	4271.55	4271.29	4270.29	4270.29	4270.29	
1412 E	756.0	756.0	757.0	757.0	233.13	233.19	234.19	234.12	234.12	234.12	IL ST. CLAIR
N	4271.0	4272.0	4272.0	4271.0	4271.35	4272.35	4272.29	4271.29	4271.29	4271.29	
1413 E	756.0	756.0	757.0	757.0	233.19	233.26	234.25	234.19	234.19	234.19	IL ST. CLAIR
N	4272.0	4273.0	4273.0	4272.0	4272.35	4273.35	4273.29	4272.29	4272.29	4272.29	
1414 E	756.0	756.0	757.0	757.0	233.26	233.32	234.32	234.25	234.25	234.25	IL ST. CLAIR
N	4273.0	4274.0	4274.0	4273.0	4273.35	4274.35	4274.28	4273.29	4273.29	4273.29	
1415 E	756.0	756.0	757.0	757.0	233.32	233.39	234.38	234.32	234.32	234.32	IL ST. CLAIR
N	4274.0	4275.0	4275.0	4274.0	4274.35	4275.34	4275.28	4274.28	4274.28	4274.28	
1416 E	756.0	756.0	757.0	757.0	233.39	233.45	234.45	234.38	234.38	234.38	IL ST. CLAIR
N	4275.0	4276.0	4276.0	4275.0	4275.34	4276.34	4276.28	4275.28	4275.28	4275.28	
1417 E	756.0	756.0	757.0	757.0	233.45	233.52	234.52	234.45	234.45	234.45	IL ST. CLAIR
N	4276.0	4277.0	4277.0	4276.0	4276.34	4277.34	4277.28	4276.28	4276.28	4276.28	
1418 E	756.0	756.0	757.0	757.0	233.52	233.58	234.58	234.52	234.52	234.52	IL ST. CLAIR
N	4277.0	4278.0	4278.0	4277.0	4277.34	4278.34	4278.27	4277.28	4277.28	4277.28	
2327 E	756.0	756.0	758.0	758.0	233.71	233.84	235.84	235.71	235.71	235.71	IL ST. CLAIR
N	4280.0	4282.0	4282.0	4280.0	4280.34	4282.33	4282.20	4280.20	4280.20	4280.20	
2328 E	756.0	756.0	757.0	757.0	233.84	233.91	234.91	234.84	234.84	234.84	IL ST. CLAIR
N	4282.0	4283.0	4283.0	4282.0	4282.33	4283.33	4283.26	4282.27	4282.27	4282.27	
1431 E	757.0	757.0	758.0	758.0	233.99	234.06	235.06	234.99	234.99	234.99	IL ST. CLAIR
N	4269.0	4270.0	4270.0	4269.0	4269.29	4270.29	4270.23	4269.23	4269.23	4269.23	
1432 E	757.0	757.0	758.0	758.0	234.06	234.12	235.12	235.06	235.06	235.06	IL ST. CLAIR
N	4270.0	4271.0	4271.0	4270.0	4270.29	4271.29	4271.22	4270.23	4270.23	4270.23	
1433 E	757.0	757.0	758.0	758.0	234.12	234.19	235.19	235.12	235.12	235.12	IL ST. CLAIR
N	4271.0	4272.0	4272.0	4271.0	4271.29	4272.29	4272.22	4271.22	4271.22	4271.22	
1434 E	757.0	757.0	758.0	758.0	234.19	234.25	235.25	235.19	235.19	235.19	IL ST. CLAIR
N	4272.0	4273.0	4273.0	4272.0	4272.29	4273.29	4273.22	4272.22	4272.22	4272.22	
1435 E	757.0	757.0	758.0	758.0	234.25	234.32	235.32	235.25	235.25	235.25	IL ST. CLAIR
N	4273.0	4274.0	4274.0	4273.0	4273.29	4274.28	4274.21	4273.22	4273.22	4273.22	

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE COUNTY
1436	E	757.0	757.0	758.0	758.0	758.0	234.32	234.38	235.38	235.32	IL ST. CLAIR
	N	4274.0	4275.0	4275.0	4274.0	4274.0	4274.28	4275.28	4275.21	4274.21	
1437	E	757.0	757.0	758.0	758.0	758.0	234.38	234.45	235.45	235.38	IL ST. CLAIR
	N	4275.0	4276.0	4276.0	4275.0	4275.0	4275.28	4276.28	4276.21	4275.21	
1438	E	757.0	757.0	758.0	758.0	758.0	234.45	234.52	235.51	235.45	IL ST. CLAIR
	N	4276.0	4277.0	4277.0	4276.0	4276.0	4276.28	4277.28	4277.21	4276.21	
1439	E	757.0	757.0	758.0	758.0	758.0	234.52	234.58	235.58	235.51	IL ST. CLAIR
	N	4277.0	4278.0	4278.0	4277.0	4277.0	4277.28	4278.27	4278.21	4277.21	
1440	E	757.0	757.0	758.0	758.0	758.0	234.58	234.65	235.64	235.58	IL ST. CLAIR
	N	4278.0	4279.0	4279.0	4278.0	4278.0	4278.27	4279.27	4279.21	4278.21	
1441	E	757.0	757.0	758.0	758.0	758.0	234.65	234.71	235.71	235.64	IL ST. CLAIR
	N	4279.0	4280.0	4280.0	4279.0	4279.0	4279.27	4280.27	4280.20	4279.21	
2330	E	757.0	757.0	758.0	758.0	758.0	234.84	234.91	235.91	235.84	IL ST. CLAIR
	N	4282.0	4283.0	4283.0	4282.0	4282.0	4282.27	4283.26	4283.20	4282.20	
1449	E	758.0	758.0	759.0	759.0	759.0	234.99	235.06	236.05	235.99	IL ST. CLAIR
	N	4269.0	4270.0	4270.0	4269.0	4269.0	4269.23	4270.23	4270.16	4269.16	
1450	E	758.0	758.0	759.0	759.0	759.0	235.06	235.12	236.12	236.05	IL ST. CLAIR
	N	4270.0	4271.0	4271.0	4270.0	4270.0	4270.23	4271.22	4271.16	4270.16	
1451	E	758.0	758.0	759.0	759.0	759.0	235.12	235.19	236.18	236.12	IL ST. CLAIR
	N	4271.0	4272.0	4272.0	4271.0	4271.0	4271.22	4272.22	4272.16	4271.16	
1452	E	758.0	758.0	759.0	759.0	759.0	235.19	235.25	236.25	236.18	IL ST. CLAIR
	N	4272.0	4273.0	4273.0	4272.0	4272.0	4272.22	4273.22	4273.15	4272.16	
1453	E	758.0	758.0	759.0	759.0	759.0	235.25	235.32	236.31	236.25	IL ST. CLAIR
	N	4273.0	4274.0	4274.0	4273.0	4273.0	4273.22	4274.21	4274.15	4273.15	
1454	E	758.0	758.0	759.0	759.0	759.0	235.32	235.38	236.38	236.31	IL ST. CLAIR
	N	4274.0	4275.0	4275.0	4274.0	4274.0	4274.21	4275.21	4275.15	4274.15	
1455	E	758.0	758.0	760.0	760.0	760.0	235.38	235.51	237.51	237.38	IL ST. CLAIR
	N	4275.0	4277.0	4277.0	4275.0	4275.0	4275.21	4277.21	4277.08	4275.08	
1456	E	758.0	758.0	760.0	760.0	760.0	235.51	235.64	237.64	237.51	IL ST. CLAIR
	N	4277.0	4279.0	4279.0	4277.0	4277.0	4277.21	4279.21	4279.07	4277.08	

TABLE 1. (CONTINUED)

ST LOUIS AUCK GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY		
1457	E	758.0	758.0	759.0	759.0	759.0	235.64	235.71	236.64	IL	ST. CLAIR	
	N	4279.0	4280.0	4280.0	4279.0	4279.0	4279.21	4280.20	4279.14			
2331	E	758.0	758.0	760.0	760.0	760.0	235.71	235.84	237.84	IL	ST. CLAIR	
	N	4280.0	4282.0	4282.0	4280.0	4280.0	4280.20	4282.20	4282.07			
2332	E	758.0	758.0	759.0	759.0	759.0	235.84	235.91	236.90	IL	ST. CLAIR	
	N	4282.0	4283.0	4283.0	4282.0	4282.0	4282.20	4283.20	4282.13			
1459	E	759.0	759.0	760.0	760.0	760.0	235.73	235.79	236.79	IL	ST. CLAIR	
	N	4265.0	4266.0	4266.0	4265.0	4265.0	4265.17	4266.17	4265.11			
1460	E	759.0	759.0	760.0	760.0	760.0	235.79	235.86	236.86	IL	ST. CLAIR	
	N	4266.0	4267.0	4267.0	4266.0	4266.0	4266.17	4267.16	4266.10			
1461	E	759.0	759.0	760.0	760.0	760.0	235.86	235.92	236.92	IL	ST. CLAIR	
	N	4267.0	4268.0	4268.0	4267.0	4267.0	4267.16	4268.16	4267.10			
1462	E	759.0	759.0	760.0	760.0	760.0	235.92	235.99	236.99	IL	ST. CLAIR	
	N	4268.0	4269.0	4269.0	4268.0	4268.0	4268.16	4269.16	4268.10			
1463	E	759.0	759.0	760.0	760.0	760.0	235.99	236.05	237.05	IL	ST. CLAIR	
	N	4269.0	4270.0	4270.0	4269.0	4269.0	4269.16	4270.16	4269.10			
1464	E	759.0	759.0	760.0	760.0	760.0	236.05	236.12	237.12	IL	ST. CLAIR	
	N	4270.0	4271.0	4271.0	4270.0	4270.0	4270.16	4271.16	4270.09			
1465	E	759.0	759.0	760.0	760.0	760.0	236.12	236.18	237.18	IL	ST. CLAIR	
	N	4271.0	4272.0	4272.0	4271.0	4271.0	4271.16	4272.16	4271.09			
1466	E	759.0	759.0	760.0	760.0	760.0	236.18	236.25	237.25	IL	ST. CLAIR	
	N	4272.0	4273.0	4273.0	4272.0	4272.0	4272.16	4273.15	4272.09			
1467	E	759.0	759.0	760.0	760.0	760.0	236.25	236.31	237.31	IL	ST. CLAIR	
	N	4273.0	4274.0	4274.0	4273.0	4273.0	4273.15	4274.15	4273.09			
1468	E	759.0	759.0	760.0	760.0	760.0	236.31	236.38	237.38	IL	ST. CLAIR	
	N	4274.0	4275.0	4275.0	4274.0	4274.0	4274.15	4275.15	4274.09			
1469	E	759.0	759.0	760.0	760.0	760.0	236.64	236.71	237.71	IL	ST. CLAIR	
	N	4279.0	4280.0	4280.0	4279.0	4279.0	4279.14	4280.14	4279.07			
2334	E	759.0	759.0	760.0	760.0	760.0	236.84	236.90	237.90	IL	ST. CLAIR	
	N	4282.0	4283.0	4283.0	4282.0	4282.0	4282.13	4283.13	4282.07			

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		COUNTY
1481	E	760.0	760.0	765.0	765.0	235.42	235.75	240.74	240.41	IL	ST. CLAIR
	N	4245.0	4250.0	4250.0	4245.0	4245.15	4250.14	4249.81	4244.82		
1482	E	760.0	760.0	765.0	765.0	235.75	236.07	241.06	240.74	IL	ST. CLAIR
	N	4250.0	4255.0	4250.0	4250.0	4250.14	4255.13	4254.80	4249.81		
1483	E	760.0	760.0	765.0	765.0	236.07	236.40	241.39	241.06	IL	ST. CLAIR
	N	4255.0	4260.0	4260.0	4255.0	4255.13	4260.12	4259.79	4254.80		
1484	E	760.0	760.0	765.0	765.0	236.40	236.73	241.71	241.39	IL	ST. CLAIR
	N	4260.0	4265.0	4265.0	4260.0	4260.12	4265.11	4264.78	4259.79		
1485	E	760.0	760.0	761.0	761.0	236.73	236.79	237.79	237.72	IL	ST. CLAIR
	N	4265.0	4266.0	4266.0	4265.0	4265.11	4266.10	4266.04	4265.04		
1486	E	760.0	760.0	761.0	761.0	236.79	236.86	237.85	237.79	IL	ST. CLAIR
	N	4266.0	4267.0	4267.0	4266.0	4266.10	4267.10	4267.04	4266.04		
1487	E	760.0	760.0	761.0	761.0	236.86	236.92	237.92	237.85	IL	ST. CLAIR
	N	4267.0	4268.0	4268.0	4267.0	4267.10	4268.10	4268.04	4267.04		
1488	E	760.0	760.0	761.0	761.0	236.92	236.99	237.98	237.92	IL	ST. CLAIR
	N	4268.0	4269.0	4269.0	4268.0	4268.10	4269.10	4269.03	4268.04		
1489	E	760.0	760.0	761.0	761.0	236.99	237.05	238.05	237.98	IL	ST. CLAIR
	N	4269.0	4270.0	4270.0	4269.0	4269.10	4270.09	4270.03	4269.03		
1494	E	760.0	760.0	763.0	763.0	237.70	237.90	240.89	240.70	IL	ST. CLAIR
	N	4280.0	4283.0	4283.0	4280.0	4280.07	4283.07	4282.87	4279.88		
2337	E	760.0	760.0	762.0	762.0	237.05	237.18	239.18	239.05	IL	ST. CLAIR
	N	4270.0	4272.0	4272.0	4270.0	4270.09	4272.09	4271.96	4269.96		
2338	E	760.0	760.0	762.0	762.0	237.18	237.31	239.31	239.18	IL	ST. CLAIR
	N	4272.0	4274.0	4274.0	4272.0	4272.09	4274.09	4273.96	4271.96		
2339	E	760.0	760.0	762.0	762.0	237.31	237.44	239.44	239.31	IL	ST. CLAIR
	N	4274.0	4276.0	4276.0	4274.0	4274.09	4276.08	4275.95	4273.96		
2340	E	760.0	760.0	762.0	762.0	237.44	237.57	239.57	239.44	IL	ST. CLAIR
	N	4276.0	4278.0	4278.0	4276.0	4276.08	4278.08	4277.95	4275.95		
2341	E	760.0	760.0	762.0	762.0	237.57	237.70	239.70	239.57	IL	ST. CLAIR
	N	4278.0	4280.0	4280.0	4278.0	4278.08	4280.07	4279.94	4277.95		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)										
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY
1508	E	761.0	762.0	762.0	237.72	237.79	238.79	238.72	IL	ST. CLAIR
	N	4265.0	4266.0	4265.0	4265.04	4266.04	4265.97	4264.97		
1509	E	761.0	762.0	762.0	237.79	237.85	238.85	238.79	IL	ST. CLAIR
	N	4266.0	4267.0	4266.0	4266.04	4267.04	4266.97	4265.97		
1510	E	761.0	762.0	762.0	237.85	237.92	238.92	238.85	IL	ST. CLAIR
	N	4267.0	4268.0	4267.0	4267.04	4268.04	4267.97	4266.97		
1511	E	761.0	762.0	762.0	237.92	237.98	238.98	238.92	IL	ST. CLAIR
	N	4268.0	4269.0	4268.0	4268.04	4269.03	4268.96	4267.97		
1512	E	761.0	762.0	762.0	237.98	238.05	239.05	238.98	IL	ST. CLAIR
	N	4269.0	4270.0	4269.0	4269.03	4270.03	4269.96	4268.96		
1517	E	762.0	763.0	763.0	238.72	238.79	239.78	239.72	IL	ST. CLAIR
	N	4265.0	4266.0	4265.0	4264.97	4265.97	4265.91	4264.91		
1518	E	762.0	763.0	763.0	238.79	238.85	239.85	239.78	IL	ST. CLAIR
	N	4266.0	4267.0	4266.0	4265.97	4266.97	4266.91	4265.91		
1519	E	762.0	763.0	763.0	238.85	238.92	239.91	239.85	IL	ST. CLAIR
	N	4267.0	4268.0	4267.0	4266.97	4267.97	4267.90	4266.91		
1520	E	762.0	763.0	763.0	238.92	238.98	239.98	239.91	IL	ST. CLAIR
	N	4268.0	4269.0	4268.0	4267.97	4268.96	4268.90	4267.90		
1521	E	762.0	763.0	763.0	238.98	239.05	240.05	239.98	IL	ST. CLAIR
	N	4269.0	4270.0	4269.0	4268.96	4269.96	4269.90	4268.90		
2349	E	762.0	764.0	764.0	239.05	239.18	241.17	241.04	IL	ST. CLAIR
	N	4270.0	4272.0	4270.0	4269.96	4271.96	4271.83	4269.83		
2350	E	762.0	764.0	764.0	239.18	239.31	241.30	241.17	IL	ST. CLAIR
	N	4272.0	4274.0	4272.0	4271.96	4273.96	4273.82	4271.83		
2351	E	762.0	764.0	764.0	239.31	239.44	241.43	241.30	IL	ST. CLAIR
	N	4274.0	4276.0	4274.0	4273.96	4275.95	4275.82	4273.82		
2352	E	762.0	764.0	764.0	239.44	239.57	241.57	241.43	IL	ST. CLAIR
	N	4276.0	4278.0	4276.0	4275.95	4277.95	4277.82	4275.82		
2353	E	762.0	764.0	764.0	239.57	239.70	241.70	241.57	IL	ST. CLAIR
	N	4278.0	4280.0	4278.0	4277.95	4279.94	4279.81	4277.82		

TABLE 1. (CONTINUED)

ST LOUIS AOCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE COUNTY
1539	E	763.0	763.0	764.0	764.0	764.0	239.72	239.78	240.78	240.72	IL ST. CLAIR
	N	4265.0	4266.0	4266.0	4265.0	4265.0	4264.91	4265.91	4265.84	4264.84	
1540	E	763.0	763.0	764.0	764.0	764.0	239.78	239.85	240.85	240.78	IL ST. CLAIR
	N	4266.0	4267.0	4267.0	4266.0	4266.0	4265.91	4266.91	4266.84	4265.84	
1541	E	763.0	763.0	764.0	764.0	764.0	239.85	239.91	240.91	240.85	IL ST. CLAIR
	N	4267.0	4268.0	4268.0	4267.0	4267.0	4266.91	4267.90	4267.84	4266.84	
1542	E	763.0	763.0	764.0	764.0	764.0	239.91	239.98	240.98	240.91	IL ST. CLAIR
	N	4268.0	4269.0	4269.0	4268.0	4268.0	4267.90	4268.90	4268.84	4267.84	
1543	E	763.0	763.0	764.0	764.0	764.0	239.98	240.05	241.04	240.98	IL ST. CLAIR
	N	4269.0	4270.0	4270.0	4269.0	4269.0	4268.90	4269.90	4269.83	4268.84	
1544	E	763.0	763.0	764.0	764.0	764.0	240.70	240.76	241.76	241.70	IL ST. CLAIR
	N	4280.0	4281.0	4281.0	4280.0	4280.0	4279.88	4280.88	4280.81	4279.81	
1545	E	763.0	763.0	764.0	764.0	764.0	240.76	240.83	241.83	241.76	IL ST. CLAIR
	N	4281.0	4282.0	4282.0	4281.0	4281.0	4280.88	4281.87	4281.81	4280.81	
1546	E	763.0	763.0	764.0	764.0	764.0	240.83	240.89	241.89	241.83	IL ST. CLAIR
	N	4282.0	4283.0	4283.0	4282.0	4282.0	4281.87	4282.87	4282.80	4281.81	
1559	E	764.0	764.0	765.0	765.0	765.0	240.72	240.78	241.78	241.71	IL ST. CLAIR
	N	4265.0	4266.0	4266.0	4265.0	4265.0	4264.84	4265.84	4265.78	4264.78	
1560	E	764.0	764.0	765.0	765.0	765.0	240.78	240.85	241.85	241.78	IL ST. CLAIR
	N	4266.0	4267.0	4267.0	4266.0	4266.0	4265.84	4266.84	4266.77	4265.78	
1561	E	764.0	764.0	765.0	765.0	765.0	240.85	240.91	241.91	241.85	IL ST. CLAIR
	N	4267.0	4268.0	4268.0	4267.0	4267.0	4266.84	4267.84	4267.77	4266.77	
1562	E	764.0	764.0	765.0	765.0	765.0	240.91	240.98	241.98	241.91	IL ST. CLAIR
	N	4268.0	4269.0	4269.0	4268.0	4268.0	4267.84	4268.84	4268.77	4267.77	
1563	E	764.0	764.0	765.0	765.0	765.0	240.98	241.04	242.04	241.98	IL ST. CLAIR
	N	4269.0	4270.0	4270.0	4269.0	4269.0	4268.84	4269.83	4269.77	4268.77	
2369	E	764.0	764.0	766.0	766.0	766.0	241.04	241.17	243.17	243.04	IL ST. CLAIR
	N	4270.0	4272.0	4272.0	4270.0	4270.0	4269.83	4271.83	4271.70	4269.70	
2370	E	764.0	764.0	766.0	766.0	766.0	241.17	241.30	243.30	243.17	IL ST. CLAIR
	N	4272.0	4274.0	4274.0	4272.0	4272.0	4271.83	4273.82	4273.70	4271.70	

TABLE 1. (CONTINUED)

ST LOUIS ADCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY	
2371	E	764.0	764.0	766.0	766.0	241.30	241.43	243.43	243.30	IL	ST. CLAIR
	N	4274.0	4276.0	4276.0	4274.0	4273.82	4275.82	4275.69	4273.70		
2372	E	764.0	764.0	766.0	766.0	241.43	241.57	243.56	243.43	IL	ST. CLAIR
	N	4276.0	4278.0	4278.0	4276.0	4275.82	4277.82	4277.68	4275.69		
2373	E	764.0	764.0	766.0	766.0	241.57	241.70	243.69	243.56	IL	ST. CLAIR
	N	4278.0	4280.0	4280.0	4278.0	4277.82	4279.81	4279.68	4277.68		
1564	E	764.0	764.0	765.0	765.0	241.70	241.76	242.76	242.69	IL	ST. CLAIR
	N	4280.0	4281.0	4281.0	4280.0	4279.81	4280.81	4280.74	4279.75		
1565	E	764.0	764.0	765.0	765.0	241.76	241.83	242.82	242.76	IL	ST. CLAIR
	N	4281.0	4282.0	4282.0	4281.0	4280.81	4281.81	4281.74	4280.74		
1566	E	764.0	764.0	765.0	765.0	241.83	241.89	242.89	242.82	IL	ST. CLAIR
	N	4282.0	4283.0	4283.0	4282.0	4281.81	4282.80	4282.74	4281.74		
1583	E	765.0	765.0	770.0	770.0	240.41	240.74	245.73	245.40	IL	ST. CLAIR
	N	4245.0	4250.0	4250.0	4245.0	4244.82	4249.81	4249.49	4244.50		
1584	E	765.0	765.0	775.0	775.0	240.74	241.39	251.37	250.72	IL	ST. CLAIR
	N	4250.0	4260.0	4260.0	4250.0	4249.81	4259.79	4259.14	4249.16		
1585	E	765.0	765.0	770.0	770.0	241.39	241.71	246.70	246.36	IL	ST. CLAIR
	N	4260.0	4265.0	4265.0	4260.0	4259.79	4264.78	4264.45	4259.46		
1586	E	765.0	765.0	770.0	770.0	241.71	242.04	247.03	246.70	IL	ST. CLAIR
	N	4265.0	4270.0	4270.0	4265.0	4264.78	4269.77	4269.44	4264.45		
2388	E	766.0	766.0	770.0	770.0	243.04	243.30	247.29	247.03	IL	ST. CLAIR
	N	4270.0	4274.0	4274.0	4270.0	4269.70	4273.70	4273.43	4269.44		
2389	E	766.0	766.0	768.0	768.0	243.30	243.43	245.43	245.30	IL	ST. CLAIR
	N	4274.0	4276.0	4276.0	4274.0	4273.70	4275.69	4275.56	4273.56		
2390	E	766.0	766.0	768.0	768.0	243.43	243.56	245.56	245.43	IL	ST. CLAIR
	N	4276.0	4278.0	4278.0	4276.0	4275.69	4277.68	4277.55	4275.56		
2391	E	766.0	766.0	768.0	768.0	243.56	243.69	245.69	245.56	IL	ST. CLAIR
	N	4278.0	4280.0	4280.0	4278.0	4277.68	4279.68	4279.55	4277.55		
2400	E	768.0	768.0	770.0	770.0	245.30	245.43	247.42	247.29	IL	ST. CLAIR
	N	4274.0	4276.0	4276.0	4274.0	4273.56	4275.56	4275.43	4273.43		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)													
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 17 *****		***** UTM ZONE 18 *****		***** UTM ZONE 19 *****		STATE	COUNTY	
2401	E	768.0	768.0	770.0	770.0	770.0	770.0	770.0	245.43	245.56	247.55	247.42	IL ST. CLAIR
	N	4276.0	4278.0	4278.0	4278.0	4278.0	4278.0	4278.0	4275.56	4277.55	4277.43	4275.43	
2402	E	768.0	768.0	770.0	770.0	770.0	770.0	770.0	245.56	245.69	247.68	247.55	IL ST. CLAIR
	N	4278.0	4280.0	4280.0	4280.0	4280.0	4280.0	4280.0	4277.55	4279.55	4279.42	4277.43	
1617	E	770.0	770.0	780.0	780.0	780.0	780.0	780.0	244.75	245.40	255.38	254.73	IL ST. CLAIR
	N	4235.0	4245.0	4245.0	4245.0	4245.0	4245.0	4245.0	4234.52	4244.50	4243.85	4233.87	
1618	E	770.0	770.0	775.0	775.0	775.0	775.0	775.0	245.40	245.73	250.72	250.39	IL ST. CLAIR
	N	4245.0	4250.0	4250.0	4250.0	4250.0	4250.0	4250.0	4244.50	4249.49	4249.16	4244.17	
1619	E	770.0	770.0	775.0	775.0	775.0	775.0	775.0	246.38	246.70	251.69	251.37	IL ST. CLAIR
	N	4260.0	4265.0	4265.0	4265.0	4265.0	4265.0	4265.0	4259.46	4264.45	4264.13	4259.14	
1620	E	770.0	770.0	775.0	775.0	775.0	775.0	775.0	246.70	247.03	252.02	251.69	IL ST. CLAIR
	N	4265.0	4270.0	4270.0	4270.0	4270.0	4270.0	4270.0	4264.45	4269.44	4269.12	4264.13	
1621	E	770.0	770.0	775.0	775.0	775.0	775.0	775.0	247.03	247.36	252.34	252.02	IL ST. CLAIR
	N	4270.0	4275.0	4275.0	4275.0	4275.0	4275.0	4275.0	4269.44	4274.43	4274.11	4269.12	
1622	E	770.0	770.0	775.0	775.0	775.0	775.0	775.0	247.36	247.68	252.67	252.34	IL ST. CLAIR
	N	4275.0	4280.0	4280.0	4280.0	4280.0	4280.0	4280.0	4274.43	4279.42	4279.09	4274.11	
1634	E	775.0	775.0	780.0	780.0	780.0	780.0	780.0	250.39	250.72	255.71	255.38	IL ST. CLAIR
	N	4245.0	4250.0	4250.0	4250.0	4250.0	4250.0	4250.0	4244.17	4249.16	4248.84	4243.85	
1635	E	775.0	775.0	780.0	780.0	780.0	780.0	780.0	250.72	251.04	256.03	255.71	IL ST. CLAIR
	N	4250.0	4255.0	4255.0	4255.0	4255.0	4255.0	4255.0	4249.16	4254.15	4253.82	4248.84	
1636	E	775.0	775.0	780.0	780.0	780.0	780.0	780.0	251.04	251.37	256.36	256.03	IL ST. CLAIR
	N	4255.0	4260.0	4260.0	4260.0	4260.0	4260.0	4260.0	4254.15	4259.14	4258.81	4253.82	
1637	E	775.0	775.0	785.0	785.0	785.0	785.0	785.0	251.37	252.02	261.99	261.34	IL ST. CLAIR
	N	4260.0	4270.0	4270.0	4270.0	4270.0	4270.0	4270.0	4259.14	4269.12	4268.86	4258.49	
1638	E	775.0	775.0	780.0	780.0	780.0	780.0	780.0	252.02	252.34	257.33	257.01	IL ST. CLAIR
	N	4270.0	4275.0	4275.0	4275.0	4275.0	4275.0	4275.0	4269.12	4274.11	4273.78	4268.79	
1639	E	775.0	775.0	780.0	780.0	780.0	780.0	780.0	252.34	252.67	257.66	257.33	IL ST. CLAIR
	N	4275.0	4280.0	4280.0	4280.0	4280.0	4280.0	4280.0	4274.11	4279.09	4278.77	4273.78	
1664	E	780.0	780.0	790.0	790.0	790.0	790.0	790.0	254.73	255.38	265.36	264.71	IL ST. CLAIR
	N	4235.0	4245.0	4245.0	4245.0	4245.0	4245.0	4245.0	4233.87	4243.85	4243.20	4233.22	

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)

ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY	
1665	E	780.0	780.0	790.0	790.0	255.38	256.03	266.01	265.36	IL	ST. CLAIR
	N	4245.0	4255.0	4255.0	4245.0	4243.85	4253.82	4253.18	4243.20		
1666	E	780.0	780.0	785.0	785.0	256.03	256.36	261.34	261.02	IL	ST. CLAIR
	N	4255.0	4260.0	4260.0	4255.0	4253.82	4258.81	4258.49	4253.50		
1667	E	780.0	780.0	785.0	785.0	257.01	257.33	262.32	261.99	IL	ST. CLAIR
	N	4270.0	4275.0	4275.0	4270.0	4268.79	4273.78	4273.45	4268.46		
1668	E	780.0	780.0	785.0	785.0	257.33	257.66	262.65	262.32	IL	ST. CLAIR
	N	4275.0	4280.0	4280.0	4275.0	4273.78	4278.77	4278.44	4273.45		
1695	E	785.0	785.0	790.0	790.0	261.02	261.34	266.33	266.01	IL	ST. CLAIR
	N	4255.0	4260.0	4260.0	4255.0	4253.50	4258.49	4258.16	4253.18		
1697	E	785.0	785.0	786.0	786.0	261.67	261.73	262.73	262.67	IL	ST. CLAIR
	N	4265.0	4266.0	4266.0	4265.0	4263.48	4264.47	4264.41	4263.41		
1698	E	785.0	785.0	786.0	786.0	261.73	261.80	262.80	262.73	IL	ST. CLAIR
	N	4266.0	4267.0	4267.0	4266.0	4264.47	4265.47	4265.41	4264.41		
1699	E	785.0	785.0	786.0	786.0	261.80	261.86	262.86	262.80	IL	ST. CLAIR
	N	4267.0	4268.0	4268.0	4267.0	4265.47	4266.47	4266.40	4265.41		
1700	E	785.0	785.0	786.0	786.0	261.86	261.93	262.93	262.86	IL	ST. CLAIR
	N	4268.0	4269.0	4269.0	4268.0	4266.47	4267.46	4267.40	4266.40		
1701	E	785.0	785.0	786.0	786.0	261.93	261.99	262.99	262.93	IL	ST. CLAIR
	N	4269.0	4270.0	4270.0	4269.0	4267.46	4268.46	4268.40	4267.40		
1702	E	785.0	785.0	786.0	786.0	261.99	262.06	263.06	262.99	IL	ST. CLAIR
	N	4270.0	4271.0	4271.0	4270.0	4268.46	4269.46	4269.39	4268.40		
1703	E	785.0	785.0	786.0	786.0	262.06	262.13	263.12	263.06	IL	ST. CLAIR
	N	4271.0	4272.0	4272.0	4271.0	4269.46	4270.46	4270.39	4269.39		
1704	E	785.0	785.0	786.0	786.0	262.13	262.19	263.19	263.12	IL	ST. CLAIR
	N	4272.0	4273.0	4273.0	4272.0	4270.46	4271.46	4271.39	4270.39		
1705	E	785.0	785.0	786.0	786.0	262.19	262.26	263.25	263.19	IL	ST. CLAIR
	N	4273.0	4274.0	4274.0	4273.0	4271.46	4272.45	4272.39	4271.39		
1706	E	785.0	785.0	786.0	786.0	262.26	262.32	263.32	263.25	IL	ST. CLAIR
	N	4274.0	4275.0	4275.0	4274.0	4272.45	4273.45	4273.39	4272.39		

TABLE 1. (CONTINUED)

ST LOUIS AUCR GRID SQUARE COORDINATES (KM)													
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY	
1715	E	786.0	786.0	787.0	787.0	262.93	262.99	263.99	263.92	263.92	IL	ST. CLAIR	
	N	4269.0	4270.0	4270.0	4269.0	4267.40	4268.40	4268.33	4267.34	4267.34			
1716	E	786.0	786.0	787.0	787.0	262.99	263.06	264.06	263.99	263.99	IL	ST. CLAIR	
	N	4270.0	4271.0	4271.0	4270.0	4268.40	4269.39	4269.33	4268.33	4268.33			
1736	E	790.0	790.0	800.0	800.0	264.71	265.36	275.33	274.68	274.68	IL	WASHINGTON	
	N	4235.0	4245.0	4245.0	4235.0	4233.22	4243.20	4242.55	4232.58	4232.58			
1737	E	790.0	790.0	800.0	800.0	265.36	266.01	275.98	275.33	275.33	IL	WASHINGTON	
	N	4245.0	4255.0	4255.0	4245.0	4243.20	4253.18	4252.52	4242.55	4242.55			
1738	E	790.0	790.0	795.0	795.0	266.01	266.33	271.32	270.99	270.99	IL	WASHINGTON	
	N	4255.0	4260.0	4260.0	4255.0	4253.18	4258.16	4257.84	4252.85	4252.85			
1756	E	795.0	795.0	805.0	805.0	270.99	271.64	281.62	280.97	280.97	IL	WASHINGTON	
	N	4255.0	4265.0	4265.0	4255.0	4252.85	4262.82	4262.17	4252.20	4252.20			
1765	E	800.0	800.0	810.0	810.0	274.68	275.33	285.30	284.66	284.66	IL	WASHINGTON	
	N	4235.0	4245.0	4245.0	4235.0	4232.58	4242.55	4241.90	4231.93	4231.93			
1766	E	800.0	800.0	810.0	810.0	275.33	275.98	285.95	285.30	285.30	IL	WASHINGTON	
	N	4245.0	4255.0	4255.0	4245.0	4242.55	4252.52	4251.88	4241.90	4241.90			
1790	E	805.0	805.0	815.0	815.0	280.97	281.62	291.59	290.94	290.94	IL	WASHINGTON	
	N	4255.0	4265.0	4265.0	4255.0	4252.20	4262.17	4261.52	4251.55	4251.55			
1798	E	810.0	810.0	820.0	820.0	284.66	285.30	295.28	294.63	294.63	IL	WASHINGTON	
	N	4235.0	4245.0	4245.0	4235.0	4231.93	4241.90	4241.25	4231.28	4231.28			
1799	E	810.0	810.0	820.0	820.0	285.30	285.95	295.93	295.28	295.28	IL	WASHINGTON	
	N	4245.0	4255.0	4255.0	4245.0	4241.90	4251.88	4251.23	4241.25	4241.25			
1800	E	815.0	815.0	820.0	820.0	290.94	291.26	296.25	295.93	295.93	IL	WASHINGTON	
	N	4255.0	4260.0	4260.0	4255.0	4251.55	4256.54	4256.21	4251.23	4251.23			
1801	E	815.0	815.0	820.0	820.0	291.26	291.59	296.58	296.25	296.25	IL	WASHINGTON	
	N	4260.0	4265.0	4265.0	4260.0	4256.54	4261.52	4261.20	4256.21	4256.21			
1828	E	820.0	820.0	830.0	830.0	294.63	295.28	305.25	304.60	304.60	IL	WASHINGTON	
	N	4235.0	4245.0	4245.0	4235.0	4231.28	4241.25	4240.61	4230.64	4230.64			
1829	E	820.0	820.0	830.0	830.0	295.28	295.93	305.90	305.25	305.25	IL	WASHINGTON	
	N	4245.0	4255.0	4255.0	4245.0	4241.25	4251.23	4250.57	4240.61	4240.61			

TABLE 1. (CONTINUED)

ST LOUIS ARCH GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY			
1830	E	820.0	820.0	830.0	830.0	295.93	296.58	306.55	305.90	IL	WASHINGTON
	N	4255.0	4265.0	4265.0	4255.0	4251.23	4261.20	4260.55	4250.57		
1831	E	820.0	820.0	825.0	825.0	296.58	296.90	301.89	301.56	IL	WASHINGTON
	N	4265.0	4270.0	4270.0	4265.0	4261.20	4266.18	4265.86	4260.87		
1834	E	825.0	825.0	830.0	830.0	301.56	301.89	306.87	306.55	IL	WASHINGTON
	N	4265.0	4270.0	4270.0	4265.0	4260.87	4265.86	4265.53	4260.55		
1839	E	830.0	830.0	835.0	835.0	305.25	305.57	310.56	310.23	IL	WASHINGTON
	N	4245.0	4250.0	4250.0	4245.0	4240.61	4245.59	4245.27	4240.28		
1837	E	830.0	830.0	835.0	835.0	304.60	304.92	309.91	309.58	IL	WASHINGTON
	N	4235.0	4240.0	4235.0	4235.0	4230.64	4235.62	4235.30	4230.31		
1838	E	830.0	830.0	835.0	835.0	304.92	305.25	310.23	309.91	IL	WASHINGTON
	N	4240.0	4245.0	4245.0	4240.0	4235.62	4240.61	4240.28	4235.30		
1840	E	830.0	830.0	835.0	835.0	305.57	305.90	310.88	310.56	IL	WASHINGTON
	N	4250.0	4255.0	4255.0	4250.0	4245.59	4250.57	4250.25	4245.27		
1841	E	830.0	830.0	840.0	840.0	305.90	306.55	316.52	315.87	IL	WASHINGTON
	N	4255.0	4265.0	4265.0	4255.0	4250.57	4260.55	4259.89	4249.93		
1	E	640.0	640.0	650.0	650.0	114.93	115.58	125.58	124.93	MO	FRANKLIN
	N	4235.0	4245.0	4245.0	4235.0	4242.95	4252.95	4252.30	4242.30		
2	E	640.0	640.0	650.0	650.0	115.58	116.23	126.23	125.58	MO	FRANKLIN
	N	4245.0	4255.0	4255.0	4245.0	4252.95	4262.94	4262.29	4252.30		
3	E	640.0	640.0	650.0	650.0	116.89	117.54	127.53	126.88	MO	FRANKLIN
	N	4265.0	4275.0	4275.0	4265.0	4272.94	4282.93	4282.28	4272.28		
4	E	640.0	640.0	645.0	645.0	117.87	118.20	123.19	122.86	MO	FRANKLIN
	N	4280.0	4285.0	4285.0	4280.0	4287.93	4292.93	4292.60	4287.60		
5	E	645.0	645.0	650.0	650.0	119.60	119.93	124.93	124.60	MO	FRANKLIN
	N	4230.0	4235.0	4235.0	4230.0	4237.63	4242.63	4242.30	4237.30		
6	E	645.0	645.0	650.0	650.0	121.23	121.56	126.55	126.23	MO	FRANKLIN
	N	4255.0	4260.0	4260.0	4255.0	4262.62	4267.61	4267.29	4262.29		
7	E	645.0	645.0	650.0	650.0	121.56	121.88	126.88	126.55	MO	FRANKLIN
	N	4260.0	4265.0	4265.0	4260.0	4267.61	4272.61	4272.28	4267.29		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 1 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY			
8	E	645.0	650.0	650.0	122.54	122.86	127.86	127.53	MO	FRANKLIN	
	N	4275.0	4280.0	4275.0	4282.60	4287.60	4287.27	4282.28			
9	E	645.0	650.0	650.0	122.86	123.19	128.19	127.86	MO	FRANKLIN	
	N	4280.0	4285.0	4280.0	4287.60	4292.60	4292.27	4287.27			
10	E	650.0	655.0	655.0	124.60	124.93	129.92	129.60	MO	FRANKLIN	
	N	4230.0	4235.0	4230.0	4237.30	4242.30	4241.98	4236.98			
11	E	650.0	660.0	660.0	124.93	125.58	135.57	134.92	MO	FRANKLIN	
	N	4235.0	4245.0	4235.0	4242.30	4252.30	4251.64	4241.65			
12	E	650.0	660.0	660.0	125.58	126.23	136.22	135.57	MO	FRANKLIN	
	N	4245.0	4255.0	4245.0	4252.30	4262.29	4261.64	4251.64			
13	E	650.0	660.0	660.0	126.23	126.88	136.87	136.22	MO	FRANKLIN	
	N	4255.0	4265.0	4255.0	4262.29	4272.28	4271.63	4261.64			
14	E	650.0	660.0	660.0	126.88	127.53	137.53	136.87	MO	FRANKLIN	
	N	4265.0	4275.0	4265.0	4272.28	4282.28	4281.62	4271.63			
15	E	650.0	660.0	660.0	127.53	127.86	132.86	132.53	MO	FRANKLIN	
	N	4275.0	4280.0	4275.0	4282.28	4287.27	4286.95	4281.95			
16	E	655.0	660.0	660.0	129.60	129.92	134.92	134.59	MO	FRANKLIN	
	N	4230.0	4235.0	4230.0	4236.98	4241.98	4241.65	4236.66			
2001	E	660.0	662.0	662.0	134.59	134.72	136.72	136.59	MO	FRANKLIN	
	N	4230.0	4232.0	4230.0	4236.66	4238.66	4238.53	4236.53			
2002	E	660.0	661.0	661.0	134.72	134.79	135.79	135.72	MO	FRANKLIN	
	N	4232.0	4233.0	4232.0	4238.66	4239.66	4239.59	4238.59			
2003	E	660.0	661.0	661.0	134.79	134.85	135.85	135.79	MO	FRANKLIN	
	N	4233.0	4234.0	4233.0	4239.66	4240.65	4240.59	4239.59			
2004	E	660.0	661.0	661.0	134.85	134.92	135.92	135.85	MO	FRANKLIN	
	N	4234.0	4235.0	4234.0	4240.65	4241.65	4241.59	4240.59			
2005	E	661.0	662.0	662.0	135.72	135.79	136.79	136.72	MO	FRANKLIN	
	N	4232.0	4233.0	4232.0	4238.59	4239.59	4239.52	4238.53			
2006	E	661.0	663.0	663.0	135.79	135.92	137.92	137.79	MO	FRANKLIN	
	N	4233.0	4235.0	4233.0	4239.59	4241.59	4241.46	4239.46			

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		STATE		COUNTY				
2007	E	662.0	662.0	665.0	665.0	136.59	136.79	139.78	139.59	MU	FRANKLIN
	N	4230.0	4233.0	4233.0	4230.0	4236.53	4239.52	4239.33	4236.33		
2008	E	663.0	663.0	665.0	665.0	137.79	137.92	139.91	139.78	MU	FRANKLIN
	N	4233.0	4235.0	4235.0	4233.0	4239.46	4241.46	4241.33	4239.33		
19	E	660.0	660.0	670.0	670.0	134.92	135.57	145.56	144.91	MU	FRANKLIN
	N	4235.0	4245.0	4245.0	4235.0	4241.65	4251.64	4251.00	4241.00		
20	E	660.0	660.0	670.0	670.0	135.57	136.22	146.21	145.56	MU	FRANKLIN
	N	4245.0	4255.0	4255.0	4245.0	4251.64	4261.64	4260.98	4251.00		
21	E	660.0	660.0	670.0	670.0	136.22	136.87	146.86	146.21	MU	FRANKLIN
	N	4255.0	4265.0	4265.0	4255.0	4261.64	4271.63	4270.98	4260.98		
22	E	660.0	660.0	670.0	670.0	136.87	137.53	147.52	146.86	MU	FRANKLIN
	N	4265.0	4275.0	4275.0	4265.0	4271.63	4281.62	4280.96	4270.98		
25	E	665.0	665.0	670.0	670.0	139.59	139.91	144.91	144.59	MU	FRANKLIN
	N	4230.0	4235.0	4235.0	4230.0	4236.33	4241.33	4241.00	4236.01		
26	E	670.0	670.0	675.0	675.0	144.59	144.91	149.91	149.58	MU	FRANKLIN
	N	4230.0	4235.0	4235.0	4230.0	4236.01	4241.00	4240.68	4235.68		
27	E	670.0	670.0	680.0	680.0	144.91	145.56	155.55	154.90	MU	FRANKLIN
	N	4235.0	4245.0	4245.0	4235.0	4241.00	4251.00	4250.34	4240.36		
28	E	670.0	670.0	675.0	675.0	145.56	145.89	150.88	150.56	MU	FRANKLIN
	N	4245.0	4250.0	4250.0	4245.0	4251.00	4255.99	4255.66	4250.67		
29	E	670.0	670.0	675.0	675.0	145.89	146.21	151.21	150.88	MU	FRANKLIN
	N	4250.0	4255.0	4255.0	4250.0	4255.99	4260.98	4260.66	4255.66		
2009	E	670.0	670.0	672.0	672.0	146.21	146.34	148.34	148.21	MU	FRANKLIN
	N	4255.0	4257.0	4257.0	4255.0	4260.98	4262.98	4262.85	4260.86		
2010	E	670.0	670.0	673.0	673.0	146.34	146.54	149.53	149.34	MU	FRANKLIN
	N	4257.0	4260.0	4260.0	4257.0	4262.98	4265.98	4265.79	4262.79		
32	E	670.0	670.0	675.0	675.0	146.54	146.86	151.86	151.53	MU	FRANKLIN
	N	4260.0	4265.0	4265.0	4260.0	4265.98	4270.98	4270.65	4265.66		
33	E	670.0	670.0	673.0	673.0	146.86	147.06	150.06	149.86	MU	FRANKLIN
	N	4265.0	4268.0	4268.0	4265.0	4270.98	4273.97	4273.78	4270.78		

TABLE 1. (CONTINUED)

ST LOUIS ADCR GRID SQUARE COORDINATES (KM)

ID		*****	UTM ZONE	*****	*****	UTM ZONE	*****	*****	UTM ZONE	*****	STATE	COUNTY
34	E	670.0	670.0	671.0	671.0	671.0	671.0	147.06	147.12	148.12	MO	FRANKLIN
	N	4268.0	4269.0	4269.0	4269.0	4269.0	4268.0	4273.97	4274.97	4274.91		
35	E	670.0	670.0	671.0	671.0	671.0	671.0	147.12	147.19	148.19	MO	FRANKLIN
	N	4269.0	4270.0	4270.0	4270.0	4269.0	4269.0	4274.97	4275.97	4275.91		
2011	E	670.0	670.0	673.0	673.0	673.0	673.0	147.19	147.39	150.38	MO	FRANKLIN
	N	4270.0	4273.0	4273.0	4273.0	4270.0	4270.0	4275.97	4278.97	4278.77		
37	E	671.0	671.0	672.0	672.0	672.0	672.0	148.06	148.12	149.12	MO	FRANKLIN
	N	4268.0	4269.0	4269.0	4269.0	4268.0	4268.0	4273.91	4274.91	4274.84		
38	E	671.0	671.0	672.0	672.0	672.0	672.0	148.12	148.19	149.19	MO	FRANKLIN
	N	4269.0	4270.0	4270.0	4270.0	4269.0	4269.0	4274.91	4275.91	4275.84		
2012	E	672.0	672.0	673.0	673.0	673.0	673.0	148.21	148.27	149.27	MO	FRANKLIN
	N	4255.0	4256.0	4256.0	4256.0	4255.0	4255.0	4260.86	4261.86	4261.79		
2013	E	672.0	672.0	673.0	673.0	673.0	673.0	148.27	148.34	149.34	MO	FRANKLIN
	N	4256.0	4257.0	4257.0	4257.0	4256.0	4256.0	4261.86	4262.85	4262.79		
39	E	672.0	672.0	673.0	673.0	673.0	673.0	149.06	149.12	150.12	MO	FRANKLIN
	N	4268.0	4269.0	4269.0	4269.0	4268.0	4268.0	4273.84	4274.84	4274.78		
40	E	672.0	672.0	673.0	673.0	673.0	673.0	149.12	149.19	150.19	MO	FRANKLIN
	N	4269.0	4270.0	4270.0	4270.0	4269.0	4269.0	4274.84	4275.84	4275.77		
2014	E	673.0	673.0	675.0	675.0	675.0	675.0	149.21	149.34	151.34	MO	FRANKLIN
	N	4255.0	4257.0	4257.0	4257.0	4255.0	4255.0	4260.79	4262.79	4262.66		
2015	E	673.0	673.0	674.0	674.0	674.0	674.0	149.34	149.40	150.40	MO	FRANKLIN
	N	4257.0	4258.0	4258.0	4258.0	4257.0	4257.0	4262.79	4263.79	4263.72		
2016	E	673.0	673.0	675.0	675.0	675.0	675.0	149.40	149.53	151.53	MO	FRANKLIN
	N	4258.0	4260.0	4260.0	4260.0	4258.0	4258.0	4263.79	4265.79	4265.66		
43	E	673.0	673.0	674.0	674.0	674.0	674.0	149.86	149.93	150.92	MO	FRANKLIN
	N	4265.0	4266.0	4266.0	4266.0	4265.0	4265.0	4270.78	4271.78	4271.71		
44	E	673.0	673.0	674.0	674.0	674.0	674.0	149.93	149.99	150.99	MO	FRANKLIN
	N	4266.0	4267.0	4267.0	4267.0	4266.0	4266.0	4271.78	4272.78	4272.71		
45	E	673.0	673.0	674.0	674.0	674.0	674.0	149.99	150.06	151.06	MO	FRANKLIN
	N	4267.0	4268.0	4268.0	4268.0	4267.0	4267.0	4272.78	4273.78	4273.71		

TABLE 1. (CONTINUED)

ST LOUIS AREA GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY	
46	E	673.0	673.0	674.0	674.0	150.06	150.12	151.12	151.06	FRANKLIN	
	N	4268.0	4269.0	4269.0	4268.0	4273.78	4274.78	4274.71	4273.71	MO	
47	E	673.0	673.0	674.0	674.0	150.12	150.19	151.19	151.12	FRANKLIN	
	N	4269.0	4270.0	4270.0	4269.0	4274.78	4275.77	4275.71	4274.71	MO	
2017	E	674.0	674.0	675.0	675.0	150.34	150.40	151.40	151.34	FRANKLIN	
	N	4257.0	4258.0	4258.0	4257.0	4262.72	4263.72	4263.66	4262.66	MO	
48	E	674.0	674.0	675.0	675.0	150.86	150.92	151.92	151.86	FRANKLIN	
	N	4265.0	4266.0	4266.0	4265.0	4270.71	4271.71	4271.65	4270.65	MO	
49	E	674.0	674.0	675.0	675.0	150.92	150.99	151.99	151.92	FRANKLIN	
	N	4266.0	4267.0	4267.0	4266.0	4271.71	4272.71	4272.65	4271.65	MO	
50	E	674.0	674.0	675.0	675.0	150.99	151.06	152.06	151.99	FRANKLIN	
	N	4267.0	4268.0	4268.0	4267.0	4272.71	4273.71	4273.65	4272.65	MO	
51	E	674.0	674.0	675.0	675.0	151.06	151.12	152.12	152.05	FRANKLIN	
	N	4268.0	4269.0	4269.0	4268.0	4273.71	4274.71	4274.64	4273.65	MO	
52	E	674.0	674.0	675.0	675.0	151.12	151.19	152.18	152.12	FRANKLIN	
	N	4269.0	4270.0	4270.0	4269.0	4274.71	4275.71	4275.64	4274.64	MO	
53	E	675.0	675.0	680.0	680.0	149.58	149.91	154.90	154.58	FRANKLIN	
	N	4230.0	4235.0	4235.0	4230.0	4235.68	4240.68	4240.36	4235.36	MO	
2018	E	675.0	675.0	676.0	676.0	150.56	150.62	151.62	151.55	FRANKLIN	
	N	4245.0	4246.0	4246.0	4245.0	4250.67	4251.67	4251.61	4250.61	MO	
2019	E	675.0	675.0	676.0	676.0	150.62	150.69	151.68	151.62	FRANKLIN	
	N	4246.0	4247.0	4247.0	4246.0	4251.67	4252.67	4252.60	4251.61	MO	
2020	E	675.0	675.0	676.0	676.0	150.69	150.75	151.75	151.68	FRANKLIN	
	N	4247.0	4248.0	4248.0	4247.0	4252.67	4253.67	4253.60	4252.60	MO	
2021	E	675.0	675.0	677.0	677.0	150.75	150.88	152.88	152.75	FRANKLIN	
	N	4248.0	4250.0	4250.0	4248.0	4253.67	4255.66	4255.54	4253.54	MO	
56	E	675.0	675.0	680.0	680.0	150.88	151.21	156.20	155.88	FRANKLIN	
	N	4250.0	4255.0	4255.0	4250.0	4255.66	4260.66	4260.34	4255.34	MO	
57	E	675.0	675.0	680.0	680.0	151.21	151.53	156.53	156.20	FRANKLIN	
	N	4255.0	4260.0	4260.0	4255.0	4260.66	4265.66	4265.53	4260.53	MO	

TABLE 1. (CONTINUED)

ST LOUIS ADCR GRID SQUARE COORDINATES (KM)											
ID		***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY
58	E N	675.0 4260.0	675.0 4265.0	680.0 4260.0	680.0 4260.0	151.53 4265.66	151.86 4270.65	156.85 4270.52	156.53 4265.33	MO	FRANKLIN
59	E N	675.0 4265.0	675.0 4270.0	680.0 4270.0	680.0 4265.0	151.86 4270.65	152.18 4275.64	157.18 4275.32	156.85 4270.32	MO	FRANKLIN
2022	E N	676.0 4245.0	676.0 4247.0	678.0 4247.0	678.0 4245.0	151.55 4250.61	151.68 4252.60	153.68 4252.47	153.55 4250.48	MO	FRANKLIN
2023	E N	676.0 4247.0	676.0 4248.0	677.0 4248.0	677.0 4247.0	151.68 4252.60	151.75 4253.60	152.75 4253.54	152.68 4252.54	MO	FRANKLIN
2024	E N	677.0 4247.0	677.0 4250.0	680.0 4250.0	680.0 4247.0	152.68 4252.54	152.88 4255.54	155.88 4255.34	155.68 4252.34	MO	FRANKLIN
2025	E N	678.0 4245.0	678.0 4247.0	680.0 4247.0	680.0 4245.0	153.55 4250.48	153.68 4252.47	155.68 4252.34	155.55 4250.34	MO	FRANKLIN
64	E N	680.0 4230.0	680.0 4235.0	685.0 4235.0	685.0 4230.0	154.58 4235.36	154.90 4240.36	159.89 4240.03	159.57 4235.04	MO	FRANKLIN
65	E N	680.0 4235.0	680.0 4245.0	690.0 4245.0	690.0 4235.0	154.90 4240.36	155.55 4250.34	165.54 4249.70	164.89 4239.71	MO	FRANKLIN
66	E N	680.0 4245.0	680.0 4255.0	690.0 4255.0	690.0 4245.0	155.55 4250.34	156.20 4260.34	166.19 4259.68	165.54 4249.70	MO	FRANKLIN
67	E N	680.0 4255.0	680.0 4265.0	690.0 4265.0	690.0 4255.0	156.20 4260.34	156.85 4270.32	166.84 4269.67	166.19 4259.68	MO	FRANKLIN
68	E N	680.0 4265.0	680.0 4270.0	685.0 4270.0	685.0 4265.0	156.85 4270.32	157.18 4275.32	162.17 4274.99	161.85 4270.00	MO	FRANKLIN
72	E N	685.0 4230.0	685.0 4235.0	690.0 4235.0	690.0 4230.0	159.57 4235.04	159.89 4240.03	164.89 4239.71	164.57 4234.71	MO	FRANKLIN
73	E N	685.0 4265.0	685.0 4270.0	690.0 4270.0	690.0 4265.0	161.85 4270.00	162.17 4274.99	167.17 4274.66	166.84 4269.67	MO	FRANKLIN
79	E N	690.0 4230.0	690.0 4235.0	695.0 4235.0	695.0 4230.0	164.57 4234.71	164.89 4239.71	169.88 4239.58	169.56 4234.39	MO	FRANKLIN
86	E N	690.0 4235.0	690.0 4240.0	695.0 4240.0	695.0 4235.0	164.89 4239.71	165.21 4244.70	170.21 4244.38	169.88 4239.38	MO	FRANKLIN

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		STATE		COUNTY					
81	E	690.0	690.0	695.0	695.0	165.21	165.54	170.53	170.21	MO	FRANKLIN	
	N	4240.0	4245.0	4245.0	4240.0	4244.70	4249.70	4249.37	4244.38			
82	E	690.0	690.0	695.0	695.0	165.54	165.86	170.86	170.53	MO	FRANKLIN	
	N	4245.0	4250.0	4245.0	4240.0	4249.70	4254.69	4254.36	4249.37			
2026	E	690.0	690.0	695.0	695.0	165.86	166.19	171.18	170.86	MO	FRANKLIN	
	N	4250.0	4255.0	4255.0	4250.0	4254.69	4259.68	4259.36	4254.36			
2027	E	690.0	690.0	695.0	695.0	166.19	166.52	171.51	171.18	MO	FRANKLIN	
	N	4255.0	4260.0	4260.0	4255.0	4259.68	4264.68	4264.35	4259.36			
85	E	690.0	690.0	695.0	695.0	166.52	166.84	171.84	171.51	MO	FRANKLIN	
	N	4260.0	4265.0	4265.0	4260.0	4264.68	4269.67	4269.34	4264.35			
86	E	690.0	690.0	695.0	695.0	166.84	167.17	172.16	171.84	MO	FRANKLIN	
	N	4265.0	4270.0	4270.0	4265.0	4269.67	4274.66	4274.34	4269.34			
87	E	690.0	690.0	695.0	695.0	167.17	167.49	172.49	172.16	MO	FRANKLIN	
	N	4270.0	4275.0	4275.0	4270.0	4274.66	4279.66	4279.33	4274.34			
2029	E	695.0	695.0	700.0	700.0	171.18	171.51	176.50	176.18	MO	FRANKLIN	
	N	4255.0	4260.0	4260.0	4255.0	4259.36	4264.35	4264.02	4259.03			
2030	E	695.0	695.0	700.0	700.0	171.51	171.84	176.83	176.50	MO	FRANKLIN	
	N	4260.0	4265.0	4265.0	4260.0	4264.35	4269.34	4269.02	4264.02			
96	E	695.0	695.0	705.0	705.0	169.24	169.88	179.87	179.22	MO	JEFFERSON	
	N	4225.0	4235.0	4235.0	4225.0	4229.39	4239.38	4238.73	4228.75			
97	E	695.0	695.0	700.0	700.0	169.88	170.21	175.20	174.88	MO	JEFFERSON	
	N	4235.0	4240.0	4240.0	4235.0	4239.38	4244.38	4244.05	4239.06			
98	E	695.0	695.0	700.0	700.0	170.21	170.53	175.53	175.20	MO	JEFFERSON	
	N	4240.0	4245.0	4245.0	4240.0	4244.38	4249.37	4249.04	4244.05			
99	E	695.0	695.0	700.0	700.0	170.53	170.86	175.85	175.53	MO	JEFFERSON	
	N	4245.0	4250.0	4250.0	4245.0	4249.37	4254.36	4254.04	4249.04			
2028	E	695.0	695.0	700.0	700.0	170.86	171.18	176.18	175.85	MO	JEFFERSON	
	N	4250.0	4255.0	4255.0	4250.0	4254.36	4259.36	4259.03	4254.04			
125	E	700.0	700.0	705.0	705.0	173.91	174.23	179.22	178.90	MO	JEFFERSON	
	N	4220.0	4225.0	4225.0	4220.0	4224.08	4229.07	4228.75	4223.75			

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE		***** UTM ZONE		***** UTM ZONE		***** UTM ZONE		***** UTM ZONE		STATE	COUNTY
126	E	700.0	700.0	705.0	705.0	705.0	174.88	175.20	180.19	179.87	MO	JEFFERSON
	N	4235.0	4240.0	4240.0	4235.0	4235.0	4239.06	4244.05	4243.73	4238.73		
127	E	700.0	700.0	705.0	705.0	705.0	175.20	175.53	180.52	180.19	MO	JEFFERSON
	N	4240.0	4245.0	4245.0	4240.0	4240.0	4244.05	4249.04	4248.72	4243.73		
128	E	700.0	700.0	705.0	705.0	705.0	175.53	175.85	180.84	180.52	MO	JEFFERSON
	N	4245.0	4250.0	4250.0	4245.0	4245.0	4249.04	4254.04	4253.71	4248.72		
129	E	700.0	700.0	705.0	705.0	705.0	175.85	176.18	181.17	180.84	MO	JEFFERSON
	N	4250.0	4255.0	4255.0	4250.0	4250.0	4254.04	4259.03	4258.71	4253.71		
130	E	700.0	700.0	705.0	705.0	705.0	176.18	176.50	181.50	181.17	MO	JEFFERSON
	N	4255.0	4260.0	4260.0	4255.0	4255.0	4259.03	4264.02	4263.70	4258.71		
144	E	705.0	705.0	710.0	710.0	710.0	178.58	178.90	183.89	183.57	MO	JEFFERSON
	N	4215.0	4220.0	4220.0	4215.0	4215.0	4218.76	4223.75	4223.43	4218.44		
145	E	705.0	705.0	710.0	710.0	710.0	178.90	179.22	184.22	183.89	MO	JEFFERSON
	N	4220.0	4225.0	4225.0	4220.0	4220.0	4223.75	4228.75	4228.42	4223.43		
146	E	705.0	705.0	710.0	710.0	710.0	179.22	179.55	184.54	184.22	MO	JEFFERSON
	N	4225.0	4230.0	4230.0	4225.0	4225.0	4228.75	4233.74	4233.41	4228.42		
147	E	705.0	705.0	710.0	710.0	710.0	179.55	179.87	184.86	184.54	MO	JEFFERSON
	N	4230.0	4235.0	4235.0	4230.0	4230.0	4233.74	4238.73	4238.41	4233.41		
148	E	705.0	705.0	710.0	710.0	710.0	179.87	180.19	185.19	184.86	MO	JEFFERSON
	N	4235.0	4240.0	4240.0	4235.0	4235.0	4238.73	4243.73	4243.40	4238.41		
149	E	705.0	705.0	710.0	710.0	710.0	180.19	180.52	185.51	185.19	MO	JEFFERSON
	N	4240.0	4245.0	4245.0	4240.0	4240.0	4243.73	4248.72	4248.39	4243.40		
150	E	705.0	705.0	710.0	710.0	710.0	180.52	180.84	185.84	185.51	MO	JEFFERSON
	N	4245.0	4250.0	4250.0	4245.0	4245.0	4248.72	4253.71	4253.39	4248.39		
151	E	705.0	705.0	710.0	710.0	710.0	180.84	181.17	186.16	185.84	MO	JEFFERSON
	N	4250.0	4255.0	4255.0	4250.0	4250.0	4253.71	4258.71	4258.38	4253.39		
2039	E	705.0	705.0	707.0	707.0	707.0	181.17	181.30	183.30	183.17	MO	JEFFERSON
	N	4255.0	4257.0	4257.0	4255.0	4255.0	4258.71	4260.70	4260.57	4258.57		
2040	E	705.0	705.0	707.0	707.0	707.0	181.30	181.43	183.43	183.30	MO	JEFFERSON
	N	4257.0	4259.0	4259.0	4257.0	4257.0	4260.70	4262.70	4262.57	4260.57		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)

ID	*****	UTM	ZONE	15	*****	UTM	ZONE	16	*****	STATE	COUNTY
2041	E	705.0	705.0	707.0	707.0	181.43	181.56	183.43	183.56	MO	JEFFERSON
	N	4259.0	4261.0	4261.0	4259.0	4262.70	4264.70	4264.57	4262.57		
2048	E	707.0	707.0	709.0	709.0	183.17	183.30	185.29	185.16	MO	JEFFERSON
	N	4255.0	4257.0	4257.0	4255.0	4258.57	4260.57	4260.44	4258.45		
2049	E	707.0	707.0	709.0	709.0	183.30	183.43	185.43	185.29	MO	JEFFERSON
	N	4257.0	4259.0	4259.0	4257.0	4260.57	4262.57	4262.44	4260.44		
2050	E	707.0	707.0	709.0	709.0	183.43	183.56	185.56	185.43	MO	JEFFERSON
	N	4259.0	4261.0	4261.0	4259.0	4262.57	4264.57	4264.44	4262.44		
2057	E	709.0	709.0	711.0	711.0	185.16	185.29	187.29	187.16	MO	JEFFERSON
	N	4255.0	4257.0	4257.0	4255.0	4258.45	4260.44	4260.31	4258.32		
2058	E	709.0	709.0	711.0	711.0	185.29	185.43	187.42	187.29	MO	JEFFERSON
	N	4257.0	4259.0	4259.0	4257.0	4260.44	4262.44	4262.31	4260.31		
2059	E	709.0	709.0	711.0	711.0	185.43	185.56	187.55	187.42	MO	JEFFERSON
	N	4259.0	4261.0	4261.0	4259.0	4262.44	4264.44	4264.30	4262.31		
2060	E	709.0	709.0	711.0	711.0	185.56	185.69	187.68	187.55	MO	JEFFERSON
	N	4261.0	4263.0	4263.0	4261.0	4264.44	4266.43	4266.30	4264.30		
177	E	710.0	710.0	720.0	720.0	183.25	183.89	193.88	193.23	MO	JEFFERSON
	N	4210.0	4220.0	4220.0	4210.0	4213.45	4223.43	4222.79	4212.80		
2063	E	710.0	710.0	712.0	712.0	183.89	184.02	186.02	185.89	MO	JEFFERSON
	N	4220.0	4222.0	4222.0	4220.0	4223.43	4225.43	4225.30	4223.30		
2064	E	710.0	710.0	713.0	713.0	184.02	184.22	187.21	187.02	MO	JEFFERSON
	N	4222.0	4225.0	4225.0	4222.0	4225.43	4228.42	4228.23	4225.23		
180	E	710.0	710.0	715.0	715.0	184.22	184.54	189.53	189.21	MO	JEFFERSON
	N	4225.0	4230.0	4230.0	4225.0	4228.42	4233.41	4233.09	4228.10		
181	E	710.0	710.0	715.0	715.0	184.54	184.86	189.86	189.53	MO	JEFFERSON
	N	4230.0	4235.0	4235.0	4230.0	4233.41	4238.41	4238.09	4233.09		
182	E	710.0	710.0	715.0	715.0	184.86	185.19	190.18	189.86	MO	JEFFERSON
	N	4235.0	4240.0	4240.0	4235.0	4238.41	4243.40	4243.08	4238.09		
183	E	710.0	710.0	715.0	715.0	185.19	185.51	190.51	190.18	MO	JEFFERSON
	N	4240.0	4245.0	4245.0	4240.0	4243.40	4248.39	4248.07	4243.08		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY	
184	E	710.0	710.0	715.0	715.0	185.51	185.84	190.83	190.51	MO	JEFFERSON
	N	4245.0	4250.0	4250.0	4245.0	4248.39	4253.39	4253.06	4248.07		
185	E	710.0	710.0	715.0	715.0	185.84	186.16	191.16	190.83	MO	JEFFERSON
	N	4250.0	4255.0	4255.0	4250.0	4253.39	4258.38	4258.05	4253.06		
2065	E	711.0	711.0	713.0	713.0	187.16	187.29	189.29	189.16	MU	JEFFERSON
	N	4255.0	4257.0	4257.0	4255.0	4258.32	4260.31	4260.18	4258.18		
2066	E	711.0	711.0	713.0	713.0	187.29	187.42	189.42	189.29	MO	JEFFERSON
	N	4257.0	4259.0	4259.0	4257.0	4260.31	4262.31	4262.18	4260.18		
2067	E	711.0	711.0	713.0	713.0	187.42	187.55	189.55	189.42	MO	JEFFERSON
	N	4259.0	4261.0	4261.0	4259.0	4262.31	4264.30	4264.18	4262.18		
2068	E	711.0	711.0	715.0	715.0	187.55	187.81	191.81	191.55	MO	JEFFERSON
	N	4261.0	4265.0	4265.0	4261.0	4264.30	4268.30	4268.04	4264.05		
2071	E	712.0	712.0	714.0	714.0	185.89	186.02	188.02	187.89	MU	JEFFERSON
	N	4220.0	4222.0	4222.0	4220.0	4223.50	4225.50	4225.17	4223.17		
2072	E	713.0	713.0	714.0	714.0	187.02	187.08	188.08	188.02	MU	JEFFERSON
	N	4222.0	4223.0	4223.0	4222.0	4225.23	4226.23	4226.17	4225.17		
2073	E	713.0	713.0	714.0	714.0	187.08	187.15	188.14	188.08	MO	JEFFERSON
	N	4223.0	4224.0	4224.0	4223.0	4226.23	4227.23	4227.16	4226.17		
2074	E	713.0	713.0	714.0	714.0	187.15	187.21	188.21	188.14	MU	JEFFERSON
	N	4224.0	4225.0	4225.0	4224.0	4227.23	4228.23	4228.16	4227.16		
2075	E	713.0	713.0	715.0	715.0	189.16	189.29	191.29	191.16	MU	JEFFERSON
	N	4255.0	4257.0	4257.0	4255.0	4258.18	4260.18	4260.05	4258.05		
2076	E	713.0	713.0	715.0	715.0	189.29	189.42	191.42	191.29	MU	JEFFERSON
	N	4257.0	4259.0	4259.0	4257.0	4260.18	4262.18	4262.05	4260.05		
2077	E	713.0	713.0	715.0	715.0	189.42	189.55	191.55	191.42	MO	JEFFERSON
	N	4259.0	4261.0	4261.0	4259.0	4262.18	4264.18	4264.05	4262.05		
2079	E	714.0	714.0	716.0	716.0	187.89	188.02	190.01	189.88	MO	JEFFERSON
	N	4220.0	4222.0	4222.0	4220.0	4223.17	4225.17	4225.04	4223.04		
2080	E	714.0	714.0	715.0	715.0	188.02	188.08	189.08	189.01	MU	JEFFERSON
	N	4222.0	4223.0	4223.0	4222.0	4225.17	4226.17	4226.10	4225.11		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY	
2081	E	714.0	714.0	715.0	715.0	188.08	188.14	189.14	MO	JEFFERSON	
	N	4223.0	4224.0	4224.0	4223.0	4226.17	4227.16	4227.10			
2082	E	714.0	714.0	715.0	715.0	188.14	188.21	189.21	MO	JEFFERSON	
	N	4224.0	4225.0	4225.0	4224.0	4227.16	4228.16	4228.10			
2086	E	715.0	715.0	716.0	716.0	189.01	189.08	190.08	MO	JEFFERSON	
	N	4222.0	4223.0	4223.0	4222.0	4225.11	4226.10	4226.04			
2087	E	715.0	715.0	717.0	717.0	189.08	189.21	191.21	MO	JEFFERSON	
	N	4223.0	4225.0	4225.0	4223.0	4226.10	4228.10	4227.97			
213	E	715.0	715.0	720.0	720.0	189.21	189.53	194.52	MO	JEFFERSON	
	N	4225.0	4230.0	4230.0	4225.0	4228.10	4233.09	4232.77			
214	E	715.0	715.0	720.0	720.0	189.53	189.86	194.85	MO	JEFFERSON	
	N	4230.0	4235.0	4235.0	4230.0	4233.09	4238.09	4237.76			
215	E	715.0	715.0	720.0	720.0	189.86	190.18	195.17	MO	JEFFERSON	
	N	4235.0	4240.0	4240.0	4235.0	4238.09	4243.08	4242.75			
216	E	715.0	715.0	720.0	720.0	190.18	190.51	195.50	MO	JEFFERSON	
	N	4240.0	4245.0	4245.0	4240.0	4243.08	4248.07	4247.75			
2088	E	715.0	715.0	718.0	718.0	190.51	190.70	193.70	MO	JEFFERSON	
	N	4245.0	4248.0	4248.0	4245.0	4248.07	4251.07	4250.87			
2089	E	715.0	715.0	717.0	717.0	190.70	190.83	192.83	MO	JEFFERSON	
	N	4248.0	4250.0	4250.0	4248.0	4251.07	4253.06	4250.93			
2090	E	715.0	715.0	719.0	719.0	190.83	191.09	195.08	MO	JEFFERSON	
	N	4250.0	4254.0	4254.0	4250.0	4253.06	4257.05	4256.80			
2091	E	715.0	715.0	717.0	717.0	191.09	191.22	193.22	MO	JEFFERSON	
	N	4254.0	4256.0	4256.0	4254.0	4257.05	4259.05	4258.92			
2092	E	715.0	715.0	717.0	717.0	191.22	191.35	193.35	MO	JEFFERSON	
	N	4256.0	4258.0	4258.0	4256.0	4259.05	4261.05	4260.92			
2093	E	715.0	715.0	717.0	717.0	191.35	191.48	193.48	MO	JEFFERSON	
	N	4258.0	4260.0	4260.0	4258.0	4261.05	4263.05	4262.92			
2094	E	715.0	715.0	717.0	717.0	191.48	191.61	193.61	MO	JEFFERSON	
	N	4260.0	4262.0	4262.0	4260.0	4263.05	4265.04	4264.91			

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)

ID	***** UTM ZONE 1 *****		***** UTM ZONE 16 *****		STATE	COUNTY			
2095	E	715.0 4262.0	717.0 4264.0	717.0 4262.0	191.61 4265.04	191.74 4267.04	193.61 4264.91	MO	JEFFERSON
	N								
2107	E	716.0 4220.0	718.0 4222.0	718.0 4220.0	189.88 4223.04	190.01 4225.04	191.88 4224.91	MO	JEFFERSON
	N								
2108	E	716.0 4222.0	716.0 4223.0	717.0 4222.0	190.01 4225.04	190.08 4226.04	191.08 4225.97	MO	JEFFERSON
	N								
2110	E	717.0 4222.0	717.0 4225.0	720.0 4222.0	191.01 4224.97	191.21 4227.97	194.01 4224.78	MO	JEFFERSON
	N								
2111	E	717.0 4248.0	717.0 4250.0	719.0 4248.0	192.70 4250.93	192.83 4252.93	194.82 4250.80	MO	JEFFERSON
	N								
2112	E	717.0 4254.0	717.0 4256.0	719.0 4254.0	193.09 4256.93	193.22 4258.92	195.21 4256.80	MO	JEFFERSON
	N								
2113	E	717.0 4256.0	717.0 4258.0	719.0 4256.0	193.22 4258.92	193.35 4260.92	195.34 4258.79	MO	JEFFERSON
	N								
2114	E	717.0 4258.0	717.0 4260.0	719.0 4258.0	193.35 4260.92	193.48 4262.92	195.48 4260.79	MO	JEFFERSON
	N								
2115	E	717.0 4260.0	717.0 4262.0	719.0 4260.0	193.48 4262.92	193.61 4264.91	195.61 4262.79	MO	JEFFERSON
	N								
2116	E	717.0 4262.0	717.0 4264.0	719.0 4262.0	193.61 4264.91	193.74 4266.91	195.74 4264.78	MO	JEFFERSON
	N								
2128	E	718.0 4220.0	718.0 4222.0	720.0 4220.0	191.88 4222.91	192.01 4224.91	193.88 4222.79	MO	JEFFERSON
	N								
2129	E	718.0 4245.0	718.0 4248.0	721.0 4245.0	193.50 4247.88	193.70 4250.87	196.69 4247.68	MO	JEFFERSON
	N								
2131	E	719.0 4248.0	719.0 4250.0	721.0 4248.0	194.69 4250.80	194.82 4252.80	196.69 4250.68	MO	JEFFERSON
	N								
2132	E	719.0 4250.0	719.0 4252.0	721.0 4250.0	194.82 4252.80	194.95 4254.80	196.82 4252.67	MO	JEFFERSON
	N								
2133	E	719.0 4252.0	719.0 4254.0	721.0 4252.0	194.95 4254.80	195.08 4256.80	196.95 4254.67	MO	JEFFERSON
	N								

TABLE 1. (CONTINUED)

ST LOUIS APCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY				
2134	E	719.0 4254.0	721.0 4256.0	721.0 4254.0	195.08 4256.80	195.21 4258.79	197.08 4256.66	MU	JEFFERSON			
	N											
2135	E	719.0 4256.0	721.0 4258.0	721.0 4256.0	195.21 4258.79	195.34 4260.79	197.21 4258.66	MO	JEFFERSON			
	N											
2136	E	719.0 4258.0	721.0 4260.0	721.0 4258.0	195.34 4260.79	195.48 4262.79	197.34 4260.66	MO	JEFFERSON			
	N											
2137	E	719.0 4260.0	721.0 4262.0	721.0 4260.0	195.48 4262.79	195.61 4264.78	197.47 4262.66	MO	JEFFERSON			
	N											
2138	E	719.0 4262.0	721.0 4264.0	721.0 4262.0	195.61 4264.78	195.74 4266.78	197.60 4264.65	MU	JEFFERSON			
	N											
289	E	720.0 4215.0	730.0 4225.0	730.0 4215.0	193.55 4217.79	194.20 4227.78	203.54 4217.14	MU	JEFFERSON			
	N											
290	E	720.0 4225.0	725.0 4230.0	725.0 4225.0	194.20 4227.78	194.52 4232.77	199.19 4227.45	MO	JEFFERSON			
	N											
291	E	720.0 4230.0	725.0 4235.0	725.0 4230.0	194.52 4232.77	194.85 4237.76	199.52 4232.45	MU	JEFFERSON			
	N											
292	E	720.0 4235.0	725.0 4240.0	725.0 4235.0	194.85 4237.76	195.17 4242.75	199.84 4237.44	MO	JEFFERSON			
	N											
293	E	720.0 4240.0	725.0 4245.0	725.0 4240.0	195.17 4242.75	195.50 4247.75	200.16 4242.43	MO	JEFFERSON			
	N											
2151	E	721.0 4245.0	724.0 4248.0	724.0 4245.0	196.50 4247.68	196.69 4250.68	199.49 4247.48	MU	JEFFERSON			
	N											
2152	E	721.0 4248.0	723.0 4250.0	723.0 4248.0	196.69 4250.68	196.82 4252.67	198.69 4250.54	MU	JEFFERSON			
	N											
2153	E	721.0 4250.0	723.0 4252.0	723.0 4250.0	196.82 4252.67	196.95 4254.67	198.82 4252.54	MU	JEFFERSON			
	N											
2154	E	721.0 4252.0	723.0 4254.0	723.0 4252.0	196.95 4254.67	197.08 4256.66	198.95 4254.54	MU	JEFFERSON			
	N											
2155	E	721.0 4254.0	723.0 4256.0	723.0 4254.0	197.08 4256.66	197.21 4258.66	199.08 4258.53	MU	JEFFERSON			
	N											

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)

ID	***** UTM ZONE 18 *****		***** UTM ZONE 19 *****		***** UTM ZONE 16 *****		STATE	COUNTY	
2156	E	721.0	721.0	723.0	723.0	197.21	199.34	199.21	JEFFERSON
	N	4256.0	4258.0	4256.0	4256.0	4258.66	4260.66	4258.53	
2157	E	721.0	721.0	723.0	723.0	197.34	199.47	199.34	JEFFERSON
	N	4258.0	4260.0	4260.0	4258.0	4260.66	4262.66	4260.53	
2158	E	721.0	721.0	723.0	723.0	197.47	199.60	199.47	JEFFERSON
	N	4260.0	4262.0	4262.0	4260.0	4262.66	4264.65	4262.53	
2159	E	721.0	721.0	723.0	723.0	197.60	199.73	199.60	JEFFERSON
	N	4262.0	4264.0	4264.0	4262.0	4264.65	4266.65	4264.52	
2171	E	723.0	723.0	725.0	725.0	198.69	198.82	200.81	JEFFERSON
	N	4248.0	4250.0	4250.0	4248.0	4250.54	4252.54	4250.41	
2172	E	723.0	723.0	725.0	725.0	198.82	198.95	200.94	JEFFERSON
	N	4250.0	4252.0	4252.0	4250.0	4252.54	4254.54	4252.41	
2173	E	723.0	723.0	725.0	725.0	198.95	199.08	200.94	JEFFERSON
	N	4252.0	4254.0	4254.0	4252.0	4254.54	4256.54	4254.41	
2174	E	723.0	723.0	725.0	725.0	199.08	199.21	201.07	JEFFERSON
	N	4254.0	4256.0	4256.0	4254.0	4256.54	4258.53	4256.41	
2175	E	723.0	723.0	725.0	725.0	199.21	199.34	201.21	JEFFERSON
	N	4256.0	4258.0	4258.0	4256.0	4258.53	4260.53	4258.40	
2176	E	723.0	723.0	725.0	725.0	199.34	199.47	201.34	JEFFERSON
	N	4258.0	4260.0	4260.0	4258.0	4260.53	4262.53	4260.40	
2177	E	723.0	723.0	725.0	725.0	199.47	199.60	201.47	JEFFERSON
	N	4260.0	4262.0	4262.0	4260.0	4262.53	4264.52	4262.39	
2178	E	723.0	723.0	725.0	725.0	199.60	199.73	201.60	JEFFERSON
	N	4262.0	4264.0	4264.0	4262.0	4264.52	4266.52	4264.39	
2188	E	724.0	724.0	727.0	727.0	199.49	199.69	202.49	JEFFERSON
	N	4245.0	4248.0	4248.0	4245.0	4247.48	4250.48	4247.29	
347	E	725.0	725.0	730.0	730.0	199.19	199.52	204.18	JEFFERSON
	N	4225.0	4230.0	4230.0	4225.0	4227.45	4232.45	4227.13	
348	E	725.0	725.0	726.0	726.0	199.52	199.58	200.51	JEFFERSON
	N	4230.0	4231.0	4231.0	4230.0	4232.45	4233.44	4232.38	

TABLE 1. (CONTINUED)

ST LOUIS AGCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY			
349	E	725.0	725.0	726.0	726.0	199.58	199.65	200.64	200.58	MO	JEFFERSON
	N	4231.0	4232.0	4232.0	4231.0	4233.44	4234.44	4234.38	4233.38		
350	E	725.0	725.0	726.0	726.0	199.65	199.71	200.71	200.64	MO	JEFFERSON
	N	4232.0	4233.0	4233.0	4232.0	4234.44	4235.44	4235.38	4234.38		
351	E	725.0	725.0	726.0	726.0	199.71	199.78	200.77	200.71	MO	JEFFERSON
	N	4233.0	4234.0	4234.0	4233.0	4235.44	4236.44	4236.37	4235.38		
352	E	725.0	725.0	726.0	726.0	199.78	199.84	200.84	200.77	MO	JEFFERSON
	N	4234.0	4235.0	4235.0	4234.0	4236.44	4237.44	4237.37	4236.37		
353	E	725.0	725.0	726.0	726.0	199.84	199.91	200.90	200.84	MO	JEFFERSON
	N	4235.0	4236.0	4236.0	4235.0	4237.44	4238.43	4238.37	4237.37		
354	E	725.0	725.0	729.0	729.0	199.91	200.16	204.16	203.90	MO	JEFFERSON
	N	4236.0	4240.0	4240.0	4236.0	4238.43	4242.43	4242.17	4238.18		
355	E	725.0	725.0	730.0	730.0	200.16	200.49	205.48	205.16	MO	JEFFERSON
	N	4240.0	4245.0	4245.0	4240.0	4242.43	4247.42	4247.09	4242.10		
2190	E	725.0	725.0	727.0	727.0	200.68	200.81	202.81	202.68	MO	JEFFERSON
	N	4248.0	4250.0	4250.0	4248.0	4250.41	4252.41	4252.28	4250.29		
2191	E	725.0	725.0	727.0	727.0	200.81	200.94	202.94	202.81	MO	JEFFERSON
	N	4250.0	4252.0	4252.0	4250.0	4252.41	4254.41	4254.28	4252.28		
2192	E	725.0	725.0	727.0	727.0	200.94	201.07	203.07	202.94	MO	JEFFERSON
	N	4252.0	4254.0	4254.0	4252.0	4254.41	4256.41	4256.27	4254.28		
2193	E	725.0	725.0	727.0	727.0	201.07	201.21	203.20	203.07	MO	JEFFERSON
	N	4254.0	4256.0	4256.0	4254.0	4256.41	4258.40	4258.27	4256.27		
2194	E	725.0	725.0	727.0	727.0	201.21	201.34	203.33	203.20	MO	JEFFERSON
	N	4256.0	4258.0	4258.0	4256.0	4258.40	4260.40	4260.27	4258.27		
2195	E	725.0	725.0	727.0	727.0	201.34	201.47	203.46	203.33	MO	JEFFERSON
	N	4258.0	4260.0	4260.0	4258.0	4260.40	4262.39	4262.27	4260.27		
395	E	726.0	726.0	727.0	727.0	200.51	200.58	201.58	201.51	MO	JEFFERSON
	N	4230.0	4231.0	4231.0	4230.0	4232.38	4233.38	4233.31	4232.32		
396	E	726.0	726.0	727.0	727.0	200.58	200.64	201.64	201.58	MO	JEFFERSON
	N	4231.0	4232.0	4232.0	4231.0	4233.38	4234.38	4234.31	4233.31		

TABLE 1. (CONTINUED)

ST LOUIS AGCR GRID SQUARE COORDINATES (KM)												
ID		***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY	
397	E	726.0 4232.0	726.0 4233.0	727.0 4232.0	727.0 4233.0	200.64 4234.38	200.71 4235.38	201.71 4236.31	MO	JEFFERSON		
398	E	726.0 4233.0	726.0 4234.0	727.0 4233.0	727.0 4234.0	200.71 4235.38	200.77 4236.37	201.77 4237.30	MO	JEFFERSON		
399	E	726.0 4234.0	726.0 4235.0	727.0 4234.0	727.0 4235.0	200.77 4236.37	200.84 4237.37	201.84 4238.30	MO	JEFFERSON		
400	E	726.0 4235.0	726.0 4236.0	727.0 4235.0	727.0 4236.0	200.84 4237.37	200.90 4238.37	201.90 4239.30	MO	JEFFERSON		
424	E	727.0 4230.0	727.0 4231.0	728.0 4230.0	728.0 4231.0	201.51 4232.32	201.58 4233.31	202.58 4234.25	MO	JEFFERSON		
425	E	727.0 4231.0	727.0 4232.0	728.0 4231.0	728.0 4232.0	201.58 4233.31	201.64 4234.31	202.64 4235.25	MO	JEFFERSON		
426	E	727.0 4232.0	727.0 4233.0	728.0 4232.0	728.0 4233.0	201.64 4234.31	201.71 4235.31	202.71 4236.24	MO	JEFFERSON		
427	E	727.0 4233.0	727.0 4234.0	728.0 4233.0	728.0 4234.0	201.71 4235.31	201.77 4236.31	202.77 4237.24	MO	JEFFERSON		
428	E	727.0 4234.0	727.0 4235.0	728.0 4234.0	728.0 4235.0	201.77 4236.31	201.84 4237.30	202.84 4238.24	MO	JEFFERSON		
429	E	727.0 4235.0	727.0 4236.0	728.0 4235.0	728.0 4236.0	201.84 4237.30	201.90 4238.30	202.90 4239.24	MO	JEFFERSON		
2203	E	727.0 4245.0	727.0 4246.0	730.0 4245.0	730.0 4246.0	202.49 4247.29	202.68 4248.28	205.68 4249.24	MO	JEFFERSON		
2204	E	727.0 4246.0	727.0 4250.0	729.0 4248.0	729.0 4250.0	202.68 4250.29	202.81 4252.28	204.81 4252.15	MO	JEFFERSON		
2205	E	727.0 4250.0	727.0 4252.0	729.0 4250.0	729.0 4252.0	202.81 4252.28	202.94 4254.28	204.94 4254.15	MO	JEFFERSON		
2206	E	727.0 4252.0	727.0 4254.0	729.0 4252.0	729.0 4254.0	202.94 4254.28	203.07 4256.27	205.07 4256.14	MO	JEFFERSON		
2207	E	727.0 4254.0	727.0 4256.0	729.0 4254.0	729.0 4256.0	203.07 4256.27	203.20 4258.27	205.20 4258.14	MO	JEFFERSON		

TABLE 1. (CONTINUED)

ST LOUIS AUCH GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY
2208	E	727.0	727.0	729.0	729.0	203.20	203.33	205.33	205.20	205.20	MO	JEFFERSON
	N	4256.0	4258.0	4258.0	4256.0	4258.27	4260.27	4260.14	4258.14	4258.14		
2209	E	727.0	727.0	729.0	729.0	203.33	203.46	205.46	205.33	205.33	MO	JEFFERSON
	N	4258.0	4260.0	4260.0	4258.0	4260.27	4262.27	4262.13	4260.14	4260.14		
467	E	728.0	728.0	730.0	730.0	202.51	202.64	204.64	204.51	204.51	MO	JEFFERSON
	N	4230.0	4232.0	4232.0	4230.0	4232.25	4234.25	4234.12	4232.12	4232.12		
468	E	728.0	728.0	729.0	729.0	202.64	202.71	203.70	203.64	203.64	MO	JEFFERSON
	N	4232.0	4233.0	4233.0	4232.0	4234.25	4235.25	4235.18	4234.18	4234.18		
469	E	728.0	728.0	729.0	729.0	202.71	202.77	203.77	203.70	203.70	MO	JEFFERSON
	N	4233.0	4234.0	4234.0	4233.0	4235.25	4236.24	4236.18	4235.18	4235.18		
470	E	728.0	728.0	729.0	729.0	202.77	202.84	203.83	203.77	203.77	MO	JEFFERSON
	N	4234.0	4235.0	4235.0	4234.0	4236.24	4237.24	4237.18	4236.18	4236.18		
471	E	728.0	728.0	729.0	729.0	202.84	202.90	203.90	203.83	203.83	MO	JEFFERSON
	N	4235.0	4236.0	4236.0	4235.0	4237.24	4238.24	4238.18	4237.18	4237.18		
496	E	729.0	729.0	730.0	730.0	203.64	203.70	204.70	204.64	204.64	MO	JEFFERSON
	N	4232.0	4233.0	4233.0	4232.0	4234.18	4235.18	4235.11	4234.12	4234.12		
497	E	729.0	729.0	730.0	730.0	203.70	203.77	204.77	204.70	204.70	MO	JEFFERSON
	N	4233.0	4234.0	4234.0	4233.0	4235.18	4236.18	4236.11	4235.11	4235.11		
498	E	729.0	729.0	730.0	730.0	203.77	203.83	204.83	204.77	204.77	MO	JEFFERSON
	N	4234.0	4235.0	4235.0	4234.0	4236.18	4237.18	4237.11	4236.11	4236.11		
499	E	729.0	729.0	730.0	730.0	203.83	203.90	204.90	204.83	204.83	MO	JEFFERSON
	N	4235.0	4236.0	4236.0	4235.0	4237.18	4238.18	4238.11	4237.11	4237.11		
500	E	729.0	729.0	730.0	730.0	203.90	203.96	204.96	204.90	204.90	MO	JEFFERSON
	N	4236.0	4237.0	4237.0	4236.0	4238.18	4239.17	4239.11	4238.11	4238.11		
501	E	729.0	729.0	730.0	730.0	203.96	204.03	205.03	204.96	204.96	MO	JEFFERSON
	N	4237.0	4238.0	4238.0	4237.0	4239.17	4240.17	4240.11	4239.11	4239.11		
502	E	729.0	729.0	730.0	730.0	204.03	204.09	205.09	205.03	205.03	MO	JEFFERSON
	N	4238.0	4239.0	4239.0	4238.0	4240.17	4241.17	4241.11	4240.11	4240.11		
503	E	729.0	729.0	730.0	730.0	204.09	204.16	205.16	205.09	205.09	MO	JEFFERSON
	N	4239.0	4240.0	4240.0	4239.0	4241.17	4242.17	4242.10	4241.11	4241.11		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 1 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY
2218	E	729.0	729.0	731.0	731.0	204.68	204.81	206.80	206.67	MO	JEFFERSON	
	N	4248.0	4250.0	4248.0	4248.0	4250.16	4252.15	4252.02	4250.02			
2219	E	729.0	729.0	731.0	731.0	204.81	204.94	206.93	206.80	MO	JEFFERSON	
	N	4250.0	4252.0	4250.0	4250.0	4252.15	4254.15	4254.02	4252.02			
2220	E	729.0	729.0	731.0	731.0	204.94	205.07	207.06	206.93	MO	JEFFERSON	
	N	4252.0	4254.0	4252.0	4252.0	4254.15	4256.14	4256.02	4254.02			
2221	E	729.0	729.0	731.0	731.0	205.07	205.20	207.19	207.06	MO	JEFFERSON	
	N	4254.0	4256.0	4254.0	4254.0	4256.14	4258.14	4258.01	4256.02			
2222	E	729.0	729.0	731.0	731.0	205.20	205.33	207.33	207.19	MO	JEFFERSON	
	N	4256.0	4258.0	4256.0	4256.0	4258.14	4260.14	4260.01	4258.01			
2223	E	729.0	729.0	731.0	731.0	205.33	205.46	207.46	207.33	MO	JEFFERSON	
	N	4258.0	4260.0	4258.0	4258.0	4260.14	4262.13	4262.00	4260.01			
527	E	730.0	730.0	740.0	740.0	203.86	204.51	214.49	213.84	MO	JEFFERSON	
	N	4220.0	4230.0	4220.0	4220.0	4222.14	4232.12	4231.47	4221.49			
2233	E	730.0	730.0	741.0	731.0	205.61	205.68	206.67	206.61	MO	JEFFERSON	
	N	4247.0	4248.0	4248.0	4247.0	4249.09	4250.09	4250.02	4249.03			
2238	E	731.0	731.0	733.0	733.0	207.06	207.19	209.19	209.06	MO	JEFFERSON	
	N	4254.0	4256.0	4254.0	4254.0	4256.02	4258.01	4257.88	4255.88			
2239	E	731.0	731.0	733.0	733.0	207.19	207.33	209.32	209.19	MO	JEFFERSON	
	N	4256.0	4258.0	4258.0	4256.0	4258.01	4260.01	4259.88	4257.88			
2240	E	731.0	731.0	733.0	733.0	207.33	207.46	209.45	209.32	MO	JEFFERSON	
	N	4258.0	4260.0	4260.0	4258.0	4260.01	4262.00	4261.88	4259.88			
60	E	675.0	675.0	685.0	685.0	152.51	153.17	163.16	162.50	MO	ST. CHARLES	
	N	4275.0	4285.0	4285.0	4275.0	4280.64	4290.63	4289.97	4279.98			
61	E	675.0	675.0	685.0	685.0	153.82	154.48	164.47	163.81	MO	ST. CHARLES	
	N	4295.0	4305.0	4305.0	4295.0	4300.62	4310.61	4309.95	4299.96			
69	E	680.0	680.0	685.0	685.0	157.18	157.51	162.50	162.17	MO	ST. CHARLES	
	N	4270.0	4275.0	4275.0	4270.0	4275.32	4280.31	4279.98	4274.99			
71)	E	680.0	680.0	685.0	685.0	158.16	158.49	163.48	163.16	MO	ST. CHARLES	
	N	4285.0	4290.0	4290.0	4285.0	4290.30	4295.30	4294.97	4289.97			

TABLE 1. (CONTINUED)

ST LOUIS AUCK GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY	
71	E	680.0	680.0	685.0	685.0	158.49	158.82	163.81	163.48	MO	ST. CHARLES
	N	4290.0	4295.0	4295.0	4290.0	4295.30	4300.29	4299.96	4294.97		
74	E	685.0	685.0	690.0	690.0	162.17	162.50	167.49	167.17	MO	ST. CHARLES
	N	4270.0	4275.0	4275.0	4270.0	4274.99	4279.98	4279.66	4274.66		
75	E	685.0	685.0	695.0	695.0	162.50	163.16	173.14	172.49	MO	ST. CHARLES
	N	4275.0	4285.0	4285.0	4275.0	4279.98	4289.97	4289.32	4279.53		
76	E	685.0	685.0	695.0	695.0	163.16	163.81	173.80	173.14	MO	ST. CHARLES
	N	4285.0	4295.0	4295.0	4285.0	4289.97	4299.96	4299.30	4289.52		
77	E	685.0	685.0	690.0	690.0	163.81	164.14	169.13	168.81	MO	ST. CHARLES
	N	4295.0	4300.0	4300.0	4295.0	4299.96	4304.96	4304.63	4299.63		
78	E	685.0	685.0	690.0	690.0	164.14	164.47	169.46	169.13	MO	ST. CHARLES
	N	4300.0	4305.0	4305.0	4300.0	4304.96	4309.95	4309.62	4304.63		
88	E	690.0	690.0	695.0	695.0	168.81	169.13	174.13	173.80	MO	ST. CHARLES
	N	4295.0	4300.0	4300.0	4295.0	4299.63	4304.63	4304.30	4299.30		
89	E	690.0	690.0	694.0	694.0	169.13	169.40	173.39	173.13	MO	ST. CHARLES
	N	4300.0	4304.0	4304.0	4300.0	4304.63	4308.62	4308.36	4304.36		
90	E	690.0	690.0	692.0	692.0	169.40	169.53	171.53	171.39	MO	ST. CHARLES
	N	4304.0	4306.0	4306.0	4304.0	4308.62	4310.62	4310.49	4308.49		
91	E	690.0	690.0	694.0	694.0	169.53	169.79	173.79	173.52	MO	ST. CHARLES
	N	4306.0	4310.0	4310.0	4306.0	4310.62	4314.61	4314.35	4310.36		
93	E	692.0	692.0	694.0	694.0	171.39	171.53	173.52	173.39	MO	ST. CHARLES
	N	4304.0	4306.0	4306.0	4304.0	4308.49	4310.49	4310.36	4308.36		
94	E	694.0	694.0	698.0	698.0	173.13	173.39	177.39	177.12	MO	ST. CHARLES
	N	4300.0	4304.0	4304.0	4300.0	4304.36	4308.36	4308.10	4304.10		
95	E	694.0	694.0	700.0	700.0	173.39	173.79	179.78	179.38	MO	ST. CHARLES
	N	4304.0	4310.0	4310.0	4304.0	4308.36	4314.35	4313.96	4307.96		
106	E	695.0	695.0	700.0	700.0	172.82	173.14	178.14	177.81	MO	ST. CHARLES
	N	4280.0	4285.0	4285.0	4280.0	4284.32	4289.52	4288.99	4284.00		
107	E	695.0	695.0	700.0	700.0	173.14	173.47	178.46	178.14	MO	ST. CHARLES
	N	4285.0	4290.0	4290.0	4285.0	4289.52	4294.31	4293.98	4288.99		

TABLE 1. (Continued)

ST LOUIS AOCR GRID SQUARE COORDINATES (KM)

ID	***** UTM ZONE *****				***** UTM ZONE 16 *****				STATE	COUNTY
2055	E	708.0	708.0	711.0	711.0	186.13	186.32	189.32	MO	ST. CHARLES
	N	4285.0	4288.0	4288.0	4285.0	4288.47	4291.46	4291.27		
2056	E	708.0	708.0	717.0	710.0	186.98	187.11	189.11	MO	ST. CHARLES
	N	4298.0	4300.0	4300.0	4298.0	4301.45	4303.45	4303.31		
2062	E	709.0	709.0	711.0	711.0	187.32	187.45	189.45	MU	ST. CHARLES
	N	4288.0	4290.0	4290.0	4288.0	4291.40	4293.39	4293.26		
195	E	710.0	710.0	715.0	715.0	188.45	188.78	193.77	MU	ST. CHARLES
	N	4290.0	4295.0	4295.0	4290.0	4293.33	4298.32	4297.99		
196	E	710.0	710.0	715.0	715.0	188.78	189.11	194.10	MO	ST. CHARLES
	N	4295.0	4300.0	4300.0	4295.0	4298.32	4303.31	4302.98		
197	E	710.0	710.0	715.0	715.0	189.11	189.43	194.43	MU	ST. CHARLES
	N	4300.0	4305.0	4305.0	4300.0	4303.31	4308.30	4307.98		
2069	E	711.0	711.0	714.0	714.0	189.12	189.32	192.31	MU	ST. CHARLES
	N	4285.0	4288.0	4288.0	4285.0	4288.27	4291.27	4291.07		
2070	E	711.0	711.0	713.0	713.0	189.32	189.45	191.45	MU	ST. CHARLES
	N	4288.0	4290.0	4290.0	4288.0	4291.27	4293.26	4293.13		
2078	E	713.0	713.0	715.0	715.0	191.31	191.45	193.44	MO	ST. CHARLES
	N	4288.0	4290.0	4290.0	4288.0	4291.13	4293.13	4293.00		
2083	E	714.0	714.0	715.0	715.0	192.12	192.18	193.18	MU	ST. CHARLES
	N	4285.0	4286.0	4286.0	4285.0	4288.07	4289.07	4289.01		
2084	E	714.0	714.0	715.0	715.0	192.18	192.25	193.25	MU	ST. CHARLES
	N	4286.0	4287.0	4287.0	4286.0	4289.07	4290.07	4290.00		
2085	E	714.0	714.0	715.0	715.0	192.25	192.31	193.31	MO	ST. CHARLES
	N	4287.0	4288.0	4288.0	4287.0	4290.07	4291.07	4291.00		
2105	E	715.0	715.0	717.0	717.0	193.51	193.64	195.64	MU	ST. CHARLES
	N	4291.0	4293.0	4293.0	4291.0	4294.00	4296.00	4295.86		
2106	E	715.0	715.0	717.0	717.0	193.64	193.77	195.77	MU	ST. CHARLES
	N	4293.0	4295.0	4295.0	4293.0	4296.00	4297.99	4297.86		
217	E	715.0	715.0	716.0	716.0	193.77	193.84	194.83	MU	ST. CHARLES
	N	4295.0	4296.0	4296.0	4295.0	4297.99	4298.99	4298.93		

TABLE 1. (CONTINUED)

ST LOUIS AWCGR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY	
238	E	715.0	715.0	716.0	716.0	193.84	193.90	194.90	MO	ST. CHARLES	
	N	4296.0	4297.0	4297.0	4296.0	4298.99	4299.99	4298.93			
239	E	715.0	715.0	716.0	716.0	193.90	193.97	194.97	MO	ST. CHARLES	
	N	4297.0	4298.0	4298.0	4297.0	4299.99	4300.99	4300.92			
240	E	715.0	715.0	717.0	717.0	193.97	194.10	196.10	MO	ST. CHARLES	
	N	4298.0	4300.0	4300.0	4298.0	4300.99	4302.98	4302.85			
241	E	715.0	715.0	720.0	720.0	194.10	194.43	199.42	MO	ST. CHARLES	
	N	4300.0	4305.0	4305.0	4300.0	4302.98	4307.98	4307.65			
242	E	715.0	715.0	725.0	725.0	194.43	195.09	205.07	MO	ST. CHARLES	
	N	4305.0	4315.0	4315.0	4305.0	4307.98	4317.96	4317.50			
245	E	716.0	716.0	717.0	717.0	194.77	194.83	195.83	MO	ST. CHARLES	
	N	4295.0	4296.0	4296.0	4295.0	4297.93	4298.93	4298.86			
246	E	716.0	716.0	717.0	717.0	194.83	194.90	195.90	MO	ST. CHARLES	
	N	4296.0	4297.0	4297.0	4296.0	4298.93	4299.93	4299.86			
247	E	716.0	716.0	717.0	717.0	194.90	194.97	195.96	MO	ST. CHARLES	
	N	4297.0	4298.0	4298.0	4297.0	4299.93	4300.92	4300.86			
252	E	717.0	717.0	719.0	719.0	195.69	195.77	197.76	MO	ST. CHARLES	
	N	4293.0	4295.0	4295.0	4293.0	4295.86	4297.86	4297.73			
256	E	717.0	717.0	718.0	718.0	195.77	195.83	196.83	MO	ST. CHARLES	
	N	4295.0	4296.0	4296.0	4295.0	4297.86	4298.86	4298.79			
257	E	717.0	717.0	718.0	718.0	195.83	195.90	196.90	MO	ST. CHARLES	
	N	4296.0	4297.0	4297.0	4296.0	4298.86	4299.86	4299.79			
258	E	717.0	717.0	718.0	718.0	195.90	195.96	196.96	MO	ST. CHARLES	
	N	4297.0	4298.0	4298.0	4297.0	4299.86	4300.86	4300.79			
259	E	717.0	717.0	718.0	718.0	195.96	196.03	197.03	MI	ST. CHARLES	
	N	4298.0	4299.0	4299.0	4298.0	4300.86	4301.86	4301.79			
260	E	717.0	717.0	718.0	718.0	196.03	196.10	197.09	MO	ST. CHARLES	
	N	4299.0	4300.0	4300.0	4299.0	4301.86	4302.85	4302.79			
277	E	718.0	718.0	719.0	719.0	196.77	196.83	197.83	MO	ST. CHARLES	
	N	4295.0	4296.0	4296.0	4295.0	4297.80	4298.79	4298.73			

TABLE 1. (CONTINUED)

ST LOUIS AREA GRID SQUARE COORDINATES (NW)											
ID	***** UTM ZONE 17 *****		***** UTM ZONE 18 *****		***** UTM ZONE 19 *****		***** UTM ZONE 20 *****		***** UTM ZONE 21 *****		STATE COUNTY
278 E N	716.0 4296.0	718.0 4297.0	719.0 4297.0	719.0 4296.0	196.83 4298.79	196.90 4299.79	197.83 4299.79	197.90 4298.73	197.90 4298.73	197.83 4298.73	MU ST. CHARLES
279 E N	718.0 4297.0	718.0 4298.0	719.0 4298.0	719.0 4297.0	196.90 4299.79	196.96 4300.79	197.96 4300.73	197.96 4299.73	197.90 4299.73	197.90 4299.73	MU ST. CHARLES
280 E N	718.0 4298.0	718.0 4300.0	720.0 4300.0	720.0 4298.0	196.96 4300.79	197.09 4302.79	199.09 4302.66	199.09 4302.66	198.96 4300.66	198.96 4300.66	MU ST. CHARLES
286 E N	719.0 4295.0	719.0 4296.0	720.0 4296.0	720.0 4295.0	197.76 4297.73	197.83 4298.73	198.83 4298.66	198.83 4297.66	198.76 4297.66	198.76 4297.66	MU ST. CHARLES
287 E N	719.0 4296.0	719.0 4297.0	720.0 4297.0	720.0 4296.0	197.83 4298.73	197.90 4299.73	198.89 4299.66	198.89 4298.66	198.83 4298.66	198.83 4298.66	MU ST. CHARLES
288 E N	719.0 4297.0	719.0 4298.0	720.0 4298.0	720.0 4297.0	197.90 4299.73	197.96 4300.73	198.96 4300.66	198.96 4299.66	198.89 4299.66	198.89 4299.66	MU ST. CHARLES
309 E N	720.0 4300.0	720.0 4305.0	725.0 4305.0	725.0 4300.0	199.09 4302.66	199.42 4307.65	204.41 4307.52	204.08 4302.53	204.08 4302.53	204.08 4302.53	MU ST. CHARLES
392 E N	725.0 4300.0	725.0 4305.0	730.0 4305.0	730.0 4300.0	204.08 4302.33	204.41 4307.32	209.40 4306.99	209.07 4302.00	209.07 4302.00	209.07 4302.00	MU ST. CHARLES
393 E N	725.0 4305.0	725.0 4310.0	730.0 4310.0	730.0 4305.0	204.41 4307.32	204.74 4312.31	209.73 4311.98	209.40 4306.99	209.40 4306.99	209.40 4306.99	MU ST. CHARLES
394 E N	725.0 4310.0	725.0 4315.0	730.0 4315.0	730.0 4310.0	204.74 4312.31	205.07 4317.30	210.06 4316.97	209.73 4311.98	209.73 4311.98	209.73 4311.98	MU ST. CHARLES
569 E N	730.0 4305.0	730.0 4310.0	735.0 4310.0	735.0 4305.0	209.40 4306.99	209.73 4311.98	214.72 4311.65	214.39 4306.66	214.39 4306.66	214.39 4306.66	MU ST. CHARLES
2234 E N	730.0 4310.0	730.0 4315.0	735.0 4315.0	735.0 4310.0	209.73 4311.98	210.06 4316.97	215.05 4316.64	214.72 4311.65	214.72 4311.65	214.72 4311.65	MU ST. CHARLES
738 E N	735.0 4305.0	735.0 4310.0	740.0 4310.0	740.0 4305.0	214.39 4306.66	214.72 4311.65	219.71 4311.32	219.58 4306.33	219.58 4306.33	219.58 4306.33	MU ST. CHARLES
915 E N	740.0 4305.0	740.0 4308.0	743.0 4308.0	743.0 4305.0	219.38 4306.33	219.58 4309.33	222.57 4309.13	222.58 4306.14	222.58 4306.14	222.58 4306.14	MU ST. CHARLES
916 E N	740.0 4308.0	740.0 4310.0	742.0 4310.0	742.0 4308.0	219.58 4309.33	219.71 4311.32	221.71 4311.19	221.58 4309.20	221.58 4309.20	221.58 4309.20	MU ST. CHARLES

TABLE 1. (CONTINUED)

ID	ST. LOUIS AREA GULF SQUARE COORDINATES (M)										STATE	COUNTY
	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 17 *****		***** UTM ZONE 18 *****		***** UTM ZONE 19 *****			
1017	E	743.0	743.0	744.0	744.0	222.38	222.44	223.44	223.44	223.38	MU	ST. CHARLES
	N	4305.0	4306.0	4306.0	4305.0	4306.14	4307.13	4307.07	4307.07	4306.07		
1018	E	743.0	743.0	744.0	744.0	222.44	222.51	223.51	223.44	223.44	MO	ST. CHARLES
	N	4306.0	4307.0	4307.0	4306.0	4307.13	4308.13	4308.07	4307.07	4307.07		
1019	E	743.0	743.0	744.0	744.0	222.51	222.57	223.57	223.51	223.51	MO	ST. CHARLES
	N	4307.0	4308.0	4308.0	4307.0	4308.13	4309.13	4309.07	4308.07	4308.07		
1046	E	744.0	744.0	745.0	745.0	223.38	223.44	224.44	224.37	224.37	MO	ST. CHARLES
	N	4305.0	4306.0	4306.0	4305.0	4306.07	4307.07	4307.00	4306.00	4306.00		
1047	E	744.0	744.0	745.0	745.0	223.44	223.51	224.51	224.44	224.44	MO	ST. CHARLES
	N	4306.0	4307.0	4307.0	4306.0	4307.07	4308.07	4308.00	4307.00	4307.00		
2288	E	745.0	745.0	748.0	748.0	224.18	224.37	227.37	227.17	227.17	MO	ST. CHARLES
	N	4302.0	4305.0	4305.0	4302.0	4303.01	4306.00	4305.81	4302.81	4302.81		
1085	E	745.0	745.0	746.0	746.0	224.37	224.44	225.44	225.37	225.37	MO	ST. CHARLES
	N	4305.0	4306.0	4306.0	4305.0	4306.00	4307.00	4306.94	4305.94	4305.94		
1086	E	745.0	745.0	746.0	746.0	224.44	224.51	225.51	225.44	225.44	MO	ST. CHARLES
	N	4306.0	4307.0	4307.0	4306.0	4307.00	4308.00	4307.93	4306.94	4306.94		
1108	E	746.0	746.0	747.0	747.0	225.37	225.44	226.44	226.37	226.37	MO	ST. CHARLES
	N	4305.0	4306.0	4306.0	4305.0	4305.94	4306.94	4306.87	4305.88	4305.88		
2299	E	748.0	748.0	749.0	749.0	227.17	227.24	228.23	228.17	228.17	MO	ST. CHARLES
	N	4302.0	4303.0	4303.0	4302.0	4302.81	4303.81	4303.75	4302.75	4302.75		
2300	E	748.0	748.0	750.0	750.0	227.24	227.37	229.36	229.23	229.23	MO	ST. CHARLES
	N	4303.0	4305.0	4305.0	4303.0	4303.81	4305.81	4305.68	4303.68	4303.68		
2302	E	749.0	749.0	751.0	751.0	228.04	228.17	230.16	230.03	230.03	MO	ST. CHARLES
	N	4300.0	4302.0	4302.0	4300.0	4300.75	4302.75	4302.62	4300.62	4300.62		
2303	E	749.0	749.0	750.0	750.0	228.17	228.23	229.23	229.17	229.17	MO	ST. CHARLES
	N	4302.0	4303.0	4303.0	4302.0	4302.75	4303.75	4303.68	4302.68	4302.68		
1235	E	750.0	750.0	751.0	751.0	229.17	229.23	230.23	230.16	230.16	MO	ST. CHARLES
	N	4302.0	4303.0	4303.0	4302.0	4302.68	4303.68	4303.61	4302.62	4302.62		
1236	E	750.0	750.0	751.0	751.0	229.23	229.30	230.30	230.23	230.23	MO	ST. CHARLES
	N	4303.0	4304.0	4304.0	4303.0	4303.68	4304.68	4304.61	4303.61	4303.61		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY
103	E	695.0	695.0	700.0	700.0	700.0	171.84	172.16	177.16	176.83	MO	ST. LOUIS
	N	4265.0	4270.0	4270.0	4265.0	4265.0	4269.34	4274.34	4274.01	4269.02		
104	E	695.0	695.0	700.0	700.0	700.0	172.16	172.49	177.48	177.16	MO	ST. LOUIS
	N	4270.0	4275.0	4275.0	4270.0	4270.0	4274.34	4279.33	4279.00	4274.01		
105	E	695.0	695.0	700.0	700.0	700.0	172.49	172.82	177.81	177.48	MO	ST. LOUIS
	N	4275.0	4280.0	4280.0	4275.0	4275.0	4279.33	4284.32	4284.00	4279.00		
131	E	700.0	700.0	705.0	705.0	705.0	176.50	176.83	181.82	181.50	MO	ST. LOUIS
	N	4260.0	4265.0	4265.0	4260.0	4260.0	4264.02	4269.02	4268.69	4263.70		
132	E	700.0	700.0	705.0	705.0	705.0	176.83	177.16	182.15	181.82	MO	ST. LOUIS
	N	4265.0	4270.0	4270.0	4265.0	4265.0	4269.02	4274.01	4273.68	4268.69		
133	E	700.0	700.0	705.0	705.0	705.0	177.16	177.48	182.48	182.15	MO	ST. LOUIS
	N	4270.0	4275.0	4275.0	4270.0	4270.0	4274.01	4279.00	4278.68	4273.68		
134	E	700.0	700.0	705.0	705.0	705.0	177.48	177.81	182.80	182.48	MO	ST. LOUIS
	N	4275.0	4280.0	4280.0	4275.0	4275.0	4279.00	4284.00	4283.67	4278.68		
135	E	700.0	700.0	705.0	705.0	705.0	177.81	178.14	183.13	182.80	MO	ST. LOUIS
	N	4280.0	4285.0	4285.0	4280.0	4280.0	4284.00	4288.99	4288.66	4283.67		
2042	E	705.0	705.0	707.0	707.0	707.0	181.56	181.69	183.69	183.56	MO	ST. LOUIS
	N	4261.0	4263.0	4263.0	4261.0	4261.0	4264.70	4266.70	4266.56	4264.57		
2043	E	705.0	705.0	707.0	707.0	707.0	181.69	181.82	183.82	183.69	MO	ST. LOUIS
	N	4263.0	4265.0	4265.0	4263.0	4263.0	4266.70	4268.69	4268.56	4266.56		
156	E	705.0	705.0	710.0	710.0	710.0	181.82	182.15	187.14	186.81	MO	ST. LOUIS
	N	4265.0	4270.0	4270.0	4265.0	4265.0	4268.69	4273.68	4273.36	4268.37		
2044	E	705.0	705.0	710.0	710.0	710.0	182.15	182.48	187.47	187.14	MO	ST. LOUIS
	N	4270.0	4275.0	4275.0	4270.0	4270.0	4273.68	4278.68	4278.35	4273.36		
159	E	705.0	705.0	710.0	710.0	710.0	182.48	182.80	187.79	187.47	MO	ST. LOUIS
	N	4275.0	4280.0	4280.0	4275.0	4275.0	4278.68	4283.67	4283.34	4278.35		
160	E	705.0	705.0	710.0	710.0	710.0	182.80	183.13	188.12	187.79	MO	ST. LOUIS
	N	4280.0	4285.0	4285.0	4280.0	4280.0	4283.67	4288.66	4288.34	4283.34		
2031	E	707.0	707.0	709.0	709.0	709.0	183.56	183.69	185.69	185.56	MO	ST. LOUIS
	N	4261.0	4263.0	4263.0	4261.0	4261.0	4264.57	4266.56	4266.43	4264.44		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY	
2052	E	707.0	707.0	709.0	709.0	183.69	183.82	185.82	185.69	MO	ST. LOUIS
	N	4263.0	4265.0	4265.0	4263.0	4266.56	4268.56	4268.43	4266.43		
2061	E	709.0	709.0	711.0	711.0	185.69	185.82	187.81	187.68	MU	ST. LOUIS
	N	4263.0	4265.0	4265.0	4263.0	4266.43	4268.43	4268.30	4266.30		
189	E	710.0	710.0	715.0	715.0	186.81	187.14	192.13	191.81	MU	ST. LOUIS
	N	4265.0	4270.0	4270.0	4265.0	4268.37	4273.36	4273.03	4268.04		
190	E	710.0	710.0	715.0	715.0	187.14	187.47	192.46	192.13	MU	ST. LOUIS
	N	4270.0	4275.0	4275.0	4270.0	4273.36	4278.35	4278.02	4273.03		
191	E	710.0	710.0	715.0	715.0	187.47	187.79	192.79	192.46	MU	ST. LOUIS
	N	4275.0	4280.0	4280.0	4275.0	4278.35	4283.34	4283.02	4278.02		
192	E	710.0	710.0	715.0	715.0	187.79	188.12	193.11	192.79	MO	ST. LOUIS
	N	4280.0	4285.0	4285.0	4280.0	4283.34	4288.34	4288.01	4283.02		
2096	E	715.0	715.0	717.0	717.0	191.74	191.87	193.87	193.74	MO	ST. LOUIS
	N	4264.0	4266.0	4266.0	4264.0	4267.04	4269.04	4268.91	4266.91		
2097	E	715.0	715.0	717.0	717.0	191.87	192.00	194.00	193.87	MO	ST. LOUIS
	N	4266.0	4268.0	4268.0	4266.0	4269.04	4271.04	4270.90	4268.91		
2098	E	715.0	715.0	717.0	717.0	192.00	192.13	194.13	194.00	MU	ST. LOUIS
	N	4268.0	4270.0	4270.0	4268.0	4271.04	4273.03	4272.90	4270.90		
226	E	715.0	715.0	717.0	717.0	192.13	192.26	194.26	194.13	MO	ST. LOUIS
	N	4270.0	4272.0	4272.0	4270.0	4273.03	4275.03	4274.90	4272.90		
227	E	715.0	715.0	717.0	717.0	192.26	192.40	194.39	194.26	MU	ST. LOUIS
	N	4272.0	4274.0	4274.0	4272.0	4275.03	4277.02	4276.89	4274.90		
228	E	715.0	715.0	717.0	717.0	192.40	192.53	194.52	194.39	MU	ST. LOUIS
	N	4274.0	4276.0	4276.0	4274.0	4277.02	4279.02	4278.89	4276.89		
229	E	715.0	715.0	717.0	717.0	192.53	192.66	194.65	194.52	MU	ST. LOUIS
	N	4276.0	4278.0	4278.0	4276.0	4279.02	4281.02	4280.89	4278.89		
230	E	715.0	715.0	717.0	717.0	192.66	192.79	194.78	194.65	MU	ST. LOUIS
	N	4278.0	4280.0	4280.0	4278.0	4281.02	4283.02	4282.89	4280.89		
2099	E	715.0	715.0	716.0	716.0	192.79	192.85	193.85	193.79	MU	ST. LOUIS
	N	4280.0	4281.0	4281.0	4280.0	4283.02	4284.02	4283.95	4282.95		

TABLE 1. (CONTINUED)

ST LOUIS ADCR GRID SQUARE COORDINATES (KM)											
ID		***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY
2100	E N	715.0 4281.0	715.0 4283.0	717.0 4281.0	717.0 4281.0	192.85 4284.02	192.98 4286.01	194.98 4285.88	MO	ST. LOUIS	
2101	E N	715.0 4283.0	715.0 4285.0	717.0 4283.0	717.0 4283.0	192.98 4286.01	193.11 4288.01	195.11 4287.88	MO	ST. LOUIS	
2102	E N	715.0 4285.0	715.0 4287.0	717.0 4285.0	717.0 4285.0	193.11 4288.01	193.25 4290.00	195.24 4289.88	MO	ST. LOUIS	
2103	E N	715.0 4287.0	715.0 4289.0	717.0 4287.0	717.0 4287.0	193.25 4290.00	193.38 4292.00	195.37 4289.88	MO	ST. LOUIS	
2104	E N	715.0 4289.0	715.0 4291.0	717.0 4289.0	717.0 4289.0	193.38 4292.00	193.51 4294.00	195.50 4293.87	MO	ST. LOUIS	
2109	E N	716.0 4280.0	716.0 4281.0	717.0 4281.0	717.0 4281.0	193.79 4282.95	193.85 4283.95	194.85 4283.88	MO	ST. LOUIS	
2117	E N	717.0 4264.0	717.0 4266.0	719.0 4264.0	719.0 4264.0	193.74 4266.91	193.87 4268.91	195.87 4268.78	MO	ST. LOUIS	
2118	E N	717.0 4266.0	717.0 4268.0	719.0 4266.0	719.0 4266.0	193.87 4268.91	194.00 4270.90	196.00 4270.77	MO	ST. LOUIS	
2119	E N	717.0 4268.0	717.0 4270.0	719.0 4268.0	719.0 4268.0	194.00 4270.90	194.13 4272.90	196.13 4272.77	MO	ST. LOUIS	
251	E N	717.0 4270.0	717.0 4272.0	719.0 4270.0	719.0 4270.0	194.13 4272.90	194.26 4274.90	196.26 4274.77	MO	ST. LOUIS	
252	E N	717.0 4272.0	717.0 4274.0	719.0 4272.0	719.0 4272.0	194.26 4274.90	194.39 4276.89	196.39 4276.77	MO	ST. LOUIS	
253	E N	717.0 4274.0	717.0 4276.0	719.0 4274.0	719.0 4274.0	194.39 4276.89	194.52 4278.89	196.52 4278.76	MO	ST. LOUIS	
254	E N	717.0 4276.0	717.0 4278.0	719.0 4276.0	719.0 4276.0	194.52 4278.89	194.65 4280.89	196.65 4280.76	MO	ST. LOUIS	
255	E N	717.0 4278.0	717.0 4280.0	719.0 4278.0	719.0 4278.0	194.65 4280.89	194.78 4282.89	196.78 4282.75	MO	ST. LOUIS	
2120	E N	717.0 4280.0	717.0 4281.0	718.0 4281.0	718.0 4281.0	194.78 4282.89	194.85 4283.88	195.85 4283.82	MO	ST. LOUIS	

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY	
2121	E	717.0 4281.0	719.0 4283.0	719.0 4281.0	194.85 4283.88	194.98 4285.88	196.98 4285.75	196.85 4283.75	MU	ST. LOUIS	
2122	E	717.0 4283.0	719.0 4285.0	719.0 4283.0	194.98 4285.88	195.11 4287.88	197.11 4287.75	196.98 4285.75	MU	ST. LOUIS	
2123	E	717.0 4285.0	719.0 4287.0	719.0 4285.0	195.11 4287.88	195.24 4289.88	197.24 4289.74	197.11 4287.75	MU	ST. LOUIS	
2124	E	717.0 4287.0	719.0 4289.0	719.0 4287.0	195.24 4289.88	195.37 4291.87	197.37 4291.74	197.24 4289.74	MU	ST. LOUIS	
2125	E	717.0 4289.0	719.0 4291.0	719.0 4289.0	195.37 4291.87	195.50 4293.87	197.50 4293.74	197.37 4291.74	MU	ST. LOUIS	
2126	E	717.0 4291.0	719.0 4293.0	719.0 4291.0	195.50 4293.87	195.64 4295.86	197.63 4295.73	197.50 4293.74	MO	ST. LOUIS	
2130	E	718.0 4280.0	719.0 4281.0	719.0 4280.0	195.78 4282.82	195.85 4283.82	196.85 4283.75	196.78 4282.75	MO	ST. LOUIS	
2139	E	719.0 4264.0	721.0 4266.0	721.0 4264.0	195.74 4266.78	195.87 4268.78	197.86 4268.64	197.73 4266.65	MO	ST. LOUIS	
2140	E	719.0 4266.0	721.0 4268.0	721.0 4266.0	195.87 4268.78	196.00 4270.77	197.99 4270.64	197.86 4268.64	MU	ST. LOUIS	
2141	E	719.0 4268.0	721.0 4270.0	721.0 4268.0	196.00 4270.77	196.13 4272.77	198.12 4272.64	197.99 4270.64	MO	ST. LOUIS	
281	E	719.0 4270.0	721.0 4272.0	721.0 4270.0	196.13 4272.77	196.26 4274.77	198.25 4274.64	198.12 4272.64	MO	ST. LOUIS	
282	E	719.0 4272.0	721.0 4274.0	721.0 4272.0	196.26 4274.77	196.39 4276.77	198.39 4276.63	198.25 4274.64	MU	ST. LOUIS	
283	E	719.0 4274.0	721.0 4276.0	721.0 4274.0	196.39 4276.77	196.52 4278.76	198.52 4278.63	198.39 4276.63	MU	ST. LOUIS	
284	E	719.0 4276.0	721.0 4278.0	721.0 4276.0	196.52 4278.76	196.65 4280.76	198.65 4280.63	198.52 4278.63	MU	ST. LOUIS	
285	E	719.0 4278.0	721.0 4280.0	721.0 4278.0	196.65 4280.76	196.78 4282.75	198.78 4282.63	198.65 4280.63	MU	ST. LOUIS	

TABLE 1. (CONTINUED)

ST LOUIS ADOCK GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY	
2142	E	719.0	719.0	720.0	720.0	196.78	196.85	197.84	197.78	MO	ST. LOUIS
	N	4280.0	4281.0	4281.0	4280.0	4282.75	4283.75	4283.69	4282.69		
2143	E	719.0	719.0	721.0	721.0	196.85	196.98	198.97	198.84	MO	ST. LOUIS
	N	4281.0	4283.0	4283.0	4281.0	4283.75	4285.75	4285.62	4283.62		
2144	E	719.0	719.0	721.0	721.0	196.98	197.11	199.11	198.97	MO	ST. LOUIS
	N	4283.0	4285.0	4285.0	4283.0	4285.75	4287.75	4287.62	4285.62		
2145	E	719.0	719.0	721.0	721.0	197.11	197.24	199.24	199.11	MO	ST. LOUIS
	N	4285.0	4287.0	4287.0	4285.0	4287.75	4289.74	4289.61	4287.62		
2146	E	719.0	719.0	721.0	721.0	197.24	197.37	199.37	199.24	MO	ST. LOUIS
	N	4287.0	4289.0	4289.0	4287.0	4289.74	4291.74	4291.61	4289.61		
2147	E	719.0	719.0	721.0	721.0	197.37	197.50	199.50	199.37	MO	ST. LOUIS
	N	4289.0	4291.0	4291.0	4289.0	4291.74	4293.74	4293.61	4291.61		
2148	E	719.0	719.0	721.0	721.0	197.50	197.63	199.63	199.50	MO	ST. LOUIS
	N	4291.0	4293.0	4293.0	4291.0	4293.74	4295.73	4295.60	4293.61		
2149	E	719.0	719.0	721.0	721.0	197.63	197.76	199.76	199.63	MO	ST. LOUIS
	N	4293.0	4295.0	4295.0	4293.0	4295.73	4297.73	4297.60	4295.60		
2150	E	720.0	720.0	721.0	721.0	197.78	197.84	198.84	198.78	MO	ST. LOUIS
	N	4280.0	4281.0	4281.0	4280.0	4282.69	4283.69	4283.62	4282.63		
308	E	720.0	720.0	725.0	725.0	198.76	199.09	204.08	203.75	MO	ST. LOUIS
	N	4295.0	4300.0	4300.0	4295.0	4297.66	4302.66	4302.33	4297.34		
2160	E	721.0	721.0	723.0	723.0	197.73	197.86	199.86	199.73	MO	ST. LOUIS
	N	4264.0	4266.0	4266.0	4264.0	4266.65	4268.64	4268.52	4266.52		
2161	E	721.0	721.0	725.0	725.0	197.86	198.12	202.12	201.86	MO	ST. LOUIS
	N	4266.0	4270.0	4270.0	4266.0	4268.64	4272.64	4272.38	4268.39		
310	E	721.0	721.0	723.0	723.0	198.12	198.25	200.25	200.12	MO	ST. LOUIS
	N	4270.0	4272.0	4272.0	4270.0	4272.64	4274.64	4274.51	4272.51		
311	E	721.0	721.0	723.0	723.0	198.25	198.39	200.38	200.25	MO	ST. LOUIS
	N	4272.0	4274.0	4274.0	4272.0	4274.64	4276.63	4276.50	4274.51		
312	E	721.0	721.0	723.0	723.0	198.39	198.52	200.51	200.38	MO	ST. LOUIS
	N	4274.0	4276.0	4276.0	4274.0	4276.63	4278.63	4278.50	4276.50		

TABLE 1. (CONTINUED)

ST LOUIS ADCR GRID SQUARE COORDINATES (NM)												
ID	***** UTM ZONE 15 *****					***** UTM ZONE 16 *****					STATE	COUNTY
313	E	721.0	721.0	723.0	723.0	198.52	198.65	200.64	200.51	MO	ST. LOUIS	
	N	4276.0	4278.0	4278.0	4276.0	4278.63	4280.63	4280.50	4278.50			
314	E	721.0	721.0	723.0	723.0	198.65	198.78	200.77	200.64	MO	ST. LOUIS	
	N	4278.0	4280.0	4280.0	4278.0	4280.63	4282.63	4282.49	4280.50			
2162	E	721.0	721.0	722.0	722.0	198.78	198.84	199.84	199.78	MO	ST. LOUIS	
	N	4280.0	4281.0	4281.0	4280.0	4282.63	4283.62	4283.55	4282.56			
2163	E	721.0	721.0	723.0	723.0	198.84	198.97	200.97	200.84	MO	ST. LOUIS	
	N	4281.0	4283.0	4283.0	4281.0	4283.62	4285.62	4285.49	4283.49			
2164	E	721.0	721.0	723.0	723.0	198.97	199.11	201.10	200.97	MO	ST. LOUIS	
	N	4283.0	4285.0	4285.0	4283.0	4285.62	4287.62	4287.48	4285.49			
2165	E	721.0	721.0	723.0	723.0	199.11	199.24	201.23	201.10	MO	ST. LOUIS	
	N	4285.0	4287.0	4287.0	4285.0	4287.62	4289.61	4289.48	4287.48			
2166	E	721.0	721.0	723.0	723.0	199.24	199.37	201.36	201.23	MO	ST. LOUIS	
	N	4287.0	4289.0	4289.0	4287.0	4289.61	4291.61	4291.48	4289.48			
2167	E	721.0	721.0	723.0	723.0	199.37	199.50	201.49	201.36	MO	ST. LOUIS	
	N	4289.0	4291.0	4291.0	4289.0	4291.61	4293.61	4293.47	4291.48			
2168	E	721.0	721.0	723.0	723.0	199.50	199.63	201.63	201.49	MO	ST. LOUIS	
	N	4291.0	4293.0	4293.0	4291.0	4293.61	4295.60	4295.47	4293.47			
2169	E	721.0	721.0	723.0	723.0	199.63	199.76	201.76	201.63	MO	ST. LOUIS	
	N	4293.0	4295.0	4295.0	4293.0	4295.60	4297.60	4297.47	4295.47			
2170	E	722.0	722.0	723.0	723.0	199.78	199.84	200.84	200.77	MO	ST. LOUIS	
	N	4280.0	4281.0	4281.0	4280.0	4282.56	4283.55	4283.49	4282.49			
2179	E	723.0	723.0	725.0	725.0	199.73	199.86	201.86	201.73	MO	ST. LOUIS	
	N	4264.0	4266.0	4266.0	4264.0	4266.52	4268.52	4268.39	4266.39			
327	E	723.0	723.0	724.0	724.0	200.12	200.19	201.18	201.12	MO	ST. LOUIS	
	N	4270.0	4271.0	4271.0	4270.0	4272.51	4273.51	4273.44	4272.45			
328	E	723.0	723.0	724.0	724.0	200.19	200.25	201.25	201.18	MO	ST. LOUIS	
	N	4271.0	4272.0	4272.0	4271.0	4273.51	4274.51	4274.44	4273.44			
329	E	723.0	723.0	724.0	724.0	200.25	200.32	201.32	201.25	MO	ST. LOUIS	
	N	4272.0	4273.0	4273.0	4272.0	4274.51	4275.50	4275.44	4274.44			

TABLE 1. (CONTINUED)

ST LOUIS ADOX GRID SQUARE COORDINATES (KM)											
ID	UTM ZONE 15		UTM ZONE 16		UTM ZONE 16		UTM ZONE 16		UTM ZONE 16		STATE COUNTY
	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	
330 E	723.0	723.0	724.0	724.0	200.32	200.38	201.38	201.38	201.32	201.32	MO ST. LOUIS
330 N	4273.0	4274.0	4274.0	4275.0	4275.50	4276.50	4276.44	4276.44	4275.44	4275.44	
331 E	723.0	723.0	724.0	724.0	200.38	200.45	201.45	201.45	201.38	201.38	MO ST. LOUIS
331 N	4274.0	4275.0	4275.0	4276.0	4276.50	4277.50	4277.44	4277.44	4276.44	4276.44	
332 E	723.0	723.0	724.0	724.0	200.45	200.51	201.51	201.51	201.45	201.45	MO ST. LOUIS
332 N	4275.0	4276.0	4276.0	4277.0	4277.50	4278.50	4278.43	4278.43	4277.43	4277.43	
333 E	723.0	723.0	724.0	724.0	200.51	200.58	201.58	201.58	201.51	201.51	MO ST. LOUIS
333 N	4276.0	4277.0	4277.0	4278.0	4278.50	4279.50	4279.43	4279.43	4278.43	4278.43	
334 E	723.0	723.0	724.0	724.0	200.58	200.64	201.64	201.64	201.58	201.58	MO ST. LOUIS
334 N	4277.0	4278.0	4278.0	4279.0	4279.50	4280.50	4280.43	4280.43	4279.43	4279.43	
335 E	723.0	723.0	724.0	724.0	200.64	200.71	201.71	201.71	201.64	201.64	MO ST. LOUIS
335 N	4278.0	4279.0	4279.0	4280.0	4280.50	4281.50	4281.43	4281.43	4280.43	4280.43	
336 E	723.0	723.0	724.0	724.0	200.71	200.77	201.77	201.77	201.71	201.71	MO ST. LOUIS
336 N	4279.0	4280.0	4280.0	4281.0	4281.50	4282.49	4282.43	4282.43	4281.43	4281.43	
2180 E	723.0	723.0	724.0	724.0	200.77	200.84	201.84	201.84	201.77	201.77	MO ST. LOUIS
2180 N	4280.0	4281.0	4281.0	4282.0	4282.49	4283.49	4283.43	4283.43	4282.43	4282.43	
2181 E	723.0	723.0	725.0	725.0	200.84	200.97	202.97	202.97	202.84	202.84	MO ST. LOUIS
2181 N	4281.0	4283.0	4283.0	4284.0	4283.49	4285.49	4285.36	4285.36	4284.36	4284.36	
2182 E	723.0	723.0	725.0	725.0	200.97	201.10	203.10	203.10	202.97	202.97	MO ST. LOUIS
2182 N	4283.0	4285.0	4285.0	4286.0	4285.49	4287.48	4287.35	4287.35	4286.36	4286.36	
2183 E	723.0	723.0	725.0	725.0	201.10	201.23	203.23	203.23	203.10	203.10	MO ST. LOUIS
2183 N	4285.0	4287.0	4287.0	4288.0	4287.48	4289.48	4289.35	4289.35	4288.35	4288.35	
2184 E	723.0	723.0	725.0	725.0	201.23	201.36	203.36	203.36	203.23	203.23	MO ST. LOUIS
2184 N	4287.0	4289.0	4289.0	4290.0	4289.48	4291.48	4291.35	4291.35	4290.35	4290.35	
2185 E	723.0	723.0	725.0	725.0	201.36	201.49	203.49	203.49	203.36	203.36	MO ST. LOUIS
2185 N	4289.0	4291.0	4291.0	4292.0	4291.48	4293.47	4293.34	4293.34	4292.35	4292.35	
2186 E	723.0	723.0	725.0	725.0	201.49	201.63	203.63	203.63	203.49	203.49	MO ST. LOUIS
2186 N	4291.0	4293.0	4293.0	4294.0	4293.47	4295.47	4295.34	4295.34	4294.34	4294.34	
2187 E	723.0	723.0	725.0	725.0	201.63	201.76	203.76	203.76	203.63	203.63	MO ST. LOUIS
2187 N	4293.0	4295.0	4295.0	4296.0	4295.47	4297.47	4297.34	4297.34	4296.34	4296.34	

TABLE 1. (CONTINUED)

ST LOUIS ABLR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY
337	E	724.0	724.0	725.0	725.0	201.12	201.18	202.18	202.12	202.12	MO	ST. LOUIS
	N	4270.0	4271.0	4271.0	4270.0	4272.45	4273.44	4273.38	4272.38	4272.38		
338	E	724.0	724.0	725.0	725.0	201.18	201.25	202.25	202.18	202.18	MO	ST. LOUIS
	N	4271.0	4272.0	4272.0	4271.0	4273.44	4274.44	4274.38	4273.38	4273.38		
339	E	724.0	724.0	725.0	725.0	201.25	201.32	202.32	202.25	202.25	MO	ST. LOUIS
	N	4272.0	4273.0	4273.0	4272.0	4274.44	4275.44	4275.38	4274.38	4274.38		
340	E	724.0	724.0	725.0	725.0	201.32	201.38	202.38	202.31	202.31	MO	ST. LOUIS
	N	4273.0	4274.0	4274.0	4273.0	4275.44	4276.44	4276.37	4275.38	4275.38		
341	E	724.0	724.0	725.0	725.0	201.38	201.45	202.44	202.38	202.38	MO	ST. LOUIS
	N	4274.0	4275.0	4275.0	4274.0	4276.44	4277.44	4277.37	4276.37	4276.37		
342	E	724.0	724.0	725.0	725.0	201.45	201.51	202.51	202.44	202.44	MO	ST. LOUIS
	N	4275.0	4276.0	4276.0	4275.0	4277.44	4278.43	4278.37	4277.37	4277.37		
343	E	724.0	724.0	725.0	725.0	201.51	201.58	202.58	202.51	202.51	MO	ST. LOUIS
	N	4276.0	4277.0	4277.0	4276.0	4278.43	4279.43	4279.37	4278.37	4278.37		
344	E	724.0	724.0	725.0	725.0	201.58	201.64	202.64	202.58	202.58	MO	ST. LOUIS
	N	4277.0	4278.0	4278.0	4277.0	4279.43	4280.43	4280.36	4279.37	4279.37		
345	E	724.0	724.0	725.0	725.0	201.64	201.71	202.71	202.64	202.64	MO	ST. LOUIS
	N	4278.0	4279.0	4279.0	4278.0	4280.43	4281.43	4281.36	4280.36	4280.36		
346	E	724.0	724.0	725.0	725.0	201.71	201.77	202.77	202.71	202.71	MO	ST. LOUIS
	N	4279.0	4280.0	4280.0	4279.0	4281.43	4282.43	4282.36	4281.36	4281.36		
2189	E	724.0	724.0	725.0	725.0	201.77	201.84	202.84	202.77	202.77	MO	ST. LOUIS
	N	4280.0	4281.0	4281.0	4280.0	4282.43	4283.43	4283.36	4282.36	4282.36		
2196	E	725.0	725.0	727.0	727.0	201.47	201.60	203.59	203.46	203.46	MO	ST. LOUIS
	N	4260.0	4262.0	4262.0	4260.0	4262.39	4264.39	4264.26	4262.27	4262.27		
2197	E	725.0	725.0	727.0	727.0	201.60	201.73	203.72	203.59	203.59	MO	ST. LOUIS
	N	4262.0	4264.0	4264.0	4262.0	4264.39	4266.39	4266.26	4264.26	4264.26		
2198	E	725.0	725.0	727.0	727.0	201.73	201.86	203.85	203.72	203.72	MO	ST. LOUIS
	N	4264.0	4266.0	4266.0	4264.0	4266.39	4268.39	4268.25	4266.26	4266.26		
2199	E	725.0	725.0	727.0	727.0	201.86	201.99	203.98	203.85	203.85	MO	ST. LOUIS
	N	4266.0	4268.0	4268.0	4266.0	4268.39	4270.38	4270.25	4268.25	4268.25		

TABLE 1. (CONTINUED)

ST LOUIS AOCN GRID SQUARE COORDINATES (KM)										
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY
330	E	723.0 4273.0	723.0 4274.0	724.0 4275.0	200.32 4275.50	200.38 4276.50	201.38 4276.44	201.32 4275.44	MO	ST. LOUIS
331	E	723.0 4274.0	723.0 4275.0	724.0 4276.0	200.38 4276.50	200.45 4277.50	201.45 4277.44	201.38 4276.44	MO	ST. LOUIS
332	E	723.0 4275.0	723.0 4276.0	724.0 4277.0	200.45 4277.50	200.51 4278.50	201.51 4278.43	201.45 4277.44	MO	ST. LOUIS
333	E	723.0 4276.0	723.0 4277.0	724.0 4278.0	200.51 4278.50	200.58 4279.50	201.58 4279.43	201.51 4278.43	MO	ST. LOUIS
334	E	723.0 4277.0	723.0 4278.0	724.0 4279.0	200.58 4279.50	200.64 4280.50	201.64 4280.43	201.58 4279.43	MO	ST. LOUIS
335	E	723.0 4278.0	723.0 4279.0	724.0 4280.0	200.64 4280.50	200.71 4281.50	201.71 4281.43	201.64 4280.43	MO	ST. LOUIS
336	E	723.0 4279.0	723.0 4280.0	724.0 4281.0	200.71 4281.50	200.77 4282.49	201.77 4282.43	201.71 4281.43	MO	ST. LOUIS
2180	E	723.0 4280.0	723.0 4281.0	724.0 4282.0	200.77 4282.49	200.84 4283.49	201.84 4283.43	201.77 4282.43	MO	ST. LOUIS
2181	E	723.0 4281.0	723.0 4282.0	724.0 4283.0	200.84 4283.49	200.97 4284.49	202.97 4285.36	202.84 4283.36	MO	ST. LOUIS
2182	E	723.0 4282.0	723.0 4283.0	724.0 4284.0	200.97 4284.49	201.10 4285.48	203.10 4286.35	202.97 4285.36	MO	ST. LOUIS
2183	E	723.0 4283.0	723.0 4284.0	724.0 4285.0	201.10 4285.48	201.23 4286.48	203.23 4287.35	203.10 4286.35	MO	ST. LOUIS
2184	E	723.0 4284.0	723.0 4285.0	724.0 4286.0	201.23 4286.48	201.36 4287.48	203.36 4288.35	203.23 4287.35	MO	ST. LOUIS
2185	E	723.0 4285.0	723.0 4286.0	724.0 4287.0	201.36 4287.48	201.49 4288.47	203.49 4289.34	203.36 4288.35	MO	ST. LOUIS
2186	E	723.0 4286.0	723.0 4287.0	724.0 4288.0	201.49 4288.47	201.63 4289.47	203.62 4290.34	203.49 4289.34	MO	ST. LOUIS
2187	E	723.0 4287.0	723.0 4288.0	724.0 4289.0	201.63 4289.47	201.76 4290.47	203.75 4291.34	203.62 4290.34	MO	ST. LOUIS

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)													
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				*****				STATE COUNTY
337	E	724.0	724.0	725.0	725.0	725.0	725.0	201.12	201.18	202.18	202.18	202.12	MU ST. LOUIS
	N	4270.0	4271.0	4271.0	4271.0	4270.0	4270.0	4272.45	4273.44	4273.38	4272.38	4272.38	
338	E	724.0	724.0	725.0	725.0	725.0	725.0	201.18	201.25	202.25	202.18	202.18	MU ST. LOUIS
	N	4271.0	4272.0	4272.0	4272.0	4271.0	4271.0	4273.44	4274.44	4274.38	4273.38	4273.38	
339	E	724.0	724.0	725.0	725.0	725.0	725.0	201.25	201.32	202.31	202.25	202.25	MU ST. LOUIS
	N	4272.0	4273.0	4273.0	4273.0	4272.0	4272.0	4274.44	4275.44	4275.38	4274.38	4274.38	
340	E	724.0	724.0	725.0	725.0	725.0	725.0	201.32	201.38	202.38	202.31	202.31	MU ST. LOUIS
	N	4273.0	4274.0	4274.0	4274.0	4273.0	4273.0	4275.44	4276.44	4276.37	4275.38	4275.38	
341	E	724.0	724.0	725.0	725.0	725.0	725.0	201.38	201.45	202.44	202.38	202.38	MU ST. LOUIS
	N	4274.0	4275.0	4275.0	4275.0	4274.0	4274.0	4276.44	4277.44	4277.37	4276.37	4276.37	
342	E	724.0	724.0	725.0	725.0	725.0	725.0	201.45	201.51	202.51	202.44	202.44	MU ST. LOUIS
	N	4275.0	4276.0	4276.0	4276.0	4275.0	4275.0	4277.44	4278.43	4278.37	4277.37	4277.37	
343	E	724.0	724.0	725.0	725.0	725.0	725.0	201.51	201.58	202.58	202.51	202.51	MU ST. LOUIS
	N	4276.0	4277.0	4277.0	4277.0	4276.0	4276.0	4278.43	4279.43	4279.37	4278.37	4278.37	
344	E	724.0	724.0	725.0	725.0	725.0	725.0	201.58	201.64	202.64	202.58	202.58	MU ST. LOUIS
	N	4277.0	4278.0	4278.0	4278.0	4277.0	4277.0	4279.43	4280.43	4280.36	4279.37	4279.37	
345	E	724.0	724.0	725.0	725.0	725.0	725.0	201.64	201.71	202.71	202.64	202.64	MU ST. LOUIS
	N	4278.0	4279.0	4279.0	4279.0	4278.0	4278.0	4280.43	4281.43	4281.36	4280.36	4280.36	
346	E	724.0	724.0	725.0	725.0	725.0	725.0	201.71	201.77	202.77	202.71	202.71	MU ST. LOUIS
	N	4279.0	4280.0	4280.0	4280.0	4279.0	4279.0	4281.43	4282.43	4282.36	4281.36	4281.36	
2189	E	724.0	724.0	725.0	725.0	725.0	725.0	201.77	201.84	202.84	202.77	202.77	MU ST. LOUIS
	N	4280.0	4281.0	4281.0	4281.0	4280.0	4280.0	4282.43	4283.43	4283.36	4282.36	4282.36	
2196	E	725.0	725.0	727.0	727.0	727.0	727.0	201.47	201.60	203.59	203.46	203.46	MU ST. LOUIS
	N	4260.0	4262.0	4262.0	4262.0	4260.0	4260.0	4262.39	4264.39	4264.26	4262.27	4262.27	
2197	E	725.0	725.0	727.0	727.0	727.0	727.0	201.60	201.73	203.72	203.59	203.59	MU ST. LOUIS
	N	4262.0	4264.0	4264.0	4264.0	4262.0	4262.0	4264.39	4266.39	4266.26	4264.26	4264.26	
2198	E	725.0	725.0	727.0	727.0	727.0	727.0	201.73	201.86	203.85	203.72	203.72	MU ST. LOUIS
	N	4264.0	4266.0	4266.0	4266.0	4264.0	4264.0	4266.39	4268.39	4268.25	4266.26	4266.26	
2199	E	725.0	725.0	727.0	727.0	727.0	727.0	201.86	201.99	203.98	203.85	203.85	MU ST. LOUIS
	N	4266.0	4268.0	4268.0	4268.0	4266.0	4266.0	4268.39	4270.38	4270.25	4268.25	4268.25	

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY
2200	E	725.0	725.0	727.0	727.0	727.0	201.99	202.12	204.11	203.98	MO	ST. LOUIS
	N	4268.0	4270.0	4270.0	4268.0	4268.0	4270.38	4272.38	4272.25	4270.25		
366	E	725.0	725.0	726.0	726.0	726.0	202.12	202.18	203.18	203.12	MO	ST. LOUIS
	N	4270.0	4271.0	4271.0	4270.0	4270.0	4272.38	4273.38	4273.31	4272.31		
367	E	725.0	725.0	726.0	726.0	726.0	202.18	202.25	203.25	203.18	MO	ST. LOUIS
	N	4271.0	4272.0	4272.0	4271.0	4271.0	4273.38	4274.38	4274.31	4273.31		
368	E	725.0	725.0	726.0	726.0	726.0	202.25	202.31	203.31	203.25	MO	ST. LOUIS
	N	4272.0	4273.0	4273.0	4272.0	4272.0	4274.38	4275.38	4275.31	4274.31		
369	E	725.0	725.0	726.0	726.0	726.0	202.31	202.38	203.38	203.31	MO	ST. LOUIS
	N	4273.0	4274.0	4274.0	4273.0	4273.0	4275.38	4276.37	4276.30	4275.31		
370	E	725.0	725.0	726.0	726.0	726.0	202.38	202.44	203.44	203.38	MO	ST. LOUIS
	N	4274.0	4275.0	4275.0	4274.0	4274.0	4276.37	4277.37	4277.30	4276.30		
371	E	725.0	725.0	726.0	726.0	726.0	202.44	202.51	203.51	203.44	MO	ST. LOUIS
	N	4275.0	4276.0	4276.0	4275.0	4275.0	4277.37	4278.37	4278.30	4277.30		
372	E	725.0	725.0	726.0	726.0	726.0	202.51	202.58	203.57	203.51	MO	ST. LOUIS
	N	4276.0	4277.0	4277.0	4276.0	4276.0	4278.37	4279.37	4279.30	4278.30		
373	E	725.0	725.0	726.0	726.0	726.0	202.58	202.64	203.64	203.57	MO	ST. LOUIS
	N	4277.0	4278.0	4278.0	4277.0	4277.0	4279.37	4280.36	4280.30	4279.30		
374	E	725.0	725.0	726.0	726.0	726.0	202.64	202.71	203.70	203.64	MO	ST. LOUIS
	N	4278.0	4279.0	4279.0	4278.0	4278.0	4280.36	4281.36	4281.30	4280.30		
375	E	725.0	725.0	726.0	726.0	726.0	202.71	202.77	203.77	203.70	MO	ST. LOUIS
	N	4279.0	4280.0	4280.0	4279.0	4279.0	4281.36	4282.36	4282.30	4281.30		
376	E	725.0	725.0	726.0	726.0	726.0	202.77	202.84	203.84	203.77	MO	ST. LOUIS
	N	4280.0	4281.0	4281.0	4280.0	4280.0	4282.36	4283.36	4283.29	4282.30		
377	E	725.0	725.0	726.0	726.0	726.0	202.84	202.90	203.90	203.84	MO	ST. LOUIS
	N	4281.0	4282.0	4282.0	4281.0	4281.0	4283.36	4284.36	4284.29	4283.29		
378	E	725.0	725.0	726.0	726.0	726.0	202.90	202.97	203.97	203.90	MO	ST. LOUIS
	N	4282.0	4283.0	4283.0	4282.0	4282.0	4284.36	4285.36	4285.29	4284.29		
379	E	725.0	725.0	726.0	726.0	726.0	202.97	203.03	204.03	203.97	MO	ST. LOUIS
	N	4283.0	4284.0	4284.0	4283.0	4283.0	4285.36	4286.36	4286.29	4285.29		

TABLE 1. (CONTINUED)

ST LOUIS AUCK GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY	
380	E	725.0	725.0	726.0	726.0	203.03	203.10	204.10	204.03	MO	ST. LOUIS
	N	4284.0	4285.0	4285.0	4284.0	4286.36	4287.35	4287.29	4286.29		
381	E	725.0	725.0	726.0	726.0	203.10	203.16	204.16	204.10	MO	ST. LOUIS
	N	4285.0	4286.0	4286.0	4285.0	4287.35	4288.35	4288.29	4287.29		
382	E	725.0	725.0	726.0	726.0	203.16	203.23	204.23	204.16	MO	ST. LOUIS
	N	4286.0	4287.0	4287.0	4286.0	4288.35	4289.35	4289.29	4288.29		
383	E	725.0	725.0	726.0	726.0	203.23	203.29	204.29	204.23	MO	ST. LOUIS
	N	4287.0	4288.0	4288.0	4287.0	4289.35	4290.35	4290.28	4289.29		
384	E	725.0	725.0	726.0	726.0	203.29	203.36	204.36	204.29	MO	ST. LOUIS
	N	4288.0	4289.0	4289.0	4288.0	4290.35	4291.35	4291.28	4290.28		
385	E	725.0	725.0	726.0	726.0	203.36	203.43	204.42	204.36	MO	ST. LOUIS
	N	4289.0	4290.0	4290.0	4289.0	4291.35	4292.34	4292.28	4291.28		
386	E	725.0	725.0	726.0	726.0	203.43	203.49	204.49	204.42	MO	ST. LOUIS
	N	4290.0	4291.0	4291.0	4290.0	4292.34	4293.34	4293.28	4292.28		
387	E	725.0	725.0	726.0	726.0	203.49	203.56	204.56	204.49	MO	ST. LOUIS
	N	4291.0	4292.0	4292.0	4291.0	4293.34	4294.34	4294.28	4293.28		
388	E	725.0	725.0	726.0	726.0	203.56	203.62	204.62	204.56	MO	ST. LOUIS
	N	4292.0	4293.0	4293.0	4292.0	4294.34	4295.34	4295.27	4294.28		
389	E	725.0	725.0	727.0	727.0	203.62	203.75	205.75	205.62	MO	ST. LOUIS
	N	4293.0	4295.0	4295.0	4293.0	4295.34	4297.34	4297.21	4295.21		
2201	E	725.0	725.0	727.0	727.0	203.75	203.89	205.88	205.75	MO	ST. LOUIS
	N	4295.0	4297.0	4297.0	4295.0	4297.34	4299.33	4299.20	4297.21		
2202	E	725.0	725.0	728.0	728.0	203.89	204.08	207.08	206.88	MO	ST. LOUIS
	N	4297.0	4300.0	4300.0	4297.0	4299.33	4302.33	4302.13	4299.14		
401	E	726.0	726.0	727.0	727.0	203.12	203.18	204.18	204.11	MO	ST. LOUIS
	N	4270.0	4271.0	4271.0	4270.0	4272.31	4273.31	4273.25	4272.25		
402	E	726.0	726.0	727.0	727.0	203.18	203.25	204.25	204.18	MO	ST. LOUIS
	N	4271.0	4272.0	4272.0	4271.0	4273.31	4274.31	4274.25	4273.25		
403	E	726.0	726.0	727.0	727.0	203.25	203.31	204.31	204.25	MO	ST. LOUIS
	N	4272.0	4273.0	4273.0	4272.0	4274.31	4275.31	4275.24	4274.25		

TABLE 1. (CONTINUED)

ST LOUIS AGCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY		
404	E	726.0	726.0	727.0	727.0	203.31	203.38	204.38	204.31	MO	ST. LOUIS	
	N	4273.0	4274.0	4274.0	4273.0	4275.31	4276.30	4276.24	4275.24			
405	E	726.0	726.0	727.0	727.0	203.38	203.44	204.44	204.38	MO	ST. LOUIS	
	N	4274.0	4275.0	4275.0	4274.0	4276.30	4277.30	4277.24	4276.24			
406	E	726.0	726.0	727.0	727.0	203.44	203.51	204.51	204.44	MO	ST. LOUIS	
	N	4275.0	4276.0	4276.0	4275.0	4277.30	4278.30	4278.24	4277.24			
407	E	726.0	726.0	727.0	727.0	203.51	203.57	204.57	204.51	MO	ST. LOUIS	
	N	4276.0	4277.0	4277.0	4276.0	4278.30	4279.30	4279.23	4278.24			
408	E	726.0	726.0	727.0	727.0	203.57	203.64	204.64	204.57	MO	ST. LOUIS	
	N	4277.0	4278.0	4278.0	4277.0	4279.30	4280.30	4280.23	4279.23			
409	E	726.0	726.0	727.0	727.0	203.64	203.70	204.70	204.64	MU	ST. LOUIS	
	N	4278.0	4279.0	4279.0	4278.0	4280.30	4281.30	4281.23	4280.23			
410	E	726.0	726.0	727.0	727.0	203.70	203.77	204.77	204.70	MU	ST. LOUIS	
	N	4279.0	4280.0	4280.0	4279.0	4281.30	4282.30	4282.23	4281.23			
411	E	726.0	726.0	727.0	727.0	203.77	203.84	204.83	204.77	MU	ST. LOUIS	
	N	4280.0	4281.0	4281.0	4280.0	4282.30	4283.29	4283.23	4282.23			
412	E	726.0	726.0	727.0	727.0	203.84	203.90	204.90	204.83	MU	ST. LOUIS	
	N	4281.0	4282.0	4282.0	4281.0	4283.29	4284.29	4284.23	4283.23			
413	E	726.0	726.0	727.0	727.0	203.90	203.97	204.96	204.90	MU	ST. LOUIS	
	N	4282.0	4283.0	4283.0	4282.0	4284.29	4285.29	4285.23	4284.23			
414	E	726.0	726.0	727.0	727.0	203.97	204.03	205.03	204.96	MU	ST. LOUIS	
	N	4283.0	4284.0	4284.0	4283.0	4285.29	4286.29	4286.22	4285.23			
415	E	726.0	726.0	727.0	727.0	204.03	204.10	205.10	205.03	MO	ST. LOUIS	
	N	4284.0	4285.0	4285.0	4284.0	4286.29	4287.29	4287.22	4286.22			
416	E	726.0	726.0	727.0	727.0	204.10	204.16	205.16	205.10	MU	ST. LOUIS	
	N	4285.0	4286.0	4286.0	4285.0	4287.29	4288.29	4288.22	4287.22			
417	E	726.0	726.0	727.0	727.0	204.16	204.23	205.23	205.16	MU	ST. LOUIS	
	N	4286.0	4287.0	4287.0	4286.0	4288.29	4289.29	4289.22	4288.22			
418	E	726.0	726.0	727.0	727.0	204.23	204.29	205.29	205.23	MU	ST. LOUIS	
	N	4287.0	4288.0	4288.0	4287.0	4289.29	4290.28	4290.22	4289.22			

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQAKE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY	
419	E	726.0	726.0	727.0	727.0	204.29	204.36	205.36	205.29	MO	ST. LOUIS
	N	4288.0	4289.0	4289.0	4288.0	4290.28	4291.28	4291.21	4290.22		
420	E	726.0	726.0	727.0	727.0	204.36	204.42	205.42	205.36	MO	ST. LOUIS
	N	4289.0	4290.0	4290.0	4289.0	4291.28	4292.28	4292.21	4291.21		
421	E	726.0	726.0	727.0	727.0	204.42	204.49	205.49	205.42	MO	ST. LOUIS
	N	4290.0	4291.0	4291.0	4290.0	4292.28	4293.28	4293.21	4292.21		
422	E	726.0	726.0	727.0	727.0	204.49	204.56	205.55	205.49	MO	ST. LOUIS
	N	4291.0	4292.0	4292.0	4291.0	4293.28	4294.28	4294.21	4293.21		
423	E	726.0	726.0	727.0	727.0	204.56	204.62	205.62	205.55	MO	ST. LOUIS
	N	4292.0	4293.0	4293.0	4292.0	4294.28	4295.27	4295.21	4294.21		
2210	E	727.0	727.0	729.0	729.0	203.46	203.59	205.59	205.46	MO	ST. LOUIS
	N	4260.0	4262.0	4262.0	4260.0	4262.27	4264.26	4264.13	4262.13		
2211	E	727.0	727.0	729.0	729.0	203.59	203.72	205.72	205.59	MO	ST. LOUIS
	N	4262.0	4264.0	4264.0	4262.0	4264.26	4266.26	4266.13	4264.13		
2212	E	727.0	727.0	729.0	729.0	203.72	203.85	205.85	205.72	MO	ST. LOUIS
	N	4264.0	4266.0	4266.0	4264.0	4266.26	4268.25	4268.13	4266.13		
2213	E	727.0	727.0	729.0	729.0	203.85	203.98	205.98	205.85	MO	ST. LOUIS
	N	4266.0	4268.0	4268.0	4266.0	4268.25	4270.25	4270.12	4268.13		
2214	E	727.0	727.0	729.0	729.0	203.98	204.11	206.11	205.98	MO	ST. LOUIS
	N	4268.0	4270.0	4270.0	4268.0	4270.25	4272.25	4272.12	4270.12		
430	E	727.0	727.0	728.0	728.0	204.11	204.18	205.18	205.11	MO	ST. LOUIS
	N	4270.0	4271.0	4271.0	4270.0	4272.25	4273.25	4273.18	4272.18		
431	E	727.0	727.0	728.0	728.0	204.18	204.25	205.24	205.18	MO	ST. LOUIS
	N	4271.0	4272.0	4272.0	4271.0	4273.25	4274.25	4274.18	4273.18		
432	E	727.0	727.0	728.0	728.0	204.25	204.31	205.31	205.24	MO	ST. LOUIS
	N	4272.0	4273.0	4273.0	4272.0	4274.25	4275.24	4275.18	4274.18		
433	E	727.0	727.0	728.0	728.0	204.31	204.38	205.37	205.31	MO	ST. LOUIS
	N	4273.0	4274.0	4274.0	4273.0	4275.24	4276.24	4276.18	4275.18		
434	E	727.0	727.0	728.0	728.0	204.38	204.44	205.44	205.37	MO	ST. LOUIS
	N	4274.0	4275.0	4275.0	4274.0	4276.24	4277.24	4277.18	4276.18		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY
435	E	727.0	727.0	728.0	728.0	728.0	204.44	204.51	205.50	205.44	MO	ST. LOUIS
	N	4275.0	4276.0	4276.0	4275.0	4275.0	4277.24	4278.24	4278.17	4277.18		
436	E	727.0	727.0	728.0	728.0	728.0	204.51	204.57	205.57	205.50	MO	ST. LOUIS
	N	4276.0	4277.0	4277.0	4276.0	4276.0	4278.24	4279.23	4279.17	4278.17		
437	E	727.0	727.0	728.0	728.0	728.0	204.57	204.64	205.64	205.57	MO	ST. LOUIS
	N	4277.0	4278.0	4278.0	4277.0	4277.0	4279.23	4280.23	4280.17	4279.17		
438	E	727.0	727.0	728.0	728.0	728.0	204.64	204.70	205.70	205.64	MO	ST. LOUIS
	N	4278.0	4279.0	4279.0	4278.0	4278.0	4280.23	4281.23	4281.17	4280.17		
439	E	727.0	727.0	728.0	728.0	728.0	204.70	204.77	205.77	205.70	MO	ST. LOUIS
	N	4279.0	4280.0	4280.0	4279.0	4279.0	4281.23	4282.23	4282.16	4281.17		
440	E	727.0	727.0	728.0	728.0	728.0	204.77	204.83	205.83	205.77	MO	ST. LOUIS
	N	4280.0	4281.0	4281.0	4280.0	4280.0	4282.23	4283.23	4283.16	4282.16		
441	E	727.0	727.0	728.0	728.0	728.0	204.83	204.90	205.90	205.83	MO	ST. LOUIS
	N	4281.0	4282.0	4282.0	4281.0	4281.0	4283.23	4284.23	4284.16	4283.16		
442	E	727.0	727.0	728.0	728.0	728.0	204.90	204.96	205.96	205.90	MO	ST. LOUIS
	N	4282.0	4283.0	4283.0	4282.0	4282.0	4284.23	4285.23	4285.16	4284.16		
443	E	727.0	727.0	728.0	728.0	728.0	204.96	205.03	206.03	205.96	MO	ST. LOUIS
	N	4283.0	4284.0	4284.0	4283.0	4283.0	4285.23	4286.22	4286.16	4285.16		
444	E	727.0	727.0	728.0	728.0	728.0	205.03	205.10	206.09	206.03	MO	ST. LOUIS
	N	4284.0	4285.0	4285.0	4284.0	4284.0	4286.22	4287.22	4287.16	4286.16		
445	E	727.0	727.0	728.0	728.0	728.0	205.10	205.16	206.16	206.09	MO	ST. LOUIS
	N	4285.0	4286.0	4286.0	4285.0	4285.0	4287.22	4288.22	4288.16	4287.16		
446	E	727.0	727.0	728.0	728.0	728.0	205.16	205.23	206.22	206.16	MO	ST. LOUIS
	N	4286.0	4287.0	4287.0	4286.0	4286.0	4288.22	4289.22	4289.15	4288.16		
447	E	727.0	727.0	728.0	728.0	728.0	205.23	205.29	206.29	206.22	MO	ST. LOUIS
	N	4287.0	4288.0	4288.0	4287.0	4287.0	4289.22	4290.22	4290.15	4289.15		
448	E	727.0	727.0	728.0	728.0	728.0	205.29	205.36	206.36	206.29	MO	ST. LOUIS
	N	4288.0	4289.0	4289.0	4288.0	4288.0	4290.22	4291.21	4291.15	4290.15		
449	E	727.0	727.0	728.0	728.0	728.0	205.36	205.42	206.42	206.36	MO	ST. LOUIS
	N	4289.0	4290.0	4290.0	4289.0	4289.0	4291.21	4292.21	4292.15	4291.15		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY	
450	E	727.0	728.0	728.0	205.42	205.49	206.49	206.42	MO	ST. LOUIS	
	N	4290.0	4291.0	4290.0	4292.21	4293.21	4293.15	4292.15			
451	E	727.0	728.0	728.0	205.49	205.55	206.55	206.49	MO	ST. LOUIS	
	N	4291.0	4292.0	4291.0	4293.21	4294.21	4294.14	4293.15			
452	E	727.0	728.0	728.0	205.55	205.62	206.62	206.55	MO	ST. LOUIS	
	N	4292.0	4293.0	4292.0	4294.21	4295.21	4295.14	4294.14			
453	E	727.0	728.0	728.0	205.62	205.68	206.68	206.62	MO	ST. LOUIS	
	N	4293.0	4294.0	4293.0	4295.21	4296.21	4296.14	4295.14			
454	E	727.0	728.0	728.0	205.68	205.75	206.75	206.68	MO	ST. LOUIS	
	N	4294.0	4295.0	4294.0	4296.21	4297.21	4297.14	4296.14			
2215	E	727.0	729.0	729.0	205.75	205.88	207.88	207.75	MO	ST. LOUIS	
	N	4295.0	4297.0	4295.0	4297.21	4299.20	4299.07	4297.07			
472	E	728.0	730.0	730.0	205.11	205.24	207.24	207.11	MO	ST. LOUIS	
	N	4270.0	4272.0	4270.0	4272.18	4274.18	4274.05	4272.05			
473	E	728.0	729.0	729.0	205.24	205.31	206.31	206.24	MO	ST. LOUIS	
	N	4272.0	4273.0	4272.0	4274.18	4275.18	4275.11	4274.11			
474	E	728.0	729.0	729.0	205.31	205.37	206.37	206.31	MO	ST. LOUIS	
	N	4273.0	4274.0	4273.0	4275.18	4276.18	4276.11	4275.11			
475	E	728.0	729.0	729.0	205.37	205.44	206.44	206.37	MO	ST. LOUIS	
	N	4274.0	4275.0	4274.0	4276.18	4277.18	4277.11	4276.11			
476	E	728.0	729.0	729.0	205.44	205.50	206.50	206.44	MO	ST. LOUIS	
	N	4275.0	4276.0	4275.0	4277.18	4278.17	4278.11	4277.11			
477	E	728.0	729.0	729.0	205.50	205.57	206.57	206.50	MO	ST. LOUIS	
	N	4276.0	4277.0	4276.0	4278.17	4279.17	4279.11	4278.11			
478	E	728.0	729.0	729.0	205.57	205.64	206.64	206.57	MO	ST. LOUIS	
	N	4277.0	4278.0	4277.0	4279.17	4280.17	4280.11	4279.11			
479	E	728.0	729.0	729.0	205.64	205.70	206.70	206.63	MO	ST. LOUIS	
	N	4278.0	4279.0	4278.0	4280.17	4281.17	4281.10	4280.11			
480	E	728.0	729.0	729.0	205.70	205.77	206.76	206.70	MO	ST. LOUIS	
	N	4279.0	4280.0	4279.0	4281.17	4282.16	4282.10	4281.10			

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)													
ID		***** UTM ZONE 15 *****					***** UTM ZONE 16 *****					STATE	COUNTY
481	E	728.0	728.0	729.0	729.0	205.77	205.83	206.83	206.76	MO	ST. LOUIS		
	N	4280.0	4281.0	4281.0	4280.0	4282.16	4283.16	4283.10	4282.10				
482	E	728.0	728.0	729.0	729.0	205.83	205.90	206.90	206.83	MO	ST. LOUIS		
	N	4281.0	4282.0	4282.0	4281.0	4283.16	4284.16	4284.10	4283.10				
483	E	728.0	728.0	729.0	729.0	205.90	205.96	206.96	206.90	MO	ST. LOUIS		
	N	4282.0	4283.0	4283.0	4282.0	4284.16	4285.16	4285.09	4284.10				
484	E	728.0	728.0	729.0	729.0	205.96	206.03	207.03	206.96	MO	ST. LOUIS		
	N	4283.0	4284.0	4284.0	4283.0	4285.16	4286.16	4286.09	4285.09				
485	E	728.0	728.0	729.0	729.0	206.03	206.09	207.09	207.03	MO	ST. LOUIS		
	N	4284.0	4285.0	4285.0	4284.0	4286.16	4287.16	4287.09	4286.09				
486	E	728.0	728.0	729.0	729.0	206.09	206.16	207.16	207.09	MO	ST. LOUIS		
	N	4285.0	4286.0	4286.0	4285.0	4287.16	4288.16	4288.09	4287.09				
487	E	728.0	728.0	729.0	729.0	206.16	206.22	207.22	207.16	MO	ST. LOUIS		
	N	4286.0	4287.0	4287.0	4286.0	4288.16	4289.15	4289.09	4288.09				
488	E	728.0	728.0	729.0	729.0	206.22	206.29	207.29	207.22	MO	ST. LOUIS		
	N	4287.0	4288.0	4288.0	4287.0	4289.15	4290.15	4290.09	4289.09				
489	E	728.0	728.0	729.0	729.0	206.29	206.36	207.35	207.29	MO	ST. LOUIS		
	N	4288.0	4289.0	4289.0	4288.0	4290.15	4291.15	4291.09	4290.09				
490	E	728.0	728.0	729.0	729.0	206.36	206.42	207.42	207.35	MO	ST. LOUIS		
	N	4289.0	4290.0	4290.0	4289.0	4291.15	4292.15	4292.08	4291.09				
491	E	728.0	728.0	729.0	729.0	206.42	206.49	207.48	207.42	MO	ST. LOUIS		
	N	4290.0	4291.0	4291.0	4290.0	4292.15	4293.15	4293.08	4292.08				
492	E	728.0	728.0	729.0	729.0	206.49	206.55	207.55	207.48	MO	ST. LOUIS		
	N	4291.0	4292.0	4292.0	4291.0	4293.15	4294.14	4294.08	4293.08				
493	E	728.0	728.0	729.0	729.0	206.55	206.62	207.62	207.55	MO	ST. LOUIS		
	N	4292.0	4293.0	4293.0	4292.0	4294.14	4295.14	4295.08	4294.08				
494	E	728.0	728.0	729.0	729.0	206.62	206.68	207.68	207.62	MO	ST. LOUIS		
	N	4293.0	4294.0	4294.0	4293.0	4295.14	4296.14	4296.07	4295.08				
495	E	728.0	728.0	729.0	729.0	206.68	206.75	207.75	207.68	MO	ST. LOUIS		
	N	4294.0	4295.0	4295.0	4294.0	4296.14	4297.14	4297.07	4296.07				

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY	
2216	E	728.0	728.0	729.0	729.0	206.88	206.95	207.94	207.88	MO	ST. LOUIS
	N	4297.0	4298.0	4298.0	4297.0	4299.14	4300.13	4300.07	4299.07		
2217	E	728.0	728.0	730.0	730.0	206.95	207.08	209.07	208.94	MO	ST. LOUIS
	N	4298.0	4300.0	4300.0	4298.0	4300.13	4302.13	4302.00	4300.00		
2224	E	729.0	729.0	731.0	731.0	205.46	205.59	207.59	207.46	MO	ST. LOUIS
	N	4260.0	4262.0	4262.0	4260.0	4262.13	4264.13	4264.00	4262.00		
2225	E	729.0	729.0	731.0	731.0	205.59	205.72	207.72	207.59	MO	ST. LOUIS
	N	4262.0	4264.0	4264.0	4262.0	4264.13	4266.13	4266.00	4264.00		
2226	E	729.0	729.0	731.0	731.0	205.72	205.85	207.85	207.72	MO	ST. LOUIS
	N	4264.0	4266.0	4266.0	4264.0	4266.13	4268.13	4267.99	4266.00		
2227	E	729.0	729.0	731.0	731.0	205.85	205.98	207.98	207.85	MO	ST. LOUIS
	N	4266.0	4268.0	4268.0	4266.0	4268.13	4270.12	4269.99	4267.99		
2228	E	729.0	729.0	731.0	731.0	205.98	206.11	208.11	207.98	MO	ST. LOUIS
	N	4268.0	4270.0	4270.0	4268.0	4270.12	4272.12	4271.99	4269.99		
504	E	729.0	729.0	730.0	730.0	206.24	206.31	207.31	207.24	MO	ST. LOUIS
	N	4272.0	4273.0	4273.0	4272.0	4274.11	4275.11	4275.05	4274.05		
505	E	729.0	729.0	730.0	730.0	206.31	206.37	207.37	207.31	MO	ST. LOUIS
	N	4273.0	4274.0	4274.0	4273.0	4275.11	4276.11	4276.05	4275.05		
506	E	729.0	729.0	730.0	730.0	206.37	206.44	207.44	207.37	MO	ST. LOUIS
	N	4274.0	4275.0	4275.0	4274.0	4276.11	4277.11	4277.04	4276.05		
507	E	729.0	729.0	730.0	730.0	206.44	206.50	207.50	207.44	MO	ST. LOUIS
	N	4275.0	4276.0	4276.0	4275.0	4277.11	4278.11	4278.04	4277.04		
508	E	729.0	729.0	730.0	730.0	206.50	206.57	207.57	207.50	MO	ST. LOUIS
	N	4276.0	4277.0	4277.0	4276.0	4278.11	4279.11	4279.04	4278.04		
509	E	729.0	729.0	730.0	730.0	206.57	206.63	207.63	207.57	MO	ST. LOUIS
	N	4277.0	4278.0	4278.0	4277.0	4279.11	4280.11	4280.04	4279.04		
510	E	729.0	729.0	730.0	730.0	206.63	206.70	207.70	207.63	MO	ST. LOUIS
	N	4278.0	4279.0	4279.0	4278.0	4280.11	4281.10	4281.04	4280.04		
511	E	729.0	729.0	730.0	730.0	206.70	206.76	207.76	207.70	MO	ST. LOUIS
	N	4279.0	4280.0	4280.0	4279.0	4281.10	4282.10	4282.04	4281.04		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY
512	E	729.0 4280.0	730.0 4281.0	730.0 4280.0	206.76 4282.10	206.83 4283.10	207.83 4283.03	207.76 4282.04	MO	ST. LOUIS		
513	E	729.0 4281.0	730.0 4282.0	730.0 4281.0	206.83 4283.10	206.90 4284.10	207.89 4284.03	207.83 4283.03	MO	ST. LOUIS		
514	E	729.0 4282.0	730.0 4283.0	730.0 4282.0	206.90 4284.10	206.96 4285.09	207.96 4285.03	207.89 4284.03	MO	ST. LOUIS		
515	E	729.0 4283.0	730.0 4284.0	730.0 4283.0	206.96 4285.09	207.03 4286.09	208.02 4286.03	207.96 4285.03	MO	ST. LOUIS		
516	E	729.0 4284.0	730.0 4285.0	730.0 4284.0	207.03 4286.09	207.09 4287.09	208.09 4287.03	208.02 4286.03	MO	ST. LOUIS		
517	E	729.0 4285.0	730.0 4286.0	730.0 4285.0	207.09 4287.09	207.16 4288.09	208.16 4288.02	208.09 4287.03	MO	ST. LOUIS		
518	E	729.0 4286.0	730.0 4287.0	730.0 4286.0	207.16 4288.09	207.22 4289.09	208.22 4289.02	208.16 4288.02	MO	ST. LOUIS		
519	E	729.0 4287.0	730.0 4288.0	730.0 4287.0	207.22 4289.09	207.29 4290.09	208.29 4290.02	208.22 4289.02	MO	ST. LOUIS		
520	E	729.0 4288.0	730.0 4289.0	730.0 4288.0	207.29 4290.09	207.35 4291.09	208.35 4291.02	208.29 4290.02	MO	ST. LOUIS		
521	E	729.0 4289.0	730.0 4290.0	730.0 4289.0	207.35 4291.09	207.42 4292.08	208.42 4292.02	208.35 4291.02	MO	ST. LOUIS		
522	E	729.0 4290.0	730.0 4291.0	730.0 4290.0	207.42 4292.08	207.48 4293.08	208.48 4293.02	208.42 4292.02	MO	ST. LOUIS		
523	E	729.0 4291.0	730.0 4292.0	730.0 4291.0	207.48 4293.08	207.55 4294.08	208.55 4294.02	208.48 4293.02	MO	ST. LOUIS		
524	E	729.0 4292.0	730.0 4293.0	730.0 4292.0	207.55 4294.08	207.62 4295.08	208.61 4295.01	208.55 4294.02	MO	ST. LOUIS		
525	E	729.0 4293.0	730.0 4294.0	730.0 4293.0	207.62 4295.08	207.68 4296.07	208.68 4296.01	208.61 4295.01	MO	ST. LOUIS		
526	E	729.0 4294.0	730.0 4295.0	730.0 4294.0	207.68 4296.07	207.75 4297.07	208.75 4297.01	208.68 4296.01	MO	ST. LOUIS		

TABLE 1. (CONTINUED)

ST LOUIS AUCK GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY		
2229	E	729.0	729.0	730.0	730.0	207.75	207.81	208.81	MO	ST. LOUIS	208.75	4297.01
	N	4295.0	4296.0	4296.0	4295.0	4297.07	4298.07	4298.01				
2230	E	729.0	729.0	730.0	730.0	207.81	207.88	208.88	MO	ST. LOUIS	208.81	4298.01
	N	4296.0	4297.0	4297.0	4296.0	4298.07	4299.07	4299.00				
2231	E	729.0	729.0	730.0	730.0	207.88	207.94	208.94	MO	ST. LOUIS	208.88	4299.00
	N	4297.0	4298.0	4298.0	4297.0	4299.07	4300.07	4300.00				
540	E	730.0	730.0	732.0	732.0	207.11	207.24	209.24	MO	ST. LOUIS	209.11	4271.92
	N	4270.0	4272.0	4272.0	4270.0	4272.05	4274.05	4273.92				
541	E	730.0	730.0	731.0	731.0	207.24	207.31	208.30	MO	ST. LOUIS	208.24	4273.98
	N	4272.0	4273.0	4273.0	4272.0	4274.05	4275.05	4274.98				
542	E	730.0	730.0	731.0	731.0	207.31	207.37	208.37	MO	ST. LOUIS	208.30	4274.98
	N	4273.0	4274.0	4274.0	4273.0	4275.05	4276.05	4275.98				
543	E	730.0	730.0	731.0	731.0	207.37	207.44	208.43	MO	ST. LOUIS	208.37	4275.98
	N	4274.0	4275.0	4275.0	4274.0	4276.05	4277.04	4276.98				
544	E	730.0	730.0	731.0	731.0	207.44	207.50	208.50	MO	ST. LOUIS	208.43	4276.98
	N	4275.0	4276.0	4276.0	4275.0	4277.04	4278.04	4277.98				
545	E	730.0	730.0	731.0	731.0	207.50	207.57	208.56	MO	ST. LOUIS	208.50	4277.98
	N	4276.0	4277.0	4277.0	4276.0	4278.04	4279.04	4278.98				
546	E	730.0	730.0	731.0	731.0	207.57	207.63	208.63	MO	ST. LOUIS	208.56	4278.98
	N	4277.0	4278.0	4278.0	4277.0	4279.04	4280.04	4279.97				
547	E	730.0	730.0	731.0	731.0	207.63	207.70	208.70	MO	ST. LOUIS	208.63	4279.97
	N	4278.0	4279.0	4279.0	4278.0	4280.04	4281.04	4280.97				
548	E	730.0	730.0	731.0	731.0	207.70	207.76	208.76	MO	ST. LOUIS	208.70	4280.97
	N	4279.0	4280.0	4280.0	4279.0	4281.04	4282.04	4281.97				
549	E	730.0	730.0	731.0	731.0	207.76	207.83	208.83	MO	ST. LOUIS	208.76	4281.97
	N	4280.0	4281.0	4281.0	4280.0	4282.04	4283.03	4282.97				
550	E	730.0	730.0	731.0	731.0	207.83	207.89	208.89	MO	ST. LOUIS	208.83	4282.97
	N	4281.0	4282.0	4282.0	4281.0	4283.03	4284.03	4283.96				
551	E	730.0	730.0	731.0	731.0	207.89	207.96	208.96	MO	ST. LOUIS	208.89	4283.96
	N	4282.0	4283.0	4283.0	4282.0	4284.03	4285.03	4284.96				

TABLE 1. (CONTINUED)

ID	ST LOUIS AOCR GRID SQUARE COORDINATES (KM)										STATE	COUNTY
	*****	UTM ZONE 15	*****	*****	UTM ZONE 16	*****	*****	*****	*****	*****		
552 E	730.0	730.0	731.0	731.0	207.96	208.02	209.02	208.96	208.96	208.96	MO	ST. LOUIS
N	4283.0	4284.0	4285.0	4286.0	4285.03	4286.03	4285.96	4284.96	4284.96	4284.96		
553 E	730.0	730.0	731.0	731.0	208.02	208.09	209.09	209.02	209.02	209.02	MO	ST. LOUIS
N	4284.0	4285.0	4286.0	4287.0	4286.03	4287.03	4286.96	4285.96	4285.96	4285.96		
554 E	730.0	730.0	731.0	731.0	208.09	208.16	209.15	209.09	209.09	209.09	MO	ST. LOUIS
N	4285.0	4286.0	4287.0	4288.0	4287.03	4288.02	4287.96	4286.96	4286.96	4286.96		
555 E	730.0	730.0	731.0	731.0	208.16	208.22	209.22	209.15	209.15	209.15	MU	ST. LOUIS
N	4286.0	4287.0	4288.0	4289.0	4288.02	4289.02	4288.96	4287.96	4287.96	4287.96		
556 E	730.0	730.0	731.0	731.0	208.22	208.29	209.28	209.22	209.22	209.22	MU	ST. LOUIS
N	4287.0	4288.0	4289.0	4290.0	4289.02	4290.02	4289.96	4288.96	4288.96	4288.96		
557 E	730.0	730.0	731.0	731.0	208.29	208.35	209.35	209.28	209.28	209.28	MO	ST. LOUIS
N	4288.0	4289.0	4290.0	4291.0	4290.02	4291.02	4290.95	4289.96	4289.96	4289.96		
558 E	730.0	730.0	731.0	731.0	208.35	208.42	209.42	209.35	209.35	209.35	MU	ST. LOUIS
N	4289.0	4290.0	4291.0	4292.0	4291.02	4292.02	4291.95	4290.95	4290.95	4290.95		
559 E	730.0	730.0	731.0	731.0	208.42	208.48	209.48	209.42	209.42	209.42	MO	ST. LOUIS
N	4290.0	4291.0	4292.0	4293.0	4292.02	4293.02	4292.95	4291.95	4291.95	4291.95		
560 E	730.0	730.0	731.0	731.0	208.48	208.55	209.55	209.48	209.48	209.48	MU	ST. LOUIS
N	4291.0	4292.0	4293.0	4294.0	4293.02	4294.02	4293.95	4292.95	4292.95	4292.95		
561 E	730.0	730.0	731.0	731.0	208.55	208.61	209.61	209.55	209.55	209.55	MO	ST. LOUIS
N	4292.0	4293.0	4294.0	4295.0	4294.02	4295.01	4294.95	4293.95	4293.95	4293.95		
562 E	730.0	730.0	731.0	731.0	208.61	208.68	209.68	209.61	209.61	209.61	MU	ST. LOUIS
N	4293.0	4294.0	4295.0	4296.0	4295.01	4296.01	4295.95	4294.95	4294.95	4294.95		
563 E	730.0	730.0	731.0	731.0	208.68	208.75	209.74	209.68	209.68	209.68	MU	ST. LOUIS
N	4294.0	4295.0	4296.0	4297.0	4296.01	4297.01	4296.94	4295.95	4295.95	4295.95		
564 E	730.0	730.0	731.0	731.0	208.75	208.81	209.81	209.74	209.74	209.74	MO	ST. LOUIS
N	4295.0	4296.0	4297.0	4298.0	4297.01	4298.01	4297.94	4296.94	4296.94	4296.94		
565 E	730.0	730.0	731.0	731.0	208.81	208.88	209.87	209.81	209.81	209.81	MU	ST. LOUIS
N	4296.0	4297.0	4298.0	4299.0	4298.01	4299.00	4298.94	4297.94	4297.94	4297.94		
566 E	730.0	730.0	731.0	731.0	208.88	208.94	209.94	209.87	209.87	209.87	MU ¹	ST. LOUIS
N	4297.0	4298.0	4299.0	4300.0	4299.00	4300.00	4299.94	4298.94	4298.94	4298.94		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID		*****	UTM ZONE 15	*****	*****	*****	UTM ZONE 16	*****	*****	STATE	COUNTY
567	E	730.0	730.0	732.0	732.0	208.94	209.07	211.07	210.94	MO	ST. LOUIS
	N	4298.0	4300.0	4300.0	4298.0	4300.00	4302.00	4301.87	4299.87		
568	E	730.0	730.0	735.0	735.0	209.07	209.40	214.39	214.06	MO	ST. LOUIS
	N	4300.0	4305.0	4305.0	4300.0	4302.00	4306.99	4306.66	4301.67		
2241	E	731.0	731.0	733.0	733.0	207.46	207.59	209.58	209.45	MO	ST. LOUIS
	N	4260.0	4262.0	4262.0	4260.0	4262.00	4264.00	4263.87	4261.88		
2242	E	731.0	731.0	733.0	733.0	207.59	207.72	209.71	209.58	MO	ST. LOUIS
	N	4262.0	4264.0	4264.0	4262.0	4264.00	4266.00	4265.87	4263.87		
2243	E	731.0	731.0	733.0	733.0	207.72	207.85	209.84	209.71	MO	ST. LOUIS
	N	4264.0	4266.0	4266.0	4264.0	4266.00	4267.99	4267.86	4265.87		
2244	E	731.0	731.0	733.0	733.0	207.85	207.98	209.97	209.84	MO	ST. LOUIS
	N	4266.0	4268.0	4268.0	4266.0	4267.99	4269.99	4269.86	4267.86		
2245	E	731.0	731.0	733.0	733.0	207.98	208.11	210.10	209.97	MO	ST. LOUIS
	N	4268.0	4270.0	4270.0	4268.0	4269.99	4271.99	4271.86	4269.86		
571	E	731.0	731.0	732.0	732.0	208.24	208.30	209.30	209.24	MO	ST. LOUIS
	N	4272.0	4273.0	4273.0	4272.0	4273.98	4274.98	4274.92	4273.92		
572	E	731.0	731.0	732.0	732.0	208.30	208.37	209.37	209.30	MO	ST. LOUIS
	N	4273.0	4274.0	4274.0	4273.0	4274.98	4275.98	4275.91	4274.92		
573	E	731.0	731.0	732.0	732.0	208.37	208.43	209.43	209.37	MO	ST. LOUIS
	N	4274.0	4275.0	4275.0	4274.0	4275.98	4276.98	4276.91	4275.91		
574	E	731.0	731.0	732.0	732.0	208.43	208.50	209.50	209.43	MO	ST. LOUIS
	N	4275.0	4276.0	4276.0	4275.0	4276.98	4277.98	4277.91	4276.91		
575	E	731.0	731.0	732.0	732.0	208.50	208.56	209.56	209.50	MO	ST. LOUIS
	N	4276.0	4277.0	4277.0	4276.0	4277.98	4278.98	4278.91	4277.91		
576	E	731.0	731.0	732.0	732.0	208.56	208.63	209.63	209.56	MO	ST. LOUIS
	N	4277.0	4278.0	4278.0	4277.0	4278.98	4279.97	4279.91	4278.91		
577	E	731.0	731.0	732.0	732.0	208.63	208.70	209.69	209.63	MO	ST. LOUIS
	N	4278.0	4279.0	4279.0	4278.0	4279.97	4280.97	4280.91	4279.91		
578	E	731.0	731.0	732.0	732.0	208.70	208.76	209.76	209.69	MO	ST. LOUIS
	N	4279.0	4280.0	4280.0	4279.0	4280.97	4281.97	4281.90	4280.91		

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)

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TABLE 1. (CONTINUED)

ST LOUIS AUCR GRID SQUARE COORDINATES (KM)

ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY
594	E	731.0	731.0	732.0	732.0	209.74	209.81	210.81	MU	ST. LOUIS
	N	4295.0	4296.0	4296.0	4295.0	4296.94	4297.94	4297.88		
595	E	731.0	731.0	732.0	732.0	209.81	209.87	210.87	MO	ST. LOUIS
	N	4296.0	4297.0	4297.0	4296.0	4297.94	4298.94	4298.88		
596	E	731.0	731.0	732.0	732.0	209.87	209.94	210.94	MU	ST. LOUIS
	N	4297.0	4298.0	4298.0	4297.0	4298.94	4299.94	4299.87		
597	E	732.0	732.0	733.0	733.0	209.11	209.17	210.17	MU	ST. LOUIS
	N	4270.0	4271.0	4271.0	4270.0	4271.92	4272.92	4272.86		
598	E	732.0	732.0	733.0	733.0	209.17	209.24	210.23	MO	ST. LOUIS
	N	4271.0	4272.0	4272.0	4271.0	4272.92	4273.92	4273.85		
599	E	732.0	732.0	733.0	733.0	209.24	209.30	210.30	MO	ST. LOUIS
	N	4272.0	4273.0	4273.0	4272.0	4273.92	4274.92	4274.85		
600	E	732.0	732.0	733.0	733.0	209.30	209.37	210.37	MU	ST. LOUIS
	N	4273.0	4274.0	4274.0	4273.0	4274.92	4275.91	4275.85		
601	E	732.0	732.0	733.0	733.0	209.37	209.43	210.43	MO	ST. LOUIS
	N	4274.0	4275.0	4275.0	4274.0	4275.91	4276.91	4276.85		
602	E	732.0	732.0	733.0	733.0	209.43	209.50	210.50	MO	ST. LOUIS
	N	4275.0	4276.0	4276.0	4275.0	4276.91	4277.91	4277.84		
603	E	732.0	732.0	733.0	733.0	209.50	209.56	210.56	MU	ST. LOUIS
	N	4276.0	4277.0	4277.0	4276.0	4277.91	4278.91	4278.84		
604	E	732.0	732.0	733.0	733.0	209.56	209.63	210.63	MO	ST. LOUIS
	N	4277.0	4278.0	4278.0	4277.0	4278.91	4279.91	4279.84		
605	E	732.0	732.0	733.0	733.0	209.63	209.69	210.69	MU	ST. LOUIS
	N	4278.0	4279.0	4279.0	4278.0	4279.91	4280.91	4280.84		
606	E	732.0	732.0	733.0	733.0	209.69	209.76	210.76	MU	ST. LOUIS
	N	4279.0	4280.0	4280.0	4279.0	4280.91	4281.90	4281.84		
607	E	732.0	732.0	733.0	733.0	209.76	209.82	210.82	MO	ST. LOUIS
	N	4280.0	4281.0	4281.0	4280.0	4281.90	4282.90	4282.84		
608	E	732.0	732.0	733.0	733.0	209.82	209.89	210.89	MU	ST. LOUIS
	N	4281.0	4282.0	4282.0	4281.0	4282.90	4283.90	4283.84		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 17 *****		***** UTM ZONE 18 *****		***** UTM ZONE 19 *****		STATE	COUNTY
609	E	732.0	732.0	733.0	733.0	209.89	209.96	210.95	210.89	210.89	MO	ST. LOUIS
	N	4282.0	4283.0	4283.0	4282.0	4283.90	4284.90	4284.83	4283.84	4283.84		
610	E	732.0	732.0	733.0	733.0	209.96	210.02	211.02	210.95	210.95	MO	ST. LOUIS
	N	4283.0	4284.0	4284.0	4283.0	4284.90	4285.90	4285.83	4284.83	4284.83		
611	E	732.0	732.0	733.0	733.0	210.02	210.09	211.08	211.02	211.02	MO	ST. LOUIS
	N	4284.0	4285.0	4285.0	4284.0	4285.90	4286.89	4286.83	4285.83	4285.83		
612	E	732.0	732.0	733.0	733.0	210.09	210.15	211.15	211.08	211.08	MO	ST. LOUIS
	N	4285.0	4286.0	4286.0	4285.0	4286.89	4287.89	4287.83	4286.83	4286.83		
613	E	732.0	732.0	733.0	733.0	210.15	210.22	211.22	211.15	211.15	MO	ST. LOUIS
	N	4286.0	4287.0	4287.0	4286.0	4287.89	4288.89	4288.82	4287.83	4287.83		
614	E	732.0	732.0	733.0	733.0	210.22	210.28	211.28	211.22	211.22	MO	ST. LOUIS
	N	4287.0	4288.0	4288.0	4287.0	4288.89	4289.89	4289.82	4288.82	4288.82		
615	E	732.0	732.0	733.0	733.0	210.28	210.35	211.35	211.28	211.28	MO	ST. LOUIS
	N	4288.0	4289.0	4289.0	4288.0	4289.89	4290.89	4290.82	4289.82	4289.82		
616	E	732.0	732.0	733.0	733.0	210.35	210.41	211.41	211.35	211.35	MO	ST. LOUIS
	N	4289.0	4290.0	4290.0	4289.0	4290.89	4291.89	4291.82	4290.82	4290.82		
617	E	732.0	732.0	733.0	733.0	210.41	210.48	211.48	211.41	211.41	MO	ST. LOUIS
	N	4290.0	4291.0	4291.0	4290.0	4291.89	4292.88	4292.82	4291.82	4291.82		
618	E	732.0	732.0	733.0	733.0	210.48	210.55	211.54	211.48	211.48	MO	ST. LOUIS
	N	4291.0	4292.0	4292.0	4291.0	4292.88	4293.88	4293.82	4292.82	4292.82		
619	E	732.0	732.0	733.0	733.0	210.55	210.61	211.61	211.54	211.54	MO	ST. LOUIS
	N	4292.0	4293.0	4293.0	4292.0	4293.88	4294.88	4294.82	4293.82	4293.82		
620	E	732.0	732.0	733.0	733.0	210.61	210.68	211.67	211.61	211.61	MO	ST. LOUIS
	N	4293.0	4294.0	4294.0	4293.0	4294.88	4295.88	4295.81	4294.82	4294.82		
621	E	732.0	732.0	733.0	733.0	210.68	210.74	211.74	211.67	211.67	MO	ST. LOUIS
	N	4294.0	4295.0	4295.0	4294.0	4295.88	4296.88	4296.81	4295.81	4295.81		
622	E	732.0	732.0	733.0	733.0	210.74	210.81	211.81	211.74	211.74	MO	ST. LOUIS
	N	4295.0	4296.0	4296.0	4295.0	4296.88	4297.88	4297.81	4296.81	4296.81		
623	E	732.0	732.0	733.0	733.0	210.81	210.87	211.87	211.81	211.81	MO	ST. LOUIS
	N	4296.0	4297.0	4297.0	4296.0	4297.88	4298.88	4298.81	4297.81	4297.81		

TABLE 1. (CONTINUED)

ST LOUIS AQCH GRID SQUARE COORDINATES (KM)											
ID		***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY
624	E	732.0	732.0	733.0	733.0	210.87	210.94	211.94	MO	ST. LOUIS	
	N	4297.0	4298.0	4298.0	4297.0	4298.88	4299.87	4299.80			
625	E	732.0	732.0	733.0	733.0	210.94	211.00	212.00	MO	ST. LOUIS	
	N	4298.0	4299.0	4299.0	4298.0	4299.87	4300.87	4300.80			
626	E	732.0	732.0	733.0	733.0	211.00	211.07	212.07	MO	ST. LOUIS	
	N	4299.0	4300.0	4300.0	4299.0	4300.87	4301.87	4301.80			
248	E	733.0	733.0	735.0	735.0	209.06	209.19	211.19	MO	ST. LOUIS	
	N	4254.0	4256.0	4256.0	4254.0	4255.88	4257.88	4257.75			
249	E	733.0	733.0	735.0	735.0	209.19	209.32	211.32	MO	ST. LOUIS	
	N	4256.0	4258.0	4258.0	4256.0	4257.88	4259.88	4259.75			
250	E	733.0	733.0	735.0	735.0	209.32	209.45	211.45	MO	ST. LOUIS	
	N	4258.0	4260.0	4260.0	4258.0	4259.88	4261.88	4261.74			
251	E	733.0	733.0	735.0	735.0	209.45	209.58	211.58	MO	ST. LOUIS	
	N	4260.0	4262.0	4262.0	4260.0	4261.88	4263.87	4263.74			
252	E	733.0	733.0	735.0	735.0	209.58	209.71	211.71	MO	ST. LOUIS	
	N	4262.0	4264.0	4264.0	4262.0	4263.87	4265.87	4265.74			
253	E	733.0	733.0	735.0	735.0	209.71	209.84	211.84	MO	ST. LOUIS	
	N	4264.0	4266.0	4266.0	4264.0	4265.87	4267.86	4267.73			
254	E	733.0	733.0	735.0	735.0	209.84	209.97	211.97	MO	ST. LOUIS	
	N	4266.0	4268.0	4268.0	4266.0	4267.86	4269.86	4269.73			
255	E	733.0	733.0	735.0	735.0	209.97	210.10	212.10	MO	ST. LOUIS	
	N	4268.0	4270.0	4270.0	4268.0	4269.86	4271.86	4271.73			
635	E	733.0	733.0	734.0	734.0	210.10	210.17	211.17	MO	ST. LOUIS	
	N	4270.0	4271.0	4271.0	4270.0	4271.86	4272.86	4272.79			
636	E	733.0	733.0	734.0	734.0	210.17	210.23	211.23	MO	ST. LOUIS	
	N	4271.0	4272.0	4272.0	4271.0	4272.86	4273.85	4273.79			
637	E	733.0	733.0	734.0	734.0	210.23	210.30	211.30	MO	ST. LOUIS	
	N	4272.0	4273.0	4273.0	4272.0	4273.85	4274.85	4274.79			
638	E	733.0	733.0	734.0	734.0	210.30	210.37	211.36	MO	ST. LOUIS	
	N	4273.0	4274.0	4274.0	4273.0	4274.85	4275.85	4275.79			

TABLE 1. (CONTINUED)

ST LOUIS ARCH GRID SQUARE COORDINATES (KM)											
ID		***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY
641	E	733.0	733.0	734.0	734.0	210.50	210.56	211.56	211.49	MO	ST. LOUIS
	N	4276.0	4277.0	4277.0	4276.0	4277.84	4278.84	4278.78	4277.78		
642	E	733.0	733.0	734.0	734.0	210.56	210.63	211.62	211.56	MO	ST. LOUIS
	N	4277.0	4278.0	4278.0	4277.0	4278.84	4279.84	4279.78	4278.78		
643	E	733.0	733.0	734.0	734.0	210.63	210.69	211.69	211.62	MO	ST. LOUIS
	N	4278.0	4279.0	4279.0	4278.0	4279.84	4280.84	4280.77	4279.78		
644	E	733.0	733.0	734.0	734.0	210.69	210.76	211.76	211.69	MO	ST. LOUIS
	N	4279.0	4280.0	4280.0	4279.0	4280.84	4281.84	4281.77	4280.77		
645	E	733.0	733.0	734.0	734.0	210.76	210.82	211.82	211.76	MO	ST. LOUIS
	N	4280.0	4281.0	4281.0	4280.0	4281.84	4282.84	4282.77	4281.77		
646	E	733.0	733.0	734.0	734.0	210.82	210.89	211.89	211.82	MO	ST. LOUIS
	N	4281.0	4282.0	4282.0	4281.0	4282.84	4283.84	4283.77	4282.77		
647	E	733.0	733.0	734.0	734.0	210.89	210.95	211.95	211.89	MO	ST. LOUIS
	N	4282.0	4283.0	4283.0	4282.0	4283.84	4284.83	4284.77	4283.77		
648	E	733.0	733.0	734.0	734.0	210.95	211.02	212.02	211.95	MO	ST. LOUIS
	N	4283.0	4284.0	4284.0	4283.0	4284.83	4285.83	4285.77	4284.77		
649	E	733.0	733.0	734.0	734.0	211.02	211.08	212.08	212.02	MO	ST. LOUIS
	N	4284.0	4285.0	4285.0	4284.0	4285.83	4286.83	4286.77	4285.77		
650	E	733.0	733.0	734.0	734.0	211.08	211.15	212.15	212.08	MO	ST. LOUIS
	N	4285.0	4286.0	4286.0	4285.0	4286.83	4287.83	4287.76	4286.77		
651	E	733.0	733.0	734.0	734.0	211.15	211.22	212.21	212.15	MO	ST. LOUIS
	N	4286.0	4287.0	4287.0	4286.0	4287.83	4288.82	4288.76	4287.76		
652	E	733.0	733.0	734.0	734.0	211.22	211.28	212.28	212.21	MO	ST. LOUIS
	N	4287.0	4288.0	4288.0	4287.0	4288.82	4289.82	4289.76	4288.76		
653	E	733.0	733.0	734.0	734.0	211.28	211.35	212.34	212.28	MO	ST. LOUIS
	N	4288.0	4289.0	4289.0	4288.0	4289.82	4290.82	4290.76	4289.76		
654	E	733.0	733.0	734.0	734.0	211.35	211.41	212.41	212.34	MO	ST. LOUIS
	N	4289.0	4290.0	4290.0	4289.0	4290.82	4291.82	4291.75	4290.76		
655	E	733.0	733.0	734.0	734.0	211.41	211.48	212.48	212.41	MO	ST. LOUIS
	N	4290.0	4291.0	4291.0	4290.0	4291.82	4292.82	4292.75	4291.75		

TABLE 1. (CONTINUED)

ST LOUIS AUCH GRID SQUARE COORDINATES (KM)										
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY
656	E	733.0	733.0	734.0	734.0	211.48	211.54	212.54	MO	ST. LOUIS
	N	4291.0	4292.0	4292.0	4291.0	4292.82	4293.82	4293.75		
657	E	733.0	733.0	734.0	734.0	211.54	211.61	212.61	MO	ST. LOUIS
	N	4292.0	4293.0	4293.0	4292.0	4293.82	4294.82	4294.75		
658	E	733.0	733.0	734.0	734.0	211.61	211.67	212.67	MO	ST. LOUIS
	N	4293.0	4294.0	4294.0	4293.0	4294.82	4295.81	4295.75		
659	E	733.0	733.0	734.0	734.0	211.67	211.74	212.74	MO	ST. LOUIS
	N	4294.0	4295.0	4295.0	4294.0	4295.81	4296.81	4296.75		
660	E	733.0	733.0	734.0	734.0	211.74	211.81	212.80	MO	ST. LOUIS
	N	4295.0	4296.0	4296.0	4295.0	4296.81	4297.81	4297.75		
661	E	733.0	733.0	734.0	734.0	211.81	211.87	212.87	MO	ST. LOUIS
	N	4296.0	4297.0	4297.0	4296.0	4297.81	4298.81	4298.74		
662	E	733.0	733.0	734.0	734.0	211.87	211.94	212.93	MO	ST. LOUIS
	N	4297.0	4298.0	4298.0	4297.0	4298.81	4299.80	4299.74		
663	E	733.0	733.0	734.0	734.0	211.94	212.00	213.00	MO	ST. LOUIS
	N	4298.0	4299.0	4299.0	4298.0	4299.80	4300.80	4300.74		
664	E	733.0	733.0	734.0	734.0	212.00	212.07	213.07	MO	ST. LOUIS
	N	4299.0	4300.0	4300.0	4299.0	4300.80	4301.80	4301.74		
665	E	734.0	734.0	735.0	735.0	211.10	211.17	212.17	MO	ST. LOUIS
	N	4270.0	4271.0	4271.0	4270.0	4271.79	4272.79	4272.72		
666	E	734.0	734.0	735.0	735.0	211.17	211.23	212.23	MO	ST. LOUIS
	N	4271.0	4272.0	4272.0	4271.0	4272.79	4273.79	4273.72		
675	E	734.0	734.0	735.0	735.0	211.76	211.82	212.82	MO	ST. LOUIS
	N	4280.0	4281.0	4281.0	4280.0	4281.77	4282.77	4282.71		
676	E	734.0	734.0	735.0	735.0	211.82	211.89	212.88	MO	ST. LOUIS
	N	4281.0	4282.0	4282.0	4281.0	4282.77	4283.77	4283.70		
677	E	734.0	734.0	735.0	735.0	211.89	211.95	212.95	MO	ST. LOUIS
	N	4282.0	4283.0	4283.0	4282.0	4283.77	4284.77	4284.70		
678	E	734.0	734.0	735.0	735.0	211.95	212.02	213.02	MO	ST. LOUIS
	N	4283.0	4284.0	4284.0	4283.0	4284.77	4285.77	4285.70		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****					***** UTM ZONE 16 *****					STATE	COUNTY
679	E	734.0 4284.0	734.0 4285.0	735.0 4285.0	735.0 4284.0	212.02 4285.77	212.08 4286.77	213.08 4286.70	213.02 4285.70	MO	ST. LOUIS	
680	E	734.0 4285.0	734.0 4286.0	735.0 4286.0	735.0 4285.0	212.08 4286.77	212.15 4287.76	213.15 4287.70	213.08 4286.70	MO	ST. LOUIS	
681	E	734.0 4286.0	734.0 4287.0	735.0 4287.0	735.0 4286.0	212.15 4287.76	212.21 4288.76	213.21 4288.70	213.15 4287.70	MO	ST. LOUIS	
682	E	734.0 4287.0	734.0 4288.0	735.0 4288.0	735.0 4287.0	212.21 4288.76	212.28 4289.76	213.28 4289.69	213.21 4288.70	MO	ST. LOUIS	
683	E	734.0 4288.0	734.0 4289.0	735.0 4289.0	735.0 4288.0	212.28 4289.76	212.34 4290.76	213.34 4290.69	213.28 4289.69	MO	ST. LOUIS	
684	E	734.0 4289.0	734.0 4290.0	735.0 4290.0	735.0 4289.0	212.34 4290.76	212.41 4291.75	213.41 4291.69	213.34 4290.69	MO	ST. LOUIS	
685	E	734.0 4290.0	734.0 4291.0	735.0 4291.0	735.0 4290.0	212.41 4291.75	212.48 4292.75	213.47 4292.69	213.41 4291.69	MO	ST. LOUIS	
686	E	734.0 4291.0	734.0 4292.0	735.0 4292.0	735.0 4291.0	212.48 4292.75	212.54 4293.75	213.54 4293.69	213.47 4292.69	MO	ST. LOUIS	
687	E	734.0 4292.0	734.0 4293.0	735.0 4293.0	735.0 4292.0	212.54 4293.75	212.61 4294.75	213.61 4294.68	213.54 4293.69	MO	ST. LOUIS	
688	E	734.0 4293.0	734.0 4294.0	735.0 4294.0	735.0 4293.0	212.61 4294.75	212.67 4295.75	213.67 4295.68	213.61 4294.68	MO	ST. LOUIS	
689	E	734.0 4294.0	734.0 4295.0	735.0 4295.0	735.0 4294.0	212.67 4295.75	212.74 4296.75	213.74 4296.68	213.67 4295.68	MO	ST. LOUIS	
690	E	734.0 4295.0	734.0 4296.0	735.0 4296.0	735.0 4295.0	212.74 4296.75	212.80 4297.75	213.80 4297.68	213.74 4296.68	MO	ST. LOUIS	
691	E	734.0 4296.0	734.0 4297.0	735.0 4297.0	735.0 4296.0	212.80 4297.75	212.87 4298.74	213.87 4298.68	213.80 4297.68	MO	ST. LOUIS	
692	E	734.0 4297.0	734.0 4298.0	735.0 4298.0	735.0 4297.0	212.87 4298.74	212.93 4299.74	213.93 4299.68	213.87 4298.68	MO	ST. LOUIS	
693	E	734.0 4298.0	734.0 4299.0	735.0 4299.0	735.0 4298.0	212.93 4299.74	213.00 4300.74	214.00 4300.67	213.93 4299.68	MO	ST. LOUIS	

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY
694	E	734.0	734.0	735.0	735.0	735.0	213.00	213.07	214.06	214.00	MO	ST. LOUIS
	N	4299.0	4300.0	4299.0	4299.0	4300.0	4300.74	4301.74	4301.67	4300.67		
2256	E	735.0	735.0	737.0	737.0	737.0	211.45	211.58	213.58	213.44	MO	ST. LOUIS
	N	4260.0	4262.0	4260.0	4260.0	4260.0	4261.74	4263.74	4263.61	4261.61		
2257	E	735.0	735.0	736.0	736.0	736.0	211.58	211.64	212.64	212.58	MO	ST. LOUIS
	N	4262.0	4263.0	4262.0	4262.0	4262.0	4263.74	4264.74	4264.67	4263.68		
2258	E	735.0	735.0	736.0	736.0	736.0	211.64	211.71	212.71	212.64	MO	ST. LOUIS
	N	4263.0	4264.0	4263.0	4263.0	4263.0	4264.74	4265.74	4265.67	4264.67		
2259	E	735.0	735.0	736.0	736.0	736.0	211.71	211.77	212.77	212.71	MO	ST. LOUIS
	N	4264.0	4265.0	4264.0	4264.0	4264.0	4265.74	4266.73	4266.67	4265.67		
702	E	735.0	735.0	736.0	736.0	736.0	211.77	211.84	212.84	212.77	MO	ST. LOUIS
	N	4265.0	4266.0	4265.0	4265.0	4265.0	4266.73	4267.73	4267.67	4266.67		
703	E	735.0	735.0	736.0	736.0	736.0	211.84	211.90	212.90	212.84	MO	ST. LOUIS
	N	4266.0	4267.0	4266.0	4266.0	4266.0	4267.73	4268.73	4268.66	4267.67		
704	E	735.0	735.0	736.0	736.0	736.0	211.90	211.97	212.97	212.90	MO	ST. LOUIS
	N	4267.0	4268.0	4267.0	4267.0	4267.0	4268.73	4269.73	4269.66	4268.66		
705	E	735.0	735.0	736.0	736.0	736.0	211.97	212.04	213.03	212.97	MO	ST. LOUIS
	N	4268.0	4269.0	4268.0	4268.0	4268.0	4269.73	4270.73	4270.66	4269.66		
706	E	735.0	735.0	736.0	736.0	736.0	212.04	212.10	213.10	213.03	MO	ST. LOUIS
	N	4269.0	4270.0	4269.0	4269.0	4269.0	4270.73	4271.73	4271.66	4270.66		
707	E	735.0	735.0	736.0	736.0	736.0	212.10	212.17	213.16	213.10	MO	ST. LOUIS
	N	4270.0	4271.0	4270.0	4270.0	4270.0	4271.73	4272.72	4272.66	4271.66		
720	E	735.0	735.0	736.0	736.0	736.0	212.95	213.02	214.01	213.95	MO	ST. LOUIS
	N	4283.0	4284.0	4283.0	4283.0	4283.0	4284.70	4285.70	4285.64	4284.64		
721	E	735.0	735.0	736.0	736.0	736.0	213.02	213.08	214.08	214.01	MO	ST. LOUIS
	N	4284.0	4285.0	4284.0	4284.0	4284.0	4285.70	4286.70	4286.63	4285.64		
722	E	735.0	735.0	736.0	736.0	736.0	213.08	213.15	214.14	214.08	MO	ST. LOUIS
	N	4285.0	4286.0	4285.0	4285.0	4285.0	4286.70	4287.70	4287.63	4286.63		
723	E	735.0	735.0	736.0	736.0	736.0	213.15	213.21	214.21	214.14	MO	ST. LOUIS
	N	4286.0	4287.0	4286.0	4286.0	4286.0	4287.70	4288.70	4288.63	4287.63		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)										
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY		
724 E N	735.0 4287.0	735.0 4288.0	736.0 4287.0	213.21 4288.70	213.28 4289.69	214.28 4289.63	214.21 4288.63	MO	ST. LOUIS	
725 E N	735.0 4288.0	735.0 4289.0	736.0 4288.0	213.28 4289.69	213.34 4290.69	214.34 4290.63	214.28 4289.63	MO	ST. LOUIS	
726 E N	735.0 4289.0	735.0 4290.0	736.0 4289.0	213.34 4290.69	213.41 4291.69	214.41 4291.63	214.34 4290.63	MO	ST. LOUIS	
727 E N	735.0 4290.0	735.0 4291.0	736.0 4290.0	213.41 4291.69	213.47 4292.69	214.47 4292.62	214.41 4291.63	MO	ST. LOUIS	
728 E N	735.0 4291.0	735.0 4292.0	736.0 4291.0	213.47 4292.69	213.54 4293.69	214.54 4293.62	214.47 4292.62	MO	ST. LOUIS	
729 E N	735.0 4292.0	735.0 4293.0	736.0 4292.0	213.54 4293.69	213.61 4294.68	214.60 4294.62	214.54 4293.62	MO	ST. LOUIS	
730 E N	735.0 4293.0	735.0 4294.0	736.0 4293.0	213.61 4294.68	213.67 4295.68	214.67 4295.62	214.60 4294.62	MO	ST. LOUIS	
731 E N	735.0 4294.0	735.0 4295.0	736.0 4294.0	213.67 4295.68	213.74 4296.68	214.73 4296.61	214.67 4295.62	MO	ST. LOUIS	
732 E N	735.0 4295.0	735.0 4296.0	736.0 4295.0	213.74 4296.68	213.80 4297.68	214.80 4297.61	214.73 4296.61	MO	ST. LOUIS	
733 E N	735.0 4296.0	735.0 4297.0	736.0 4296.0	213.80 4297.68	213.87 4298.68	214.87 4298.61	214.80 4297.61	MO	ST. LOUIS	
734 E N	735.0 4297.0	735.0 4298.0	736.0 4297.0	213.87 4298.68	213.93 4299.68	214.93 4299.61	214.87 4298.61	MO	ST. LOUIS	
735 E N	735.0 4298.0	735.0 4299.0	736.0 4298.0	213.93 4299.68	214.00 4300.67	215.00 4300.61	214.93 4299.61	MO	ST. LOUIS	
736 E N	735.0 4299.0	735.0 4300.0	736.0 4300.0	214.00 4300.67	214.06 4301.67	215.06 4301.61	215.00 4300.61	MO	ST. LOUIS	
737 E N	735.0 4300.0	735.0 4305.0	740.0 4305.0	214.06 4301.67	214.39 4306.66	219.38 4306.33	219.06 4301.34	MO	ST. LOUIS	
2260 E N	736.0 4262.0	736.0 4265.0	739.0 4265.0	212.58 4263.68	212.77 4266.67	215.77 4266.47	215.57 4263.48	MO	ST. LOUIS	

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		COUNTY
741 E	736.0	736.0	737.0	737.0	212.77	212.84	213.84	213.77	213.84	213.77	MO
741 N	4265.0	4266.0	4266.0	4265.0	4266.67	4267.67	4267.60	4266.61	4266.60	4266.61	ST. LOUIS
742 E	736.0	736.0	737.0	737.0	212.84	212.90	213.90	213.84	213.90	213.84	MO
742 N	4266.0	4267.0	4267.0	4266.0	4267.67	4268.66	4268.60	4267.60	4268.60	4267.60	ST. LOUIS
743 E	736.0	736.0	737.0	737.0	212.90	212.97	213.97	213.90	213.97	213.90	MO
743 N	4267.0	4268.0	4268.0	4267.0	4268.66	4269.66	4269.60	4268.60	4269.60	4268.60	ST. LOUIS
744 E	736.0	736.0	737.0	737.0	212.97	213.03	214.03	213.97	214.03	213.97	MO
744 N	4268.0	4269.0	4269.0	4268.0	4269.66	4270.66	4270.60	4269.60	4270.60	4269.60	ST. LOUIS
745 E	736.0	736.0	737.0	737.0	213.03	213.10	214.10	214.03	214.10	214.03	MO
745 N	4269.0	4270.0	4270.0	4269.0	4270.66	4271.66	4271.59	4270.60	4271.59	4270.60	ST. LOUIS
760 E	736.0	736.0	737.0	737.0	214.01	214.08	215.08	215.01	215.08	215.01	MO
760 N	4284.0	4285.0	4285.0	4284.0	4285.64	4286.63	4286.57	4285.57	4286.57	4285.57	ST. LOUIS
761 E	736.0	736.0	737.0	737.0	214.08	214.14	215.14	215.08	215.14	215.08	MO
761 N	4285.0	4286.0	4286.0	4285.0	4286.63	4287.63	4287.57	4286.57	4287.57	4286.57	ST. LOUIS
762 E	736.0	736.0	737.0	737.0	214.14	214.21	215.21	215.14	215.21	215.14	MO
762 N	4286.0	4287.0	4287.0	4286.0	4287.63	4288.63	4288.56	4287.57	4288.56	4287.57	ST. LOUIS
763 E	736.0	736.0	737.0	737.0	214.21	214.28	215.27	215.21	215.27	215.21	MO
763 N	4287.0	4288.0	4288.0	4287.0	4288.63	4289.63	4289.56	4288.56	4289.56	4288.56	ST. LOUIS
764 E	736.0	736.0	737.0	737.0	214.28	214.34	215.34	215.27	215.34	215.27	MO
764 N	4288.0	4289.0	4289.0	4288.0	4289.63	4290.63	4290.56	4289.56	4290.56	4289.56	ST. LOUIS
765 E	736.0	736.0	737.0	737.0	214.34	214.41	215.40	215.34	215.40	215.34	MO
765 N	4289.0	4290.0	4290.0	4289.0	4290.63	4291.63	4291.56	4290.56	4291.56	4290.56	ST. LOUIS
766 E	736.0	736.0	737.0	737.0	214.41	214.47	215.47	215.40	215.47	215.40	MO
766 N	4290.0	4291.0	4291.0	4290.0	4291.63	4292.62	4292.56	4291.56	4292.56	4291.56	ST. LOUIS
767 E	736.0	736.0	737.0	737.0	214.47	214.54	215.54	215.47	215.54	215.47	MO
767 N	4291.0	4292.0	4292.0	4291.0	4292.62	4293.62	4293.55	4292.56	4293.55	4292.56	ST. LOUIS
768 E	736.0	736.0	737.0	737.0	214.54	214.60	215.60	215.54	215.60	215.54	MO
768 N	4292.0	4293.0	4293.0	4292.0	4293.62	4294.62	4294.55	4293.55	4294.55	4293.55	ST. LOUIS
769 E	736.0	736.0	737.0	737.0	214.60	214.67	215.67	215.60	215.67	215.60	MO
769 N	4293.0	4294.0	4294.0	4293.0	4294.62	4295.62	4295.55	4294.55	4295.55	4294.55	ST. LOUIS

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID		***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY
770	E	736.0	736.0	737.0	737.0	214.67	214.73	215.73	215.67	MO	ST. LOUIS
	N	4294.0	4295.0	4295.0	4294.0	4295.62	4296.61	4296.55	4295.55		
771	E	736.0	736.0	737.0	737.0	214.73	214.80	215.80	215.73	MO	ST. LOUIS
	N	4295.0	4296.0	4296.0	4295.0	4296.61	4297.61	4297.55	4296.55		
772	E	736.0	736.0	737.0	737.0	214.80	214.87	215.86	215.80	MO	ST. LOUIS
	N	4296.0	4297.0	4297.0	4296.0	4297.61	4298.61	4298.55	4297.55		
773	E	736.0	736.0	737.0	737.0	214.87	214.93	215.93	215.86	MO	ST. LOUIS
	N	4297.0	4298.0	4298.0	4297.0	4298.61	4299.61	4299.54	4298.55		
774	E	736.0	736.0	737.0	737.0	214.93	215.00	216.00	215.93	MO	ST. LOUIS
	N	4298.0	4299.0	4299.0	4298.0	4299.61	4300.61	4300.54	4299.54		
775	E	736.0	736.0	737.0	737.0	215.00	215.06	216.06	216.00	MO	ST. LOUIS
	N	4299.0	4300.0	4300.0	4299.0	4300.61	4301.61	4301.54	4300.54		
776	E	737.0	737.0	738.0	738.0	213.77	213.84	214.83	214.77	MO	ST. LOUIS
	N	4265.0	4266.0	4266.0	4265.0	4266.61	4267.60	4267.54	4266.54		
777	E	737.0	737.0	738.0	738.0	213.84	213.90	214.90	214.83	MO	ST. LOUIS
	N	4266.0	4267.0	4267.0	4266.0	4267.60	4268.60	4268.54	4267.54		
778	E	737.0	737.0	738.0	738.0	213.90	213.97	214.96	214.90	MO	ST. LOUIS
	N	4267.0	4268.0	4268.0	4267.0	4268.60	4269.60	4269.54	4268.54		
779	E	737.0	737.0	738.0	738.0	213.97	214.03	215.03	214.96	MO	ST. LOUIS
	N	4268.0	4269.0	4269.0	4268.0	4269.60	4270.60	4270.53	4269.54		
780	E	737.0	737.0	738.0	738.0	214.03	214.10	215.10	215.03	MO	ST. LOUIS
	N	4269.0	4270.0	4270.0	4269.0	4270.60	4271.59	4271.53	4270.53		
797	E	737.0	737.0	738.0	738.0	215.14	215.21	216.21	216.14	MO	ST. LOUIS
	N	4286.0	4287.0	4287.0	4286.0	4287.57	4288.56	4288.50	4287.50		
798	E	737.0	737.0	738.0	738.0	215.21	215.27	216.27	216.21	MO	ST. LOUIS
	N	4287.0	4288.0	4288.0	4287.0	4288.56	4289.56	4289.50	4288.50		
799	E	737.0	737.0	738.0	738.0	215.27	215.34	216.34	216.27	MO	ST. LOUIS
	N	4288.0	4289.0	4289.0	4288.0	4289.56	4290.56	4290.50	4289.50		
800	E	737.0	737.0	738.0	738.0	215.34	215.40	216.40	216.34	MO	ST. LOUIS
	N	4289.0	4290.0	4290.0	4289.0	4290.56	4291.56	4291.49	4290.50		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY			
801	E	737.0 4290.0	737.0 4291.0	738.0 4290.0	215.40 4291.56	215.47 4292.56	216.47 4292.49	216.40 4291.49	MO	ST. LOUIS	
	N										
802	E	737.0 4291.0	737.0 4292.0	738.0 4291.0	215.47 4292.56	215.54 4293.55	216.53 4293.49	216.47 4292.49	MO	ST. LOUIS	
	N										
803	E	737.0 4292.0	737.0 4293.0	738.0 4292.0	215.54 4293.55	215.60 4294.55	216.60 4294.49	216.53 4293.49	MO	ST. LOUIS	
	N										
804	E	737.0 4293.0	737.0 4294.0	738.0 4293.0	215.60 4294.55	215.67 4295.55	216.67 4295.48	216.60 4294.49	MO	ST. LOUIS	
	N										
805	E	737.0 4294.0	737.0 4295.0	738.0 4294.0	215.67 4295.55	215.73 4296.55	216.73 4296.48	216.67 4295.48	MO	ST. LOUIS	
	N										
806	E	737.0 4295.0	737.0 4296.0	738.0 4295.0	215.73 4296.55	215.80 4297.55	216.80 4297.48	216.73 4296.48	MO	ST. LOUIS	
	N										
807	E	737.0 4296.0	737.0 4297.0	738.0 4296.0	215.80 4297.55	215.86 4298.55	216.86 4298.48	216.80 4297.48	MO	ST. LOUIS	
	N										
808	E	737.0 4297.0	737.0 4298.0	738.0 4297.0	215.86 4298.55	215.93 4299.54	216.93 4299.48	216.86 4298.48	MO	ST. LOUIS	
	N										
809	E	737.0 4298.0	737.0 4299.0	738.0 4298.0	215.93 4299.54	216.00 4300.54	216.99 4300.48	216.93 4299.48	MO	ST. LOUIS	
	N										
810	E	737.0 4299.0	737.0 4300.0	738.0 4300.0	216.00 4300.54	216.06 4301.54	217.06 4301.47	216.99 4300.48	MO	ST. LOUIS	
	N										
814	E	738.0 4267.0	738.0 4268.0	739.0 4268.0	214.90 4268.54	214.96 4269.54	215.96 4269.47	215.90 4268.47	MO	ST. LOUIS	
	N										
835	E	738.0 4288.0	738.0 4289.0	739.0 4289.0	216.27 4289.50	216.34 4290.50	217.34 4290.43	217.27 4289.43	MO	ST. LOUIS	
	N										
836	E	738.0 4289.0	738.0 4290.0	739.0 4290.0	216.34 4290.50	216.40 4291.49	217.40 4291.43	217.34 4290.43	MO	ST. LOUIS	
	N										
837	E	738.0 4290.0	738.0 4291.0	739.0 4291.0	216.40 4291.49	216.47 4292.49	217.47 4292.43	217.40 4291.43	MO	ST. LOUIS	
	N										
838	E	738.0 4291.0	738.0 4292.0	739.0 4292.0	216.47 4292.49	216.53 4293.49	217.53 4293.43	217.47 4292.43	MO	ST. LOUIS	
	N										

TABLE 1. (CONTINUED)

ST. LOUIS AQCR GRID SQUARE COORDINATES (KM)										
ID		***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY	
839	E	738.0	738.0	739.0	739.0	216.53	216.60	217.53	MO	ST. LOUIS
	N	4292.0	4293.0	4293.0	4292.0	4293.49	4294.49	4293.43		
840	E	738.0	738.0	739.0	739.0	216.60	216.67	217.60	MO	ST. LOUIS
	N	4293.0	4294.0	4294.0	4293.0	4294.49	4295.48	4294.42		
841	E	738.0	738.0	739.0	739.0	216.67	216.73	217.73	MO	ST. LOUIS
	N	4294.0	4295.0	4295.0	4294.0	4295.48	4296.48	4295.42		
842	E	738.0	738.0	739.0	739.0	216.73	216.80	217.79	MO	ST. LOUIS
	N	4295.0	4296.0	4296.0	4295.0	4296.48	4297.48	4296.42		
843	E	738.0	738.0	739.0	739.0	216.80	216.86	217.86	MO	ST. LOUIS
	N	4296.0	4297.0	4297.0	4296.0	4297.48	4298.48	4297.42		
844	E	738.0	738.0	739.0	739.0	216.86	216.93	217.86	MO	ST. LOUIS
	N	4297.0	4298.0	4298.0	4297.0	4298.48	4299.48	4298.41		
845	E	738.0	738.0	740.0	740.0	216.93	217.06	218.92	MO	ST. LOUIS
	N	4298.0	4300.0	4300.0	4298.0	4299.48	4301.47	4299.35		
869	E	739.0	739.0	740.0	740.0	217.40	217.47	218.40	MO	ST. LOUIS
	N	4290.0	4291.0	4291.0	4290.0	4291.43	4292.43	4291.36		
870	E	739.0	739.0	740.0	740.0	217.47	217.53	218.46	MO	ST. LOUIS
	N	4291.0	4292.0	4292.0	4291.0	4292.43	4293.43	4292.36		
871	E	739.0	739.0	740.0	740.0	217.53	217.60	218.53	MO	ST. LOUIS
	N	4292.0	4293.0	4293.0	4292.0	4293.43	4294.42	4293.36		
872	E	739.0	739.0	740.0	740.0	217.60	217.66	218.60	MO	ST. LOUIS
	N	4293.0	4294.0	4294.0	4293.0	4294.42	4295.42	4294.36		
873	E	739.0	739.0	740.0	740.0	217.66	217.73	218.66	MO	ST. LOUIS
	N	4294.0	4295.0	4295.0	4294.0	4295.42	4296.42	4295.36		
874	E	739.0	739.0	740.0	740.0	217.73	217.79	218.73	MO	ST. LOUIS
	N	4295.0	4296.0	4296.0	4295.0	4296.42	4297.42	4296.35		
875	E	739.0	739.0	740.0	740.0	217.79	217.86	218.79	MO	ST. LOUIS
	N	4296.0	4297.0	4297.0	4296.0	4297.42	4298.41	4297.35		
876	E	739.0	739.0	740.0	740.0	217.86	217.93	218.86	MO	ST. LOUIS
	N	4297.0	4298.0	4298.0	4297.0	4298.41	4299.41	4298.35		

TABLE 1. (CONTINUED)

ST LOUIS AQCH GRID SQUARE COORDINATES (KM)												
ID		***** UTM ZONE 15 *****			***** UTM ZONE 16 *****			***** UTM ZONE 16 *****			STATE	COUNTY
906	E	740.0	740.0	741.0	741.0	218.33	218.40	219.40	219.43	MO	ST. LOUIS	
	N	4289.0	4290.0	4290.0	4289.0	4290.36	4291.36	4291.30	4290.30			
907	E	740.0	740.0	741.0	741.0	218.40	218.46	219.46	219.40	MO	ST. LOUIS	
	N	4290.0	4291.0	4291.0	4290.0	4291.36	4292.36	4292.29	4291.30			
908	E	740.0	740.0	741.0	741.0	218.46	218.53	219.53	219.46	MO	ST. LOUIS	
	N	4291.0	4292.0	4292.0	4291.0	4292.36	4293.36	4293.29	4292.29			
909	E	740.0	740.0	741.0	741.0	218.53	218.60	219.59	219.53	MO	ST. LOUIS	
	N	4292.0	4293.0	4293.0	4292.0	4293.36	4294.36	4294.29	4293.29			
910	E	740.0	740.0	741.0	741.0	218.60	218.66	219.66	219.59	MO	ST. LOUIS	
	N	4293.0	4294.0	4294.0	4293.0	4294.36	4295.36	4295.29	4294.29			
911	E	740.0	740.0	741.0	741.0	218.66	218.73	219.73	219.66	MO	ST. LOUIS	
	N	4294.0	4295.0	4295.0	4294.0	4295.36	4296.35	4296.29	4295.29			
2264	E	740.0	740.0	742.0	742.0	218.73	218.86	220.85	220.72	MO	ST. LOUIS	
	N	4295.0	4297.0	4297.0	4295.0	4296.35	4298.35	4298.22	4296.22			
2265	E	740.0	740.0	741.0	741.0	218.86	218.92	219.92	219.86	MO	ST. LOUIS	
	N	4297.0	4298.0	4298.0	4297.0	4298.35	4299.35	4299.28	4298.29			
2266	E	740.0	740.0	742.0	742.0	218.92	219.06	221.05	220.92	MO	ST. LOUIS	
	N	4298.0	4300.0	4300.0	4298.0	4299.35	4301.34	4301.21	4299.21			
914	E	740.0	740.0	745.0	745.0	219.06	219.38	224.57	224.05	MO	ST. LOUIS	
	N	4300.0	4305.0	4305.0	4300.0	4301.34	4306.33	4306.00	4301.02			
942	E	741.0	741.0	742.0	742.0	219.40	219.46	220.46	220.40	MO	ST. LOUIS	
	N	4290.0	4291.0	4291.0	4290.0	4291.30	4292.29	4292.23	4291.23			
943	E	741.0	741.0	742.0	742.0	219.46	219.53	220.53	220.46	MO	ST. LOUIS	
	N	4291.0	4292.0	4292.0	4291.0	4292.29	4293.29	4293.23	4292.23			
944	E	741.0	741.0	742.0	742.0	219.53	219.59	220.59	220.53	MO	ST. LOUIS	
	N	4292.0	4293.0	4293.0	4292.0	4293.29	4294.29	4294.23	4293.23			
945	E	741.0	741.0	742.0	742.0	219.59	219.66	220.66	220.59	MO	ST. LOUIS	
	N	4293.0	4294.0	4294.0	4293.0	4294.29	4295.29	4295.22	4294.23			
946	E	741.0	741.0	742.0	742.0	219.66	219.73	220.72	220.66	MO	ST. LOUIS	
	N	4294.0	4295.0	4295.0	4294.0	4295.29	4296.29	4296.22	4295.22			

TABLE 1. (CONTINUED)

ST. LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY	
2271	E	741.0	741.0	742.0	742.0	219.86	219.92	220.92	220.85	MO	ST. LOUIS
	N	4297.0	4298.0	4297.0	4297.0	4298.29	4299.28	4299.21	4298.22		
973	E	742.0	742.0	743.0	743.0	220.46	220.53	221.52	221.46	MO	ST. LOUIS
	N	4291.0	4292.0	4291.0	4291.0	4292.23	4293.23	4293.16	4292.16		
974	E	742.0	742.0	743.0	743.0	220.53	220.59	221.59	221.52	MO	ST. LOUIS
	N	4292.0	4293.0	4292.0	4292.0	4293.23	4294.23	4294.16	4293.16		
975	E	742.0	742.0	743.0	743.0	220.59	220.66	221.66	221.59	MO	ST. LOUIS
	N	4293.0	4294.0	4293.0	4293.0	4294.23	4295.22	4295.16	4294.16		
976	E	742.0	742.0	743.0	743.0	220.66	220.72	221.72	221.66	MO	ST. LOUIS
	N	4294.0	4295.0	4294.0	4294.0	4295.22	4296.22	4296.16	4295.16		
2274	E	742.0	742.0	743.0	743.0	220.72	220.79	221.79	221.72	MO	ST. LOUIS
	N	4295.0	4296.0	4295.0	4295.0	4296.22	4297.22	4297.15	4296.16		
2275	E	742.0	742.0	743.0	743.0	220.79	220.85	221.85	221.79	MO	ST. LOUIS
	N	4296.0	4297.0	4296.0	4296.0	4297.22	4298.22	4298.15	4297.15		
2276	E	742.0	742.0	745.0	745.0	220.85	221.05	224.05	223.85	MO	ST. LOUIS
	N	4297.0	4300.0	4297.0	4297.0	4298.22	4301.21	4301.02	4298.02		
1014	E	743.0	743.0	744.0	744.0	221.52	221.59	222.59	222.52	MO	ST. LOUIS
	N	4292.0	4293.0	4292.0	4292.0	4293.16	4294.16	4294.09	4293.10		
1015	E	743.0	743.0	744.0	744.0	221.59	221.66	222.65	222.59	MO	ST. LOUIS
	N	4293.0	4294.0	4293.0	4293.0	4294.16	4295.16	4295.09	4294.09		
1016	E	743.0	743.0	744.0	744.0	221.66	221.72	222.72	222.65	MO	ST. LOUIS
	N	4294.0	4295.0	4294.0	4294.0	4295.16	4296.16	4296.09	4295.09		
2280	E	743.0	743.0	745.0	745.0	221.72	221.85	223.85	223.72	MO	ST. LOUIS
	N	4295.0	4297.0	4295.0	4295.0	4296.16	4298.15	4298.02	4296.02		
1045	E	744.0	744.0	745.0	745.0	222.65	222.72	223.72	223.65	MO	ST. LOUIS
	N	4294.0	4295.0	4294.0	4294.0	4295.09	4296.09	4296.02	4295.03		
1062	E	745.0	745.0	750.0	750.0	223.72	224.05	229.04	228.71	MO	ST. LOUIS
	V	4295.0	4300.0	4295.0	4295.0	4296.02	4301.02	4300.69	4295.70		
2287	E	745.0	745.0	747.0	747.0	224.05	224.18	226.17	226.04	MO	ST. LOUIS
	N	4300.0	4302.0	4302.0	4300.0	4301.02	4303.01	4302.88	4300.88		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY
2295	E	747.0	749.0	749.0	749.0	226.04	226.17	226.17	226.04	226.04	MO	ST. LOUIS
	N	4300.0	4302.0	4302.0	4300.0	4300.88	4302.88	4302.75	4300.75	4300.75		
639	E	733.0	734.0	734.0	734.0	210.37	210.43	211.43	211.36	211.36	MO	ST. LOUIS CITY
	N	4274.0	4275.0	4275.0	4274.0	4275.85	4276.85	4276.78	4275.79	4275.79		
640	E	733.0	734.0	734.0	734.0	210.43	210.50	211.49	211.43	211.43	MO	ST. LOUIS CITY
	N	4275.0	4276.0	4276.0	4275.0	4276.85	4277.84	4277.78	4276.78	4276.78		
667	E	734.0	735.0	735.0	735.0	211.23	211.30	212.30	212.23	212.23	MO	ST. LOUIS CITY
	N	4272.0	4273.0	4273.0	4272.0	4273.79	4274.79	4274.72	4273.72	4273.72		
668	E	734.0	735.0	735.0	735.0	211.30	211.36	212.36	212.30	212.30	MO	ST. LOUIS CITY
	N	4273.0	4274.0	4274.0	4273.0	4274.79	4275.79	4275.72	4274.72	4274.72		
669	E	734.0	735.0	735.0	735.0	211.36	211.43	212.43	212.36	212.36	MO	ST. LOUIS CITY
	N	4274.0	4275.0	4275.0	4274.0	4275.79	4276.78	4276.72	4275.72	4275.72		
670	E	734.0	735.0	735.0	735.0	211.43	211.49	212.49	212.43	212.43	MO	ST. LOUIS CITY
	N	4275.0	4276.0	4276.0	4275.0	4276.78	4277.78	4277.71	4276.72	4276.72		
671	E	734.0	735.0	735.0	735.0	211.49	211.56	212.56	212.49	212.49	MO	ST. LOUIS CITY
	N	4276.0	4277.0	4277.0	4276.0	4277.78	4278.78	4278.71	4277.71	4277.71		
672	E	734.0	735.0	735.0	735.0	211.56	211.62	212.62	212.56	212.56	MO	ST. LOUIS CITY
	N	4277.0	4278.0	4278.0	4277.0	4278.78	4279.78	4279.71	4278.71	4278.71		
673	E	734.0	735.0	735.0	735.0	211.62	211.69	212.69	212.62	212.62	MO	ST. LOUIS CITY
	N	4278.0	4279.0	4279.0	4278.0	4279.78	4280.77	4280.71	4279.71	4279.71		
674	E	734.0	735.0	735.0	735.0	211.69	211.76	212.75	212.69	212.69	MO	ST. LOUIS CITY
	N	4279.0	4280.0	4280.0	4279.0	4280.77	4281.77	4281.71	4280.71	4280.71		
708	E	735.0	736.0	736.0	736.0	212.17	212.23	213.23	213.16	213.16	MO	ST. LOUIS CITY
	N	4271.0	4272.0	4272.0	4271.0	4272.72	4273.72	4273.66	4272.66	4272.66		
709	E	735.0	736.0	736.0	736.0	212.23	212.30	213.29	213.23	213.23	MO	ST. LOUIS CITY
	N	4272.0	4273.0	4273.0	4272.0	4273.72	4274.72	4274.66	4273.66	4273.66		
710	E	735.0	736.0	736.0	736.0	212.30	212.36	213.36	213.29	213.29	MO	ST. LOUIS CITY
	N	4273.0	4274.0	4274.0	4273.0	4274.72	4275.72	4275.65	4274.66	4274.66		
711	E	735.0	736.0	736.0	736.0	212.36	212.43	213.43	213.36	213.36	MO	ST. LOUIS CITY
	N	4274.0	4275.0	4275.0	4274.0	4275.72	4276.72	4276.65	4275.65	4275.65		

TABLE 1. (CONTINUED)

ST. LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY	
712	E	735.0	735.0	736.0	736.0	212.43	212.49	213.49	MO	ST. LOUIS CITY	
	N	4275.0	4276.0	4276.0	4275.0	4276.72	4277.71	4277.65			4276.65
713	E	735.0	735.0	736.0	736.0	212.49	212.56	213.56	MO	ST. LOUIS CITY	
	N	4276.0	4277.0	4277.0	4276.0	4277.71	4278.71	4278.65			4277.65
714	E	735.0	735.0	736.0	736.0	212.56	212.62	213.62	MO	ST. LOUIS CITY	
	N	4277.0	4278.0	4278.0	4277.0	4278.71	4279.71	4279.64			4278.65
715	E	735.0	735.0	736.0	736.0	212.62	212.69	213.69	MO	ST. LOUIS CITY	
	N	4278.0	4279.0	4279.0	4278.0	4279.71	4280.71	4280.64			4279.64
716	E	735.0	735.0	736.0	736.0	212.69	212.75	213.75	MO	ST. LOUIS CITY	
	N	4279.0	4280.0	4280.0	4279.0	4280.71	4281.71	4281.64			4280.64
717	E	735.0	735.0	736.0	736.0	212.75	212.82	213.82	MO	ST. LOUIS CITY	
	N	4280.0	4281.0	4281.0	4280.0	4281.71	4282.71	4282.64			4281.64
718	E	735.0	735.0	736.0	736.0	212.82	212.88	213.88	MO	ST. LOUIS CITY	
	N	4281.0	4282.0	4282.0	4281.0	4282.71	4283.70	4283.64			4282.64
719	E	735.0	735.0	736.0	736.0	212.88	212.95	213.95	MO	ST. LOUIS CITY	
	N	4282.0	4283.0	4283.0	4282.0	4283.70	4284.70	4284.64			4283.64
746	E	736.0	736.0	737.0	737.0	213.10	213.16	214.16	MO	ST. LOUIS CITY	
	N	4270.0	4271.0	4271.0	4270.0	4271.66	4272.66	4272.59			4271.59
747	E	736.0	736.0	737.0	737.0	213.16	213.23	214.23	MO	ST. LOUIS CITY	
	N	4271.0	4272.0	4272.0	4271.0	4272.66	4273.66	4273.59			4272.59
748	E	736.0	736.0	737.0	737.0	213.23	213.29	214.29	MO	ST. LOUIS CITY	
	N	4272.0	4273.0	4273.0	4272.0	4273.66	4274.66	4274.59			4273.59
749	E	736.0	736.0	737.0	737.0	213.29	213.36	214.36	MO	ST. LOUIS CITY	
	N	4273.0	4274.0	4274.0	4273.0	4274.66	4275.65	4275.59			4274.59
750	E	736.0	736.0	737.0	737.0	213.36	213.43	214.43	MO	ST. LOUIS CITY	
	N	4274.0	4275.0	4275.0	4274.0	4275.65	4276.65	4276.59			4275.59
751	E	736.0	736.0	737.0	737.0	213.43	213.49	214.49	MO	ST. LOUIS CITY	
	N	4275.0	4276.0	4276.0	4275.0	4276.65	4277.65	4277.59			4276.59
752	E	736.0	736.0	737.0	737.0	213.49	213.56	214.56	MO	ST. LOUIS CITY	
	N	4276.0	4277.0	4277.0	4276.0	4277.65	4278.65	4278.58			4277.59

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****			***** UTM ZONE 16 *****			STATE	COUNTY			
753	E	736.0	737.0	737.0	737.0	213.56	213.62	214.62	214.55	MO	ST. LOUIS CITY
	N	4277.0	4278.0	4278.0	4277.0	4278.65	4279.64	4279.58	4278.58		
754	E	736.0	737.0	737.0	737.0	213.62	213.69	214.68	214.62	MO	ST. LOUIS CITY
	N	4278.0	4279.0	4279.0	4278.0	4279.64	4280.64	4280.58	4279.58		
755	E	736.0	737.0	737.0	737.0	213.69	213.75	214.75	214.68	MO	ST. LOUIS CITY
	N	4279.0	4280.0	4280.0	4279.0	4280.64	4281.64	4281.58	4280.58		
756	E	736.0	737.0	737.0	737.0	213.75	213.82	214.82	214.75	MO	ST. LOUIS CITY
	N	4280.0	4281.0	4281.0	4280.0	4281.64	4282.64	4282.57	4281.58		
757	E	736.0	737.0	737.0	737.0	213.82	213.88	214.88	214.82	MO	ST. LOUIS CITY
	N	4281.0	4282.0	4282.0	4281.0	4282.64	4283.64	4283.57	4282.57		
758	E	736.0	737.0	737.0	737.0	213.88	213.95	214.95	214.88	MO	ST. LOUIS CITY
	N	4282.0	4283.0	4283.0	4282.0	4283.64	4284.64	4284.57	4283.57		
759	E	736.0	737.0	737.0	737.0	213.95	214.01	215.01	214.95	MO	ST. LOUIS CITY
	N	4283.0	4284.0	4284.0	4283.0	4284.64	4285.64	4285.57	4284.57		
781	E	737.0	738.0	738.0	738.0	214.10	214.16	215.16	215.10	MO	ST. LOUIS CITY
	N	4270.0	4271.0	4271.0	4270.0	4271.59	4272.59	4272.53	4271.53		
782	E	737.0	738.0	738.0	738.0	214.16	214.23	215.23	215.16	MO	ST. LOUIS CITY
	N	4271.0	4272.0	4272.0	4271.0	4272.59	4273.59	4273.53	4272.53		
783	E	737.0	738.0	738.0	738.0	214.23	214.29	215.29	215.23	MO	ST. LOUIS CITY
	N	4272.0	4273.0	4273.0	4272.0	4273.59	4274.59	4274.52	4273.53		
784	E	737.0	738.0	738.0	738.0	214.29	214.36	215.36	215.29	MO	ST. LOUIS CITY
	N	4273.0	4274.0	4274.0	4273.0	4274.59	4275.59	4275.52	4274.52		
785	E	737.0	738.0	738.0	738.0	214.36	214.42	215.42	215.36	MO	ST. LOUIS CITY
	N	4274.0	4275.0	4275.0	4274.0	4275.59	4276.59	4276.52	4275.52		
786	E	737.0	738.0	738.0	738.0	214.42	214.49	215.49	215.42	MO	ST. LOUIS CITY
	N	4275.0	4276.0	4276.0	4275.0	4276.59	4277.59	4277.52	4276.52		
787	E	737.0	738.0	738.0	738.0	214.49	214.55	215.55	215.49	MO	ST. LOUIS CITY
	N	4276.0	4277.0	4277.0	4276.0	4277.59	4278.58	4278.52	4277.52		
788	E	737.0	738.0	738.0	738.0	214.55	214.62	215.62	215.55	MO	ST. LOUIS CITY
	N	4277.0	4278.0	4278.0	4277.0	4278.58	4279.58	4279.52	4278.52		

TABLE 1. (CONTINUED)

ST LOUIS AOCR GRID SQUARE COORDINATES (KM)											
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY	
789	E	737.0	737.0	738.0	738.0	214.62	214.68	215.68	215.62	MO	ST. LOUIS CITY
	N	4278.0	4279.0	4279.0	4278.0	4279.58	4280.58	4280.51	4279.52		
790	E	737.0	737.0	738.0	738.0	214.68	214.75	215.75	215.68	MO	ST. LOUIS CITY
	N	4279.0	4280.0	4280.0	4279.0	4280.58	4281.58	4281.51	4280.51		
791	E	737.0	737.0	738.0	738.0	214.75	214.82	215.81	215.75	MO	ST. LOUIS CITY
	N	4280.0	4281.0	4281.0	4280.0	4281.58	4282.57	4282.51	4281.51		
792	E	737.0	737.0	738.0	738.0	214.82	214.88	215.88	215.81	MO	ST. LOUIS CITY
	N	4281.0	4282.0	4282.0	4281.0	4282.57	4283.57	4283.51	4282.51		
793	E	737.0	737.0	738.0	738.0	214.88	214.95	215.94	215.88	MO	ST. LOUIS CITY
	N	4282.0	4283.0	4283.0	4282.0	4283.57	4284.57	4284.51	4283.51		
794	E	737.0	737.0	738.0	738.0	214.95	215.01	216.01	215.94	MO	ST. LOUIS CITY
	N	4283.0	4284.0	4284.0	4283.0	4284.57	4285.57	4285.50	4284.51		
795	E	737.0	737.0	738.0	738.0	215.01	215.08	216.08	216.01	MO	ST. LOUIS CITY
	N	4284.0	4285.0	4285.0	4284.0	4285.57	4286.57	4286.50	4285.50		
796	E	737.0	737.0	738.0	738.0	215.08	215.14	216.14	216.08	MO	ST. LOUIS CITY
	N	4285.0	4286.0	4286.0	4285.0	4286.57	4287.57	4287.50	4286.50		
815	E	738.0	738.0	739.0	739.0	214.96	215.03	216.03	215.96	MO	ST. LOUIS CITY
	N	4268.0	4269.0	4269.0	4268.0	4269.54	4270.53	4270.46	4269.47		
816	E	738.0	738.0	739.0	739.0	215.03	215.10	216.09	216.03	MO	ST. LOUIS CITY
	N	4269.0	4270.0	4270.0	4269.0	4270.53	4271.53	4271.46	4270.46		
817	E	738.0	738.0	739.0	739.0	215.10	215.16	216.16	216.09	MO	ST. LOUIS CITY
	N	4270.0	4271.0	4271.0	4270.0	4271.53	4272.53	4272.46	4271.46		
818	E	738.0	738.0	739.0	739.0	215.16	215.23	216.22	216.16	MO	ST. LOUIS CITY
	N	4271.0	4272.0	4272.0	4271.0	4272.53	4273.53	4273.46	4272.46		
819	E	738.0	738.0	739.0	739.0	215.23	215.29	216.29	216.22	MO	ST. LOUIS CITY
	N	4272.0	4273.0	4273.0	4272.0	4273.53	4274.52	4274.46	4273.46		
820	E	738.0	738.0	739.0	739.0	215.29	215.36	216.35	216.29	MO	ST. LOUIS CITY
	N	4273.0	4274.0	4274.0	4273.0	4274.52	4275.52	4275.46	4274.46		
821	E	738.0	738.0	739.0	739.0	215.36	215.42	216.42	216.35	MO	ST. LOUIS CITY
	N	4274.0	4275.0	4275.0	4274.0	4275.52	4276.52	4276.46	4275.46		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY
822	E	738.0	738.0	739.0	739.0	739.0	215.42	215.49	216.49	216.42	MO	ST. LOUIS CITY
	N	4275.0	4276.0	4276.0	4275.0	4275.0	4276.52	4277.52	4277.45	4276.46		
823	E	738.0	738.0	739.0	739.0	739.0	215.49	215.55	216.55	216.49	MO	ST. LOUIS CITY
	N	4276.0	4277.0	4277.0	4276.0	4276.0	4277.52	4278.52	4278.45	4277.45		
824	E	738.0	738.0	739.0	739.0	739.0	215.55	215.62	216.62	216.55	MO	ST. LOUIS CITY
	N	4277.0	4278.0	4278.0	4277.0	4277.0	4278.52	4279.52	4279.45	4278.45		
825	E	738.0	738.0	739.0	739.0	739.0	215.62	215.68	216.68	216.62	MO	ST. LOUIS CITY
	N	4278.0	4279.0	4279.0	4278.0	4278.0	4279.52	4280.51	4280.45	4279.45		
826	E	738.0	738.0	739.0	739.0	739.0	215.68	215.75	216.75	216.68	MO	ST. LOUIS CITY
	N	4279.0	4280.0	4280.0	4279.0	4279.0	4280.51	4281.51	4281.45	4280.45		
827	E	738.0	738.0	739.0	739.0	739.0	215.75	215.81	216.81	216.75	MO	ST. LOUIS CITY
	N	4280.0	4281.0	4281.0	4280.0	4280.0	4281.51	4282.51	4282.45	4281.45		
828	E	738.0	738.0	739.0	739.0	739.0	215.81	215.88	216.88	216.81	MO	ST. LOUIS CITY
	N	4281.0	4282.0	4282.0	4281.0	4281.0	4282.51	4283.51	4283.44	4282.44		
829	E	738.0	738.0	739.0	739.0	739.0	215.88	215.94	216.94	216.88	MO	ST. LOUIS CITY
	N	4282.0	4283.0	4283.0	4282.0	4282.0	4283.51	4284.51	4284.44	4283.44		
830	E	738.0	738.0	739.0	739.0	739.0	215.94	216.01	217.01	216.94	MO	ST. LOUIS CITY
	N	4283.0	4284.0	4284.0	4283.0	4283.0	4284.51	4285.50	4285.44	4284.44		
831	E	738.0	738.0	739.0	739.0	739.0	216.01	216.08	217.07	217.01	MO	ST. LOUIS CITY
	N	4284.0	4285.0	4285.0	4284.0	4284.0	4285.50	4286.50	4286.44	4285.44		
832	E	738.0	738.0	739.0	739.0	739.0	216.08	216.14	217.14	217.07	MO	ST. LOUIS CITY
	N	4285.0	4286.0	4286.0	4285.0	4285.0	4286.50	4287.50	4287.43	4286.44		
833	E	738.0	738.0	739.0	739.0	739.0	216.14	216.21	217.20	217.14	MO	ST. LOUIS CITY
	N	4286.0	4287.0	4287.0	4286.0	4286.0	4287.50	4288.50	4288.43	4287.43		
834	E	738.0	738.0	739.0	739.0	739.0	216.21	216.27	217.27	217.20	MO	ST. LOUIS CITY
	N	4287.0	4288.0	4288.0	4287.0	4287.0	4288.50	4289.50	4289.43	4288.43		
847	E	739.0	739.0	740.0	740.0	740.0	215.96	216.03	217.03	216.96	MO	ST. LOUIS CITY
	N	4288.0	4289.0	4289.0	4288.0	4288.0	4289.47	4290.46	4290.40	4289.40		
848	E	739.0	739.0	740.0	740.0	740.0	216.03	216.09	217.09	217.03	MO	ST. LOUIS CITY
	N	4289.0	4290.0	4290.0	4289.0	4289.0	4290.46	4291.46	4291.40	4290.40		

TABLE 1. (CONTINUED)

ST. LOUIS AQCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****					***** UTM ZONE 16 *****					STATE	COUNTY
849	E	739.0	739.0	740.0	740.0	216.09	216.16	217.16	217.09	MO	ST. LOUIS CITY	
	N	4270.0	4271.0	4271.0	4270.0	4271.46	4272.46	4272.40	4271.40			
850	E	739.0	739.0	740.0	740.0	216.16	216.22	217.22	217.16	MO	ST. LOUIS CITY	
	N	4271.0	4272.0	4272.0	4271.0	4272.46	4273.46	4273.39	4272.40			
851	E	739.0	739.0	740.0	740.0	216.22	216.29	217.29	217.22	MO	ST. LOUIS CITY	
	N	4272.0	4273.0	4273.0	4272.0	4273.46	4274.46	4274.39	4273.39			
852	E	739.0	739.0	740.0	740.0	216.29	216.35	217.35	217.29	MO	ST. LOUIS CITY	
	N	4273.0	4274.0	4274.0	4273.0	4274.46	4275.46	4275.39	4274.39			
853	E	739.0	739.0	740.0	740.0	216.35	216.42	217.42	217.35	MO	ST. LOUIS CITY	
	N	4274.0	4275.0	4275.0	4274.0	4275.46	4276.46	4276.39	4275.39			
854	E	739.0	739.0	740.0	740.0	216.42	216.49	217.49	217.42	MO	ST. LOUIS CITY	
	N	4275.0	4276.0	4276.0	4275.0	4276.46	4277.45	4277.39	4276.39			
855	E	739.0	739.0	740.0	740.0	216.49	216.55	217.55	217.48	MO	ST. LOUIS CITY	
	N	4276.0	4277.0	4277.0	4276.0	4277.45	4278.45	4278.39	4277.39			
856	E	739.0	739.0	740.0	740.0	216.55	216.62	217.61	217.55	MO	ST. LOUIS CITY	
	N	4277.0	4278.0	4278.0	4277.0	4278.45	4279.45	4279.38	4278.39			
857	E	739.0	739.0	740.0	740.0	216.62	216.68	217.68	217.61	MO	ST. LOUIS CITY	
	N	4278.0	4279.0	4279.0	4278.0	4279.45	4280.45	4280.38	4279.38			
858	E	739.0	739.0	740.0	740.0	216.68	216.75	217.74	217.68	MO	ST. LOUIS CITY	
	N	4279.0	4280.0	4280.0	4279.0	4280.45	4281.45	4281.38	4280.38			
859	E	739.0	739.0	740.0	740.0	216.75	216.81	217.81	217.74	MO	ST. LOUIS CITY	
	N	4280.0	4281.0	4281.0	4280.0	4281.45	4282.45	4282.38	4281.38			
860	E	739.0	739.0	740.0	740.0	216.81	216.88	217.88	217.81	MO	ST. LOUIS CITY	
	N	4281.0	4282.0	4282.0	4281.0	4282.45	4283.44	4283.38	4282.38			
861	E	739.0	739.0	740.0	740.0	216.88	216.94	217.94	217.88	MO	ST. LOUIS CITY	
	N	4282.0	4283.0	4283.0	4282.0	4283.44	4284.44	4284.38	4283.38			
862	E	739.0	739.0	740.0	740.0	216.94	217.01	218.01	217.94	MO	ST. LOUIS CITY	
	N	4283.0	4284.0	4284.0	4283.0	4284.44	4285.44	4285.38	4284.38			
863	E	739.0	739.0	740.0	740.0	217.01	217.07	218.07	218.01	MO	ST. LOUIS CITY	
	N	4284.0	4285.0	4285.0	4284.0	4285.44	4286.44	4286.37	4285.38			

TABLE 1. (CONTINUED)

ST LOUIS AUCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY		
	Easting	Northing	Easting	Northing	Easting	Northing	Easting	Northing			Easting	Northing
864 E	739.0	739.0	740.0	740.0	217.07	217.14	218.14	218.07	MO	ST. LOUIS CITY	218.14	218.07
864 N	4285.0	4286.0	4286.0	4285.0	4286.44	4287.43	4287.37	4286.37			4287.37	4286.37
865 E	739.0	739.0	740.0	740.0	217.14	217.20	218.20	218.14	MO	ST. LOUIS CITY	218.20	218.14
865 N	4286.0	4287.0	4287.0	4286.0	4287.43	4288.43	4288.37	4287.37			4288.37	4287.37
866 E	739.0	739.0	740.0	740.0	217.20	217.27	218.27	218.20	MO	ST. LOUIS CITY	218.27	218.20
866 N	4287.0	4288.0	4288.0	4287.0	4288.43	4289.43	4289.37	4288.37			4289.37	4288.37
867 E	739.0	739.0	740.0	740.0	217.27	217.34	218.33	218.27	MO	ST. LOUIS CITY	218.33	218.27
867 N	4288.0	4289.0	4289.0	4288.0	4289.43	4290.43	4290.36	4289.37			4290.36	4289.37
868 E	739.0	739.0	740.0	740.0	217.34	217.40	218.40	218.33	MO	ST. LOUIS CITY	218.40	218.33
868 N	4289.0	4290.0	4290.0	4289.0	4290.43	4291.43	4291.36	4290.36			4291.36	4290.36
888 E	740.0	740.0	741.0	741.0	217.16	217.22	218.22	218.15	MO	ST. LOUIS CITY	218.22	218.15
888 N	4271.0	4272.0	4272.0	4271.0	4272.40	4273.39	4273.33	4272.33			4273.33	4272.33
889 E	740.0	740.0	741.0	741.0	217.22	217.29	218.29	218.22	MO	ST. LOUIS CITY	218.29	218.22
889 N	4272.0	4273.0	4273.0	4272.0	4273.39	4274.39	4274.33	4273.33			4274.33	4273.33
890 E	740.0	740.0	741.0	741.0	217.29	217.35	218.35	218.29	MO	ST. LOUIS CITY	218.35	218.29
890 N	4273.0	4274.0	4274.0	4273.0	4274.39	4275.39	4275.33	4274.33			4275.33	4274.33
891 E	740.0	740.0	741.0	741.0	217.35	217.42	218.42	218.35	MO	ST. LOUIS CITY	218.42	218.35
891 N	4274.0	4275.0	4275.0	4274.0	4275.39	4276.39	4276.32	4275.33			4276.32	4275.33
892 E	740.0	740.0	741.0	741.0	217.42	217.48	218.48	218.42	MO	ST. LOUIS CITY	218.48	218.42
892 N	4275.0	4276.0	4276.0	4275.0	4276.39	4277.39	4277.32	4276.32			4277.32	4276.32
893 E	740.0	740.0	741.0	741.0	217.48	217.55	218.55	218.48	MO	ST. LOUIS CITY	218.55	218.48
893 N	4276.0	4277.0	4277.0	4276.0	4277.39	4278.39	4278.32	4277.32			4278.32	4277.32
894 E	740.0	740.0	741.0	741.0	217.55	217.61	218.61	218.55	MO	ST. LOUIS CITY	218.61	218.55
894 N	4277.0	4278.0	4278.0	4277.0	4278.39	4279.38	4279.32	4278.32			4279.32	4278.32
895 E	740.0	740.0	741.0	741.0	217.61	217.68	218.68	218.61	MO	ST. LOUIS CITY	218.68	218.61
895 N	4278.0	4279.0	4279.0	4278.0	4279.38	4280.38	4280.32	4279.32			4280.32	4279.32
896 E	740.0	740.0	741.0	741.0	217.68	217.74	218.74	218.68	MO	ST. LOUIS CITY	218.74	218.68
896 N	4279.0	4280.0	4280.0	4279.0	4280.38	4281.38	4281.32	4280.32			4281.32	4280.32
897 E	740.0	740.0	741.0	741.0	217.74	217.81	218.81	218.74	MO	ST. LOUIS CITY	218.81	218.74
897 N	4280.0	4281.0	4281.0	4280.0	4281.38	4282.38	4282.32	4281.32			4282.32	4281.32

TABLE 1. (CONTINUED)

ST LOUIS AGRIC GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		***** UTM ZONE 16 *****		STATE	COUNTY		
898	E	740.0 4281.0	740.0 4282.0	741.0 4281.0	217.81 4282.38	217.88 4283.38	218.87 4283.31	218.81 4282.31	MO	ST. LOUIS CITY		
	N											
899	E	740.0 4282.0	740.0 4283.0	741.0 4282.0	217.88 4283.38	217.94 4284.38	218.94 4284.31	218.87 4283.31	MO	ST. LOUIS CITY		
	N											
900	E	740.0 4283.0	740.0 4284.0	741.0 4283.0	217.94 4284.38	218.01 4285.38	219.00 4285.31	218.94 4284.31	MO	ST. LOUIS CITY		
	N											
901	E	740.0 4284.0	740.0 4285.0	741.0 4284.0	218.01 4285.38	218.07 4286.37	219.07 4286.30	219.00 4285.31	MO	ST. LOUIS CITY		
	N											
902	E	740.0 4285.0	740.0 4286.0	741.0 4285.0	218.07 4286.37	218.14 4287.37	219.14 4287.30	219.07 4286.30	MO	ST. LOUIS CITY		
	N											
903	E	740.0 4286.0	740.0 4287.0	741.0 4286.0	218.14 4287.37	218.20 4288.37	219.20 4288.30	219.14 4287.30	MO	ST. LOUIS CITY		
	N											
904	E	740.0 4287.0	740.0 4288.0	741.0 4287.0	218.20 4288.37	218.27 4289.37	219.27 4289.30	219.20 4288.30	MO	ST. LOUIS CITY		
	N											
905	E	740.0 4288.0	740.0 4289.0	741.0 4288.0	218.27 4289.37	218.33 4290.36	219.33 4290.30	219.27 4289.30	MO	ST. LOUIS CITY		
	N											
924	E	741.0 4272.0	741.0 4273.0	742.0 4272.0	218.22 4273.33	218.29 4274.33	219.28 4274.26	219.22 4273.27	MO	ST. LOUIS CITY		
	N											
925	E	741.0 4273.0	741.0 4274.0	742.0 4273.0	218.29 4274.33	218.35 4275.33	219.35 4275.26	219.28 4274.26	MO	ST. LOUIS CITY		
	N											
926	E	741.0 4274.0	741.0 4275.0	742.0 4274.0	218.35 4275.33	218.42 4276.32	219.41 4276.26	219.35 4275.26	MO	ST. LOUIS CITY		
	N											
927	E	741.0 4275.0	741.0 4276.0	742.0 4275.0	218.42 4276.32	218.48 4277.32	219.48 4277.26	219.41 4276.26	MO	ST. LOUIS CITY		
	N											
928	E	741.0 4276.0	741.0 4277.0	742.0 4276.0	218.48 4277.32	218.55 4278.32	219.54 4278.25	219.48 4277.26	MO	ST. LOUIS CITY		
	N											
929	E	741.0 4277.0	741.0 4278.0	742.0 4277.0	218.55 4278.32	218.61 4279.32	219.61 4279.25	219.54 4278.25	MO	ST. LOUIS CITY		
	N											
930	E	741.0 4278.0	741.0 4279.0	742.0 4278.0	218.61 4279.32	218.68 4280.32	219.68 4280.25	219.61 4279.25	MO	ST. LOUIS CITY		
	N											

TABLE 1. (CONTINUED)

ST LOUIS AUCR GRID SQUARE COORDINATES (KM)													
ID		*****	UTM	ZONE	15	*****	*****	UTM	ZONE	16	*****	STATE	COUNTY
931	E	741.0 4279.0	741.0 4280.0		742.0 4280.0	742.0 4279.0	218.68 4280.32	218.74 4281.32	219.74 4281.25		219.68 4280.25	MO	ST. LOUIS CITY
932	E	741.0 4280.0	741.0 4281.0		742.0 4281.0	742.0 4280.0	218.74 4281.32	218.81 4282.31	219.81 4282.25		219.74 4281.25	MO	ST. LOUIS CITY
933	E	741.0 4281.0	741.0 4282.0		742.0 4282.0	742.0 4281.0	218.81 4282.31	218.87 4283.31	219.87 4283.25		219.81 4282.25	MO	ST. LOUIS CITY
934	E	741.0 4282.0	741.0 4283.0		742.0 4283.0	742.0 4282.0	218.87 4283.31	218.94 4284.31	219.94 4284.25		219.87 4283.25	MO	ST. LOUIS CITY
935	E	741.0 4283.0	741.0 4284.0		742.0 4284.0	742.0 4283.0	218.94 4284.31	219.00 4285.31	220.00 4285.24		219.94 4284.25	MO	ST. LOUIS CITY
936	E	741.0 4284.0	741.0 4285.0		742.0 4285.0	742.0 4284.0	219.00 4285.31	219.07 4286.30	220.07 4286.24		220.00 4285.24	MO	ST. LOUIS CITY
937	E	741.0 4285.0	741.0 4286.0		742.0 4286.0	742.0 4285.0	219.07 4286.30	219.14 4287.30	220.13 4287.24		220.07 4286.24	MO	ST. LOUIS CITY
938	E	741.0 4286.0	741.0 4287.0		742.0 4287.0	742.0 4286.0	219.14 4287.30	219.20 4288.30	220.20 4288.24		220.13 4287.24	MO	ST. LOUIS CITY
939	E	741.0 4287.0	741.0 4288.0		742.0 4288.0	742.0 4287.0	219.20 4288.30	219.27 4289.30	220.26 4289.23		220.20 4288.24	MO	ST. LOUIS CITY
940	E	741.0 4288.0	741.0 4289.0		742.0 4289.0	742.0 4288.0	219.27 4289.30	219.33 4290.30	220.33 4290.23		220.26 4289.23	MO	ST. LOUIS CITY
941	E	741.0 4289.0	741.0 4290.0		742.0 4290.0	742.0 4289.0	219.33 4290.30	219.40 4291.30	220.40 4291.23		220.33 4290.23	MO	ST. LOUIS CITY
955	E	742.0 4273.0	742.0 4274.0		743.0 4274.0	743.0 4273.0	219.28 4274.26	219.35 4275.26	220.35 4275.20		220.28 4274.20	MO	ST. LOUIS CITY
956	E	742.0 4274.0	742.0 4275.0		743.0 4275.0	743.0 4274.0	219.35 4275.26	219.41 4276.26	220.41 4276.20		220.35 4275.20	MO	ST. LOUIS CITY
957	E	742.0 4275.0	742.0 4276.0		743.0 4276.0	743.0 4275.0	219.41 4276.26	219.48 4277.26	220.48 4277.19		220.41 4276.20	MO	ST. LOUIS CITY
958	E	742.0 4276.0	742.0 4277.0		743.0 4277.0	743.0 4276.0	219.48 4277.26	219.54 4278.25	220.54 4278.19		220.48 4277.19	MO	ST. LOUIS CITY

TABLE 1. (CONTINUED)

ST. LOUIS AND SUBURB COORDINATES (NM)

ID		***** UTM ZONE 15 *****				***** UTM ZONE 16 *****				STATE	COUNTY
959	E	742.0	742.0	743.0	743.0	219.54	219.61	220.61	220.54	MO	ST. LOUIS CITY
	N	4277.0	4278.0	4278.0	4277.0	4278.25	4279.25	4279.19	4278.19		
960	E	742.0	742.0	743.0	743.0	219.61	219.68	220.67	220.61	MO	ST. LOUIS CITY
	N	4278.0	4279.0	4279.0	4278.0	4279.25	4280.25	4280.19	4279.19		
961	E	742.0	742.0	743.0	743.0	219.68	219.74	220.74	220.67	MO	ST. LOUIS CITY
	N	4279.0	4280.0	4280.0	4279.0	4280.25	4281.25	4281.18	4280.19		
962	E	742.0	742.0	743.0	743.0	219.74	219.81	220.80	220.74	MO	ST. LOUIS CITY
	N	4280.0	4281.0	4281.0	4280.0	4281.25	4282.25	4282.18	4281.18		
963	E	742.0	742.0	743.0	743.0	219.81	219.87	220.87	220.80	MO	ST. LOUIS CITY
	N	4281.0	4282.0	4282.0	4281.0	4282.25	4283.25	4283.18	4282.18		
964	E	742.0	742.0	743.0	743.0	219.87	219.94	220.94	220.87	MO	ST. LOUIS CITY
	N	4282.0	4283.0	4283.0	4282.0	4283.25	4284.25	4284.18	4283.18		
965	E	742.0	742.0	743.0	743.0	219.94	220.00	221.00	220.94	MO	ST. LOUIS CITY
	N	4283.0	4284.0	4284.0	4283.0	4284.25	4285.24	4285.18	4284.18		
966	E	742.0	742.0	743.0	743.0	220.00	220.07	221.07	221.00	MO	ST. LOUIS CITY
	N	4284.0	4285.0	4285.0	4284.0	4285.24	4286.24	4286.18	4285.18		
967	E	742.0	742.0	743.0	743.0	220.07	220.13	221.13	221.07	MO	ST. LOUIS CITY
	N	4285.0	4286.0	4286.0	4285.0	4286.24	4287.24	4287.17	4286.18		
968	E	742.0	742.0	743.0	743.0	220.13	220.20	221.20	221.13	MO	ST. LOUIS CITY
	N	4286.0	4287.0	4287.0	4286.0	4287.24	4288.24	4288.17	4287.17		
969	E	742.0	742.0	743.0	743.0	220.20	220.26	221.26	221.20	MO	ST. LOUIS CITY
	N	4287.0	4288.0	4288.0	4287.0	4288.24	4289.23	4289.17	4288.17		
970	E	742.0	742.0	743.0	743.0	220.26	220.33	221.33	221.26	MO	ST. LOUIS CITY
	N	4288.0	4289.0	4289.0	4288.0	4289.23	4290.23	4290.17	4289.17		
971	E	742.0	742.0	743.0	743.0	220.33	220.40	221.39	221.33	MO	ST. LOUIS CITY
	N	4289.0	4290.0	4290.0	4289.0	4290.23	4291.23	4291.16	4290.17		
972	E	742.0	742.0	743.0	743.0	220.40	220.46	221.46	221.39	MO	ST. LOUIS CITY
	N	4290.0	4291.0	4291.0	4290.0	4291.23	4292.23	4292.16	4291.16		
999	E	743.0	743.0	744.0	744.0	220.41	220.48	221.48	221.41	MO	ST. LOUIS CITY
	N	4275.0	4276.0	4276.0	4275.0	4276.20	4277.19	4277.13	4276.13		

TABLE 1. (CONTINUED)

ST LOUIS AQCR GRID SQUARE COORDINATES (KM)														
ID	***** UTM ZONE 15 *****						***** UTM ZONE 16 *****						STATE	COUNTY
1000	E	743.0	743.0	744.0	744.0	744.0	220.48	220.54	221.54	221.48	MO	ST. LOUIS CITY		
	N	4276.0	4277.0	4277.0	4276.0	4276.0	4277.19	4278.19	4278.13	4277.13				
1001	E	743.0	743.0	744.0	744.0	744.0	220.54	220.61	221.61	221.54	MO	ST. LOUIS CITY		
	N	4277.0	4278.0	4278.0	4277.0	4277.0	4278.19	4279.19	4279.13	4278.13				
1002	E	743.0	743.0	744.0	744.0	744.0	220.61	220.67	221.67	221.61	MO	ST. LOUIS CITY		
	N	4278.0	4279.0	4279.0	4278.0	4278.0	4279.19	4280.19	4280.12	4279.13				
1003	E	743.0	743.0	744.0	744.0	744.0	220.67	220.74	221.74	221.67	MO	ST. LOUIS CITY		
	N	4279.0	4280.0	4280.0	4279.0	4279.0	4280.19	4281.18	4281.12	4280.12				
1004	E	743.0	743.0	744.0	744.0	744.0	220.74	220.80	221.80	221.74	MO	ST. LOUIS CITY		
	N	4280.0	4281.0	4281.0	4280.0	4280.0	4281.18	4282.18	4282.12	4281.12				
1005	E	743.0	743.0	744.0	744.0	744.0	220.80	220.87	221.87	221.80	MO	ST. LOUIS CITY		
	N	4281.0	4282.0	4282.0	4281.0	4281.0	4282.18	4283.18	4283.12	4282.12				
1006	E	743.0	743.0	744.0	744.0	744.0	220.87	220.94	221.93	221.87	MO	ST. LOUIS CITY		
	N	4282.0	4283.0	4283.0	4282.0	4282.0	4283.18	4284.18	4284.11	4283.12				
1007	E	743.0	743.0	744.0	744.0	744.0	220.94	221.00	222.00	221.93	MO	ST. LOUIS CITY		
	N	4283.0	4284.0	4284.0	4283.0	4283.0	4284.18	4285.18	4285.11	4284.11				
1008	E	743.0	743.0	744.0	744.0	744.0	221.00	221.07	222.06	222.00	MO	ST. LOUIS CITY		
	N	4284.0	4285.0	4285.0	4284.0	4284.0	4285.18	4286.18	4286.11	4285.11				
1009	E	743.0	743.0	744.0	744.0	744.0	221.07	221.13	222.13	222.06	MO	ST. LOUIS CITY		
	N	4285.0	4286.0	4286.0	4285.0	4285.0	4286.18	4287.17	4287.11	4286.11				
1013	E	743.0	743.0	744.0	744.0	744.0	221.46	221.52	222.52	222.46	MO	ST. LOUIS CITY		
	N	4291.0	4292.0	4292.0	4291.0	4291.0	4292.16	4293.16	4293.10	4292.10				
1030	E	744.0	744.0	745.0	745.0	745.0	221.41	221.48	222.47	222.41	MO	ST. LOUIS CITY		
	N	4275.0	4276.0	4276.0	4275.0	4275.0	4276.13	4277.13	4277.06	4276.06				
1031	E	744.0	744.0	745.0	745.0	745.0	221.48	221.54	222.54	222.47	MO	ST. LOUIS CITY		
	N	4276.0	4277.0	4277.0	4276.0	4276.0	4277.13	4278.13	4278.06	4277.06				
1032	E	744.0	744.0	745.0	745.0	745.0	221.54	221.61	222.60	222.54	MO	ST. LOUIS CITY		
	N	4277.0	4278.0	4278.0	4277.0	4277.0	4278.13	4279.13	4279.06	4278.06				
1033	E	744.0	744.0	745.0	745.0	745.0	221.61	221.67	222.67	222.60	MO	ST. LOUIS CITY		
	N	4278.0	4279.0	4279.0	4278.0	4278.0	4279.13	4280.12	4280.05	4279.06				

TABLE 1. (CONTINUED)

ST. LOUIS AOCR GRID SQUARE COORDINATES (KM)												
ID	***** UTM ZONE 15 *****		***** UTM ZONE 16 *****		***** STATE		COUNTY					
1034	E	744.0	744.0	745.0	745.0	221.67	221.74	222.74	222.67	MO	ST. LOUIS CITY	
	N	4279.0	4280.0	4280.0	4279.0	4280.12	4281.12	4281.05	4280.05			
1035	E	744.0	744.0	745.0	745.0	221.74	221.80	222.80	222.74	MO	ST. LOUIS CITY	
	N	4280.0	4281.0	4281.0	4280.0	4281.12	4282.12	4282.05	4281.05			
1036	E	744.0	744.0	745.0	745.0	221.80	221.87	222.87	222.80	MO	ST. LOUIS CITY	
	N	4281.0	4282.0	4282.0	4281.0	4282.12	4283.12	4283.05	4282.05			
1037	E	744.0	744.0	745.0	745.0	221.87	221.93	222.93	222.87	MO	ST. LOUIS CITY	
	N	4282.0	4283.0	4283.0	4282.0	4283.12	4284.11	4284.05	4283.05			
1038	E	744.0	744.0	745.0	745.0	221.93	222.00	223.00	222.93	MO	ST. LOUIS CITY	
	N	4283.0	4284.0	4284.0	4283.0	4284.11	4285.11	4285.05	4284.05			
1039	E	744.0	744.0	745.0	745.0	222.00	222.06	223.06	223.00	MO	ST. LOUIS CITY	
	N	4284.0	4285.0	4285.0	4284.0	4285.11	4286.11	4286.04	4285.05			
1043	E	744.0	744.0	745.0	745.0	222.52	222.59	223.59	223.52	MO	ST. LOUIS CITY	
	N	4292.0	4293.0	4293.0	4292.0	4293.10	4294.09	4294.03	4293.03			
1044	E	744.0	744.0	745.0	745.0	222.59	222.65	223.65	223.59	MO	ST. LOUIS CITY	
	N	4293.0	4294.0	4294.0	4293.0	4294.09	4295.09	4295.03	4294.03			

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**RESIDENTIAL AND COMMERCIAL
AREA SOURCE EMISSION
INVENTORY METHODOLOGY
FOR THE REGIONAL
AIR POLLUTION STUDY**

by

Environmental Science and Engineering, Inc.
Gainesville, Florida

Contract No. 68-02-1003

EPA Project Officer: Charles C. Masser

Prepared for

ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Waste Management
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

September 1975

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ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

GAINESVILLE, FLORIDA

Draft Final Report
Project 73-009-003

A RESIDENTIAL AND COMMERCIAL
AREA SOURCE EMISSION INVENTORY
METHODOLOGY FOR THE REGIONAL
AIR POLLUTION STUDY

PREPARED FOR THE
U.S. ENVIRONMENTAL PROTECTION AGENCY
CONTRACT NO. 68-02-1003

EPA PROJECT OFFICER: Mr. Charles C. Masser
SEPTEMBER, 1975

R. E. Holden, Project Manager

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INTRODUCTION

One of the major objectives of the Regional Air Pollution Study (RAPS) is to provide data on the emissions of air pollutants, meteorological conditions and ambient air quality with unprecedented density and resolution as to allow the testing and development of a spectrum of mathematical models to simulate relationships between emissions of pollutants and air quality. Crucial to the achievement of this objective is an emissions inventory cataloging the pollutant emissions of the St. Louis region on an hour-by-hour basis. As part of this effort, Environmental Science and Engineering, Inc. (ESE) has developed a methodology for estimating the pollutant emissions from stationary residential and commercial-institutional area sources on an hour-by-hour basis, and apportioning them to a grid system especially designed for the RAPS.

The boundaries of the region of interest are established as the St. Louis Interstate Air Quality Control Region (AQCR 70). ESE has collected data on fuel usage, distribution of residential and commercial-institutional land use, gasoline sales, paint sales, use of dry cleaning fluids, solid waste disposal and uncontrolled fires for the region, analyzed such data and developed a series of models to estimate the area emissions of sulfur dioxide, particulates, nitrogen oxides, hydrocarbons and carbon monoxide for each specified grid square shown in Figure 1.1. A temporal allocation procedure was then developed from the data to define emissions on an hourly basis.

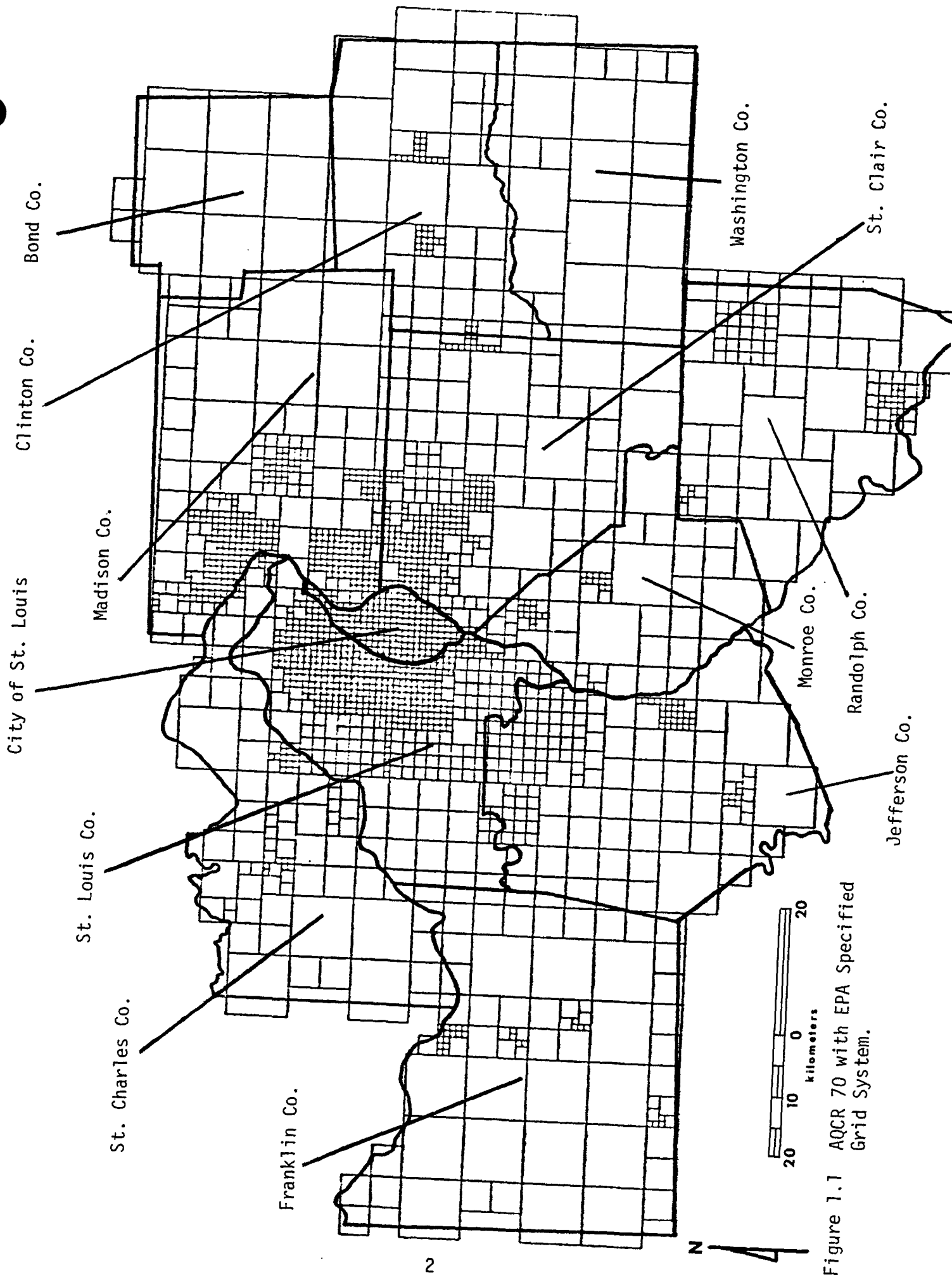


Figure 1.1 AQCR 70 with EPA Specified Grid System.

RESIDENTIAL AND COMMERCIAL-INSTITUTIONAL FUEL USE

Residential and commercial-institutional burning of fuels for space heating and other functions in urbanized areas has long been recognized as an important source of pollutants. The spatial distribution of the emissions from such fuel burning to the specified Environmental Protection Agency (EPA) grid system (Figure 1.1) was accomplished by analysis of population and commercial land use density from census tapes; The East-West Gateway Coordinating Council Report 1971-72 Existing Land Use Update and Analysis, St. Louis City Planning Commission St. Louis Development Program, and the Bureau of Census Population Estimates and Projections for 1972-73. Temporal distributions were obtained by an analysis of natural gas flow and billing data obtained from the LaClede Gas Company, with respect to time of day, ambient temperature and wind speed.

Fuel Use Emission Estimates

The emission estimates are based upon the National Emissions Data System (NEDS) Stationary Source Fuel Summaries Report. These values are shown in Table 2.1. The Fuel Summaries Report does not include information on bottled (LP) gas consumption for area sources. It has been assumed that the ratio of homes using bottled gas to natural gas is the same as the ratio of the BTU's consumed by users of bottled gas to the users of natural gas. As bottled gas is relatively clean and is not of major concern in the urbanized areas, this assumption appears reasonable. Revisions of annual fuel summary figures are readily translated into revised emissions, per grid, through direct proportionality factors.

Estimated sulfur and ash contents of the bituminous coal used for

Table 2.1 Fuel Summaries Report, National Emissions Data System, Annual Area Source Fuel Usages.*

LOCATION	FUEL TYPE				
	BITM. COAL (Tons)	RESID. OIL (10 ³ Gal.)	DIST. OIL (10 ³ Gal.)	NAT. GAS (10 ⁶ Cu.Ft.)	WOOD (Tons)
Bond Co., Ill. Residential Industrial Commercial-Institutional	5520 710 --	-- 30 760	2350 40 --	290 60 170	200 -- --
					5474 -- --
Clinton Co., Ill. Residential Industrial Commercial-Institutional	8200 2490 --	-- 110 1530	2880 130 --	640 210 350	200 -- --
					8806 -- --
Madison Co., Ill. Residential Industrial Commercial-Institutional	63150 64540 --	-- 2840 13600	21730 3490 --	8040 5570 3120	400 -- --
					39632 -- --
Monroe Co., Ill. Residential Industrial Commercial-Institutional	4180 180 --	-- 10 1020	1910 10 --	220 20 240	200 -- --
					13339 -- --

*

** See Footnotes on following page.

Table 2.1 Fuel Summaries Report, National Emissions Data System, Annual Area Source Fuel Usages.*
(Continued)

LOCATION	FUEL TYPE					
	BITM. COAL (Tons)	RESID. OIL (10 ³ Gal.)	DIST. OIL (10 ³ Gal.)	NAT. GAS (10 ⁶ Cu.Ft.)	WOOD (Tons)	BOTTLED** (LP) GAS (10 ³ Gal.)
Randolph Co., Ill.						
Residential	13070	--	3190	440	--	13506
Industrial	4620	200	250	400	--	--
Commercial-Institutional	--	1700	--	390	--	--
St. Clair Co., Ill.						
Residential	86210	--	23410	8370	1000	44919
Industrial	30760	1350	1660	2660	--	--
Commercial-Institutional	--	15450	--	3540	--	--
Washington Co., Ill.						
Residential	6220	--	1810	330	800	9784
Industrial	1070	50	60	90	--	--
Commercial-Institutional	--	740	--	170	--	--
Franklin Co., Mo.						
Residential	2260	--	5600	1090	4600	55558
Industrial	31710	920	350	780	--	--
Commercial-Institutional	--	850	1220	1600	--	--

*

** See Footnotes on following page.

Table 2.1 Fuel Summaries Report, National Emissions Data System, Annual Area Source Fuel Usages.*
(Continued)

LOCATION	FUEL TYPE					
	BITM. COAL (Tons)	RESID. OIL (10 ³ Gal.)	DIST. OIL (10 ³ Gal.)	NAT. GAS (10 ⁶ Cu.Ft.)	WOOD (Tons)	BOTTLED** (LP) GAS (10 ³ Gal.)
Jefferson Co., Mo.						
Residential	1080	--	5350	2860	2200	89537
Industrial	--	90	60	2970	--	--
Commercial-Institutional	--	--	80	10580	--	--
St. Charles Co., Mo.						
Residential	1520	--	4940	2480	700	56341
Industrial	--	20	560	180	--	--
Commercial-Institutional	--	--	620	190	--	--
St. Louis Co., Mo.						
Residential	4760	--	22020	34450	500	44512
Industrial	33500	3760	--	17720	--	--
Commercial-Institutional	--	--	--	--	--	--
St. Louis City, Mo.						
Residential	18560	--	13560	26400	1800	16619
Industrial	100,000	800	10000	28600	--	--
Commercial-Institutional	112,000	--	35000	11100	--	--

* Industrial area sources were not considered in this study; the fuels summary includes these values for comparison purposes.

**Calculated fuel usage.

calculating emissions were 2.5 percent and 5 percent,* respectively. These figures must be taken as representative, but they are subject to large variations. The percentage of homes using coal for heating may, at first glance, appear to be insignificant; however, 0.3 percent of the homes in St. Louis County burning an average Illinois coal containing 2.5 percent sulfur generates almost half as much sulfur dioxide emissions as the 9 percent of the homes burning distillate oil containing typically 0.2 percent sulfur.** Careful monitoring of the sulfur and ash content of coal sold for residential use will be required to attach greater confidence to the sulfur dioxide emissions estimates from coal combustion by residential users at any point in the future.

Emissions from wood combustion were found to be insignificant and are therefore not included in the computer routine for emissions computations.

All emissions estimates are based upon the emission factors utilized by the National Emissions Data System.

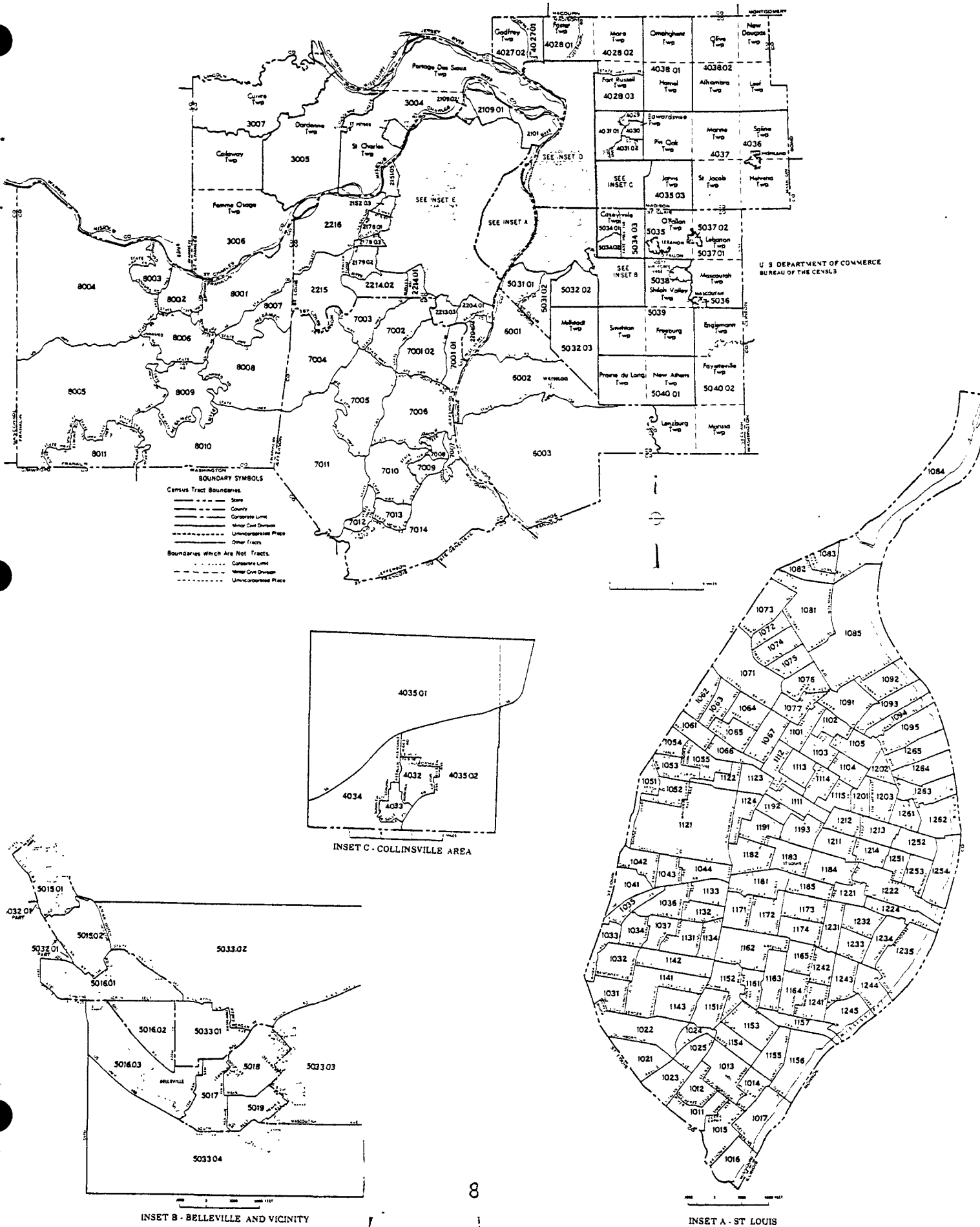
Spatial Resolution

Residential Fuel Usage - The U. S. Bureau of Census Fourth Count Computer Summary Tapes contain data on size and nativity of families, education, employment status, age of home, and fuel usage for space-heating, water-heating, and cooking for census tracts, county subdivisions, and counties. The determination of the spatial distribution of residential fuel usage was estimated from the data on these tapes for the tracts in the St.

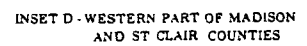
* Average of proximate analyses for coals from Saline, Perry, and Sangamon Counties, Illinois.

** Average of typical analysis for No. 1 and No. 2 fuel oil.

CENSUS TRACTS IN THE ST. LOUIS, MO.-ILL. SMSA AND ADJACENT AREA



9



Louis Standard Metropolitan Statistical Area (SMSA). Figure 2.1 shows these tracts. As shown, the St. Louis SMSA included tract data for 417 tracts. The more populous areas have more tracts, as can be seen by the fact that St. Louis City, with a 1970 population of 950,000 has 126 tracts, whereas the geographically larger Franklin County, population 55,000 is divided into only 11 tracts.

The four untraced counties within the AQCR have an average population (1970) of 22,000. Randolph, Washington, Clinton, and Bond Counties, Illinois were assumed to have homogeneous uses of fuel types. The specific grid system was reproduced using Computer Plotting Techniques (Calcomp) to a 1:250,000 scale and overlain on U.S. Geological Survey (USGS) maps (photorevised in 1969) of the same scale. Population Density per grid was estimated from known populations of townships, cities, towns, and settlements from the Bureau of Census Population of County Subdivisions. Comparison of these results with the population density of similar tracted areas in western AQCR 70 proved favorable.

The census data provide information on the number of housing units using 1) natural gas, 2) bottled (LP) gas, 3) electricity, 4) fuel oil, 5) coal or coke, 6) wood, 7) other and 8) none. It was thus possible to determine annual tract fuel usages by the following formula:

$$\frac{\text{No. of homes in tract heated by fuel type } i}{\text{No. of homes in county heated by fuel type } i} \times \text{annual county residential area source use of fuel type } i$$

The annual county residential area source fuel usage of each fuel type was available from the EPA NEDS Stationary Source Fuel Summary Reports for the respective counties.

The major difficulty with using census tract data consists of accurately determining the tract(s) in each square of the specified EPA grids. Using detailed USGS 7.5 minute series maps, the relationship between the census tract maps and the EPA grid system was graphically determined. Calcomp was again utilized to obtain the EPA grid system on the same scales as the available tract maps. Every grid square was listed with a visually estimated land area percentage of the total tract area of each tract contributing to the land area of the grid. The estimated tract areas which resulted were then normalized to insure that exactly 100 percent of each tract had been apportioned among the grid system.

This procedure allowed elimination of special terrain and land use effects. Significant deviations from land use typical of the overall census tract occur primarily along the banks of the Mississippi River; near Forest Park in St. Louis city; near Lambert Field; near Washington University; and near Grant's Farm. Although these areas were included in the tract information, zero percent of the pertinent tract was apportioned to the affected grid squares. Near the Mississippi River, portions of the tracts over the water were similarly excluded in determining the percentage of the tract lying within a given grid.

For Bond, Clinton, Randolph, and Washington Counties, Illinois (the untraced counties) all grids falling within those counties were artificially designated as tracts for computational purposes, and tract numbers were assigned corresponding to their EPA grid numbers (thus EPA Grid 1632 falling in Randolph County was said to contain 100 percent of "Tract 1632").

Tract data was then created for each grid-tract using the Population Density Per Grid, Number of persons per housing unit, and Percentage of housing units using the various fuels. These data are available for each county in the Bureau of Census Detailed Housing Characteristics. Thus for competition purposes, tract data were created in the same format as the available tract data for the counties within the SMSA.

Utilizing these techniques, a high degree of reliability can be attached to the spatial resolution of area source emissions due to residential fuel consumption.

Commercial-Institutional Fuel Usage - Apportioning commercial-institutional fuel usage involved the same basic problems as that of residential fuel use. These problems are those of determining where the commercial use occurs and of determining the type of fuel used.

The Bureau of the Census gathered data of a different kind for business than those gathered for housing.* Furthermore, problems of confidentiality for geographic areas smaller than an SMSA occur.**

Therefore, in order to determine the distribution of commercial land usage, the 1971-1972 Existing Land Use Update and Analysis, prepared by the East-West Gateway Coordinating Council (EWGCC) was utilized. The

* This data included number of reporting units, payroll, and employment by industry and county location.

** In accordance with Federal Law, data that disclose the operations of an individual employer are not published. Data are not shown separately for any industry that does not have at least 100 employees or 10 reporting units in the statistical area.

St. Louis SMSA was divided into 5,000 feet by 5,000 feet grids, with nine scalings for the percent of land use within each grid. The land use was indicated as zero, less than one, 1-10, 10-20, 20-30, 30-40, 40-60, 60-80, and 80-100 percent of land use within the grid as being utilized for a given purpose. The EPA specified grid system was plotted with computer techniques (using the Calcomp plot routine) to the same scale as the EWGCC grid maps of the St. Louis SMSA. The EPA grid was then overlayed on the EWGCC map. The number of each category of EWGCC grid squares lying within an EPA grid was recorded. Based on the total number of EWGCC grids lying within an EPA grid, it was possible to determine the commercial land use area within each of the EPA grid squares. The commercial land use area within each grid (CLUG) square is thus:

$$CLUG = \left(\frac{\sum_{i=1}^9 \text{no. of EWGCC grids of commercial \% } i \times \frac{\text{percentage category } i}{100}}{\text{total no. of EWGCC grids within the EPA grid}} \right) \times \text{total land area of the EPA grid (km}^2\text{)}$$

where the percentage categories were treated as zero, 0.5, 5, 15, 25, 35, 50, 70, and 90 (the midpoint of each range).

Using the same approach, the total commercial land use within each county (CLUC) was determined. This approach enabled ESE to determine the spatial distribution of commercial land usage.

The fuel consumed by commercial-institutional establishments was assumed to have the same relative distribution, as to the type of fuel, as utilized for space heating by residences in a given area.¹ The simplest approach would be to assume each grid's portion of its counties full use in proportion to its fraction of counties commercial-institutional

land use. This leads to inaccuracies because certain grids are "enriched" in some fuels because of the fuel distribution system, particularly gas mains. Thus a few of the grids may account for the vast majority of a county's use of a particular fuel. To account for this problem, an "enrichment factor" was applied to the result of the land use distribution calculation. This "enrichment factor" was equal to the ratio of the fraction of residences in a given grid using a given fuel to the fraction of residences using the same fuel in the county. The assumption is that the residential and the commercial-institutional "enrichment factor" are equal for any grid.

The annual commercial-institutional fuel use total per grid is thus:

$$\text{Annual Fuel Use} = \frac{\text{CLUG}}{\text{CLUC}} \times \left(\frac{\text{County Total Area}}{\text{Source Commercial Use of Type of Fuel}} \right) \times \text{EF}$$

where: EF = the "enrichment factor" and

$$\text{EF} = \frac{\left(\frac{\text{No. of homes in grid using } j \text{ type of fuel for heat}}{\text{Total number of homes in grid}} \right)}{\left(\frac{\text{No. of homes in county using } j \text{ type of fuel for heat}}{\text{Total number of homes in county}} \right)}$$

The data for the fraction of homes in the various counties using each type of fuel are summarized in Table 2.2.

Temporal Distribution of Fuel Usage

After a great deal of effort to reduce electrical demand data specific for residential, commercial, and industrial areas to produce different energy demand functions of time, an assumption was made that residen-

Table 2.2 Fuel Use for Occupied Housing Units, by County, Within AQCRE 70. *

County	% Urban	Utility Gas %	Fuel Oil %	Coal %	Wood %	Electricity %	LPG %	Other & None %
<u>Missouri</u>								
Franklin	46	6	41	2	3	7	40	1
Jefferson	19	32	22	1	1	7	37	0
St. Charles	50	42	24	1	0	7	27	0
St. Louis	96	85	10	0	0	3	2	0
St. Louis City	100	86	8	2	0	2	1	1
<u>Illinois</u>								
Bond	34	40	36	5	0	4	14	1
Clinton	32	60	17	6	0	3	14	0
Madison	74	71	16	4	0	2	6	1
Monroe	50	46	20	3	0	2	28	1
Randolph	43	49	24	8	0	2	17	0
St. Clair	83	69	16	6	0	2	6	1
Washington	22	35	21	14	2	2	26	0

* Bureau of the Census Detailed Housing Characteristics for Illinois and Missouri, 1970.

tial and commercial-institutional fuel use temporal distribution was the same. The most extensive data base consisted of hourly natural gas flow data from the LaClede Gas Company. The analysis of this data produced a "BTU demand" model to estimate space heating and appliance demands for fuel consumption over time.

Data-Fuel Usage -

Electrical Demand - Since overall electrical system data was not available in a form that would allow analysis by grid area and service type, it was decided to obtain base data from three substations selected because they served predominantly residential, commercial and industrial areas respectively. The data obtained was in the form of circular charts which were digitized. Analysis of the data revealed gaps in the data and internal inconsistencies which could not be resolved with the available data. For these reasons, the data proved to be of little value to the project.

Natural Gas Flows - Hourly gas flows in MCF for the LaClede, St. Louis gas system were obtained in tabular form for January through November of 1974 and October, November and December of 1973. This was converted to machine readable form and used extensively in the analysis procedure described below to develop patterns of usage by various parametric classifications.

Further, the LaClede Gas Company cooperated in supplying a copy of their billing history for the period specified on some twenty magnetic tapes to provide both the monthly consumption and the customer classifications.

Meteorology - The hourly gas flow data obtained from LaClede was accompanied by concurrent measurement of the following meteorological parameters taken at the LaClede installation at 3950 Forest Park: radiation in Langley's, wind speed in miles per hour, wind direction and ambient temperature in degrees Fahrenheit.

Analysis Procedure - Fuel consumption data was summed over each day, midnight to midnight. The daily consumption was plotted against the average daily temperature to investigate temperature dependence characteristics. The resultant plot is indicated in Figure 2.2. This dependence is apparent from the plot and is strongly inverse linear below about 68°F. Above this temperature the usage plot indicates an independence from temperature effects.

In plotting hourly averages of consumption over the daily cycle, the temperature, averaged midnight to midnight, was found to introduce an artificial boundary condition and thereby a discontinuity around midnight. In order to eliminate this and provide a more realistic model, a traveling temperature average of the previous 24 hours was utilized. This was the average daily temperature used in all subsequent analyses (i.e., for calculating hourly flow, we must know whether the temperature over the previous 24 hours was less than 68°F or not).

Figure 2.3 shows the hourly average flow for the full 14-month data period. The cyclical nature of this consumption is due in part to the diurnal variation in temperature. The consumption exhibits an inverse proportionality to the average hourly temperatures. The remaining variation in the daily flow pattern is attributed to a diurnal consumption pattern.

Figure 2.2 Daily Gas Flow Vs. Average Daily Temperature.

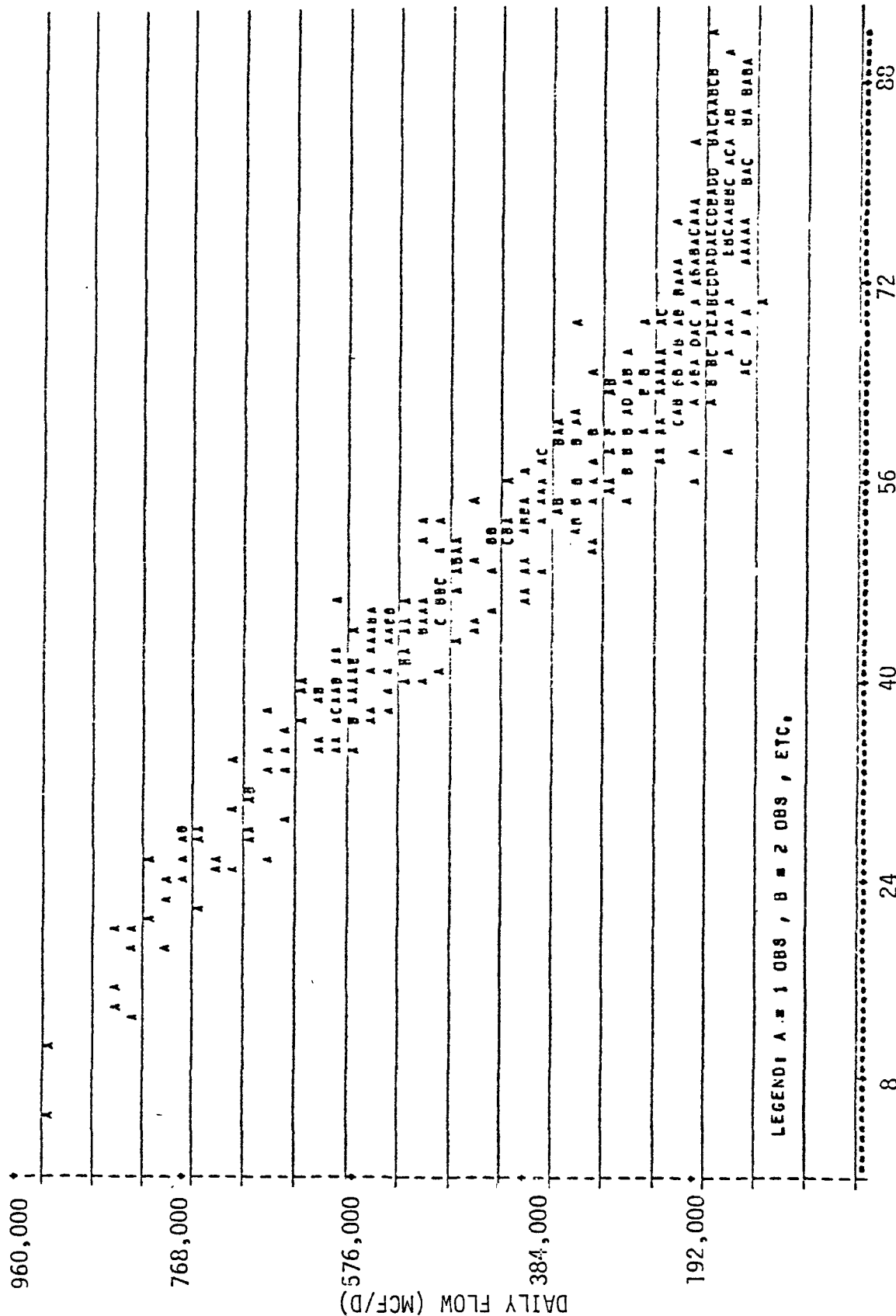
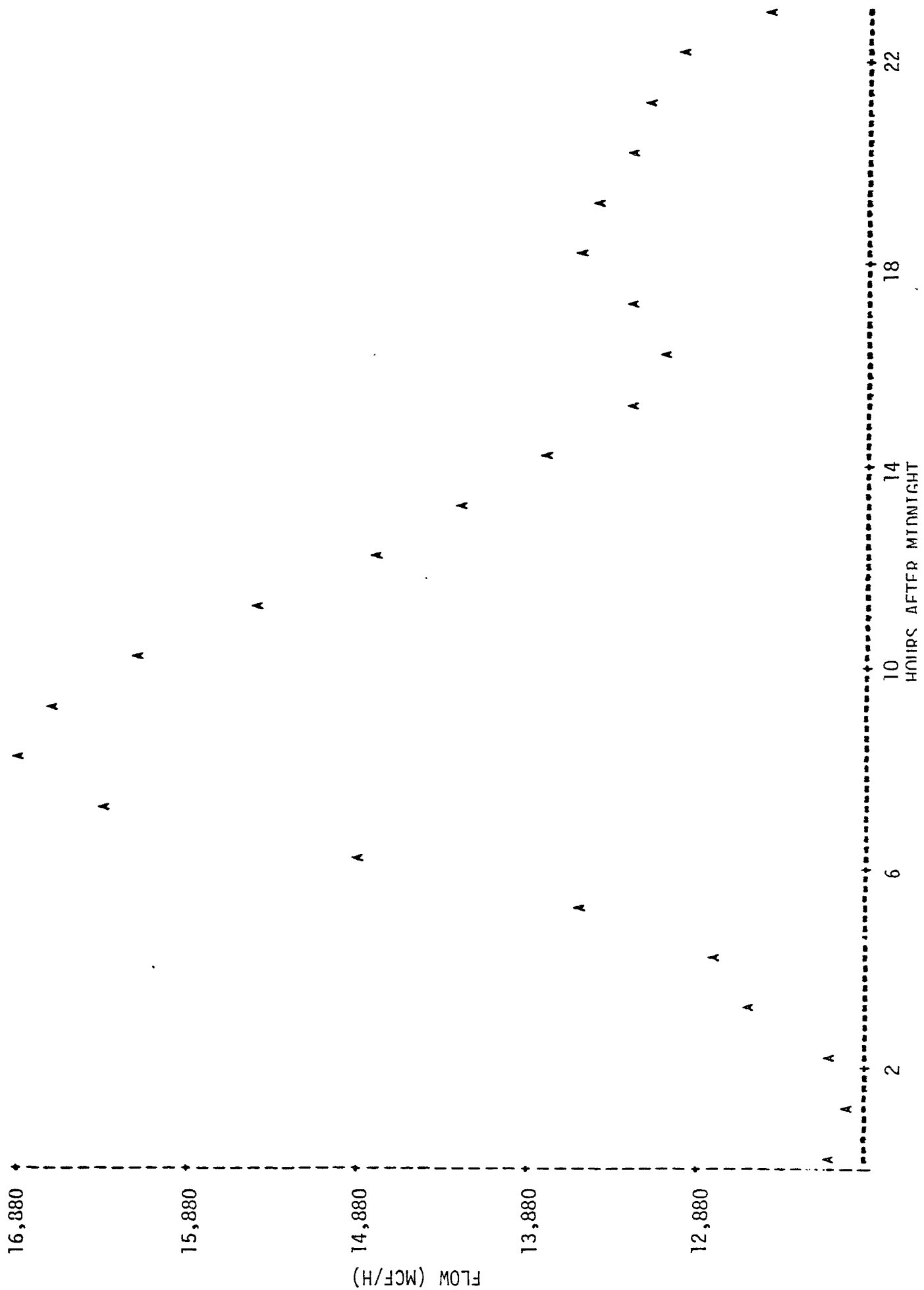


Figure 2.3 Average Hourly Total Flow.



In order to isolate these effects, the data having little or no temperature dependence were treated separately. The observations with a traveling temperature average greater than 68°F were separated and analyzed. Figure 2.4 shows the daily consumption pattern of this "warm" data. This usage curve was considered to be the base or background consumption that is always present due to use of fuel for other than space heating.

Flow equations were developed for the two cases: for the baseline flow on warm days (>68°F); and the "cold" flow on days below 68°F where the "cold" flow is equal to the total observed flow minus the average warm day flow. These equations are:

$$FT(hr) = FC(hr, T, R, WS) + FW(hr) \text{ For All Temperatures } \leq 68^{\circ}F$$

where the total gas flow (FT) by hour is a function of the cold data variation (FC) by hour (hr), temperature (T), radiation (R), wind speed (WS) and of the warm data variation (FW) by hour. Thus, it can be seen that for all periods of average temperature greater than 68°F, this reduces to:

$$FT(hr) = FW(hr) \text{ For All Temperatures } > 68^{\circ}F.$$

Figure 2.5 shows the temporal pattern for the cold data. In order to estimate FC from this, the background consumption FW shown in Figure 2.4 must be subtracted.

The adjusted data is well described by a linear function of temperature, wind speed and radiation. The results of a stepwise multiple linear regression of the data indicated an excellent fit for the equation:

Figure 2.4 Average Hourly Gas Flow for 24-Hour Average Temperature Greater Than 68°F.

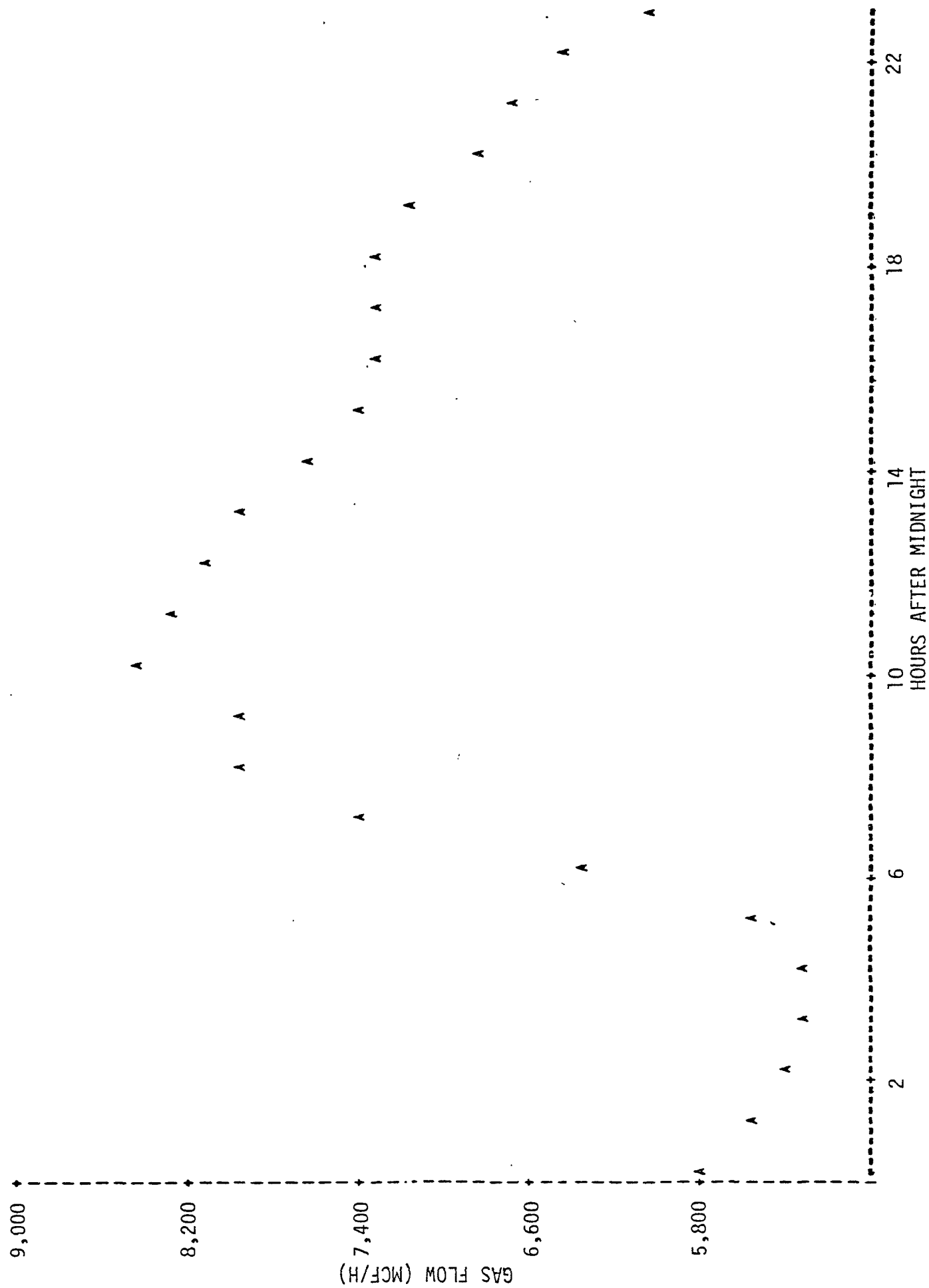
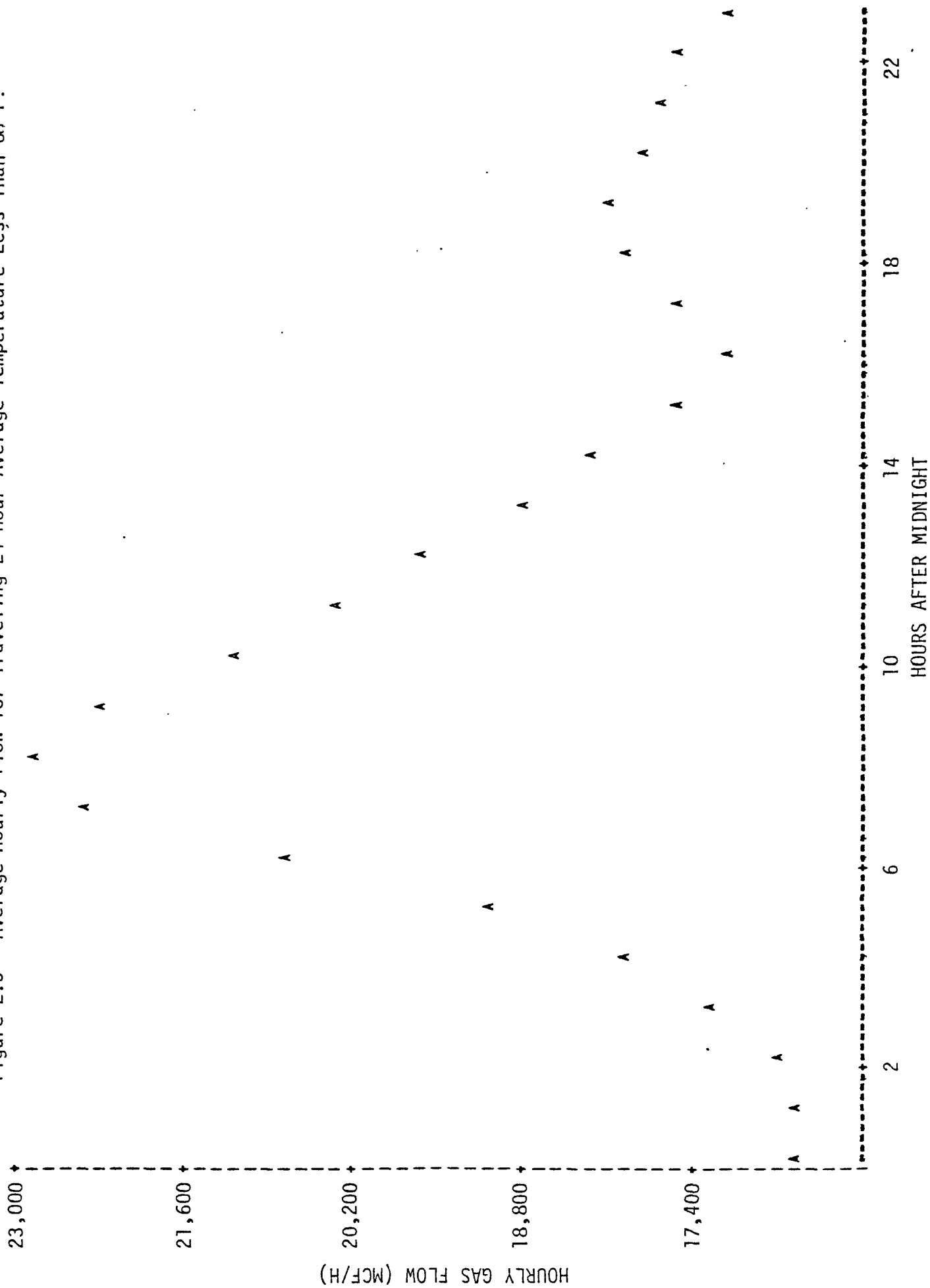


Figure 2.5 Average Hourly Flow for Traveling 24-Hour Average Temperature Less Than 68°F.



$$FC = 3.6798 \times 10^4 - 5.4507 \times 10^2 T + 1.0798 \times 10^2 R + 97.873 WS$$

where:

FC = total MSCF/hour attributed to heating use

T = temperature in °F

R = radiation in percent of two Langley's/min*

WS = wind speed in mph

The above regression equation would indicate that space heating demands increased with an increase in the intensity of solar radiation. This is contrary to the usual concept of the impact of solar radiation on space heating. Further investigation indicated that the highest recorded R values were in the autumn, and that the summer months contained a disproportionate number of low values, presumably due to clouds. In order to remove this potential problem in predicting fuel usage for a particular day or hour, the regression was repeated without a solar radiation term. The results are shown in Table 2.3 and the equation is:

$$FC = 3.4772 \times 10^4 - 5.0895 \times 10^2 T + 1.0478 \times 10^2 WS$$

where the variables are the same as defined previously. These results are similar to those obtained by the LaClede Gas Company in the development of a model for different purposes². Integrated over the entire

* The mean intensity of the solar radiation received at the boundary of the atmosphere ranges from 2.007 to 1.877 calories per cm² per minute (Langley's). Two Langley's/minute thus is the maximum radiation that could be received. The metered values used in this study thus represent a percent of this figure.

Table 2.3

REG OF COLD DATA WITH WARM SUBTRACTED

MAXIMUM R-SQUARE IMPROVEMENT FOR DEPENDENT VARIABLE FLW

NUMBER IN R-SQUARE VARIABLES IN MODEL

2 0.87251673 TMP WS

THE ABOVE MODEL IS THE BEST 2 VARIABLE MODEL FOUND BY THE MAXIMUM R-SQUARE IMPROVEMENT PROCEDURE

ANALYSIS OF VARIANCE TABLE, REGRESSION COEFFICIENTS, AND STATISTICS OF FIT FOR THE ABOVE MODEL

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB > F	R-SQUARE	C.V.
REGRESSION	2	383694469564.94880	191847234782.47440	21894.48820	0.0001	0.87251673	27.69507 %
ERROR	6398	56061534626.92543	8762353.02078				
CORRECTED TOTAL	6400	439756004191.87420					

SOURCE	DF	SEQUENTIAL SS	F VALUE	PROB > F	PARTIAL SS	F VALUE	PROB > F
TMP	1	381755450861.87660	43567.68667	0.0001	383588940190.12810	43776.93289	0.0001
WS	1	1939018703.07225	221.28973	0.0001	1939018703.07225	221.28973	0.0001

SOURCE	B VALUES	T FOR HO:B=0	PROB > |T|	STD ERR B	STD B VALUES
MEAN	34772.33225349				
TMP	508.95257545	-209.22938	0.0001	2.43251009	0.93534958
WS	104.77697749	14.87581	0.0001	7.04344682	0.06650157

fourteen months of available data from LaClede (i.e. 9780 hours of observations), the total predicted cold flow using this equation is 7.1697×10^7 MSCF. Over the same period the non-space heating or "baseline" flow accounted for 6.7027×10^7 MSCF (approximately 48 percent of the gas flow). The total 13.8724×10^7 MSCF is within 3% of the total LaClede data. (Total observed equals 13.5145×10^7 MSCF.)

The baseline flow is most appropriately represented as a composite average for the time periods when the traveling average 24-hour temperature exceeds 68°F. As seen in Table 2.4 the above fourteen month baseline flow reduced to an average hourly baseline flow is 6.854 MSCF. This table summarizes the hourly baseline flow by the hour and the proportionality factor (PF) by hour related to the average flow. Hourly baseline gas flow can then be approximated by:

$$\text{Hourly Baseline Flow (HBF)} = \frac{\text{yearly flow} \times 0.4832 \times \text{PF}}{8760} \quad (\text{EQN 2.1})$$

When the temperature is above 68°F, this equation applies. Hourly natural gas flow is then (where FC has been normalized by the yearly predicted flow):

$$\text{Hourly Gas Flow} = \text{yearly flow} \times \left[4.849 \times 10^{-4} - 7.0986 \times 10^{-6}T + 1.4614 \times 10^{-6} \text{ WS} + \frac{0.4832 \times \text{PF}}{8760} \right] \quad (\text{EQN 2.2})$$

where the temperature is less than or equal to 68°F.

As these equations represent portions of total yearly quantities, these equations apply equally well to bottled (LP) gas which has the same usage characteristics (i.e., its use for cooking, water heating, etc., in addition to space heating).

Table 2.4 Average Hourly Baseline Gas Flows for the LaCiede Gas Company (temperature >68°F).

Hour	Composite Average Flow (MSCF)	Proportionality Factor
1	5727	0.84
2	5490	0.80
3	5339	0.78
4	5301	0.77
5	5262	0.77
6	5550	0.81
7	6312	0.92
8	7378	1.08
9	7899	1.15
10	7948	1.16
11	8387	1.22
12	8214	1.20
13	8062	1.18
14	7892	1.15
15	7640	1.11
16	7360	1.07
17	7245	1.06
18	7267	1.06
19	7315	1.07
20	7094	1.04
21	6769	0.99
22	6632	0.97
23	6433	0.94
24 (midnight)	5971	0.87
Average hourly flow	6854	1.00

For other fuels such as fuel oil, coal or coke and wood, the usage characteristics differ in that these fuels are almost totally used for space heating. The demands therefore depends only on temperature and wind speed according to the previously developed equation, without any dependency on a baseline value. Thus:

$$T \leq 68^{\circ}\text{F}$$

$$\text{Hourly Demand} = \text{yearly total} \times [4.8499 \times 10^{-4} - 7.0986 \times 10^{-6} T + 1.4614 \times 10^{-6} \text{ WS}] \quad (\text{EQN 2.3})$$

and for $T > 68^{\circ}\text{F}$ the hourly demand is equal to zero.

EVAPORATIVE HYDROCARBON LOSSES

Evaporative losses of hydrocarbons to the atmosphere from dry cleaning plants, surface coating operations and gasoline marketing were considered in this study. Spatial allocation of these emissions were based upon population and commercial land use densities. The temporal allocations were based on the regular 8:00 a.m. to 5:00 p.m. workday or upon the diurnal traffic cycle observed in St. Louis.

Evaporative Hydrocarbon Emissions Estimates

Dry Cleaning Emissions--

The dry cleaning industry uses two basic types of organic solvents in the cleaning of clothes. These are petroleum solvents and chlorinated synthetic solvents (perchloroethylene). Volatile hydrocarbon emissions occur mainly from the hot air tumbler process of drying the solvent soaked garments.

According to the St. Louis County dry cleaning plant survey, 89 percent of dry cleaning establishments use perchloroethylene solvent and 63 percent of all clothes are cleaned with this material. Due to the rising cost of petroleum and increased cost of synthetic solvent (perchloroethylene costs approximately \$15/gal.), emission control and recovery equipment has been greatly improved and much more widely used in recent years. Based on the St. Louis County data, 0.53 pounds of hydrocarbons from this type of source are emitted per capita per year. It was assumed that this per capita figure was applicable for the entire AQCR. The emissions occur during normal working hours and are spatially distributed according to the percentage of commercial land use per grid.

A county-by-county breakdown of evaporative hydrocarbon emissions is summarized in Table 3.1.

Thus the yearly county data is allotted to the grid areas by a proportion of commercial land in the grid to the total county value. This is then distributed evenly over the nine hour business day from 8:00 a.m. to 5:00 p.m. in which cleaning is done over the five workdays a week.

Paint Emissions--

Hydrocarbon emissions from the evaporation of solvents from paint have been found to be significant in previous studies.³ For residential and commercial-institutional area source emissions the type of paints utilized are referred to as "trade-sale" (as distinct from industrial). Trade-sale paints are distributed through retail stores to the general public. The most accurate available statistics for estimating the sales of these paints in AQCR 70 consists of those developed by the National Paint Coating Association (NPCA) in Washington, D.C. These statistics indicate that 21.9 and 10.2 percent of the nationally sold trade-sale paints are sold in the East North Central Region (Ohio, Indiana, Illinois, Michigan, Wisconsin) and the West North Central Region (Minnesota, Iowa, Missouri, Kansas, North Dakota, South Dakota, Nebraska), respectively. The NPCA statistics indicate that in 1973, 424,000,000 gallons of trade-sale paints were sold. Trade-sale paint sales in AQCR 70 were therefore estimated by the following formulas:

$$\begin{aligned} \text{trade-sale paints} &= \frac{\text{national total} \times 0.219}{\text{pop. of (Ohio + Ind. + Ill. + Mich. + Wisc.)}} \\ \text{sold in Illinois} &= 2.32 \text{ gallons per capita} \end{aligned}$$

$$\text{trade sale paints sold in Missouri} = \frac{\text{national total} \times 0.102}{\text{pop. of (Minn.+Iowa + Mo.+Ks. + N.D.+S.D. +Neb.)}}$$

$$= 2.70 \text{ gallons per capita}$$

The Technical Director of NPCA, Mr. Ray Conner, estimated that nationally approximately 70 percent of all trade-sale paints were water based.⁴ The Boston hydrocarbon study indicated that water based paints contained approximately 3.5 percent by weight volatile hydrocarbons. Mr. Conner estimated that non-water based paints contained approximately 50 percent volatile hydrocarbons. For this study it was therefore assumed that each gallon of trade-sale paint contained approximately 17.5 percent volatile hydrocarbons, by volume or 1.14 pounds of hydrocarbons per gallon of paint. The density of these volatile hydrocarbons was assumed to be 6.5 pounds mass per gallon (the approximate weight of mineral spirits).

Gasoline Marketing Emissions--

Evaporative losses of hydrocarbons in the marketing of gasoline at local service stations occur in two ways--filling losses from underground storage tanks and filling losses and spillage from the filling of automobile tanks.

State totals of gasoline sales were obtained from the Departments of Revenue for the states of Illinois and Missouri. County figures were derived by allocating sales per service station to the number of stations per county as found in the 1972 County Business Patterns.

It was established due to their age that the majority of underground storage tanks are filled by the gravity drop splash fill method with no emission control equipment.⁵ These tanks are filled during normal business hours. Emissions estimates based on this produce predictions of

evaporative losses from gasoline marketing approximately 15 percent higher than those derived in the St. Louis County Emissions inventory for gasoline marketing. This agreement is good considering the differences in methodologies.

Spatial Allocations

Emissions from dry cleaning plants and from gasoline marketing operations were apportioned on the basis of the commercial land use within each grid as derived from the EWGCC commercial land use information. The formula utilized was:

$$\begin{aligned} \text{Grid Annual Dry Cleaning or Gasoline Marketing Emissions} &= \frac{\text{area of land in grid under commercial usage (CLUG)}}{\text{total county land area under commercial usage (CLUC)}} \\ &\quad \times \text{total county dry cleaning or gasoline marketing emissions} \end{aligned}$$

Surface coating emissions from the evaporation of solvents from trade-sale paints were apportioned on the basis of population, as follows:

$$\text{Total Grid Surface Coating Emissions} = \frac{\text{Grid Population (GPOP)}}{\text{County Population (GPOP)}} \times \text{Total County Surface Coating Emissions}$$

Temporal Allocations

The temporal allocations of hydrocarbon emissions are most appropriately based upon the 8:00 a.m. to 5:00 p.m. workday for all emissions except those produced by the filling of automobile gasoline tanks. The hydrocarbon emissions from automobile tank filling account for fifty percent of the gasoline marketing emissions.

The other fifty percent of the gasoline marketing emissions are allocated on the basis of being proportional to the measured diurnal traffic cycle in St. Louis. Figure 3.1 shows this cycle for weekdays, Saturday and Sunday. Table 3.2 shows the weighting factors to be used for this apportionment. In addition to these factors, an allowance for the

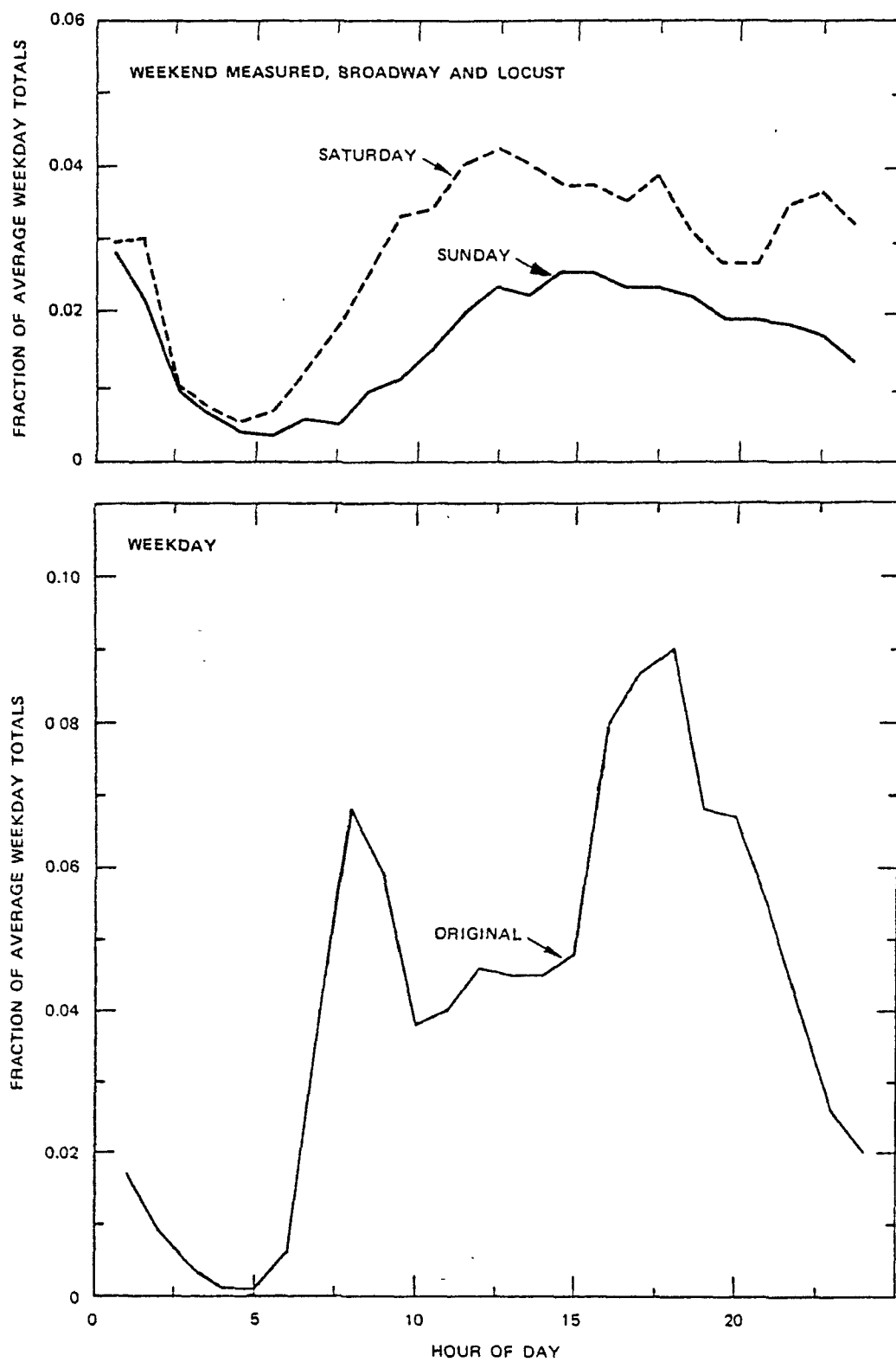


Figure 3.1 DIURNAL EMISSION PATTERNS FOR ST. LOUIS.

Table 3.2 Temporal Allocation Factors for the Filling of Automobile Gasoline Tanks.

Hour	Weekdays	Saturday	Sunday
1	6.45×10^{-5}	9.70×10^{-5}	9.70×10^{-5}
2	5.82×10^{-5}	9.70×10^{-5}	8.09×10^{-5}
3	1.62×10^{-5}	7.12×10^{-5}	5.82×10^{-5}
4	3.23×10^{-6}	2.59×10^{-5}	1.62×10^{-5}
5	3.23×10^{-6}	2.59×10^{-5}	1.29×10^{-5}
6	1.62×10^{-5}	3.23×10^{-5}	1.62×10^{-5}
7	9.70×10^{-5}	4.53×10^{-5}	1.94×10^{-5}
8	2.20×10^{-4}	6.79×10^{-5}	2.59×10^{-5}
9	1.94×10^{-4}	9.70×10^{-5}	3.23×10^{-5}
10	1.29×10^{-4}	1.07×10^{-4}	3.88×10^{-5}
11	1.29×10^{-4}	1.23×10^{-4}	5.18×10^{-5}
12	1.46×10^{-4}	1.29×10^{-4}	6.47×10^{-5}
13	1.46×10^{-4}	1.29×10^{-4}	6.47×10^{-5}
14	1.46×10^{-4}	1.16×10^{-4}	7.76×10^{-5}
15	1.52×10^{-4}	1.13×10^{-4}	7.76×10^{-5}
16	2.43×10^{-4}	1.13×10^{-4}	7.44×10^{-5}
17	2.72×10^{-4}	1.20×10^{-4}	7.12×10^{-5}
18	2.85×10^{-4}	1.10×10^{-4}	7.12×10^{-5}
19	2.10×10^{-4}	9.06×10^{-5}	2.47×10^{-5}
20	2.07×10^{-4}	8.73×10^{-5}	6.14×10^{-5}
21	1.62×10^{-4}	9.70×10^{-5}	5.82×10^{-5}
22	1.23×10^{-4}	1.10×10^{-4}	5.82×10^{-5}
23	9.70×10^{-5}	1.10×10^{-4}	5.18×10^{-5}

variation in seasonal driving habits is necessary. Figure 3.2 shows the monthly gasoline sales for the state of Missouri in 1973 and 1974. Similar data is available for Illinois. As shown, there are marked differences between summer and winter gasoline sales. The monthly sales factor shown in the figure is based upon the average of the 1973 and 1974 values and the relative fraction of sales for a composite average month.

The temporal allocation is then:

(from 8:00 a.m. to 5:00 p.m.) (EQN 3.1)

$$\text{Evaporative HC Emissions} = \frac{1}{2340} * [\text{annual dry cleaning emissions} + \text{annual surface coating emissions} + (0.5 \times \text{annual gasoline marketing emissions} \times \text{monthly sales factor})] + (\text{automobile allocation factor} \times 0.5 \times \text{annual gasoline marketing emissions} \times \text{monthly sales factor})$$

(from 5:00 p.m. to 8:00 a.m.) (EQN 3.2)

$$\text{Evaporative HC Emissions} = \text{automobile allocation factor} \times 0.5 \times \text{annual gasoline marketing emissions} \times \text{monthly sales factor}$$

* This number is based on a workday from 8:00 a.m. to 5:00 p.m., five days a week and 52 weeks per year.

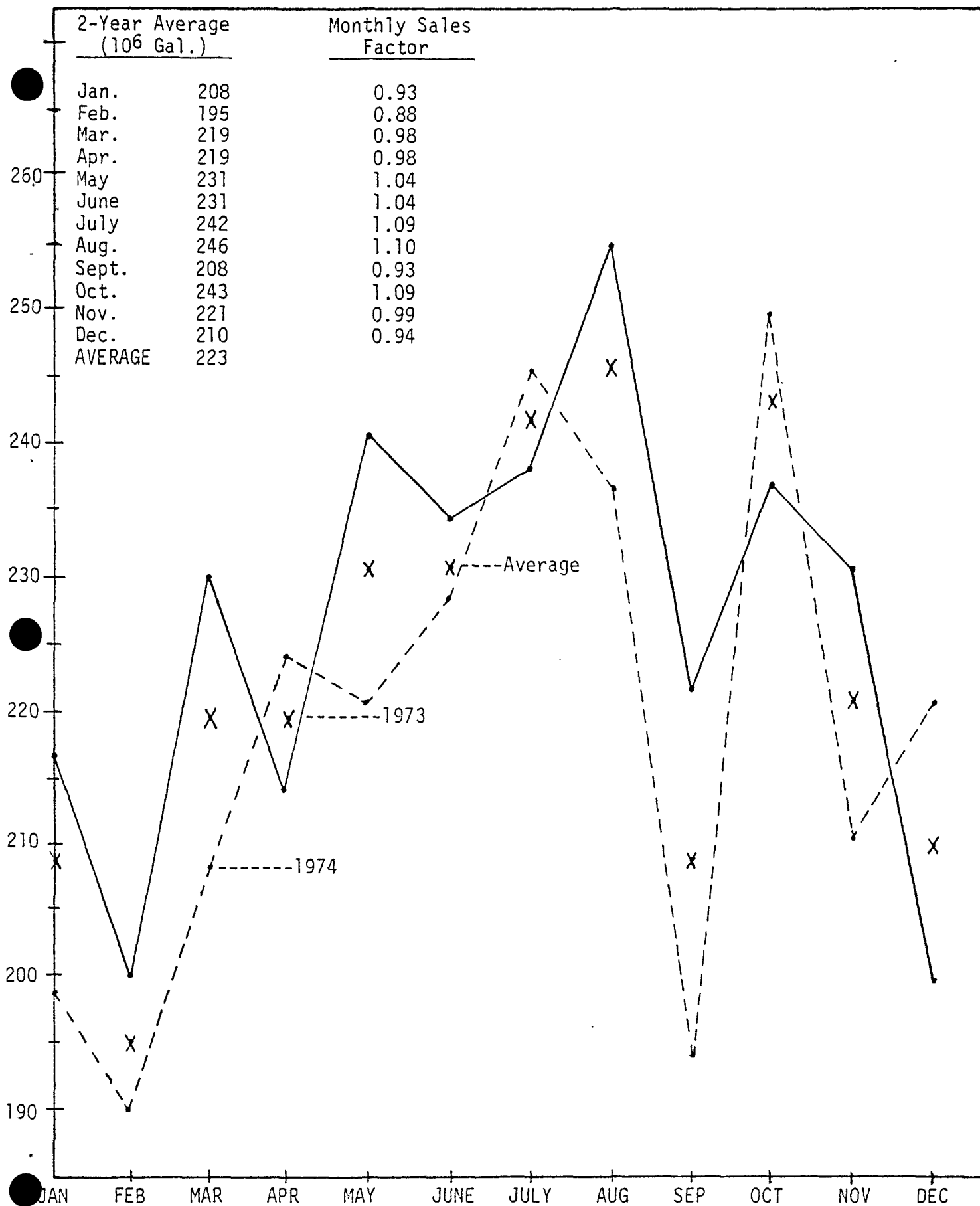


Figure 3.2 State of Missouri Gasoline Sales.

SOLID WASTE DISPOSAL

Emissions from solid waste disposal through open burning and incineration were considered in this study. Conversations with the St. Louis County Air Pollution Control Board⁶ and with the Missouri Air Conservation Commission⁷ indicated that open burning was banned from the populous areas of AQCR 70. It is allowed by law only where no public or commercial refuse collection service is available and in places where population density is less than 100 dwelling units or less per square mile. The emissions from open burning are considered insignificant in this study.

Information sources on solid waste incineration included a nationwide study and the emission inventory prepared by St. Louis County. The latter source of information appeared to be the most reliable as it included actual emissions data other than nationwide statistics. This study indicated that residential incineration was negligible. According to the Pollution Control Regulations for the St. Louis Metropolitan Area, only multiple chamber incinerators may be used and must not exceed 0.3 grains of particulate per dry standard cubic foot of exhaust gas. Since the emission standards are stringent and the cost of multiple chambered units high, residential incineration emissions were considered insignificant in this study. The only significant source of incineration pertinent to this study was the commercial-institutional area source category.

Treating the St. Louis County figures as being representative of the entire AQCR, Table 4.1 summarizes the emissions estimates from solid waste disposal by county.

The spatial and temporal allocation procedures are similar to those for emissions from the dry cleaning process; that is, in proportion to the commercial-institutional land use in each grid square, and an 8:00 a.m. to 5:00 p.m. workday.

Table 4.1 Solid Waste Commercial-Institutional Incineration
Emissions (tons/year) in AQCR 70 for 1973.

County	Part.	SO _x	NO _x	HC	CO
<u>Missouri</u>					
Franklin	3.21	0.38	0.58	2.57	5.13
Jefferson	6.05	0.73	1.09	4.84	9.67
St. Charles	5.47	0.66	0.98	4.37	8.75
St. Louis	50.00	6.00	9.00	40.00	80.00
St. Louis City	29.86	3.58	5.38	23.89	47.78
<u>Illinois</u>					
Bond	0.74	0.09	0.13	0.59	1.18
Clinton	1.52	0.18	0.27	1.22	2.44
Madison	13.30	1.60	2.40	10.68	21.37
Monroe	0.95	0.11	0.17	0.76	1.51
Randolph	1.63	0.20	0.29	1.30	2.61
St. Clair	15.09	1.81	2.72	12.07	24.14
Washington	0.74	0.09	0.13	0.59	1.18

STRUCTURAL FIRES

Data was not available for wildfires and forest fires. The available data on structural fires is such that a high degree of reliability cannot be placed on the emissions estimates. The available data included:

- 1) the number of fires and dollar damage on a monthly basis for Illinois;⁸
- 2) statewide statistics on the total number of fires (10,000) doing \$45,500,000 worth of damage in 1974;⁹ and 3) nationwide statistics indicating that 40 percent of the typical structure is consumed in a fire and that the average structure contains approximately 17 tons of combustible material.¹⁰

For Missouri the statewide figures were disaggregated to the county level on the basis of population. Using the emission factors in AP-42 for open burning of municipal solid waste, the emission estimates were derived. These values are summarized in Table 5.1

The spatial apportionment is most appropriately conducted on the basis of the number of housing units per tract:

$$\text{Grid Emissions} = \frac{\text{no. of housing units in grid}}{\text{no. of housing units in county}} \times \text{County Emissions}$$

The temporal distribution of these fires is random. The apportionment figures can be utilized on an annual basis as a reasonable approximation. However, for the purpose of the calibration of dispersion models, the only appropriate approach is for the modeler to be aware of whether or not a structural fire has occurred that may affect short-term model results. The fire can be treated as a ground level point source. An estimate of emissions can be included in the grid area based upon 40 percent of the 17 tons of combustible material being consumed in a four hour period using the emission factors for incinerator without controls from AP-42.

Table 5.1 Estimated Annual 1973 Emissions (tons/year) from
Structural Fires in AQCR 70.

County	Part.	SO _x	CO	HC	NO _x
<u>Illinois</u>					
Bond	0.7	<0.1	3.8	1.3	0.3
Clinton	2.1	0.1	11.0	3.9	0.8
Madison	49.7	3.1	264.2	93.2	18.7
Monroe	2.2	0.1	11.6	4.1	0.8
Randolph	3.8	0.2	19.9	7.0	1.4
St. Clair	56.2	3.5	298.5	105.4	21.1
Washington	1.1	0.1	6.1	2.1	0.4
<u>Missouri</u>					
Franklin	7.0	0.4	37.3	13.2	2.6
Jefferson	13.2	0.8	70.2	24.8	5.0
St. Charles	12.0	0.8	63.6	22.4	4.5
St. Louis	109.3	6.8	580.9	205.0	41.0
St. Louis City	65.3	4.1	347.1	122.5	24.5

SUMMARY

General

The Regional Air Pollution Study has unique requirements of its component emission inventories. Generally it requires degrees of spatial and temporal resolution that have not been previously achieved. This document brings together data on fuel usage, land use, sales of gasoline and paints, the use of dry cleaning fluids, solid waste disposal and uncontrolled fires for the St. Louis region and develops methodologies for estimating the pollutant emissions from stationary residential and commercial-institutional area sources on an hour-by-hour basis for components of a spatial grid system developed for RAPS.

The methodologies presented in this document are a series of sub-elements integrated into a single system for deriving the required emission data. This system seeks to provide the best emission estimates possible from the available data. In order to provide the RAPS with as much flexibility as possible to meet the multiple and varied demands upon it, the inventory is presented as direct statements of weight of pollutant emitted by this class of source as a function of location for every hour.

Specific Results

Space Heating - The emissions from space heating were based upon the emission factors utilized by the National Emissions Data System and from AP-42 for each fuel. The distribution within the RAPS grid system was determined by allocating total county fuel use for residential, and, in a separate calculation, commercial-institutional fuel usage to each grid area in proportion to the number of units using that fuel in the grid area. The temporal fuel use variation and variation with meteorological

parameters was established by statistically analyzing the detailed data available on gas use. This analysis identified a base component of usage which is largely independent of meteorological influence and has a distinct relationship with the time of day. The remaining component was shown to be strongly affected by the ambient temperature and wind velocity.

Evaporative Emissions

The major components of residential and commercial-institutional area sources of evaporated hydrocarbons were identified as surface coating (primarily painting), gasoline handling, and dry cleaning. Characteristic emissions on a per capita basis were established and the emissions determined for each grid area by allocating the total projected county emissions in proportion to commercial land use in the grid area for gasoline handling and dry cleaning, and in proportion to population for surface coating.

Structural Fires and Solid Waste Disposal

Emissions from structural fires were difficult to quantify; however, average data was used and total estimated county emissions were allocated to grid areas based on the number of homes in the grid. However, it was realized that significant structural fires would be best handled as a point source.

Emissions from the disposal of solid wastes is largely restricted to commercial-institutional enterprises and large incinerators because of the restrictive air pollution regulations. Thus the NEDS county emissions were allocated to grid areas in proportion to the commercial-institutional land use in the grids.

REFERENCES

1. Personal communication between Mr. Don McQueen of Environmental Science and Engineering, Inc. and representatives of the LaCleda Gas Company, May, 1975.
2. Ryan, Richard R., Gas Sendout Forecasting with Weather Sensitive Loads, LaCleda Gas Company, May 1974.
3. Hydrocarbon Emission Sources in the Metropolitan Boston Intrastate Air Quality Control Region, Vol. 1, prepared for the U.S. Environmental Protection Agency by GCA/Technology Division, May, 1974.
4. Personal communication between Mr. Robert Holden of Environmental Science and Engineering, Inc. and Mr. Ray Conner of the National Paint Coating Association, May, 1975.
5. Personal communication between Mr. Don McQueen of Environmental Science and Engineering, Inc. and the Mobil Oil Distributors, St. Louis, Missouri, May, 1975.
6. Personal communication between Mr. Robert Holden of Environmental Science and Engineering, Inc. and Mr. Michael L. Farley, Engineer, Air Pollution Control Branch, Division of Environmental Health Care Services, March, 1975.
7. Personal communication between Mr. Robert Holden of Environmental Science and Engineering, Inc. and Mr. Hoffman of the Missouri Air Conservation Commission, May, 1975.
8. Illinois State Fire Marshal's Office, May, 1975.
9. Personal communication between Mr. Pete Burnette of Environmental Science and Engineering, Inc. and the Missouri State Fire Marshal, May, 1975.
10. Derived from data provided by the National Fire Protection Association of Boston, Massachusetts.

APPENDIX A

Description of the Annual Emission Inventory Calculation

Emissions from residential space heating were determined by allocating total county residential fuel usage to each grid base on the number of homes in the grid using a given fuel type:

$$SHR_{i,j,k} = \frac{NHGFU_{i,j}}{NHC_{i,j}} \times TCFUR_{i,j} \times EF_{j,k}$$

Equations and Input Parameters

Where: $SHR_{i,j,k}$ = residential space heating emissions
of pollutant k
from fuel type j
in grid number i

$NHGFU_{i,j}$ = number of homes in grid i using
fuel type j

$NHC_{j,f}$ = number of homes using fuel type j
in the county f in which grid is located

$TCFUR_{j,f}$ = total residential usage of fuel type j
in the county f in which grid is located

$EF_{j,k}$ = emission factor (AP-42) for fuel
type j and pollutant k.

Emissions from commercial fuel usage was determined by allocating total commercial fuel usage in a given county to each grid based on commercial land use within a grid and the ratio of the number of homes using a given fuel type in a grid to the total number of homes within that grid.

$$COM_{i,j,k} = \frac{CLUG_i}{CLUC_f} \times \frac{NHGFU_{i,j}}{HG_i} \times TCFUC_{i,j} \times EF_{j,k} \\ \times \frac{NHC_{j,f}}{NHCT_f}$$

Where: $COM_{i,j,k}$ = emissions from commercial fuel usage
of pollutant k
from fuel type j
in grid number i

$CLUG_i$ = commercial land use (km^2) in grid i

$CLUC_f$ = commercial land use (km^2) in the county
in which grid is located

NHG_i = total number of homes in grid i

$TCFUC_{j,f}$ = total commercial usage of fuel type j
in the county

$NCH_{j,f}$ = is defined above

$NHCT_f$ = total number of homes in county f

Evaporative hydrocarbon emissions for the three processes indicated below were determined for each grid by allocating total county emissions from the three processes on the basis shown.

<u>Process</u>	<u>Allocation Basis</u>
1) Surface Coating	Grid Population
2) Gasoline Handling	Commercial Land Use
3) Dry Cleaning	Commercial Land Use

$$GHCE_{i,1} = CHCE_{1,f} \times \frac{GPOP_i}{CPOP_f}$$

$$GHCE_{i,2} = CHCE_{2,f} \times \frac{CLUG_i}{CLUC_f}$$

$$GHCE_{i,3} = CHCE_{3,f} \times \frac{CLUG_i}{CLUC_f}$$

Where: $GHCE_{i,j}$ = evaporative hydrocarbon emissions
in grid i from process j

$CHCE_{j,f}$ = total county f emissions from process j

$GPOP_i$ = population of grid i

$CPOP_f$ = population of county in which grid is located

Emissions from structural fires were determined by allocating total county emissions to each grid based on the number of homes in the grid.

$$EMSF_{i,k} = ESFC_{k,f} \times \frac{NHGi}{NHCT_f}$$

Where: $EMSF_{i,k}$ = emissions from structural fires
of pollutant k in grid i

$ESFC_{k,f}$ = total county emissions from structural
fires of pollutant k from county in
which grid is located

$NHCT_f$ = total number of homes in county

Emissions from the disposal of solid wastes was determined by allocating total county emissions to each grid based on commercial land use within that grid.

$$ESW_{i,k} = ESWC_{k,f} \times \frac{CLUG_i}{CLUC_f}$$

Where: $ESW_{i,k}$ = emissions from solid waste disposal
of pollutant k in grid i

$ESWC_{k,f}$ = total county emissions from solid waste disposal of pollutant k for county in which grid is located.

APPENDIX B
Sample Calculation

I. EMISSION FACTORS

<u>Fuel Type</u>	<u>Part</u>	<u>Pollutant</u>			
		<u>SO₂</u>	<u>CO</u>	<u>HC</u>	<u>NO_x</u>
Bituminous Coal (tons/ton)					
Domestic	0.0100	0.00475	0.0450	0.0100	0.0015
Commercial	0.0140	0.00475	0.0036	0.0010	0.0046
Residual Oil (tons/10 ³ gal)					
Commercial	0.0115	0.1590	0.0020	0.0015	0.0300
Distillate Oil (tons/10 ³ gal)					
Domestic	0.0050	0.0144	0.0025	0.0015	0.0060
Commercial	0.0075	0.0144	0.0020	0.0015	0.0300
Natural Gas (tons/10 ⁶ cu. ft.)					
Domestic	0.0050	0.0003	0.0100	0.0040	0.0400
Commercial	0.0050	0.0003	0.0100	0.0040	0.0600
Bottled (LP) Gas (tons/10 ³ gal)					
Domestic	0.00095	7.2x10 ⁻⁶	0.0010	0.0004	0.0400

II. COUNTY AND GRID ANNUAL DATA

A. Attributes of County No. 2:*

Population		CPOP	568100
Commercial Land Use		CLUC	11.965 km ²
Number of Homes Using Fuel Type	1 Oil	NHC	16949
	2 NG		186093
	3 LPG		2523
	4 Coal		3375
Total Residential Usage of Fuel Type	1		13560
(Table 2.1) (TCFUR)	2		26400
	3		16619
	4		18560
Total Commercial Usage of Fuel Type	1 Dist-35,000 Residents		0
(Table 2.1) (TCFUC)	2		11100
	3		0
	4		112000
Total Evaporative Hydrocarbon Emissions	1		872
(Table 3.1) (CHCE)	2		3078
	3		151
Total County Emissions from Structural Fires Pollutant	1 Part		65 Tons
(Table 5.1) (ESFC)	2 SO ₂		4
	3 CO ₂		347
	4 HC		123
	5 NO _x		25
Total County Emissions from Solid Waste Disposal Pollutant	1		30 Tons
(Table 4.1) (ESWC)	2		4
	3		48
	4		24
	5		5
Total Number of Occupied Homes in the County			= 215479
(NHCT)			

*All units are standard NEDS units (emissions as tons/year, fuel oil as 10³ gal/year, natural gas as 10⁶ cu ft/year, LPG as 10³ gal/year, and coal as tons/year.

B. Attributes for Grid No. 895, located in the City of St. Louis
which is treated as County No. 2:

Population		GPOP	5096
Area			1.0 km ²
Commercial Land Use		CLUG	0.15 km ²
Number of Homes		NHG	1547
Homes Using Fuel Type	1	NHGFU	139
	2		1302
	3		26
	4		41

III. GRID EMISSION CALCULATIONS FOR POLLUTANT NO. 4 (HYDROCARBONS)

A. Residential Fuel Consumption

1. Fuel Type 1, Fuel Oil

$$\frac{\text{NHGFU}(1)}{\text{NHC}(1)} \times \text{TCFUR}(1) \times \text{EF} = \frac{139}{16949} \times 13560(10^3 \text{gal}) \times$$

$$0.0015(\text{tons}/10^3 \text{gal}) = 0.1668 (\text{tons}/\text{year})$$

2. Fuel Type 2, Natural Gas

$$\frac{\text{NHGFU}(2)}{\text{NHC}(1)} \times \text{TCFUR}(2) \times \text{EF} = \frac{1302}{186093} \times 26,400(10^6 \text{cu.ft.}) \times$$

$$.0004 (\text{tons}/10^6 \text{cu.ft.}) = 0.7388 (\text{tons}/\text{year})$$

3. All other Fuel Types similar

B. Commercial and Institutional Fuel Usage

1. Fuel Type 1, Fuel Oil

a. Distillate Oil

$$\frac{\text{CLUG}}{\text{CLUC}} \times \frac{\text{NHGFU}(1)}{\text{NHG}} \times \frac{\text{NHCT}}{\text{NHC}(1)} \times \text{EF} \times \text{CFT}(\text{dist.}) =$$

$$\frac{0.15}{11.965} \times \frac{139}{1547} \times \frac{215479}{16949} \times 0.0015 \left(\frac{\text{tons}}{10^3 \text{gal}} \right) \times$$

$$35000(10^3 \text{gal}) = 0.7518 (\text{tons}/\text{year})$$

b. Residual Oil

$$\frac{\text{CLUG}}{\text{CLUC}} \times \text{EF} \times \text{TCFUC} (\text{res.}) = \frac{0.15}{11.965} \times .0015 (\text{tons}/10^3 \text{gal}) \times$$

$$0(10^3 \text{gal}) = 0.0 (\text{tons}/\text{year})$$

c. Total Commercial Fuel Oil HC Emissions

$$\text{Results of "a"} + \text{"b"} = 0.7518 \times 0.0 = 0.7518 (\text{tons}/\text{year})$$

2. Fuel Type 2, Natural Gas

$$\frac{CLUG}{CLUC} \times \frac{NHGFU(2)}{NHG} \times \frac{NHCT}{NHC(2)} \times EF \times TCFUC(2) =$$
$$\frac{0.15}{11.965} \times \frac{1302}{1547} \times \frac{215479}{186093} \times .004(\text{tons}/10^6\text{cu.ft.}) \times$$
$$11100 (10^6\text{cu.ft.}) = 0.5424(\text{tons}/\text{year})$$

3. All other Fuel Types similar to 1a and 2 above.

C. Emissions from Structural Fires

$$ESFC(4) \times \frac{NHG}{NHCT} = 123(\text{tons}) \times \frac{1547}{215479} =$$
$$0.8831(\text{tons}/\text{year})$$

D. Emissions from Solid Waste Disposal

$$ESWC(4) \times \frac{CLUG}{CLUC} = 24(\text{tons}) \times \frac{0.15}{11.965} = 0.3009(\text{tons}/\text{year})$$

E. Evaporative Hydrocarbons

1. Surface Coating

$$CHCE(1) \times \frac{GPOP}{CPOP} = 872(\text{tons}) \times \frac{5096}{568100} = 7.822(\text{tons}/\text{year})$$

2. Gasoline Handling

$$CHCE(2) \times \frac{CLUG}{CLUC} = 3078(\text{tons}) \times \frac{0.15}{11.965} = 38.5875(\text{tons}/\text{year})$$

3. Dry Cleaning

$$CHCE(3) \times \frac{CLUG}{CLUC} = 151(\text{tons}) \times \frac{0.15}{11.965} = 1.8930(\text{tons}/\text{year})$$

IV. GRID HOURLY EMISSIONS FOR HC

A. Hourly Characterization

1. Time: 8:00 a.m. = 9:00 a.m.
2. Wind Speed: 15 mph
3. Temperature: 40°F
4. Day: Tuesday
5. Month: February

B. Fuel Oil

$$\begin{aligned} & [\text{Residential} + \text{Commercial} + \text{Institutional Fuel Oil Yearly} \\ & \text{Emissions}] \times [4.8499 \times 10^{-4} - 7.0986 \times 10^{-6}T + 1.4614 \times \\ & 10^{-6}WS] = [\text{Results III A.1 plus III B.1}] \times \text{Eqn} = \\ & [0.1668 + 0.7518] (\text{tons/year}) \times [4.8499 \times 10^{-4} - 7.0986 \times \\ & 10^{-6} \times (40) + 1.4614 \times 10^{-6}(15)] \left(\frac{\text{year}}{\text{hour}} \right) = (0.9186) \times (7.9086 \times 10^{-4}) = \\ & 7.2648 \times 10^{-4} \text{ tons/hour} \end{aligned}$$

C. Natural Gas

$$\begin{aligned} & [\text{Residential} + \text{Commercial} + \text{Institutional Natural Gas Yearly} \\ & \text{Emissions}] \times 4.8499 \times 10^{-4} - 7.0986 \times 10^{-6}T + 1.4614 \times 10^{-6}WS + \\ & \frac{0.4832}{8760} \times \text{PF}] = [\text{Results III A.2 and III B.2}] \times [\text{Eqn with PF} \\ & \text{from Table 2.4}] = [0.7388 + 0.5424] \left(\frac{\text{tons}}{\text{year}} \right) \times [4.8499 \times 10^{-4} - \\ & 7.0986 \times 10^{-6} \times (40) + 1.4614 \times 10^{-6} \times (15) + \frac{0.4832 \times 1.15}{8760}] \\ & \left(\frac{\text{years}}{\text{hours}} \right) = (1.2812) \times (8.5429 \times 10^{-4}) \left(\frac{\text{tons}}{\text{hour}} \right) = 1.0945 \times 10^{-3} \text{ tons/hour} \end{aligned}$$

D. Other Fuels

1. LP Gas - same as C above
2. Coal - same as B above

E. Structural Fires

Hourly emissions based on a random distribution may be used. However, for use in dispersion models these values would be meaningless. For this source, the modeller must investigate the nature of any fires. The random distribution is obtained by dividing the yearly figure by 8760.

F. Solid Waste

$$[\text{Results from III D}] \times 4.27 \times 10^{-4} = 1.28 \times 10^{-4} \frac{\text{tons}}{\text{hour}}$$

G. Evaporative Hydrocarbons

$$\begin{aligned} &4.27 \times 10^{-4} \times [\text{annual dry cleaning emissions} + \text{surface coating} \\ &\text{emissions} + (0.5 \times \text{gasoline marketing emissions} \times \text{monthly sales} \\ &\text{factor}^*)] + (\text{automobile allocation factor}^{**} \times 0.5 \times \text{gasoline} \\ &\text{marketing emissions} \times \text{monthly sales factor}) = 4.27 \times 10^{-4} \times \\ &[1.8930 + 7.822 + (0.5 \times 38.5875 \times 0.88)] + (1.94 \times 10^{-4} \times \\ &0.5 \times 38.5875 \times 0.88) = 1.14 \times 10^{-2} + 0.33 \times 10^{-2} = 1.47 \times \\ &10^{-2} \text{ tons/hour} \end{aligned}$$

TECHNICAL REPORT DATA <i>(Please read Instructions on the reverse before completing)</i>		
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16. ABSTRACT One of the major objectives of the Regional Air Pollution Study (RAPS) is to provide data on the emissions of air pollutants, meteorological conditions and ambient air quality with unprecedented density and resolution as to allow the testing and development of a spectrum of mathematical models to simulate relationships between emissions of pollutants and air quality. As part of this effort a methodology for estimating the pollutant emissions from stationary residential and commercial-institutional area sources on an hour-by-hour basis, and apportioning them to the RAPS grid system is presented.		
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REGIONAL AIR POLLUTION STUDY (RAPS)

100% COMPLETION REPORT

FOR

TASK ORDER 108-D

STATIONARY INDUSTRIAL AREA SOURCE

EMISSION INVENTORY

Prepared for

Environmental Protection Agency
Office of Air & Water Management
Office Of Air Quality Planning Standards
Research Triangle Park, N.C. 27711

by

Fred F. Littman
Kevin Isam

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1.0 INTRODUCTION

The Regional Air Pollution Study (RAPS) emission inventory was designed to provide emission data for the St. Louis Air Quality Control Region (AQCR-70) to complement the meteorological data and ambient concentrations of pollutants gathered in the framework of RAPS. The emission inventories encompass several segments:

- a. Major Stationary Point Sources
- b. Minor Stationary Point Sources
- c. Airports, Railroads and Vessel Emissions
- d. Off-Highway Mobile Sources
- e. Stationary Residential/Commercial Area Sources
- f. Stationary Industrial Area Sources
- g. Mobile Sources
- h. Hydrocarbon Inventory
- i. Heat Emission Inventory
- j. Non-Criteria Pollutant Inventory
- k. Particulate Size Distribution Inventory
- l. Fugitive Dust Inventory

All inventories are stored in the RAPS data handling system using a Univac 1110 computer at the Environmental Protection Agency's headquarters at Research Triangle Park, N.C. The major stationary point source inventory is the most detailed one. It contains hourly measured values for fuel consumption or process rates which can be transformed into emission rates using emission factors. Other inventories are less detailed, but all will yield hourly values.

Major Stationary Point Sources includes all sources which individually contribute more than approximately 0.1% of the total emissions of a given pollutant in the AQCR. Minor ones, for which less detailed data are available, includes sources emitting more than 0.01% of a given pollutant.

All remaining emissions are designated "Area Source Emissions." These include industrial area sources as well as residential and commercial area sources. The latter are discussed in EPA report no. 450/3-75-078 entitled "Residential

and Commercial Area Source Emission Inventory Methodology For RAPS." The former are the subject of this report. Table 1 shows the amounts involved.

As indicated in Table 1, point sources account for the bulk of the emissions of SO₂, particulates and oxides of nitrogen, but only for a minor part of hydrocarbons and in particular, carbon monoxide emissions. Of all the point sources, major sources account for 85 to 95% of the emissions. Industrial Area Sources, that is, sources emitting individually less than 0.01% of a given pollutant, account for only 0.2 to 0.6% of the total amount of pollutants. Nor do they contribute significantly to the area source emissions, since they account for only 0.2 to 13% of other area emissions.

All area emission sources are assigned to a system of grid squares developed for RAPS⁽¹⁾ which divides the AQCR into squares from 1 to 100Km². Emissions from residential and commercial sources are assigned to the grid squares on a population density basis using various correction factors to account for the effect of ambient temperature, etc. Unfortunately, the distribution of industrial area sources on the micro scale of grid squares does not lend itself to any estimations based on industrial employment, which have been used successfully for larger scale estimates⁽²⁾. Thus, the only available techniques consisted in an actual count of the sources, coupled with determinations of their exact locations (in UTM coordinates), estimates of their annual fuel consumption or process rates and work patterns.

- (1) The Regional Air Pollution Study (RAPS) Grid Study
R.C. Haws and R.E. Paddock, Research Triangle Inst., Dec. 1975
- (2) Residential and Commercial Area Source Emission Inventory
Environmental Science & Engineering, Inc., Gainesville, Fla.
EPA 450/3-75-078

TABLE 1
SOURCES AND EMISSIONS IN THE ST. LOUIS AQCR

A. PARTICULATES

	Tons/Yr.	# Of Sources	# Of Companies	% Of Total
Total Emissions In AQCR	354,665	-	-	100
Point Source Emissions	317,140	512	94	89.4
Major Sources (> 250T)	304,936	72	29	86.0
Minor Sources (> 25T)	10,100	138	24	2.8
Industrial Area Sources (> 1T)	2,104	302	41	0.6
Other Area Sources	37,525	-	-	10.6

B. SULFUR DIOXIDE

Total Emissions In AQCR	1,234,395	-	-	100
All Point Sources	1,187,294	349	62	96.2
Major Point Sources (> 1000T)	1,142,906	62	20	92.5
Minor Point Sources (> 100T)	38,003	120	13	3.1
Industrial Area Sources (> 1T)	6,385	167	29	0.5
Other Area Sources	47,101	-	-	3.8

TABLE 1 (CON'T)

C. OXIDES OF NITROGEN

	Tons/Yr.	# Of Sources	# Of Companies	% Of Total
Total Emissions In AQCR	433,547	-	-	100
All Point Sources	310,992	382	83	71.7
Major Point Sources (> 300T)	291,438	55	15	67.2
Minor Point Sources (> 30T)	17,010	194	30	3.9
Industrial Air Sources (> 1T)	2,544	133	38	0.6
Other Area Sources	122,554	-	-	28.3

D. HYDROCARBONS

Total Emissions In AQCR	295,123	-	-	100
All Point Sources	78,497	455	69	26.5
Major Point Sources (> 100T)	71,051	103	30	24.1
Minor Point Sources (> 10T)	5,893	163	24	2.0
Industrial Area Sources (> T)	1,533	189	15	0.5
Other Area Sources	216,646	-	-	73.4

TABLE 1 (CON'T)

E. CARBON MONOXIDE

	Tons/Yr.	# Of Sources	# Of Companies	% Of Total
Total Emissions In AQCR	1,079,522	-	-	100
All Point Sources	63,045	202	59	5.8
Major Point Sources (> 100T)	51,570	31	18	4.8
Minor Point Sources (> 10T)	9,030	69	12	0.8
Industrial Area Sources (> 1T)	2,446	102	29	0.2
Other Area Sources	1,016,477	-	-	94.2

2.0 METHODOLOGY AND APPROACH

The data shown in Table 1 (column 3) indicates a total number of between 15 to 41 companies in the Industrial Area category. Others were added from listings of these manufacturers. Over 60 potential industrial area sources were contacted; satisfactory data were obtained from 55. There is a good deal of overlap, since combustion sources, which constitute the bulk of the emission sources, emit all five "criteria" pollutants (SO_2 , NO_x , particulates, hydrocarbons and carbon monoxides.)

On the other hand, gas-fired sources emit only NO_x and hydrocarbons; most important hydrocarbon sources originate from evaporation rather than combustion; and sources of particulates frequently do not emit other pollutants.

The first step in inventorying these sources consisted of the preparation of a cross-referenced list of the companies involved. This was followed up by actual contact with the appropriate officials to obtain current consumption or process rates as well as work patterns.

For the purposes of the industrial area emission inventory a source is an individual company. By the term "company" is meant a plant location of industrial character which is treated as a separate entity, though it may be one of several subsidiary plants of a larger or parent firm. Annual 1975 information on fuel usage, incineration, paint and solvent usage, and production was obtained from the companies. Emissions of each of the five criteria pollutants were calculated using the 1975 data along with AP-42 emission factors ⁽³⁾. Also, each of the companies was assigned to a grid square after determination and verification of its UTM coordinates.

In those cases where data was unobtainable due to lack of cooperation of the companies involved, either National Emission Data System (NEDS), Illinois EPA Emission Inventory, or Missouri Emission Inventory (MEI) data from 1973 was used to calculate emission. Those few cases are identified by an asterisk in Table 2, which lists all companies included in the inventory, its grid

(3) Compilation of Air Pollutant Emission Factors (2nd. Ed.)
Environmental Protection Agency, Research Triangle Park, N.C. No. AP-42

square location and total pounds of emissions of each of the five criteria pollutants. As a starting point for the inventory, NEDS and MEI were consulted, using the numerical criteria shown in Table 3 for placing a source in the industrial area category. Other NEDS or MEI companies listed were added to the list of candidates if there was either no data given for them, or the 1973 data appeared questionable.

Knowing the SCC code for each process, the units processed, and the emission factor(s) corresponding to the SCC code, it is straightforward to calculate pounds of pollutant emitted:

$$\text{EMISSIONS (LBL)} = \text{EMISSION FACTOR} \times \text{UNITS PROCESSED} \times (1 - \text{CONTROL EFFICIENCY})$$

(lbs./unit)

At no time was there a problem in finding an appropriate SCC code to classify the data received from the companies. The emission factors for inprocess fuel SCC codes are zero because the emissions should be included in the associated SCC process code. In several cases, however, emission data is not available to include inprocess fuel emissions with the process emissions. To circumvent this obstacle, emission factors of inprocess fuel SCC source codes were assigned industrial boiler codes. This was done only when inprocess fuel emissions were not accounted for in the process emission factors. All such substitutions appear in Table 4.

Some of the companies examined were not included in Table 2 because the magnitude of their emissions placed them in the Minor Source category. On the other hand, a few companies whose emissions of each of the five pollutants fall below one ton have been included in Table 2 anyway. Data listed in this table were entered on coding sheets, keypunched on cards and entered into the RAPS Emission Inventory System at Research Triangle Park, North Carolina.

TABLE 2
EMISSIONS FROM INDUSTRIAL AREA SOURCES

COMPANY NAME	GRID SQUARE	EMISSIONS (LBS)/YEAR				
		PART	SO _x	NO _x	HC	CO
A.B. Chance Transformer Works Washington, Mo.	#39	111	110	742	107,446	98
Beall Tool Mfg. Div. of Varien Corporation East Alton, Ill.	#1240	1,356	4,192	12,421	502	2,099
Coates Steel Prod. Granville, Ill.	#1795	11,730	42,182	51,720	2,406	3,988
Continental Can Plant* 2419 Lemp St. Louis, Mo.	#958	0	0	0	6,000	0
Corn Sweetners Granite City, Ill.	#1128	417	25	9,591	125	709
Drug Package, Inc. O'Fallon, Mo.	#2034	540	32	28,170	162	918
East St. Louis Castings Co. East St. Louis, Illinois	#1252	2,023	0	0	0	1,725
Eaton Corp. Washington, Mo.	#2011	1,910	0	0	0	0
Excelsior Foundry Belleville, Ill.	#1561	410	1,562	1,650	83	110
Gilster-Mary Lee Chester, Ill.	#1579	48	3	576	14	82
G & S Foundry Freeburg, Ill.	#1584	509	454	480	24	136
Havin Material Service St. Clair, Mo.	#2022	2,702	0	0	0	0

TABLE 2 (CON'T)

COMPANY NAME	GRID SQUARE	EMISSIONS (LBS)/YEAR				
		PART	SO _x	NO _x	HC	CO
Havin Material Service Sullivan, Mo.	#2002	2,366	0	0	0	0
International Shoe Company* St. Clair, Mo.	#2022	465	1,761	1,920	93	124
J.C. George St. Clair, Mo.	#56	0	0	0	0	0
Jennison-Wright Corporation Granite City, Ill.	#1128	7,576	3,956	8,844	6,792	9,102
Kellwood Co. Finishing Div. New Haven, Mo.	#3	180	108	2,160	54	306
Kohen Concrete Products Germantown, Ill.	#1768	1,506	0	0	0	0
Kurtz Concrete St. Charles, Mo.	#2126	11,000	0	0	0	0
MacLay Concrete Festus, Mo.	#467	7,200	0	0	0	0
Mascoutah Grain and Feed Mascoutah, Ill.	#1637	13,702	0	0	0	0
Masters Bros. Sand Co. Pevely, Mo.	#292	4,000	0	0	0	0
Micro Alloy Corporation O'Fallon, Mo.	#2034	167	10	2,004	50	284
Missouri Meerschaum Washington, Mo.	#47	262	2,685	34	23,876	46

TABLE 2 (CON'T)

COMPANY NAME	GRID SQUARE	EMISSIONS (LBS)/YEAR				
		PART	SO _x	NO _x	HC	CO
Missouri Portland Loading Terminal St. Louis, Mo.	#972	1,800	0	0	0	0
Mon Clair Grain St. Clair County Belleville, Ill.	#1484	16,977	0	0	0	0
Mon Clair Grain Waterloo, Ill.	#1146	15,400	0	0	0	0
National Mine Service Nashville, Ill.	#1829	0	0	1,500	750	2,500
New Baden Grain Company New Baden, Ill.	#1714	6,616	0	0	0	0
Peavy Flour Mills Alton, Ill.	#1020	12,750	0	0	0	0
Permaneer Corp. Union, Mo.	#2015	600	593	4,011	15,100	531
Pre-Coat Metals St. Louis, Mo.	#852	3,400	204	40,800	16,700	5,780
Koesch Enamel Mfg. Belleville, Ill.	#1511	1,780	107	40,940	534	3,026
Ruprecht Quarry Lemay, Mo.	#744	48,000	0	0	0	0
St. Louis Grain Corporation Duncan Street St. Louis, Mo.	#858	179	0	0	0	0
Washington Metal Products Washington, Mo.	#59	1,080	4,090	4,320	216	288

TABLE 2 (CON'T)

COMPANY NAME	GRID SQUARE	EMISSIONS (LBS)/YEAR				
		PART	SO _x	NO _x	HC	CO
St. Louis Grain Corporation Foot of E. Grand St. Louis, Mo.	#1008	1,607	0	0	0	0
St. Louis Grain Corporation Cahokia, Ill.	#997	535	0	0	0	0
St. Louis Steel Casting St. Louis, Mo.	#849	13,520	0	2,080	0	0
Spartan Aluminum Products Sparta, Ill.	#2448	6,840	0	0	0	0
Sterling Steel Casting Co. Sauget, Ill.	#1095	1,414	988	5,460	162	697
Sunoco Petroleum 255 E. Monroe Kirkwood, Mo.	#404	0	0	0	4,105	0
Sunoco Petroleum 1252 E. Road Manchester, Mo.	#789	0	0	0	728	0
Thompson Asphalt Alton, Ill.	#2281	7,025	4	870	22	123
Trautman Quarry Pevely, Mo.	#355	13,336	0	0	0	0
Troy Grain Co. Troy, Ill.	#1624	4,300	0	0	0	0
Vitro Products* St. Louis, Mo.	#1072	0	0	0	22,400	0
Weber, Inc., Fred O'Fallon Plant O'Fallon, Mo.	#118	3,250	5,680	6,000	300	400

TABLE 2 (CON'T)

COMPANY NAME	GRID SQUARE	EMISSIONS (LBS)/YEAR				
		PART	SO _x	NO _x	HC	CO
Weber, Inc., Fred Festus Asphalt Plant Festus, Mo.	#467	3,590	6,305	6,660	333	444
Weber, Inc., Fred South Asphalt Plant Lemay, Mo.	#2245	13,230	41,350	43,680	2,184	2,972
Weber, Inc., Fred North Asphalt Plant Creve Coeur, Mo.	#2147	16,565	93	18,600	465	2,635
Western Litho Plate St. Louis, Mo.	#281	240	14	2,880	72	96
Wirco Castings, Inc. New Athens, Ill.	#1683	1,050	0	0	0	0

* ASTERISK INDICATES DATA DERIVED FROM 1973 INVENTORIES

TABLE 3
EMISSION LIMITS FOR INDUSTRIAL AREA SOURCES

PARTICULATES	SO _x	NO _x	HC	CO
1 < X < 25	1 < X < 100	1 < X < 30	1 < X < 10	1 < X < 10

X = Tons/Year OF POLLUTANT EMITTED

Upper limits in Table 3 are based on emissions of less than 0.01% of a given pollutant.

TABLE 4
EMISSION FACTOR SUBSTITUTIONS

STANDARD <u>SCC CODE</u>	SUBSTITUTE <u>SCC CODE</u>
3-90-004-XX	1-02-004-0X
3-90-005-XX	1-02-005-0X
3-90-006-XX	1-02-006-0X
3-90-008-XX	1-02-007-0X
3-90-010-99	1-02-010-0X

METHODOLOGY FOR THE DETERMINATION OF EMISSION LINE SOURCES

Environmental Protection Agency
Contract No. 68-02-1417
February 28, 1975

Washington University
School of Engineering and Applied Science
Department of Civil Engineering
St. Louis, Missouri 63130

Dr. Lonnie E. Haefner
Principal Investigator

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CHAPTER I

INTRODUCTION - STUDY DESIGN

CHAPTER I

INTRODUCTION - STUDY DESIGN

A. INTRODUCTION - OBJECTIVES OF RESEARCH

The study of pollution concentrations in a metropolitan area requires accurate characterization of pollution emitted due to the presence and operation of transportation corridors and grids, termed line sources. Accurate reporting of emissions depends on efficient monitoring of traffic flow and system design and location parameters critical to the emission process, in addition to adequate characterization of vehicular emissions under a range of operating conditions.

The objective of this research is to develop a methodology which documents the bases and criteria for determining which major freeway and arterial links should be considered emission line sources in a metropolitan area, and their geographic and temporal sensitivity to frequency and duration of monitoring. In addition to developing the methodology, it is to be verified through testing in the St. Louis Air Quality Control Region, determining specifically what links in this region shall be considered as line sources. In accomplishing the above, several specific performance objectives will be attained, which are:

- a.) Obtainment and documentation of the most recent traffic data relevant to emissions phenomena for the St. Louis Region.
- b.) Development of the methodology, and use of the above data to estimate emissions levels, through the use of the Department of Transportation model SAPOLLUT, which computes aggregate emissions and concentrations of CO, NO_x and HC for a traffic network. Detailed discussion of the model operation as used in this research is found in Chapters III, IV and Appendix A.

- c.) Additional conceptualization of the methodology to formulate a sensitivity analysis which analyzes emissions information provided by different combinations of line source components, and allows comparison of information output vs. different specifications of traffic network inputs.
- d.) Verification of the sensitivity analysis on the St. Louis Area, ultimately yielding appropriate specifications of emission line sources in the area.

B. LIMITED LITERATURE SEARCH

The objective of a limited literature search into traffic behavior and air pollution emissions in a project such as this one is to reinforce basic knowledge of relationships of emissions to key traffic behavioral variables. In so doing, the search allows the research team to see the rationale for their model building, its particular relationship to emissions stimuli, and to develop an overview and fluency with the traffic engineering literature dealing with the problem.

1.) Relevance of Air Standards

A basic research program with such a broad and intensive scope as the RAPS program is interested in accurately uncovering the phenomena of behavior of line sources and their resultant emissions, and the part these emissions play in the region-wide emissions problem. In so doing, the capability exists to add to basic knowledge which may ultimately lead to improved strategies for meeting ambient air standards.¹

The highway system acting as a line source may act as a primary cause of CO. It may be a contributor to NO_x and HC emissions. Certain aspects of the highway transportation system will now be investigated in relation to these.

2.) Relationships of Emissions to Key Traffic Engineering Stimuli

The pollutants of CO, HC and NO_x have documented associations with speed.² Results of recent research on such associations is graphically shown in Figures 1, 2, and 3. These figures are the result of developed equations of:

$$\text{LN HC} = A + B\bar{S} + C\bar{S}^2 \text{ in grams/mile}$$

$$\text{LN CO} = A' + B'\bar{S} + C'\bar{S}^2 \text{ in grams/mile}$$

$$\text{NO}_x = A'' + B''\bar{S} \text{ in grams/mile}$$

In the above, $\bar{S}$ is the average speed of the driving sequence. To determine the speed correction factor at any particular speed in the range of 15 to 45 miles per hour, a ratio of the above equations is used. The emissions are determined at the desired speed and ratioed with the emissions at a speed of 19.6 miles per hour, the average speed over the federal driving schedule.³ Figure 1 represents vehicle model year 1968 in low altitudes, Figure 2 represents the 1968 vehicle model year in Denver, and Figure 3 represents the 1971 model year in Denver. It should be noted the relationship is quadratic with respect to HC and CO, and linear with respect to NO_x, yielding decreasing emissions with increased average route speed for HC and CO, and increasing emissions of NO_x with increased average route speeds.

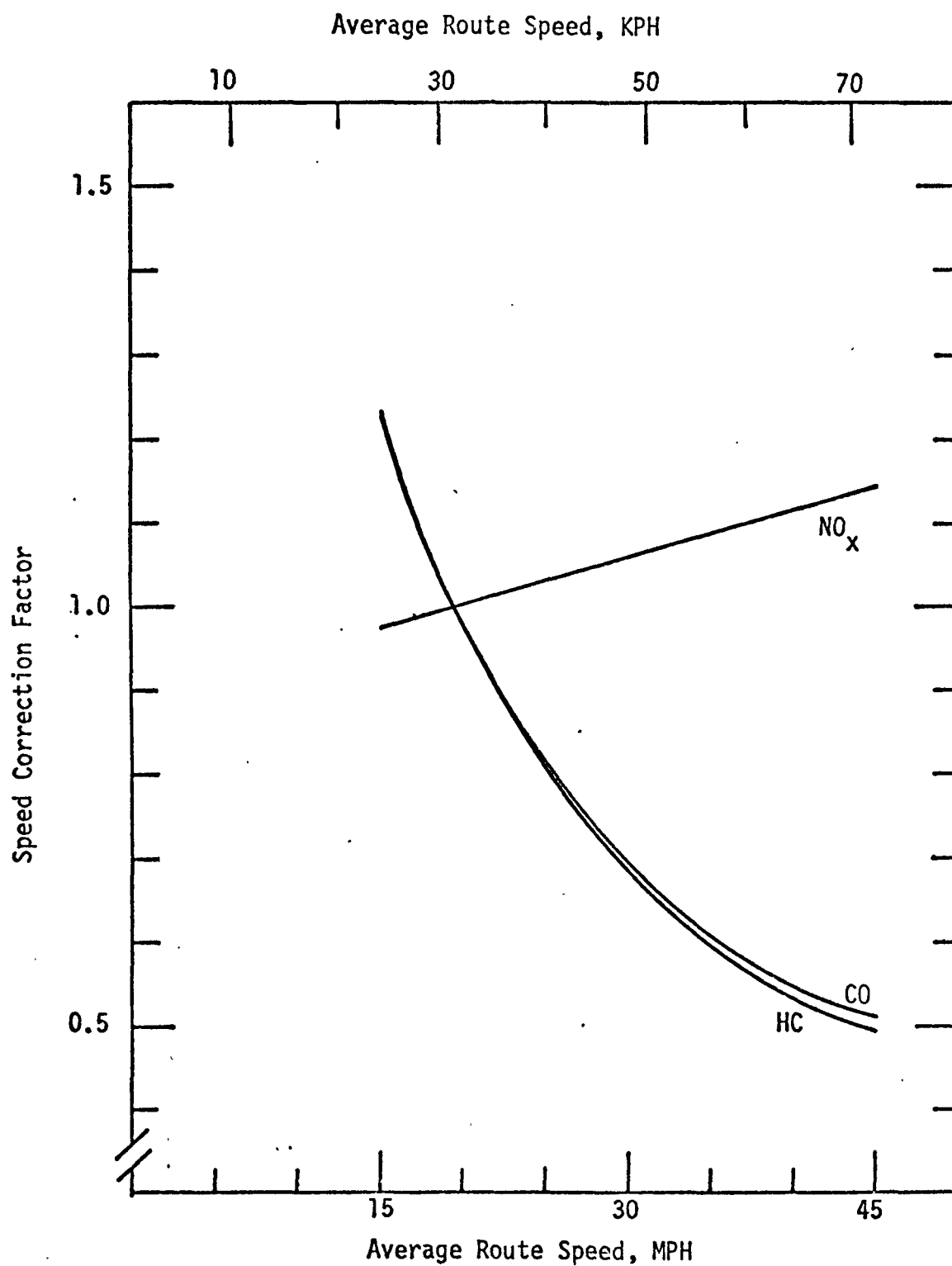


FIGURE 1. Speed Correction Factors for 1968 Model Year Vehicles in Low Altitudes

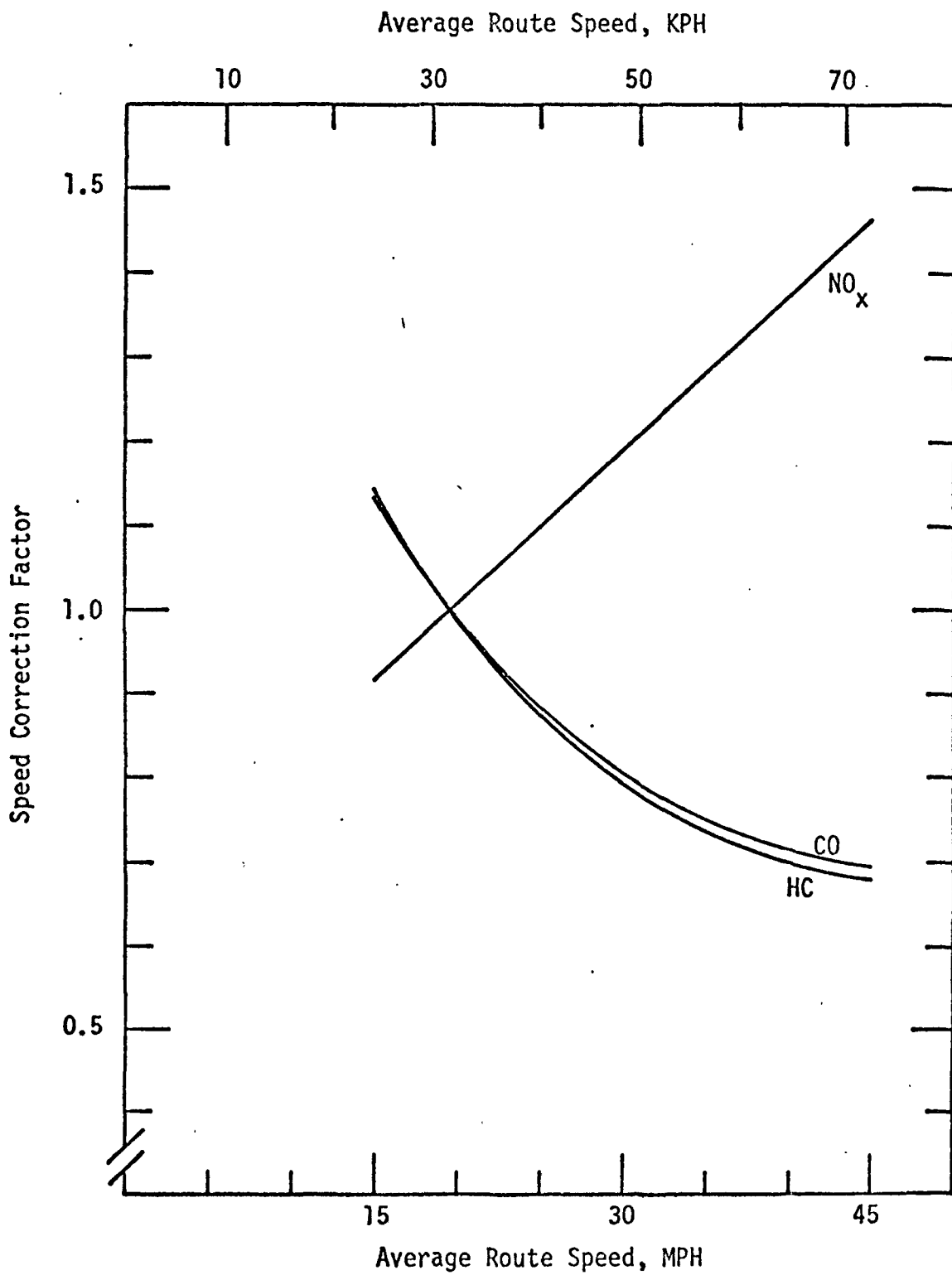


FIGURE 2. Speed Correction Factors for
1968 Model Year Vehicles in Denver

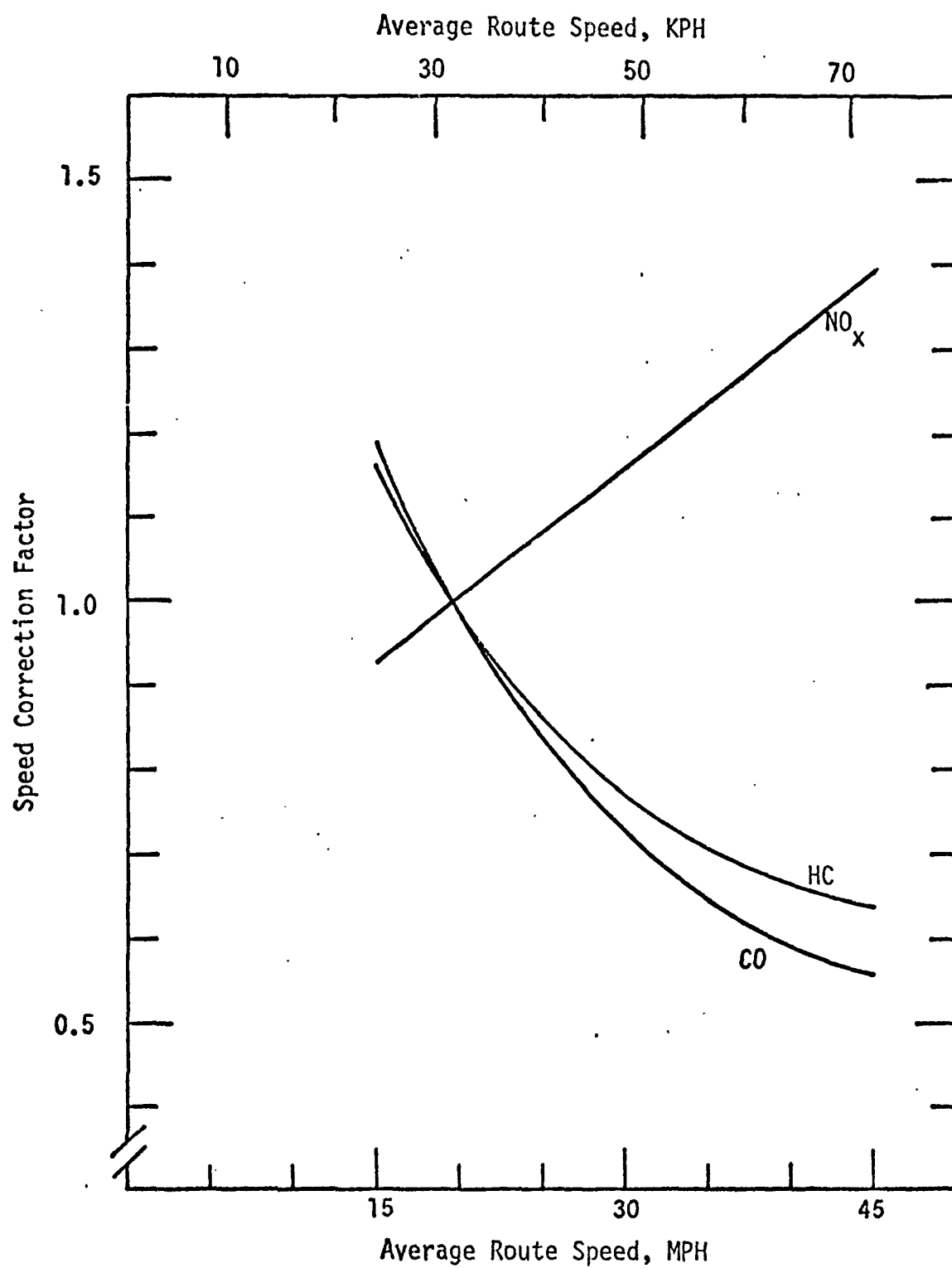


FIGURE 3. Speed Correction Factors for
1971 Model Year Vehicles in Denver

A further finding is that complex highway design configurations, unique localized meteorology, presence of topography and rough terrain and downtown or high-rise street canyons play readily identifiable, but relatively less understood roles in air quality. In the simplest sense, average speed and vehicle miles of travel on a link are relevant inputs as indicators of CO, HC and NO_x emissions. The realistic design, environmental and neighborhood attributes modify the impact of these two basic stimuli on air quality, and the mechanics of these modifications are not developed in depth in the basic research to date. Figures 4, 5 and 6 are offered as visual examples of research output of the effect of geometric configuration on air quality.⁴ A further behavioral input, closely related to average speed, is the smoothness of traffic flow and capability of avoiding traffic congestion effects. Figure 7 shows the concentrations for smooth, uninterrupted flow of 30 mph of typical freeway movement versus higher emissions induced by poor signal timing, pedestrian and parking interference which increases delay on a typical interrupted flow arterial street operating poorly.⁵ As such, from a traffic engineering point of view, V/C ratios and acceleration noise parameters of the traffic stream are relevant to emissions levels.

In conclusion, the literature search revealed:

- 1.) The basic stimuli of emissions to be well documented against inputs of average speed and VMT for CO and HC, with more questionable data and relationships with respect to NO_x.
- 2.) Further complexities in air quality overlaid on the above when cut, fill, and complex cross section and geometric design configurations are included, as illustrated in Figures 4, 5 and 6.

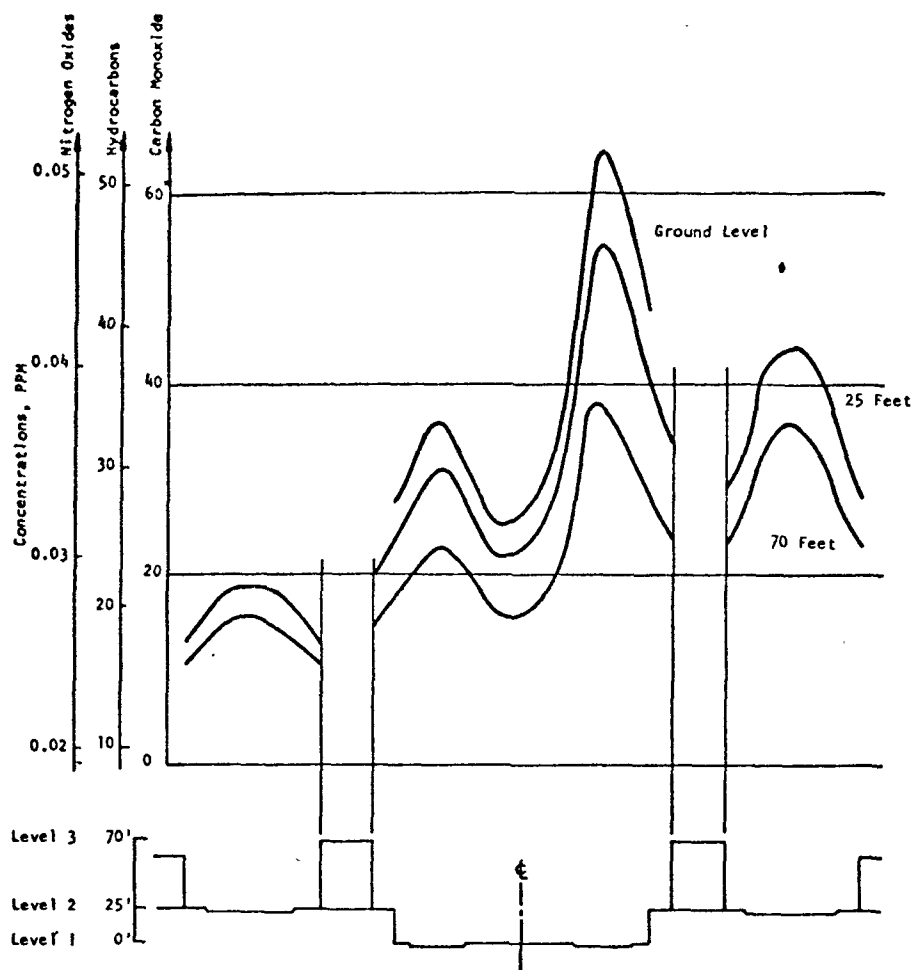


FIGURE 4. Pollution Levels Along Transverse Street Cross Section of Centered Expressway with Joint Development Structures

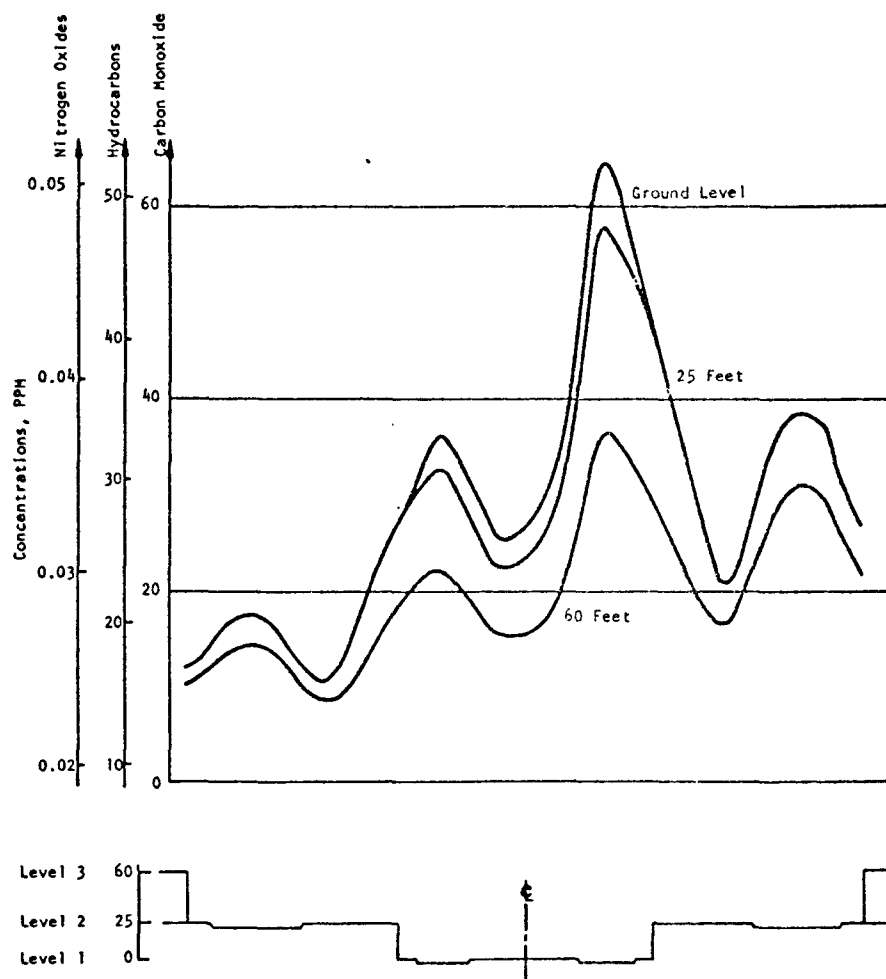


FIGURE 5. Pollution Levels Along Transverse Street Cross Section of Centered Expressway Without Joint Development Structures

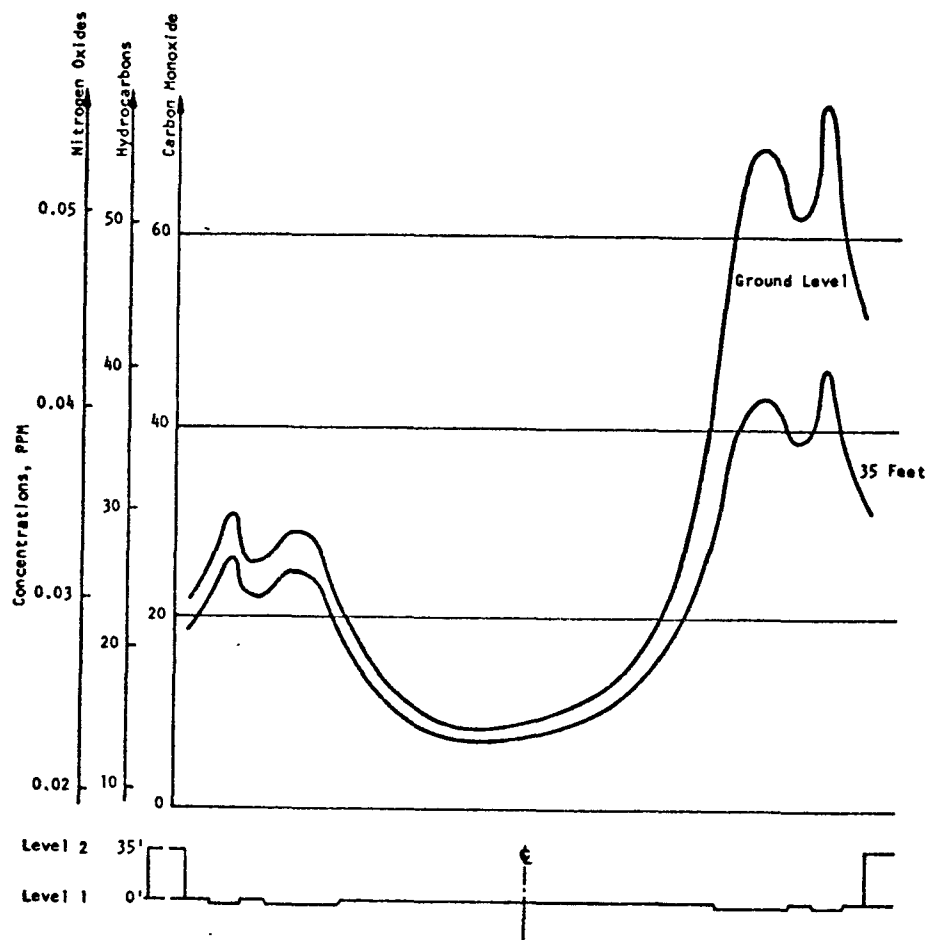


FIGURE 6. Pollution Levels Along Transverse Street Cross Section of Centered Expressway-Boulevard

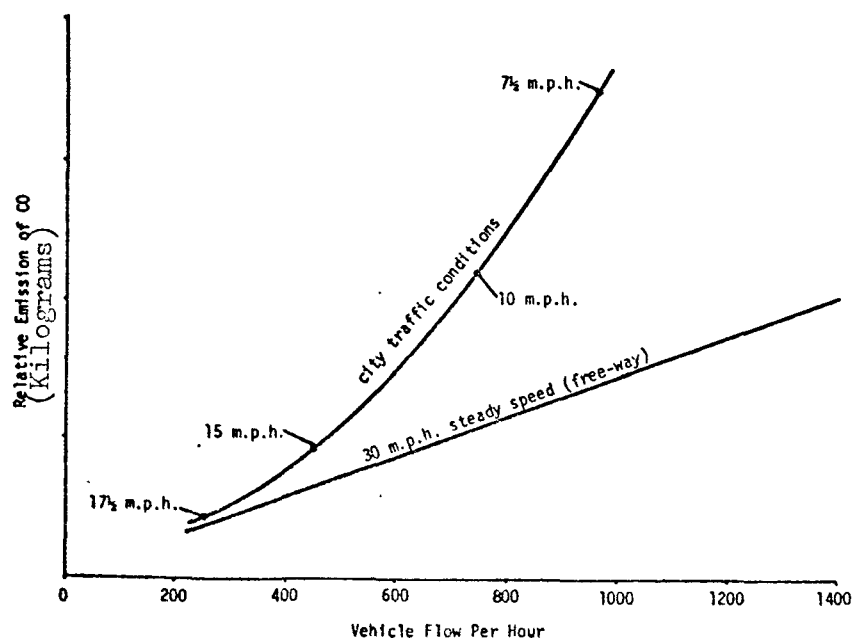


FIGURE 7. Comparison of City Street and Freeway Conditions

- 3.) Further complexity in emissions when system delay from congestion is introduced, as illustrated in Figure 7.
- 4.) Further complexity in air quality when overlaid by local, uniquely complex topography and terrain, and localized unique meteorologic conditions.
- 5.) The apparent need for further basic research on line sources where such complexities in 2-4 above are introduced. That is, further research into locating them, stratifying their attributes, classifying them in an orderly data system, and relating their attributes to their resulting link emissions and the air quality of their locale.

C. FORMAL RESEARCH WORK PLAN

1.) Emissions and Air Quality-Related Traffic Flow Research Aspects

In light of the previous literature search, it has been categorically found that volume, or vehicle miles of travel, and average speed are critical inputs which relate to emissions of nitrogen oxides, carbon monoxides and hydrocarbons. However, exhaustive use of typical traffic flow data related to the above two inputs should allow a refined and meaningful statement of flow phenomena and traffic systems design which pollution output is sensitive to. Thus, a short discussion of such flow-related parameters is warranted, to demonstrate their categorization as inputs:

Volumes - Average Daily Traffic and peak hour volumes, historically as indicators of use of the facility.

Average Travel Speed - As an indicator of efficiency of the facility and adequacy of design.

General Interzonal Origin-Destination Patterns - As a regional mapping of incidence of travel, and proximity of travel paths to other regional activities.

Functional Classification of Highways - Classed as whether freeway, arterial, collector or local, as an indication of importance and frequency of use and level of design standards employed.

Delay Information - which modifies or refines information on average speed, above, through studies of volume to capacity ratios, travel time profiles, travel time contours, or waiting time or delay contours. Locations are detected in the system where speeds are radically altered due to delay and congestion.

Locations of Design Related Phenomena - such as extremely complicated route or interchange configurations, and areas of cut or fill, or frontage roads with structures, which induce localized alterations in air quality and emissions, the latter when average speed is modified due to the design phenomena.

Unique Areas of Progression - in addition to areas which can be reviewed from speed and delay information as stated above, these are unique in the network, in that some engineering or planning alteration exists to eliminate congestion by specific means with highly predictable results, such as one-way street flows, or progressive signalization, thus allowing atypical consistency in volumes or average speeds, with stable emissions output.

Areas of Critical Land Use Adjacent to or Within the Network -

The first type is an area adjacent to the traffic system which is a highly sensitive land use to emissions output and local air quality, or a land use type such as industrial, which supplements and confounds the emissions level and air quality in the vicinity of the corridor. The second type is the downtown or core area, or like areas of high-rise, high-density buildings. The building heights or "street canyons" affect air quality in the vicinity of the grid and corridor sources.

Vehicle Mix - the composition of traffic, in terms of percentage of autos, intermediate size trucks and large size trucks is relevant, due to differing emissions from vehicle type, and the impact of the traffic composition on average speed and traffic flow throughout a link. The composition of vehicles by age also determines the level of emissions from the traffic stream.

Frequency of Monitoring - all links under study will encompass some or many of the above flow related phenomena which have an impact on emissions and/or air quality. The frequency of observing such network components with respect to adequate characterization of CO, NO_x, and HC information is critical. Typical choices of duration of traffic volume counting periods include 1, 8, 12, 24 hours, weekly, and peak-off peak combinations.

Thus, the above considerations are relevant to comprehensively using traffic flow information to develop the "optimal" network inputs for specifying emissions line sources. Use of this information may be characterized by the following three dimensional array in Figure 8.

The research proceeds by essentially categorizing each apparently relevant link component with respect to the above array, then testing and trading off combinations of these with respect to emissions levels to ultimately produce a set of line sources. The process proceeds interactively, making full use of local traffic engineering knowledge about network components, yet developing the taxonomy in a rigorous and consistent logic.

2.) Specific Work Plan of Research

To accomplish the stated objectives, and develop the output discussed above, a six-phase work program has been pursued, as shown in Figure 9.

Phase 1 has four tasks, which were carried on simultaneously. Task 1.1 consisted of review of the flow aspects discussed above with respect to their impact on emissions. Tasks 1.2 and 1.3 included the procurement of St. Louis Air Quality Control Regional Traffic data, and review of important links and their traffic operating attributes (Figure 8) with local professionals. Through the principal investigator's local knowledge and contacts, use was made of East-West Gateway Regional Coordinating Council professionals, and engineers with Missouri State Highway Department, Illinois Department of Transportation, and St. Louis, St. Clair, Madison and other appropriate county engineering personnel. The results of 1.2 and 1.3 yielded realistic insights into the operation of corridors and arterial highway grid components. In Task 1.4, the traffic input and emissions output aspects of the model SAPOLLUT was reviewed, and the model was procured and put on the Washington University Software Library.

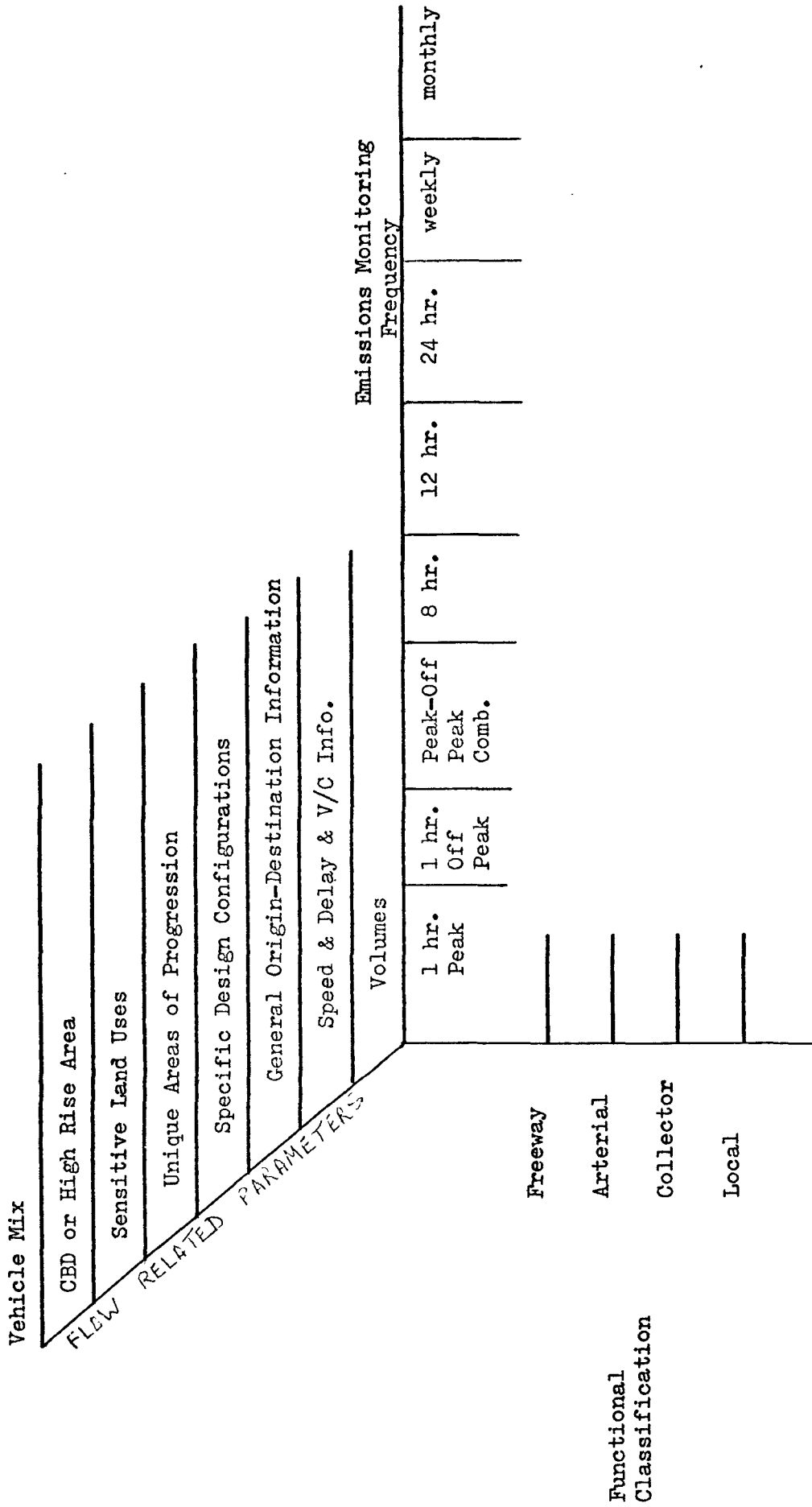


FIGURE 8. Flow Parameters Related to Emissions and/or Air Quality Phenomena

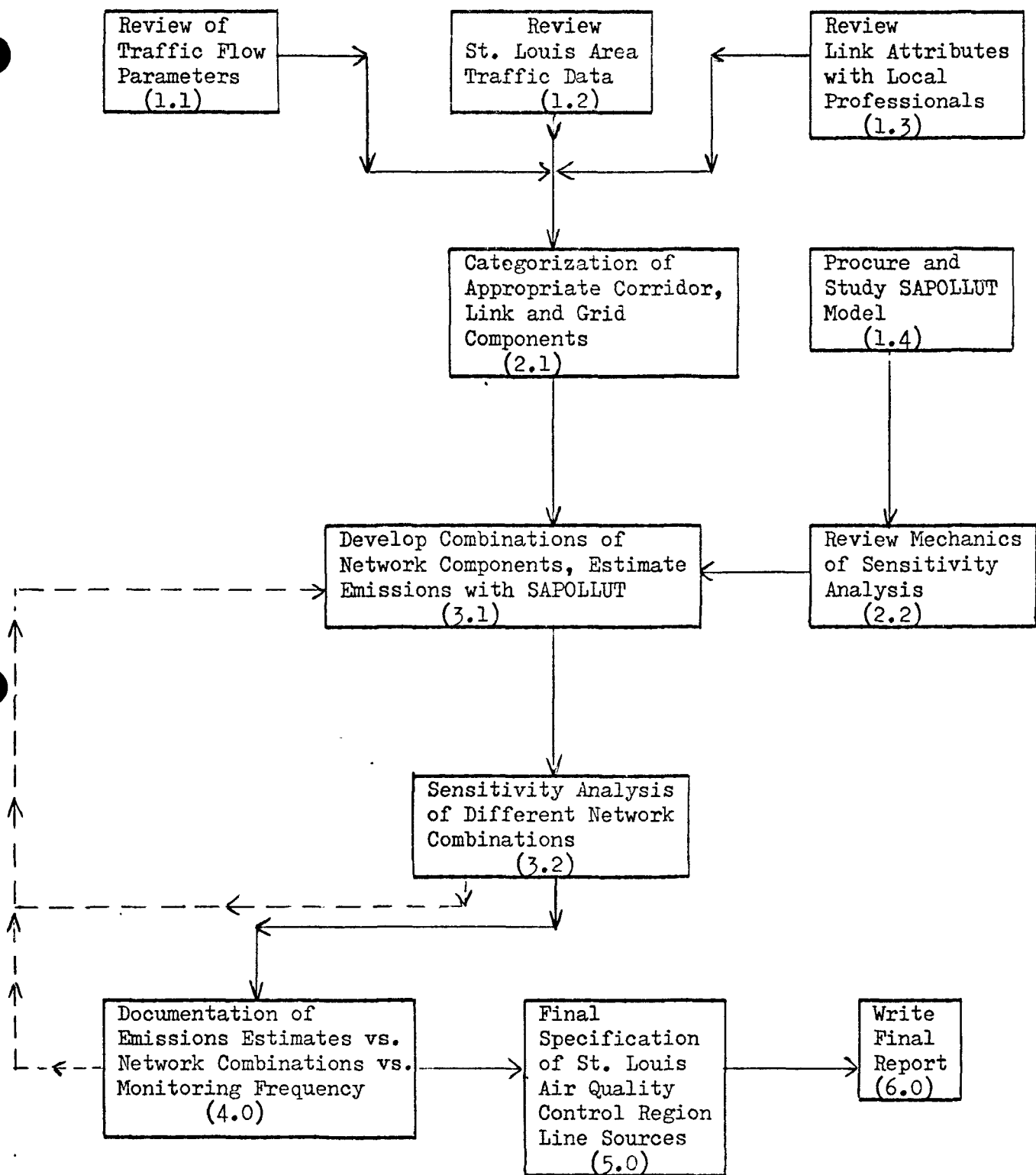


FIGURE 9. Research Work Plan

Phase 2 included two overlapping tasks. The initial task, 2.1 categorized appropriate corridors, links and street grid components with respect to the flow phenomena illustrated in the previous three-dimensional array. The coding was developed so that a complete set of descriptors exists for each corridor, link or arterial street grid level conceptualized and developed as input. Overlapping with this, task 2.2 familiarized the study team with the sensitivity analysis, and the mechanics of its performance in order to assure continuity between Phase 3 and later phases.

Phase 3 had two tasks. Task 3.1 developed levels and combinations of network hierarchical components as inputs to studying emissions. The following sequence of components were developed for use with SAPOLLUT and sensitivity testing:

- Round 1: All freeway corridors, link components broken up by average speed differentials and volume differentials.
- Round 2: All freeway corridors, additional breakdown by sites of specifically complex configuration.
- Round 3: Addition of the arterial street grid to above, broken down by speed, delay and volume differentials.
- Round 4: All the above, additional breakdown by arterial sites of specifically complex configuration.
- Round 5: Addition of refined locations adjacent to sensitive land use areas, and areas of exceptional progression.
- Round 6: All of the above, cross classified by vehicle mix.

Thus, the approach is to ultimately yield a descriptive network of line sources N , which is composed of

$$N = \sum_{i,j,k,m,n,o,p,q,\dots,t} \ell_{ijkmmopq} \dots t$$

where ℓ is a specific link or network component and $i, j, k, m, n, o, p, q, \dots$ are its flow parameters shown in the three-dimensional array, and t is the monitoring frequency. At each of the above rounds, the network could be input to SAPOLLUT, and emissions information estimated. The network is synthesized in a sequential manner through the several rounds, to develop clarity about its composition and emissions output, allowing for a more orderly sensitivity analysis.

Task 3.2 articulated changes in the above synthesized network and site monitoring frequency. From knowledge of the local area, specific link and network components developed through all of the above rounds were removed or added, noting through the use of SAPOLLUT in a sensitivity analysis, the change in resulting emissions information. The sensitivity analysis of the coded link and network components was developed in a batch software format, to allow a certain programmed sequence of network alterations to occur. This process was hooked with SAPOLLUT, to allow network input operations and emissions estimation to occur in one continuous software run.

Phase 4 documented the results of the use of SAPOLLUT and the sensitivity analysis carried on in 3.2. Reference to Figure 9 shows feedback and interaction across 3.1, 3.2 and 4 to adequately formulate test, converge and document the above processes.

Phase 5 utilizes the above array of sensitivity and convergence information and specifically states network component locations, their frequency of emissions monitoring, and the required traffic flow-related data. This specification defines the emission line sources for the St. Louis Air Quality Control Region.

Phase 6 combines previous conceptual analysis, the computer software, associated network synthesis, use of SAPOLLUT and the sensitivity analysis and its results, with specifications for refinement and further research into a final written report contained herein. The following text will elaborate on data collection, software development, use of SAPOLLUT, sensitivity analysis and definition line sources, and provide appropriate appendices on software documentation and data formats.

Footnotes Chapter I

¹Federal Register, Volume 36, No. 84, Friday, April 30, 1971.

²Scott Research Laboratories, Inc., Development of Representative Driving Patterns at Various Average Route Speeds, EPA No. 68-02-1301 (6-73).
February 11, 1974, San Bernadino, California.

³Ibid., pp. 3-1 through 4-18.

⁴Sturman, G. M., The Effect of Highways on the Environment, May, 1970.

⁵Steering Group and Working Group Appointed by the Minister of Transport, Great Britain, Cars for Cities, 1967.

CHAPTER II

DATA DEVELOPMENT

CHAPTER II

DATA DEVELOPMENT

An assessment of highway line sources with respect to emissions requires that the road network under study be classified according to a set of parameters that allows appropriate hierarchical analysis, since some links will be much more critical from an emissions standpoint than others.

The data collection effort focused on those areas designated as urban and urbanizing. The East-West Gateway Coordinating Council defines these areas to include the City of St. Louis, St. Louis County, and parts of St. Charles and Jefferson Counties in Missouri. In Illinois part of Monroe, and Madison and St. Clair Counties are included.

Roadway data was collected within this area in light of emissions and their sensitivity to highway functional class, volume and composition of vehicles present, and the operational characteristics of vehicles related to both traffic volume and average speed alterations due to roadway alignment and profile. Other data collected, such as the intensity and type of the adjacent land use is relevant, along with certain highway design characteristics, to the localized air quality.

A number of agencies were contacted to compile the inventory. They included the East-West Gateway Coordinating Council, Missouri State Highway Department Jefferson City Office and St. Louis Office, the Region VII Office of the Illinois Department of Transportation, the Office of the Deputy Commissioner of the City of St. Louis Street Department, St. Louis County Division of Highways and Traffic, and the City of St. Charles.

A working set of highway links was established through the use of East-West Gateway's 7001 link-node map for the entire region under

study. Actual street names for all links were recorded from maps provided by the Auto Club of Missouri.

The initial major data collection effort was for the freeway functional class. Volume and vehicle attributes sought for each link were average daily traffic, peak hour traffic, hourly distribution of traffic, percent of heavy duty vehicles, and the directional distribution of traffic. All the above were obtained for the Missouri counties except percent heavy duty vehicles. However, in Illinois, only average daily traffic and percent heavy duty vehicle data was available.

Link attributes sought to describe vehicle operating characteristics were the volume to capacity ratio (V/C), peak hour speed by direction, off peak speed by direction, frequency of complex interchanges, lane drops and existing freeway bottleneck sections. The capacity information obtained from East-West Gateway was a representative daily capacity factored down to obtain a peak hour V/C ratio at level of service E.¹ An hourly V/C ratio table was given in the SAPOLLUT users manual based on an hourly speed distribution. Current peak hour speed data by direction was available for 75% of the area freeway links from East-West Gateway. Through the cooperation of the Illinois Department of Transportation and local agencies in St. Louis and St. Louis County, a complete set of links with complex interchanges, lane drops, and major freeway bottlenecks was compiled. The study team drove the network to collect information on roadway topography as a freeway link descriptor. Four terrain types were categorized: high fill, deep cut, rolling terrain, and level terrain.

As a final set of link descriptors for the freeway functional class, land use by type and intensity was sought. East-West Gateway provided an area map delineating high density regionally oriented land uses. Types included commercial, educational, medical, recreational, and airport.

The next major data collection effort was for principal arterial roadways. These roadways are characterized by a minimum number of intersections at grade. Such intersections are typically designated to provide channelization and signal synchronization to enhance the traffic movement along the arterial. The link attributes sought to describe volume and vehicle composition were as before, average daily traffic, peak hour traffic, hourly distribution of traffic, percent of heavy duty vehicles, and the directional distribution of travel. The same data gaps that existed for freeways exist for principal arterials in this attribute set. In addition to volume to capacity ratios, peak hour directional speed, off peak directional speed, lane drops, and general roadway bottlenecks were collected as link attributes for vehicle operating characteristics. Further, information concerning the degree of progressive movement was sought. Progressive movement is typified by a continuous flow of a platoon of vehicles over long stretches of highway. Such movement can be induced by the type of signal systems employed at intersections and the distribution of one-way streets. It is desirable to separate out links that have progressive movement since the degree of vehicle delay is much less than on arterials without it. Attributes for progression included links with pre-timed signal systems, physically interconnected signal

systems, and one-way street flows. The City of St. Louis, St. Louis County, Missouri State Highway Department, and the Illinois Department of Transportation provided us with complete information on this attribute set.

As in the freeway case, sensitive land uses were included as link descriptors. In addition to those already listed, the central business district was included as an area type in the inventory. This was done to aid in the delineation of an additional topography attribute, the categorization of street canyons.

The final data collection report was for minor arterial roadways. Such roadways provide for both traffic movement and land access. The data sought was the same for principal arterials and had the same data gaps.

In total, 28 link descriptors across three functional classes of highway were assembled. This data was compiled on an individual link basis, coded for keypunching and readied for input into the software system to be described in Chapters III and IV. The collection and coding format is illustrated in Appendix B.

Footnotes Chapter II

¹Level of Service E represents operation of the system with volume at or near capacity. Operating speed is relatively low, flow is unstable and momentary stoppage occurs; the system is on the verge of complete jam and saturation with attendant congestion effects.

CHAPTER III

MODEL DEVELOPMENT

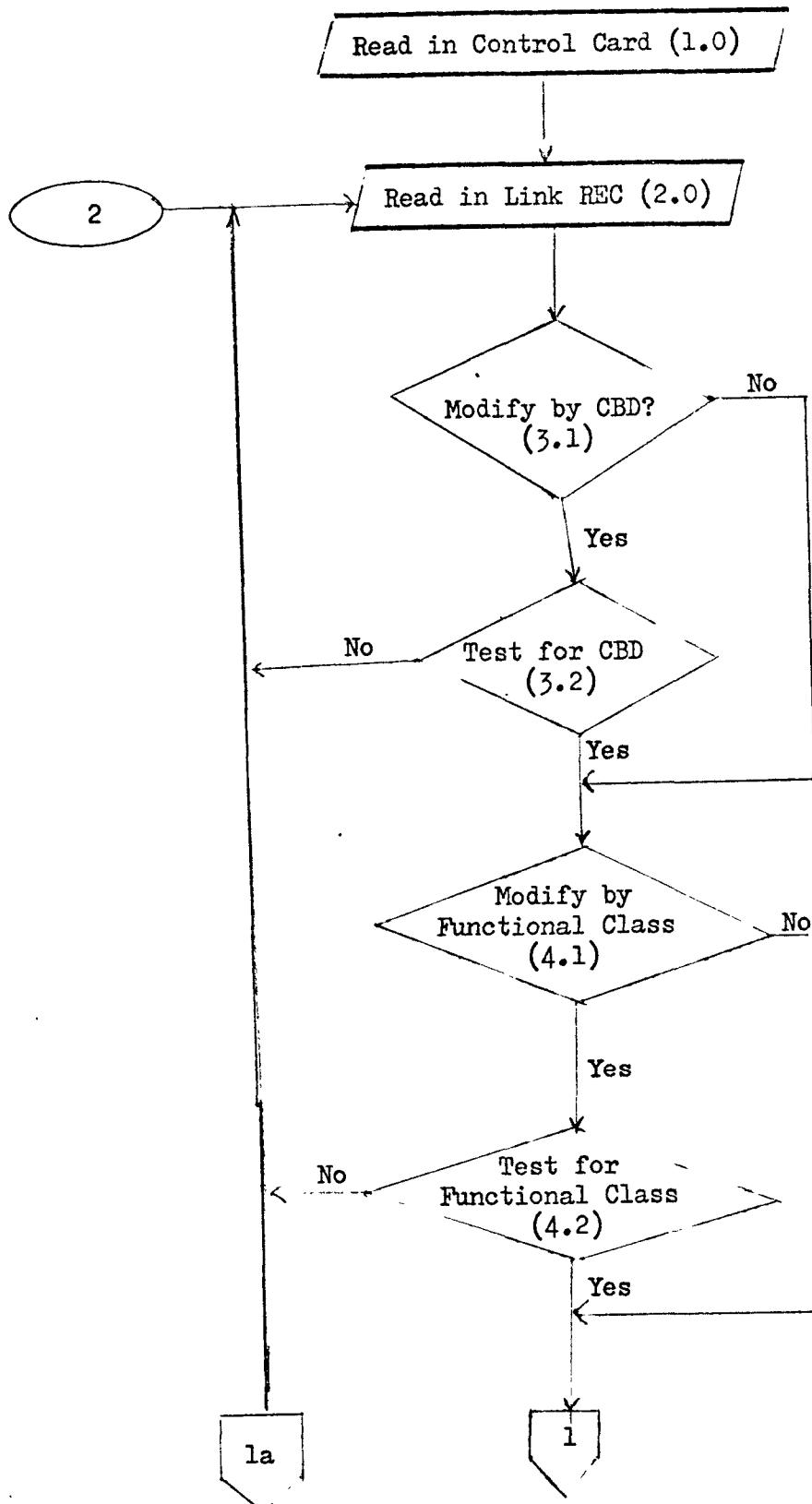
CHAPTER III

MODEL DEVELOPMENT

A. OVERVIEW OF MODEL LOGIC

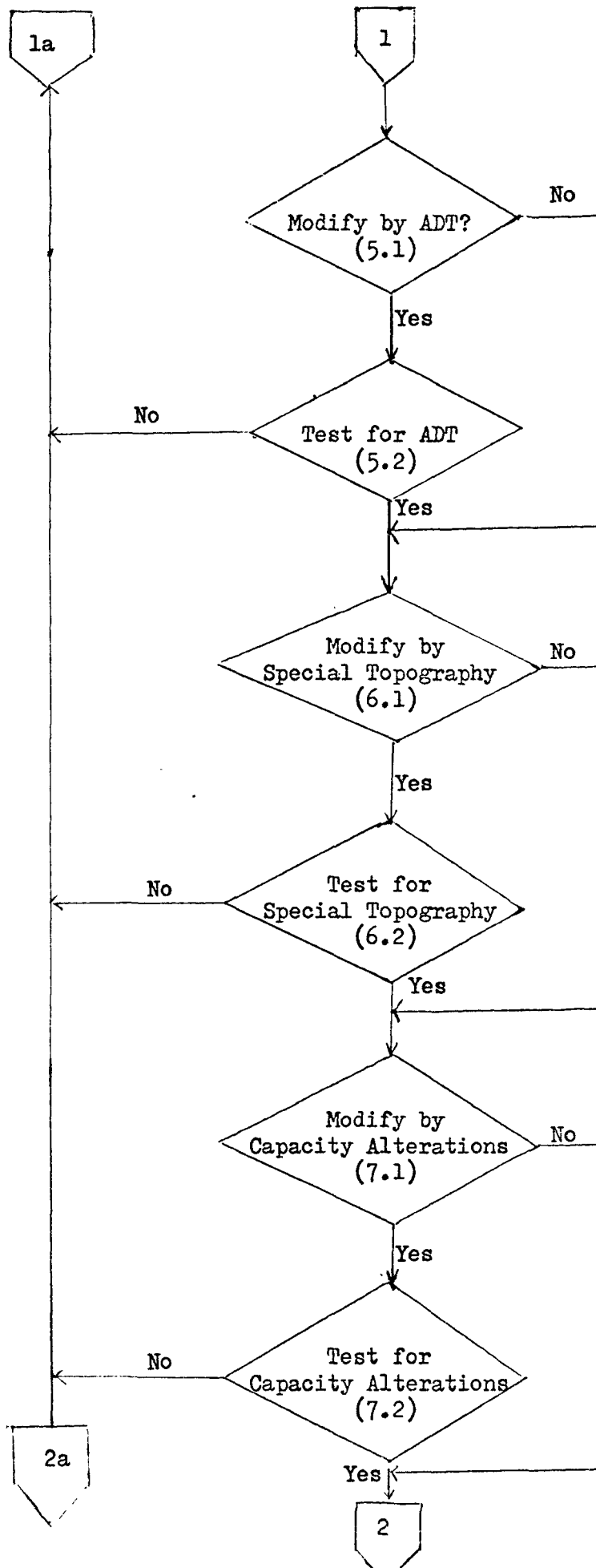
This chapter describes the logic construct of the network sensitivity model NETSEN, and its interface with the emissions estimation model SAPOLLUT. The flow chart of the master logic for the model NETSEN is shown in Figure 10. In general, the model works by defining a series of sequential tests of presence of network related attributes shown in steps 2.0-13.0. These are presence of the link within the Central Business District (i.e., the Downtown Core Commercial Area), functional class of the link, its ADT, presence of special topography, capacity alterations, presence of sensitive land uses, presence of progressive movement, speed difference, truck volumes, and V/C ratio. After reading the coded link data records in, with step 2.0, each link is tested to sort and classify it according to combinations of attributes present in it. Those groups of links thus containing certain combinations specified in the control card in step 1.0 are then output to SAPOLLUT for use in estimating emissions. A complete description of the software documentation is given in Appendix A. Two specific points are important in overviewing the logic at this point:

- 1.) The network and any link subset component of it can be tested at any level of data attributes relevant, from very gross descriptions containing only ADT information, to very refined descriptions of the network, classifying and locating all of the attributes shown in steps 2.0-13.0 on the network.

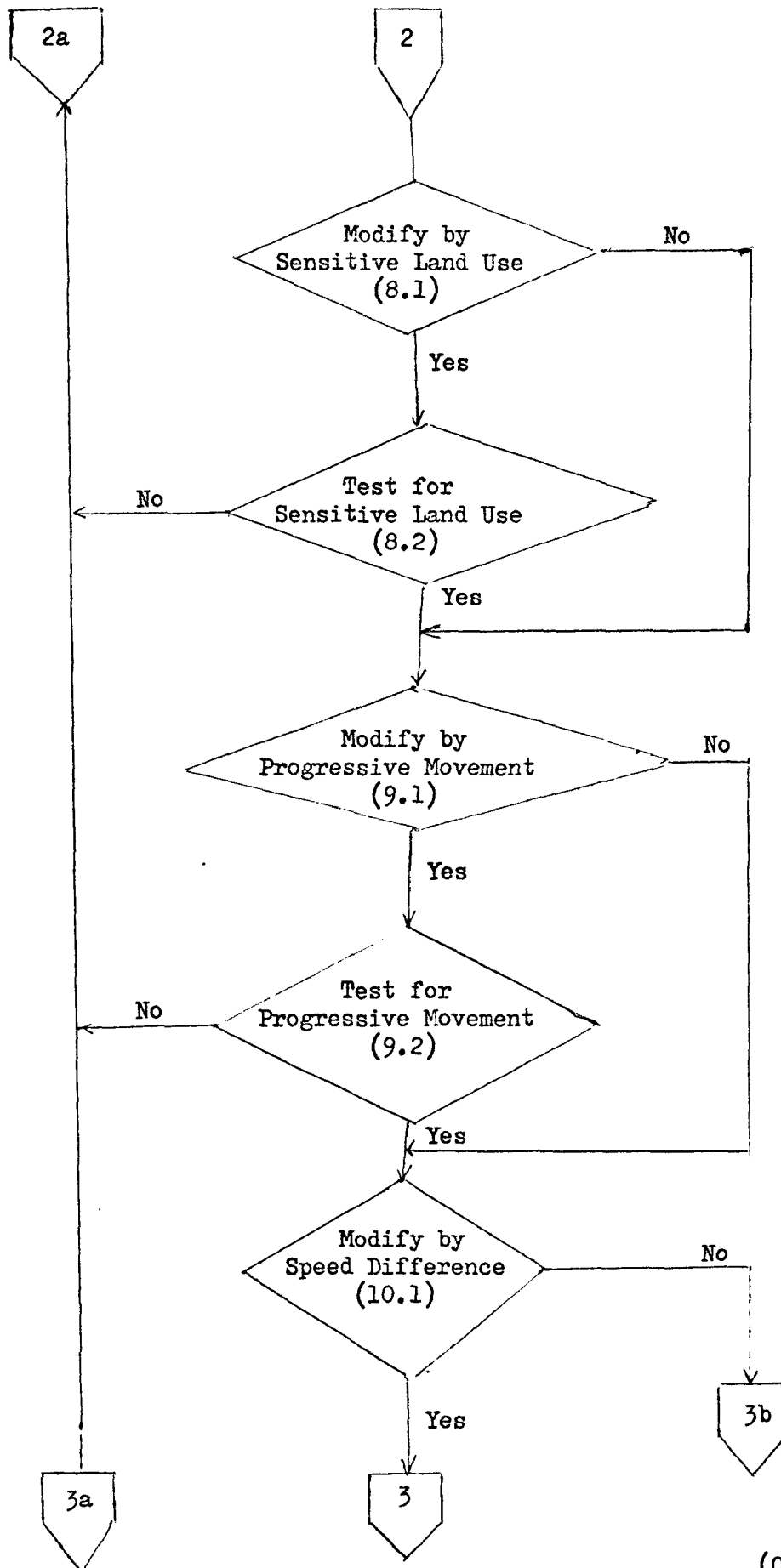


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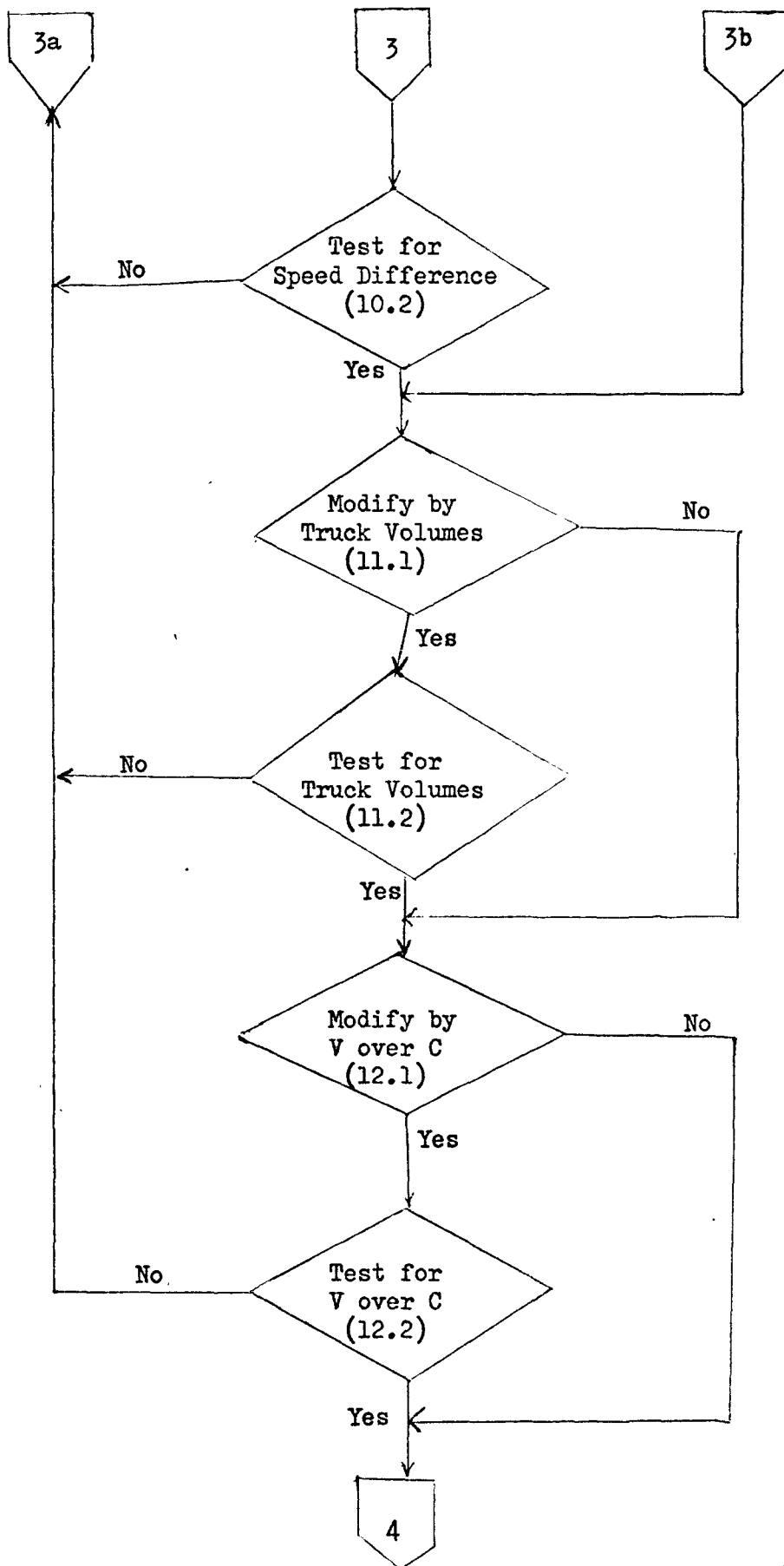
FIGURE 10. Master Logic of NETSEN Model



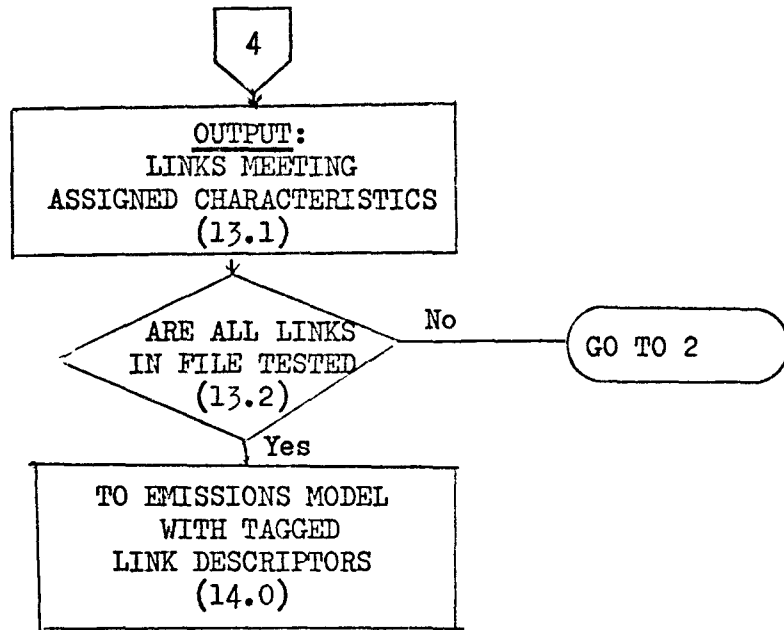
(Continued)



(Continued)



(Continued)



2. The level of attribute refinement chosen to be tested for may be varied with the refinement of detail of data present on the network the user has access to, or the level of refinement deemed necessary for the user to study emissions. Thus, complete flexibility exists in describing the traffic related behavioral aspects of the network as related to emissions estimation.

B. SOFTWARE SYSTEM DEVELOPMENT

A discussion of the formal software system and interface with SAPOLLUT should be prefaced with brief mention of the traditional Urban Transportation Planning (UTP) background of SAPOLLUT. The implication is that the model was designed to link to the FHWA programming battery which performs the UTP process of trip generation, trip distribution and traffic assignment, with the attendant problem of using a loaded traffic assignment network versus actual ground counts.¹ The design of the UTP process makes it necessary to modify some software usage in order to use realistic ground counts in SAPOLLUT.

The completed software system correctly employing these modifications is shown in Figure 11. The system begins with the sequential file of the network link records of data attributes (1.1). The complete documentation of the format of this file is in Appendix A. The system branch containing program modules 1.2, 1.3 and 1.4 is an initialization routine executed only one time to set up the system's

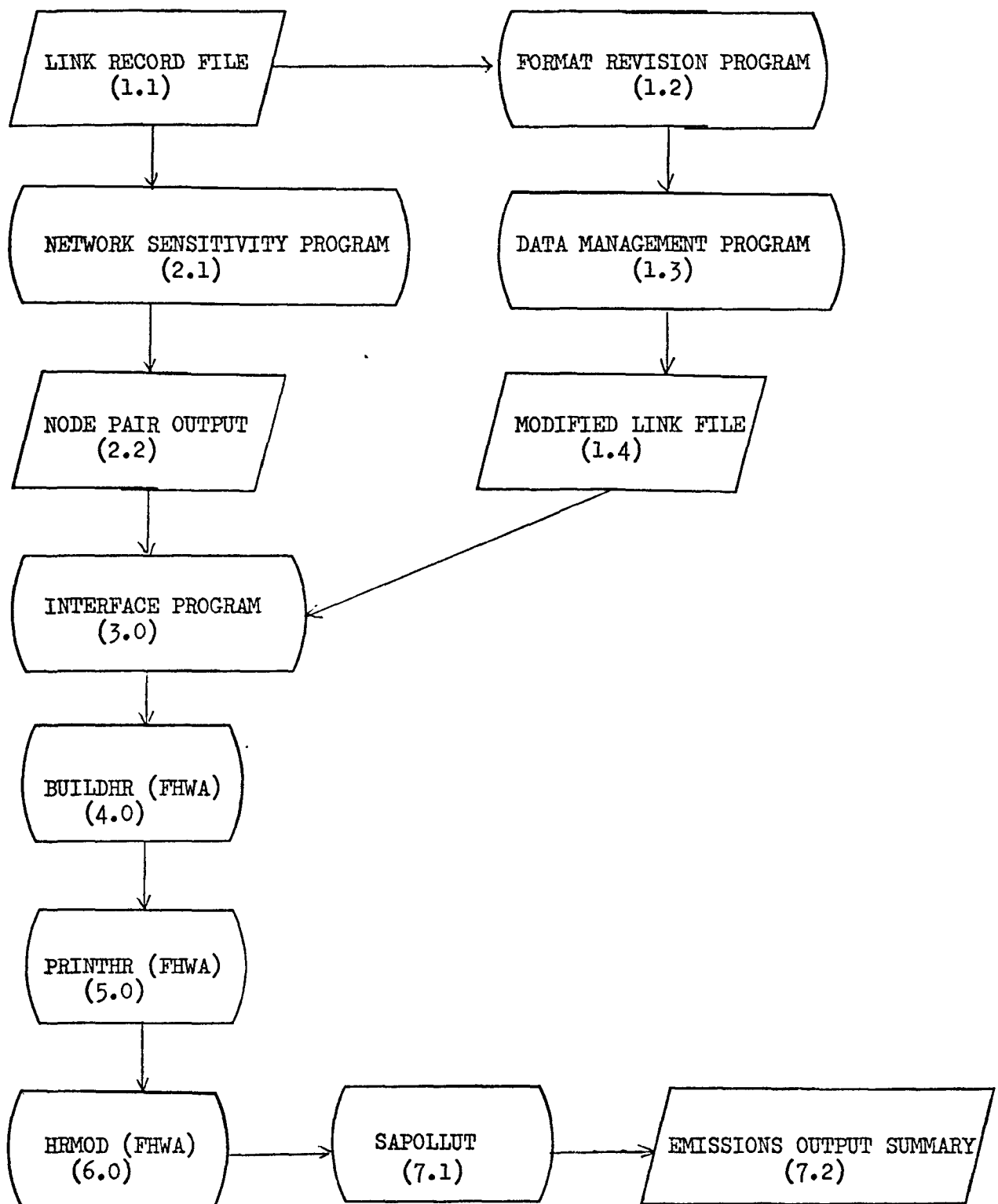


FIGURE 11. Traffic Emissions Software System

operation. The format revision program HRCVRT (1.2), takes the link record file as input and transforms it into output which will eventually be in a usable format for input into the FHWA program BUILDHR in step 4.0.

As such, module 1.3, referred to as the Data Management Program, accepts as input the link records from the Format Revision Program. The program creates what is called an indexed sequential data set. Essentially, this implies attaching a key to each link record so that it may later be retrieved with a single command, obviating a search procedure. The output of the program, termed a modified link (1.4) file, is essentially the same as its input except for the above keyed reorganization to speed access. It is important to emphasize that this program does not make any functional changes in the link records and its function could be performed elsewhere in the system. As noted earlier, this program is only executed once for all runs of NETSEN.

The next program in the software is the Interface Program (3.0), and as its name implies, it is the heart of the interfacing procedure. It accepts input from two places. First, it accepts a node pair output (2.2) from the NETSEN Program (2.1) which has passed all logic tests in that program. It then uses this node pair as a key to retrieve with a single statement the link record from 1.4 which is identified by the node pair. The program then processes the link by producing a dummy link to connect to its A-node if the previous link already processed does not have a B-node which is the same as the current A-node. The program then checks to see if the A-node is numerically less than the B-node, and if so the two are reversed. Further action takes the sum

of the A-B volume count and the B-A volume count and places this sum minus 1000 in an A-B count location. The program then makes a series of edit checks to assure that valid links or dummy links do not violate any of the traffic assignment coding conventions for leg numbers and to assure that the proper count volumes are passed to SAPOLLUT. The output is a network compatible to the historical record building program, BUILDHR, in 4.0.

The next program in the software system is the FHWA BUILDHR program. The program accepts link records as input, and functionally, the program performs edit checking on them for consistency in coding, ultimately outputting a binary historical record for each link and also one for each node. The types of edit checking done by BUILDHR include checking for unusually long links, excessively large volume-to-capacity ratios as well as duplicate node and leg numbers.

Another FHWA program, PRINTHR (5.0), follows in the software system. The program accepts the binary historical records as input from BUILDHR and prepares a printed summary of information in the records which is useful in checking for proper operation of preceding programs as well as for interpreting the output of SAPOLLUT on the basis of a specific set of links. Although this program is not functionally necessary for operation of the system, it provides useful information at a small cost.

The final interface program preceding SAPOLLUT is the FHWA program, HERMOD (6.0). This program is necessary because of SAPOLLUT's orientation toward traffic assignment loaded networks. Although the basic historical record has ground count information included in it, SAPOLLUT

can not use it in its storage location. It is necessary to relocate actual ground count data from their storage locations in the historical record to those storage locations where traffic assignment loads would normally be. The program HRMOD is used to shift the ground counts to the locations where the loads are normally situated. It then outputs this modified historical record to SAPOLLUT.

The last program in the software system is the emissions model SAPOLLUT (7.1). It receives the modified historical record from HRMOD and several control cards as input. It then proceeds to compute three types of emissions (HC, CO, NO_x) for three different area types (CBD, Central City, Suburb)² and two different functional classes, freeways and arterials, using vehicle miles of travel and average speed input, the latter developed by one of three alternative methods available to the program. The emissions output is currently available only in the aggregate, broken down by area type, hour of the day, and functional class across each emission type. By further dividing gross kilograms of emissions by vehicle-miles traveled it provides emissions in grams per vehicle-mile and grams per passenger-mile, given an average auto occupancy level.

In its current state the software system is fully automated in batch mode. Thus, when the network inventory is loaded onto a tape or disk data set and the initialization programs (Format Revision Program (1.2) and Data Management Program (1.3)) are run once, the system can execute several runs of NETSEN, examining the network at several levels of refinement, with one submittal to the computer. By providing a series of control cards to NETSEN, separate member data

sets for each run are created, saving the individual sets of node pairs to be processed all the way through SAPOLLUT on successive runs through the system. This enables the user to rapidly analyze the network with a set of pre-determined runs. It should be emphasized that no manual interface is necessary during this process. The following chapter will demonstrate the flexibility and solution properties of the system operation in documenting line sources for the St. Louis Air Quality Control Region.

Footnotes Chapter III

¹Program Documentation, Urban Transportation Planning, March 1972,
Federal Highway Administration. A loaded network is defined
as a transportation planning network in which the traffic volumes
on various links are the result of theoretical computation. A
ground count is defined as the actual recorded count of vehicles
on a roadway link, generally made by mechanical counting devices.

²Central Business District is the downtown commercial core; the Central
City is the non-commercial downtown core area, and the suburban
area is the outlying area of lesser density.

CHAPTER IV .

DOCUMENTATION OF EMISSION LINE SOURCES

CHAPTER IV

DOCUMENTATION OF EMISSION LINE SOURCES

A. Introduction-Issues in Defining Line Sources

As previously discussed, useful definition of line sources hinges on the capability to analyze the highway network and its traffic and design attributes at varying levels of detail, depending on the data availability and the level of spatial refinement sought in emissions information from SAPOLLUT. As such, this chapter demonstrates the development of a very unrefined definition of line sources, termed gross line sources, and the sequential refinement of such to a set of descriptors termed ultimate line sources. Each of these extremes of definition are consistent with the basic definition of a line source, given immediately below in Section B.

B. Basic Definitions-Delineation of Gross Line Sources

The following basic definition of a line source was employed in documenting emissions for the St. Louis Regional network:

"the smallest segment of inventoried roadway depictable with a given specific set of attributes for the roadway."

At the grossest level, the line sources were broken down in the categories depicted by Table 1. The X's indicate which ADT ranges were used for functional classes of roadway. In addition, separate baseline runs were made to select all freeways, all principal arterials, and all minor arterials within these ADT classes. The emissions produced by this gross ADT breakdown of line sources are summarized in the following set of figures and tables for 24-hour periods:

1. Figure 12 represents those freeway links in each of the ADT ranges from Table 1. Table 2 presents vehicle-miles travelled (VMT), total emissions, and emission rates for freeways in each of these ADT ranges.

2. Figure 13 represents those principal arterial links in each of the ADT ranges from Table 1. Table 3 presents VMT, total emissions, and rates for principal arterials in each of these ADT ranges.

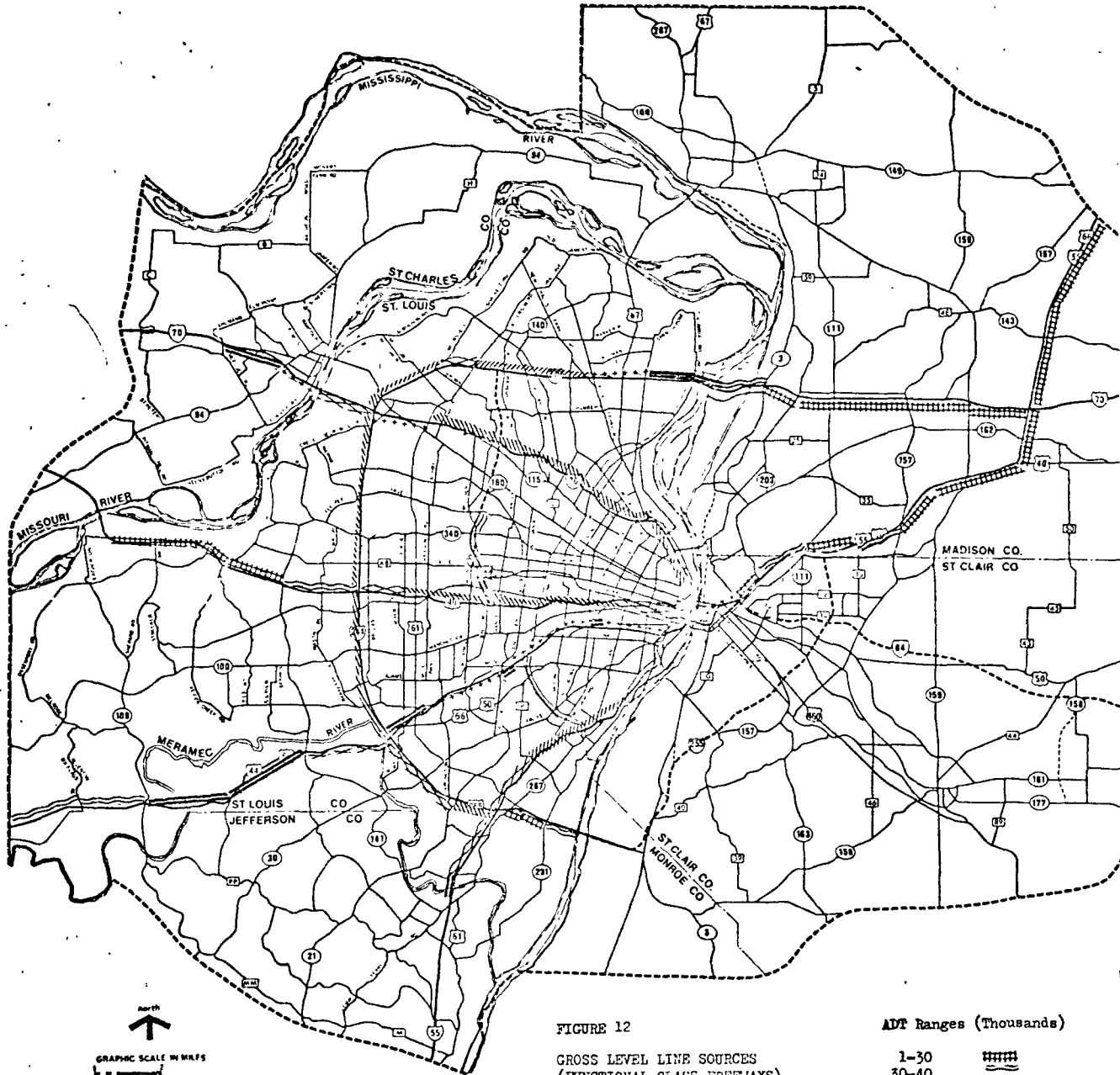
3. Figure 14 represents those minor arterial links in each of the ADT ranges from Table 1. Table 4 presents VMT, total emissions and rates for minor arterials in each of these ADT ranges.

A composite analysis of these tables leads to conclusions generally consistent with the literature, subject to subtle interpretation which must be employed when aggregating emissions information over all links under study in a particular functional class. Total kg of emissions over all categories (CO, NO_x, and HC) rank lowest for minor arterials, reflecting lowest VMT exposure. Both the freeways and principal arterials have very similar VMT totals. However, the freeways exhibit lower totals for CO and HC, and higher NO_x totals than the principal arterials, reflecting consistently lower average speeds on the arterials. The CO rates (grams/vehicle mile) show the most noticeable change across ADT ranges for all functional classes, with the most sharp changes associated with the last three ADT ranges in each class. This is apparently due to the distinct reduction in average speed associated with links at these particular ADT ranges nearing or exceeding saturation for their functional class. HC and NO_x, however, show generally stable emissions totals across all functional classes. The HC rate rises slightly, reflecting the aggregate impact across all links in the network of reduced average speed

ADT Ranges (Thousands)	Freeways	Principal Arterials	Minor Arterials
1-30	X		
30-40	X		
40-50	X		
50-60	X		
60-70	X		
70-200	X		
5-10		X	X
10-15		X	X
15-20		X	X
20-25		X	
25-30		X	
30-35		X	
35-40		X	
40-100		X	
20-40			X

TABLE 1

ADT RANGES USED FOR GROSS
LEVEL LINE SOURCE DEFINITION



north
 GRAPHIC SCALE IN MILES
 SYSTEM 7001

FIGURE 12
 GROSS LEVEL LINE SOURCES
 (FUNCTIONAL CLASS-FREWAYS)

ADT Ranges (Thousands)

1-30	|||||
30-40	||||
40-50	||||
50-60	||||
60-70	||||
70-200	||||

ADT Ranges (Thousands)

	1-30	30-40	40-50	50-60	60-70	70-200	Total
VMT (24 hours)	624,407	563,007	889,163	1,015,384	1,728,011	2,774,162	7,594,134
Emissions (kilo- grams/24-hr. period)							
CO	10,906	10,221	16,876	20,849	35,901	60,375	155,128
NO _x	5,809	5,133	7,929	8,701	14,747	23,163	65,482
HC	2,257	2,073	3,340	3,956	6,773	11,126	29,525
Emissions Rates (grams per vehicle-mile)							
CO	17	18	19	21	21	22	
NO _x	9	9	9	9	9	8	
HC	4	4	4	4	4	4	

TABLE 2

GROSS LEVEL LINE SOURCE EMISSIONS
(FUNCTIONAL CLASS-FREEWAYS)

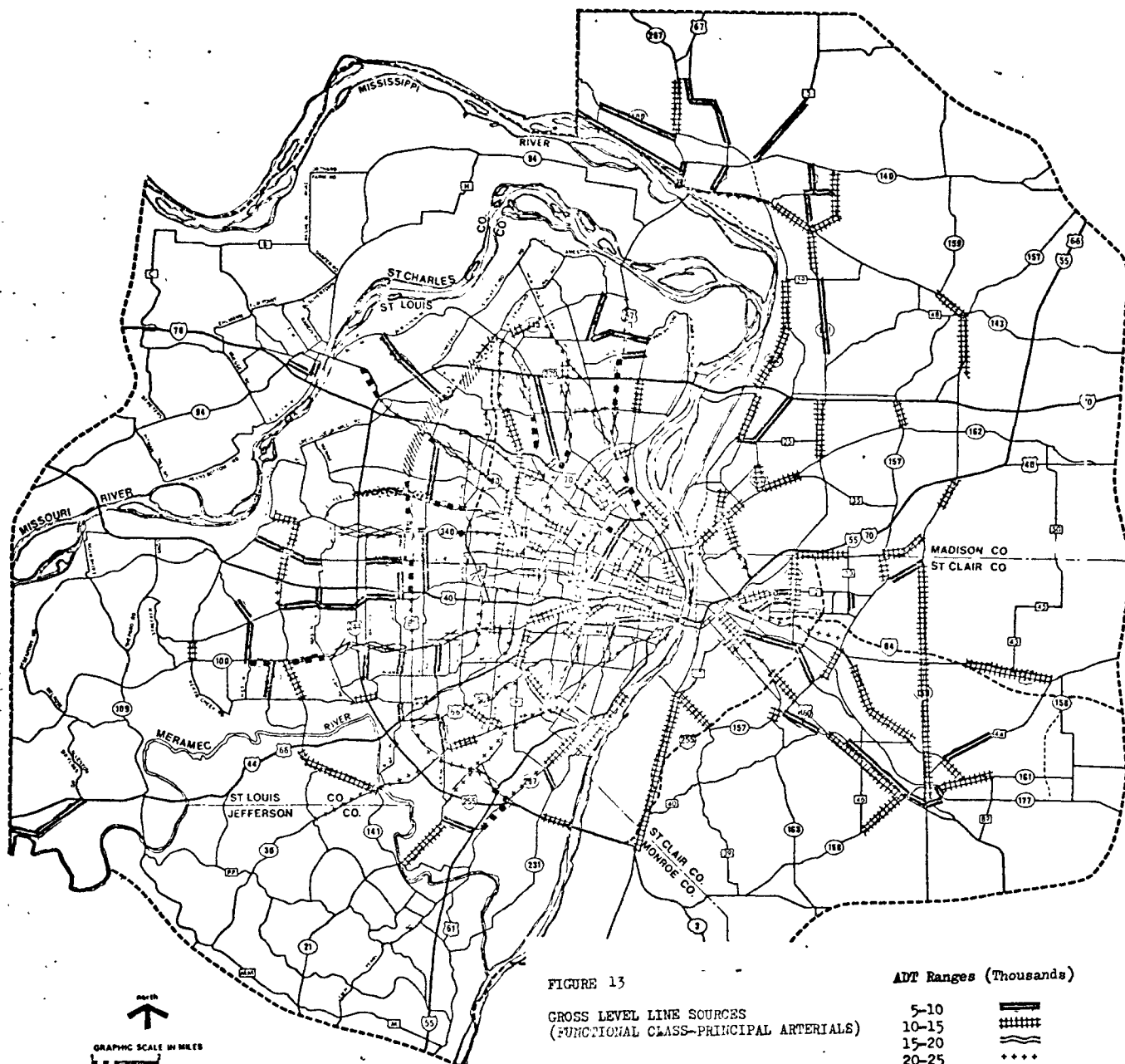


FIGURE 13

GROSS LEVEL LINE SOURCES
(FUNCTIONAL CLASS-PRINCIPAL ARTERIALS)

ADT Ranges (Thousands)

5-10	=====
10-15	#####
15-20	~~~~~
20-25	+++++
25-30	-----
30-35	-----
35-40	-----
40-100	/////

GRAPHIC SCALE IN MILES
SYSTEM 7001

ADT Ranges (Thousands)

	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-100	Total
ADT (24 hours)	672,528	1,576,094	1,482,781	1,564,475	1,190,306	622,281	134,964	205,360	7,448,789
Emissions (kilo-grams/24-hour period)									
CO	21,545	52,802	51,358	53,330	45,273	26,201	5,723	8,613	264,845
NO _x	3,848	8,913	8,380	8,856	6,644	3,450	748	1,132	41,971
HC	3,325	7,982	7,610	7,973	6,384	3,498	760	1,155	38,245
Emissions Rate (grams per veh.-mile)									
CO	32	34	35	34	38	42	42	46	
NO _x	6	6	6	6	6	6	6	6	
HC	5	5	5	5	5	6	6	6	

TABLE 3
GROSS LEVEL LINE SOURCE EMISSIONS
(FUNCTIONAL CLASS-PRINCIPAL ARTERIALS)

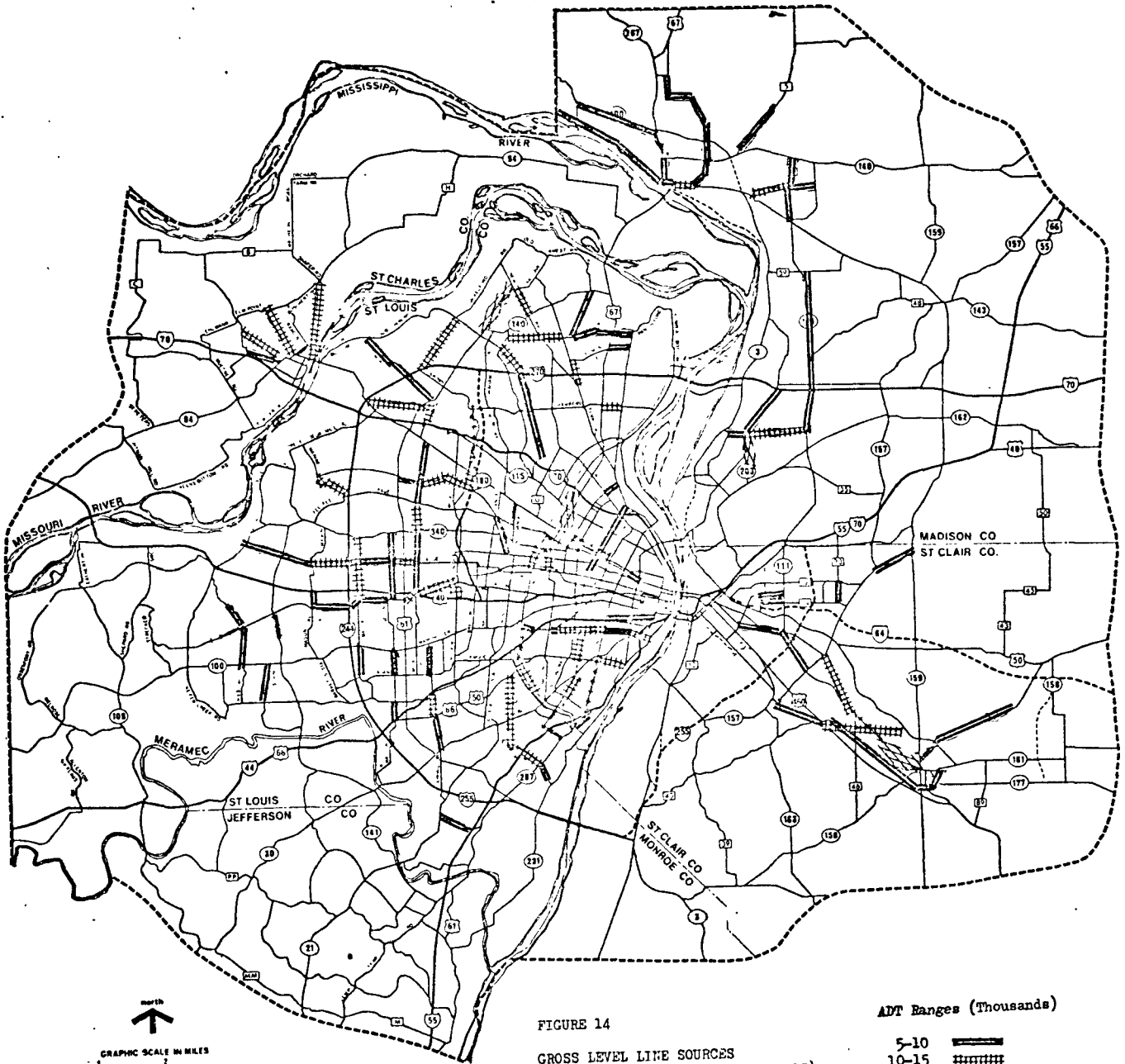
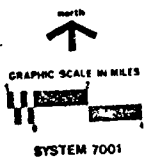


FIGURE 14
GROSS LEVEL LINE SOURCES
(FUNCTIONAL CLASS-MINOR ARTERIALS)



ADT Ranges (Thousands)

	5-10	10-15	15-20	20-40	Total
VMT (24 hours)	612,870	594,058	319,406	191,680	1,718,014
Emissions (kilo- grams/24-hour period)					
CO	20,330	19,713	12,611	9,695	62,349
NO _x	3,496	3,369	1,779	1,012	9,656
HC	3,076	2,994	1,744	1,193	9,007
Emissions Rates (g/veh.- mile)					
CO	33	33	39	51	
NO _x	6	6	6	5	
HC	5	5	5	6	

TABLE 4

GROSS LEVEL LINE SOURCE EMISSIONS
(FUNCTIONAL CLASS-MINOR ARTERIALS)

due to increased flow. The NO_x rate shows some reductions in the latter ADT ranges of each class. This is apparently due to reductions in the average speed on these higher volume sets of links which operate at or near saturated levels of congestion.

C. Refined Level - Ultimate Definition of Line Sources

The most refined level of line source definition used involved classifying the links by narrow ranges of ADT and combinations of special characteristics defining their attributes. These attributes have been noted in depth in Chapters II and III. The following paragraphs show some examples of typical 24-hour graphic and tabular information which form the ultimate definition of line sources for the St. Louis Air Quality Control Region. Detailed commentary will be reserved until synthesis of information occurs in Table 17.

The initial presentation in Table 5 exhibits the basic ADT ranges used in conjunction with the various combinations of attributes. Figure 15 represents those freeway links in the various ADT ranges for which none of the attributes of special topography, capacity alterations, or sensitive land use were present. Table 6 is an emissions summary of these links from Figure 15. Further, Figure 16 depicts those freeway links in various ADT ranges for which capacity alterations were present but not special topography or sensitive land use attributes. Their emissions are summarized in Table 7. Likewise, Figure 17 depicts those freeway links in various ADT ranges for which both special topography and capacity alterations were present, but sensitive land use attributes were not. Table 8 summarizes emissions for these particular links. Figure 18 represents those freeway links,

in various ADT ranges, for which the combination of attributes of special topography, capacity alterations and sensitive land use were present. Their emissions are summarized in Table 9 .

The next component series of figures and tables illustrates the most refined level of line source definition for principal arterials, using ADT ranges as noted in Table 5 . Figure 19 exhibits those principal arterial links in various ADT ranges which do not have any of the attributes of capacity alteration, progressive movement, or sensitive land use present. Table 10 summarizes emissions for these links. Figure 20 depicts those principal arterial links in various ADT ranges which had attributes of capacity alteration, but no attributes of progressive movement, or sensitive land use. Their emissions are summarized in Table 11. Further, Figure 21 illustrates those principal arterial links in various ADT ranges which have attributes of capacity alteration and progressive movement, but not sensitive land use. The emissions summary for these links is shown in Table 12. Figure 22 exhibits those principal arterial links in various ADT ranges which have all the attributes of capacity alteration, progressive movement, and sensitive land use. Their emissions are summarized in Table 13.

The final example of line source definitions is composed of minor arterials in the ADT ranges previously noted in Table 5. Figure 23 illustrates those minor arterial links in various ADT ranges which did not have any attributes of capacity alterations, progressive movement, or sensitive land use. Their emissions are summarized in Table 14. Figure 24 shows those minor arterial links in various

ADT Ranges (Thousands)	Freeways	Principal Arterials	Minor Arterials
5-10		X	X
10-15		X	X
15-20		X	X
20-25		X	
20-40			X
25-30		X	
30-35	X	X	
35-40	X	X	
40-45	X		
45-50	X		
50-55	X		
55-60	X		
60-65	X		
65-70	X		
70-200	X		
40-100		X	

TABLE 5

ADT RANGES USED FOR ULTIMATE
LINE SOURCE DEFINITION

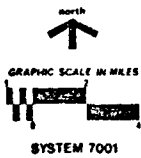
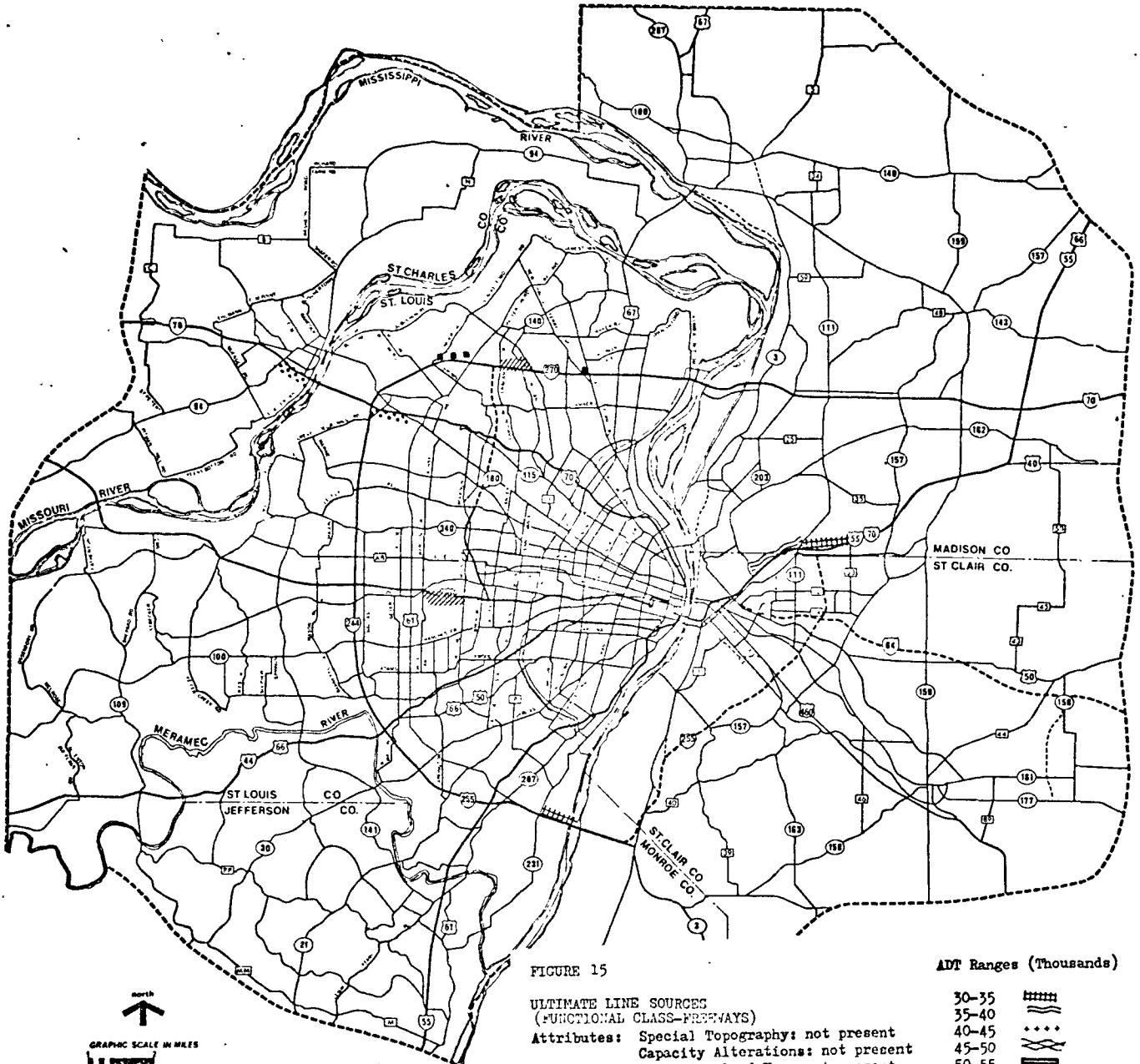


FIGURE 15

ULTIMATE LINE SOURCES
(FUNCTIONAL CLASS-FREWAYS)

Attributes: Special Topography: not present
Capacity Alterations: not present
Sensitive Land Use: not present

ADT Ranges (Thousands)

30-35	|||||
35-40	=====
40-45	.....
45-50	~~~~~
50-55	=====
55-60	.....
60-65	.....
65-70	.....
70-200	///////

ADT Ranges (Thousands)

	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-200	Total
VMT (24 hours)	90,462	0	0	0	0	153,325	0	124,945	245,958	614,677
Emissions (kilo- grams/24-hour period)										
CO	2,697	0	0	0	0	2,984	0	6,598	13,242	25,521
NO _x	690	0	0	0	0	1,350	0	809	1,570	4,419
HC	424	0	0	0	0	582	0	809	1,613	3,428
Emissions Rates (g/veh.- mile)										
CO	30	0	0	0	0	19	0	53	54	
NO _x	8	0	0	0	0	9	0	6	6	
HC	5	0	0	0	0	4	0	6	7	

TABLE 6

ULTIMATE LINE SOURCE EMISSIONS
(FUNCTIONAL CLASS - FREEWAYS)

Attributes: Special Topography: not present
Capacity Alterations: not present
Sensitive Land Use: not present

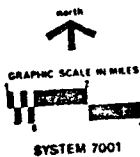
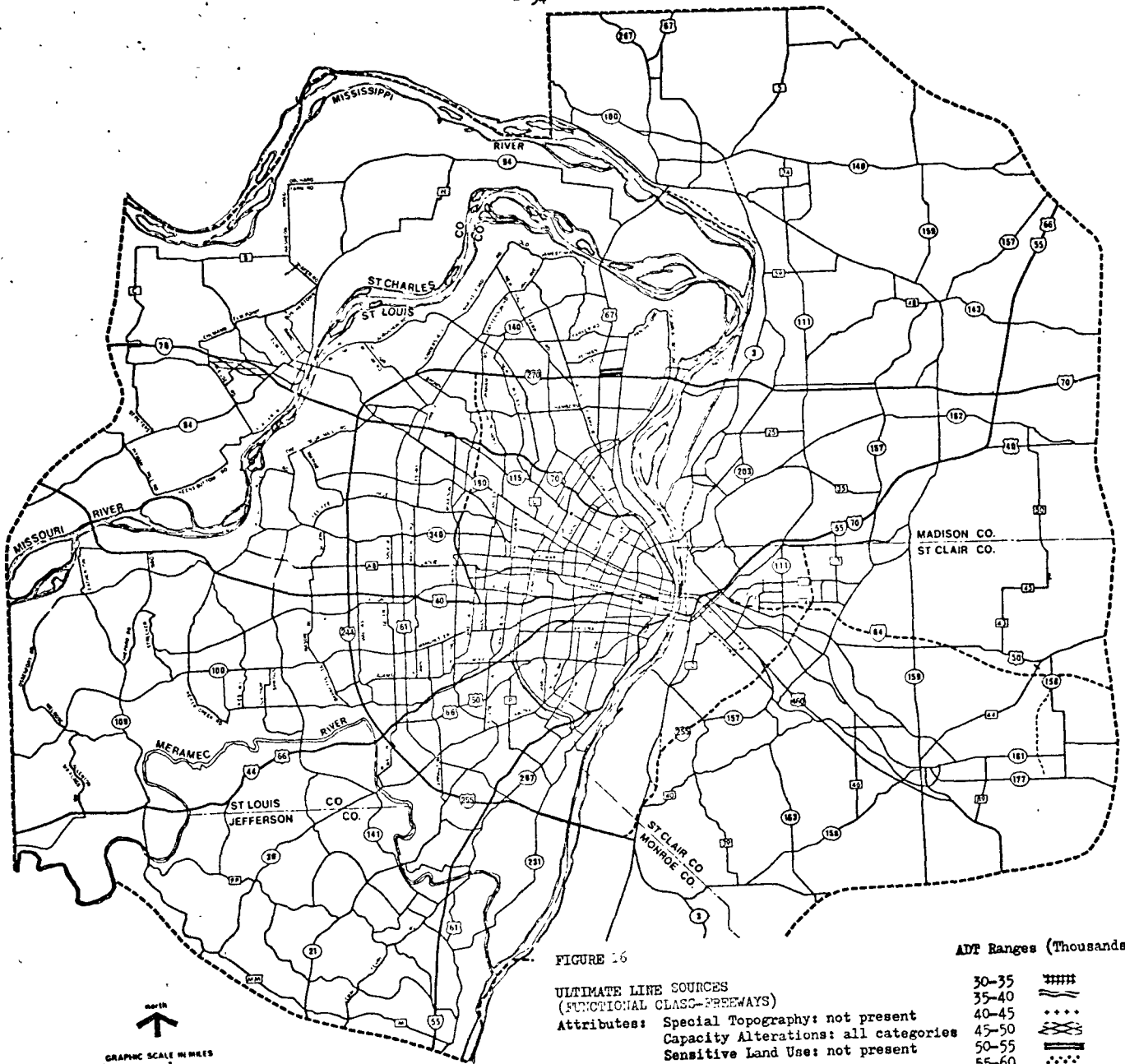


FIGURE 16

ULTIMATE LINE SOURCES
(FUNCTIONAL CLASS-FREWAYS)

Attributes: Special Topography: not present
Capacity Alterations: all categories
Sensitive Land Use: not present

ADT Ranges (Thousands)

30-35	|||||
35-40	=====
40-45	.....
45-50	~~~~~
50-55	=====
55-60	.....
60-65	~~~~~
65-70	=====
70-200	|||||

ADT Ranges (Thousands)

ADT Ranges (Thousands)	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-200	Total
VMT (24 hours)	0	0	0	133,200	53,388	0	0	0	0	186,588
Emissions (kilo-grams/24-hour period)										
CO	0	0	0	2,520	355	0	0	0	0	2,875
NO _x	0	0	0	1,189	322	0	0	0	0	1,511
HC	0	0	0	500	46	0	0	0	0	546
Emissions Rates (g/veh.-mile)										
CO	0	0	0	19	46	0	0	0	0	
NO _x	0	0	0	9	7	0	0	0	0	
HC	0	0	0	4	6	0	0	0	0	

TABLE 7

ULTIMATE LINE SOURCE EMISSIONS
(FUNCTIONAL CLASS - FREEWAYS)

Attributes: Special Topography: not present
Capacity Alterations: all categories
Sensitive Land Use: not present

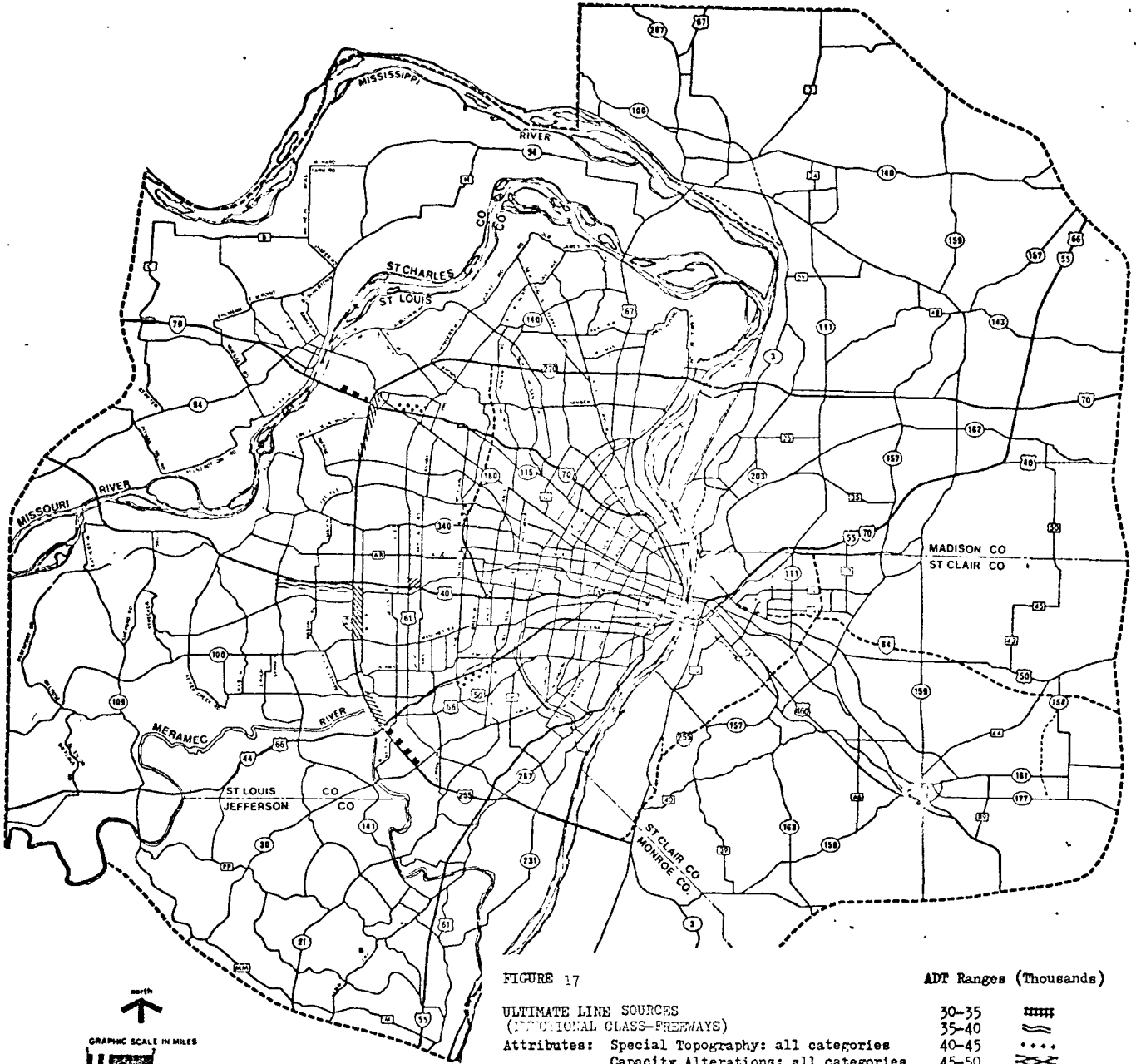


FIGURE 17

ULTIMATE LINE SOURCES
(FUNCTIONAL CLASS-FREWAYS)

Attributes: Special Topography: all categories
Capacity Alterations: all categories
Sensitive Land Use: not present

ADT Ranges (Thousands)

30-35	|||||
35-40	||||
40-45	||||
45-50	||||
50-55	||||
55-60	||||
60-65	||||
65-70	||||
70-200	||||

GRAPHIC SCALE IN MILES
SYSTEM 7001

ADT Ranges (Thousands)

	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-200	Total
VMT (24 hours)	29,475	122,582	22,373	0	0	180,470	16,210	256,155	320,842	948,107
Emissions (kilo- grams/24-hour period)										
CO	532	2,247	558	0	0	3,648	410	10,295	16,091	33,781
NO _x	269	1,112	172	0	0	1,562	124	1,876	2,084	7,199
HC	108	453	96	0	0	697	70	1,400	2,016	4,840
Emissions Rates (g/veh.- mile)										
CO	18	18	25	0	0	20	25	40	50	
NO _x	9	9	8	0	0	9	8	7	6	
HC	4	4	4	0	0	4	4	5	6	

TABLE 8

ULTIMATE LINE SOURCE EMISSIONS
(FUNCTIONAL CLASS-FREWAYS)

Attributes: Special Topography: all categories
Capacity Alterations: all categories
Sensitive Land Use: not present

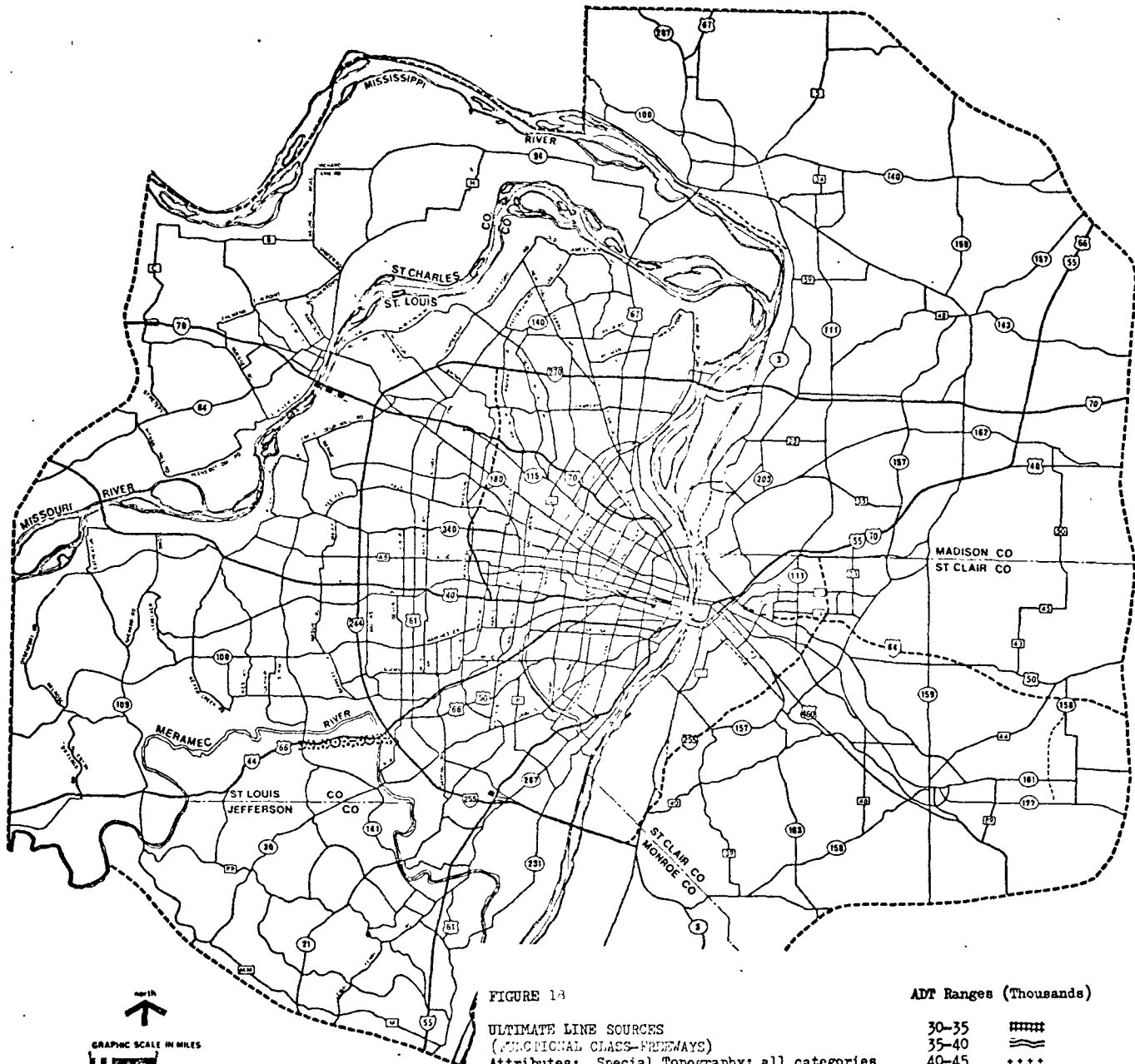


FIGURE 1A

ULTIMATE LINE SOURCES

(FUNCTIONAL CLASS-FREWAYS)

Attributes: Special Topography: all categories
Capacity Alterations: all categories
Sensitive Land Use: all categories

ADT Ranges (Thousands)

30-35	|||||
35-40	=====
40-45	.....
45-50	|||||
50-55	|||||
55-60	|||||
60-65	|||||
65-70	|||||
70-200	|||||

ADT Ranges (Thousands)

	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-200	Total
VMT (24 hours)	0	17,589	0	0	0	11,158	267,212	138,132	36,184	470,275
Emissions (kilo- grams/24-hour period)										
CO	0	666	0	0	0	551	5,883	4,572	972	12,644
NO _x	0	126	0	0	0	71	2,293	1,008	269	3,767
HC	0	94	0	0	0	70	1,071	683	163	2,081
Emissions Rates (g/veh.- mile)										
CO	0	38	0	0	0	49	22	33	27	
NO _x	0	7	0	0	0	6	9	7	7	
HC	0	5	0	0	0	6	4	5	4	

TABLE 2

ULTIMATE LINE SOURCE EMISSIONS (FUNCTIONAL CLASS-FREEMAYS)

Attributes: Special Topography: all categories
Capacity Alterations: all categories
Sensitive Land Use: all categories



FIGURE 19

ULTIMATE LINE SOURCES
(FUNCTIONAL CLASS-PRINCIPAL ARTERIALS)
Attributes: Capacity Alterations: not present
Progressive Movement: not present
Sensitive Land Use: not present

ADT Ranges (Thousands)

5-10

10-15

15-20

20-25

25-30
30-3530-35
35-40

35-40
40-100

40-100



ADT Ranges (Thousands)

	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-100	Total
WAT (24 hours)	440,668	921,497	643,503	921,216	368,674	246,413	23,179	110,994	3,676,144
Emissions (kilo-grams/24-hour period)									
CO	14,094	30,530	21,804	31,373	14,326	12,140	728	4,974	129,969
NO _x	2,522	5,234	3,655	5,237	2,057	1,341	133	607	20,786
HC	2,178	4,634	3,267	4,680	1,995	1,500	113	645	19,012
Emissions Rate (grams per veh.-mile)									
CO	32	33	34	34	39	49	31	45	
NO _x	6	6	6	6	6	5	6	5	
HC	5	5	5	5	5	6	5	6	

TABLE 10

ULTIMATE LINE SOURCE EMISSIONS
(FUNCTIONAL CLASS-PRINCIPAL ARTERIALS)

Attributes: Capacity Alterations: not present
Progressive Movement: not present
Sensitive Land Use: not present

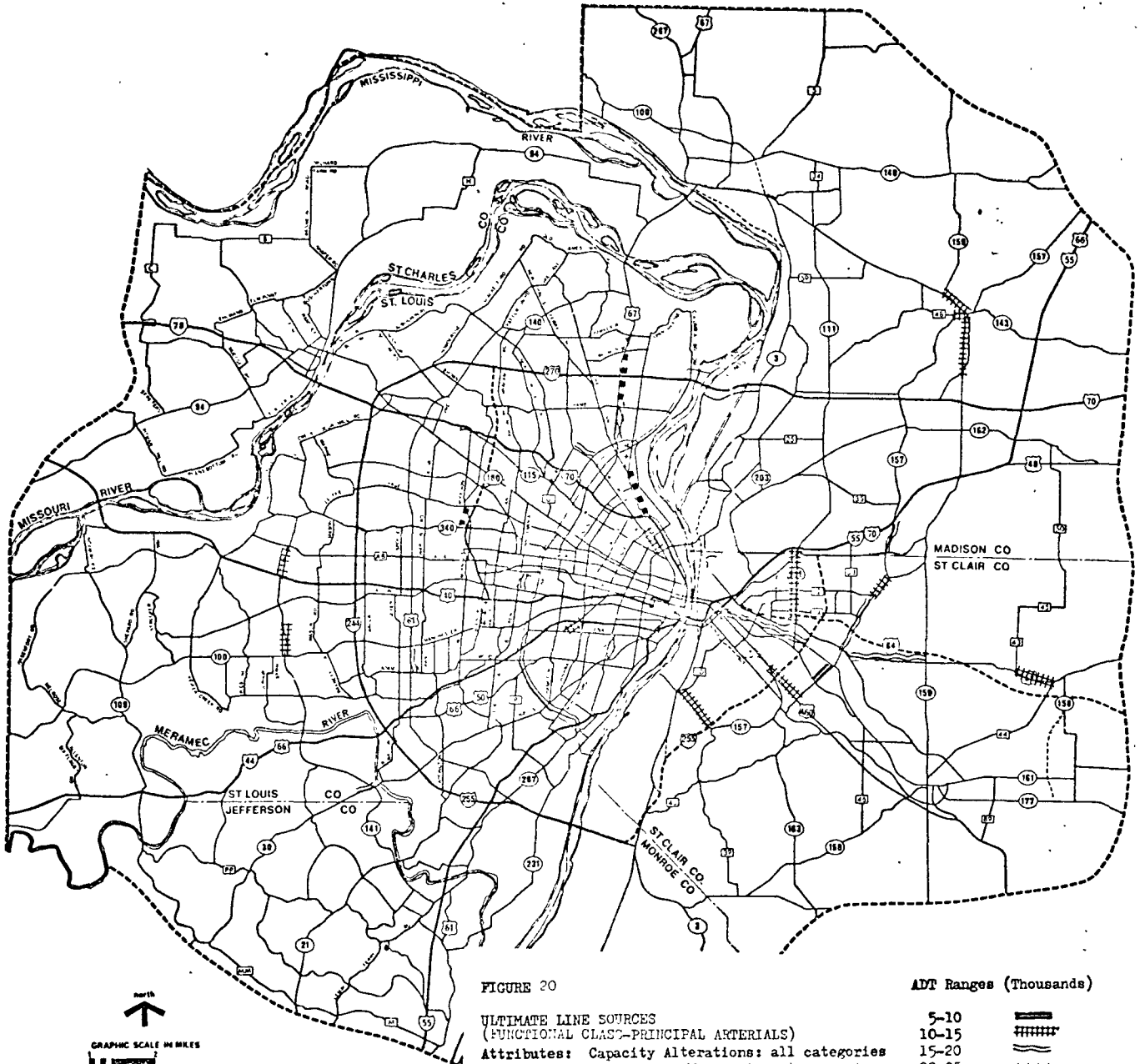


FIGURE 20

ULTIMATE LINE SOURCES
(FUNCTIONAL CLASS - PRINCIPAL ARTERIALS)

Attributes: Capacity Alterations: all categories
Progressive Movement: not present
Sensitive Land Use: not present

ADT Ranges (Thousands)

5-10	=====
10-15	#####
15-20	~~~~~
20-25	+++++
25-30	-----
30-35	.....
35-40	.....
40-100	.....

North
GRAPHIC SCALE IN MILES
SYSTEM 7001

ADT ranges which have attributes of capacity alteration, but no progressive movement or sensitive land use. Emissions from the link subset are summarized in Table 15. Figure 25 depicts those minor arterial links in various ADT ranges which have attributes of capacity alteration and progressive movement, but no sensitive land use attributes. Table 16 summarizes these particular emissions. Finally, there are no minor arterial links in various ADT ranges which have all the attributes of capacity alteration, progressive movement, and sensitive land use. The synthesis of all possible component attribute groups over all functional classes represents the most refined and accurate level of line source definition for the St. Louis Air Quality Control Region on the basis of current network data. Discussion of the implications of this synthesis will occur in the immediately following section.

D. Synthesis of Line Source Information

The synthesis of 24-hour detailed definition and description of line source information provided by NETSEN, and their resulting emissions computations from SAPOLLUT is shown in Table 17. The aggregate network of line sources encompasses approximately 1,370 miles of roadway, with a total of nearly 17 million vehicle miles of travel daily. Approximately 45% of this VMT exposure occurs on freeways, 44% on principal arterials, and the remaining 11% on minor arterials. In terms of mileage, 195 miles is composed of freeway line sources, representing the freeway corridors of the region, and the principal and minor arterials comprise the remaining 1,175 miles of line sources. The aggregate 24-hour emissions are 482,322 kg. of CO, 117,109 kg. of NO_x and 76,777 kg. of HC. A component analysis in Table 18 shows that

ADT Ranges (Thousands)

	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-100	Total
VMT (24 hours)	25,200	160,958	112,732	157,693	82,300	88,483	10,950	0	638,316
Emissions (kilo- grams/24-hour period)									
CO	829	5,464	4,191	5,994	3,166	3,408	362	0	23,414
NOx	143	906	627	870	460	493	62	0	3,561
HC	127	822	599	850	443	478	55	0	3,374
Emissions Rate (grams per veh.-mile)									
CO	33	34	37	38	38	39	33	0	
NOx	6	6	6	6	6	6	6	0	
HC	5	5	5	5	5	5	5	0	

TABLE 11

ULTIMATE LINE SOURCE EMISSIONS
(FUNCTIONAL CLASS-PRINCIPAL ARTERIALS)

Attributes: Capacity Alterations: all categories
Progressive Movement: not present
Sensitive Land Use: not present

ADT Ranges (Thousands)

	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-100	Total
VMT (24 hours)	0	38,160	17,780	0	46,867	40,470	0	0	143,277
Emissions (kilo-grams/24-hour period)									
CO	0	1,245	841	0	1,748	1,624	0	0	5,458
NO _x	0	217	96	0	261	225	0	0	799
HC	0	191	106	0	250	223	0	0	770
Emissions Rate (grams per veh.-mile)									
CO	0	33	47	0	37	40	0	0	
NO _x	0	6	5	0	6	6	0	0	
HC	0	5	6	0	5	5	0	0	

TABLE 12

ULTIMATE LINE SOURCE EMISSIONS
(FUNCTIONAL CLASS-PRINCIPAL ARTERIALS)

Attributes: Capacity Alterations: all categories
Progressive Movement: all categories
Sensitive Land Use: not present

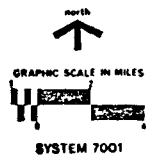
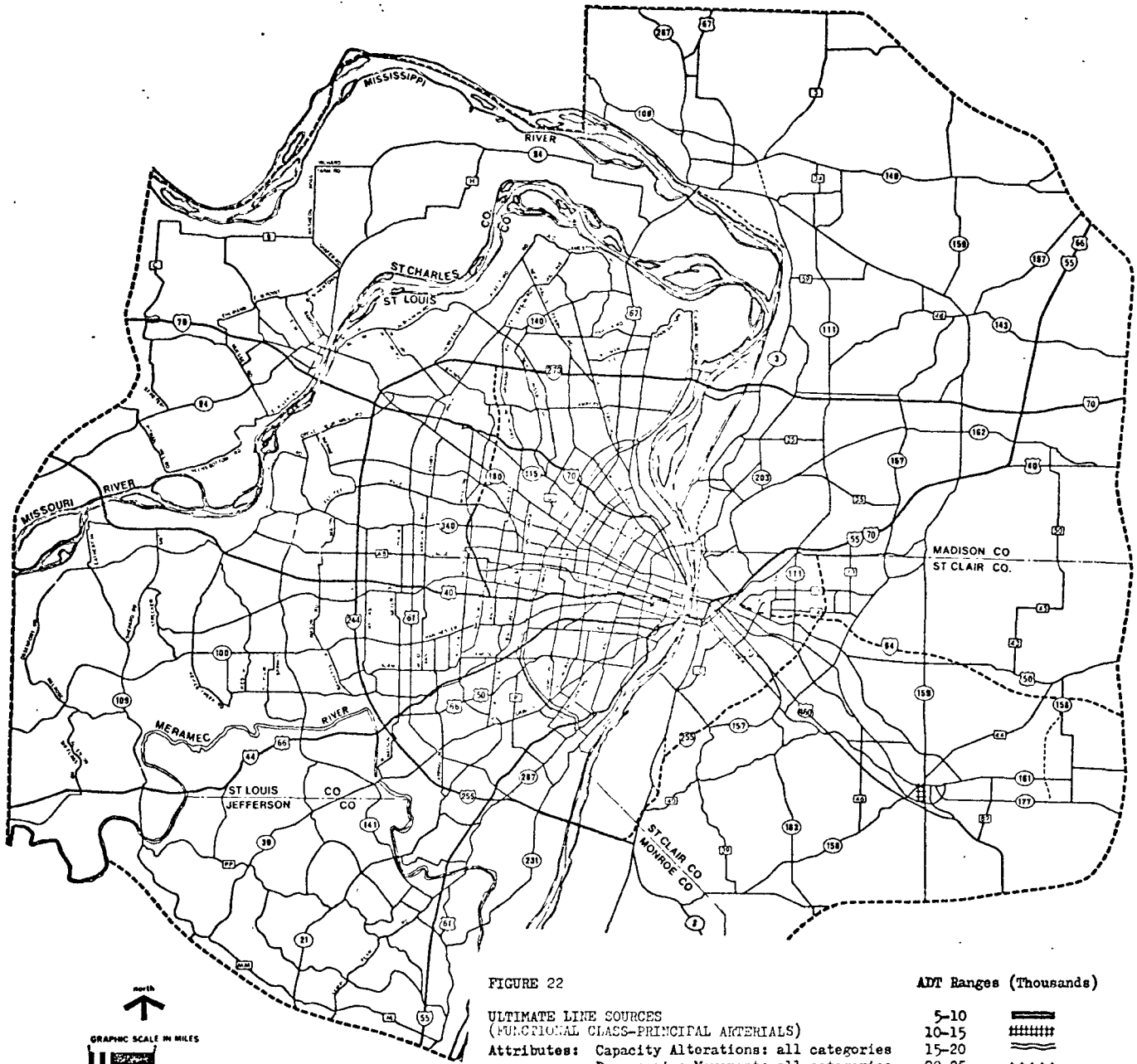


FIGURE 22

ULTIMATE LINE SOURCES
(FUNCTIONAL CLASS-PRINCIPAL ARTERIALS)
Attributes: Capacity Alterations: all categories
Progressive Movement: all categories
Sensitive Land Use: all categories

ADT Ranges (Thousands)

5-10	=====
10-15	#####
15-20	=====
20-25	.....
25-30	.....
30-35	.....
35-40	.....
40-100	.....

ADT Ranges (Thousands)

	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-100	Total
VMT (24 hours)	0	8,240	0	0	0	0	0	0	8,240
Emissions (kilo-grams/24-hour period)									
CO	0	277	0	0	0	0	0	0	277
NO _x	0	46	0	0	0	0	0	0	46
HC	0	42	0	0	0	0	0	0	42
Emissions Rate (grams per veh.-mile)									
CO	0	34	0	0	0	0	0	0	
NO _x	0	6	0	0	0	0	0	0	
HC	0	5	0	0	0	0	0	0	

TABLE 13

ULTIMATE LINE SOURCE EMISSIONS
(FUNCTIONAL CLASS-PRINCIPAL ARTERIALS)
Attributes: Capacity Alterations: all categories
Progressive Movement: all categories
Sensitive Land Use: all categories

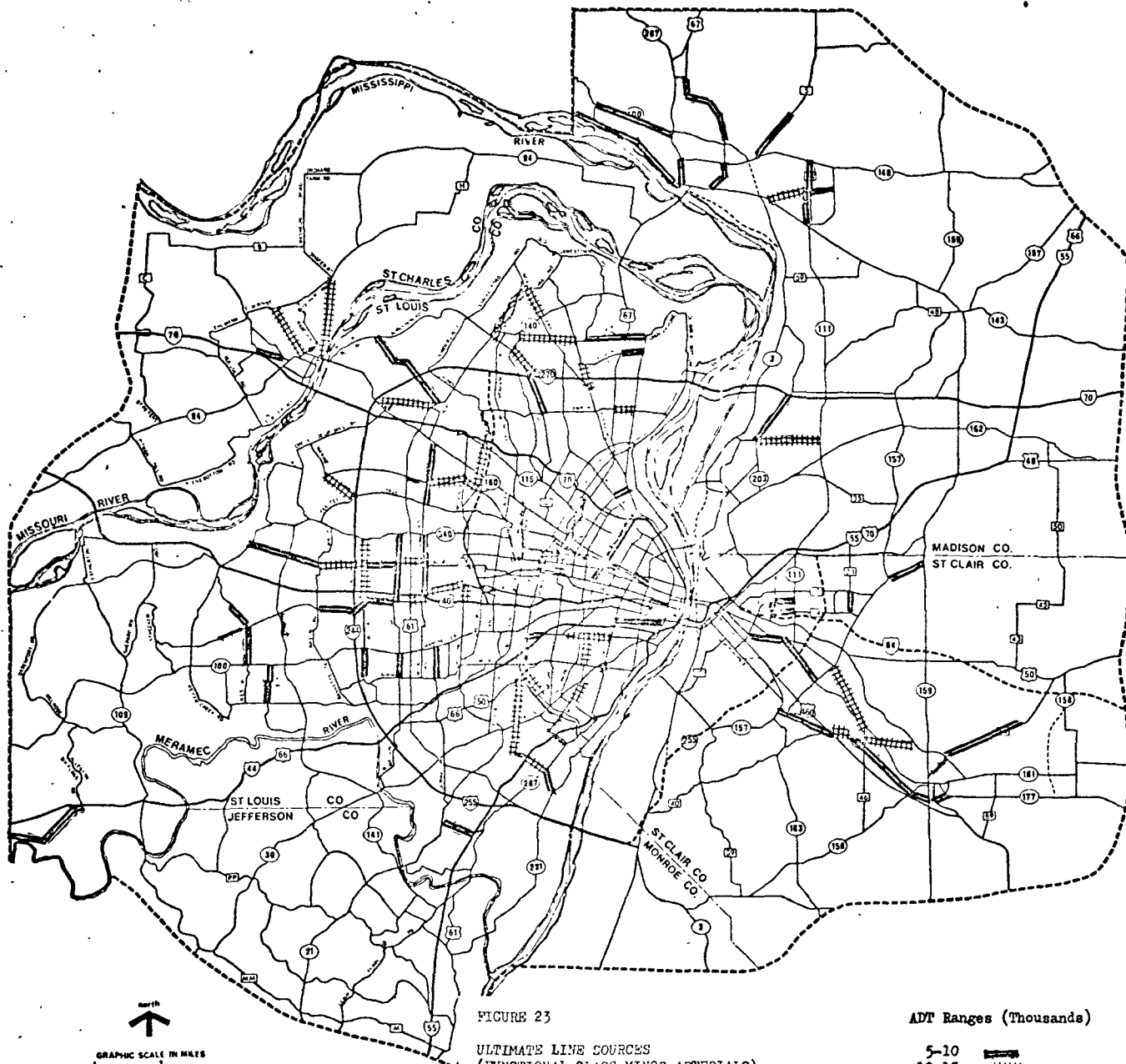


FIGURE 23

ULTIMATE LINE SOURCES
(FUNCTIONAL CLASS-MINOR ARTERIALS)

Attributes: Capacity Alterations: not present
Progressive Movement: not present
Sensitive Land Use: not present

ADT Ranges (Thousands)

5-10	—————
10-15	|||||
15-20	.....
20-40	———

North
GRAPHIC SCALE IN MILES
SYSTEM 7001

ADT Ranges (Thousands)

	5-10	10-15	15-20	20-40	Total
VMT (24 hours)	539,917	488,099	218,731	90,525	1,377,272
Emissions (kilo- grams/24-hour period)					
CO	18,020	16,144	9,043	4,357	47,564
NO _x	3,078	2,772	1,216	488	7,554
HC	2,717	2,455	1,218	547	6,937
Emissions Rates (g/veh.- mile)					
CO	33	33	41	48	
NO _x	6	6	6	5	
HC	5	5	6	6	

TABLE 14

ULTIMATE LINE SOURCE EMISSIONS
(FUNCTIONAL CLASS-MINOR ARTERIALS)

Attributes: Capacity Alterations: not present
Progressive Movement: not present
Sensitive Land Use: not present

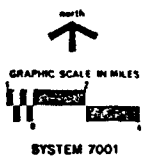
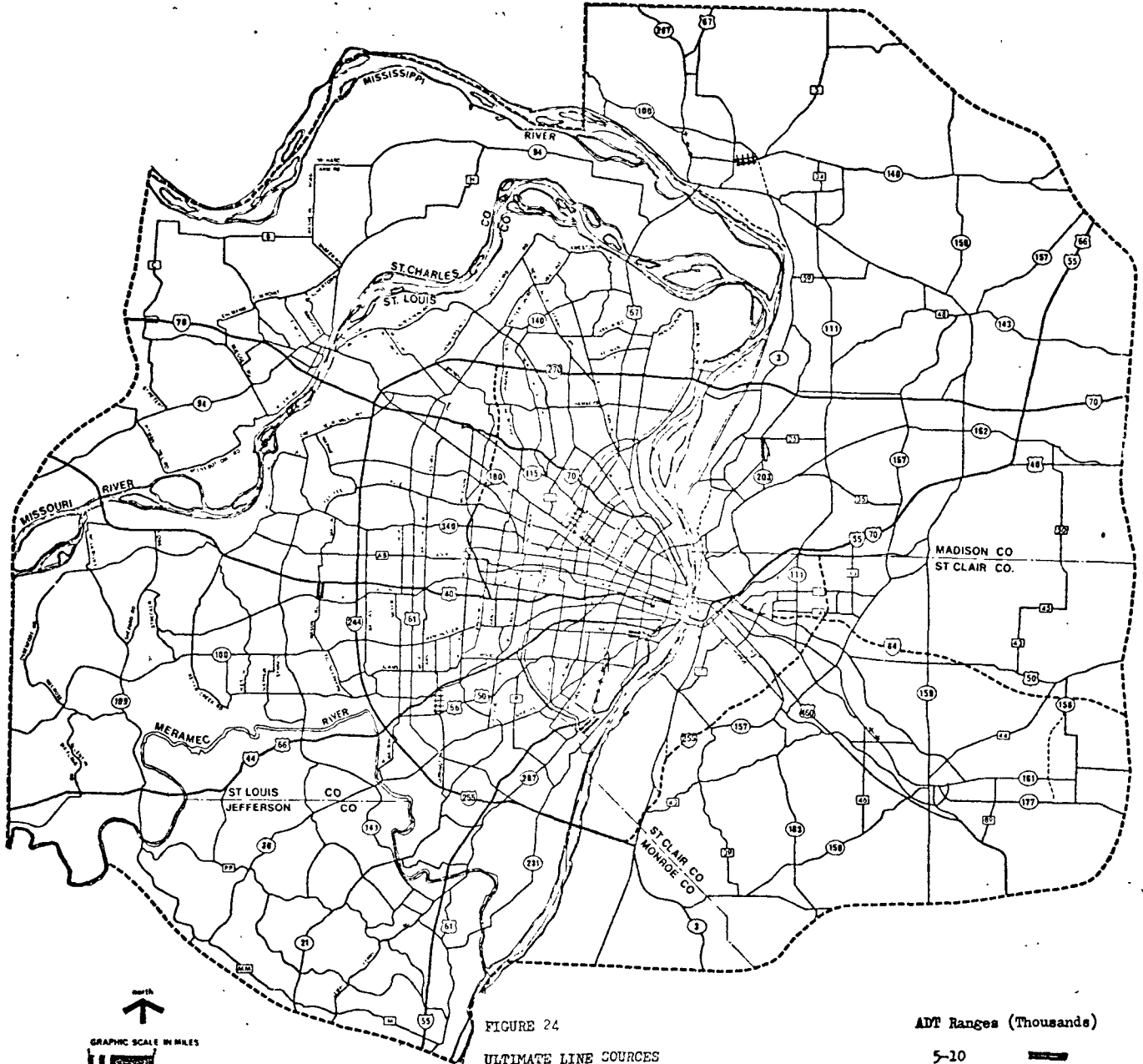


FIGURE 24

ULTIMATE LINE SOURCES
(FUNCTIONAL CLASS-MINOR ARTERIALS)
Attributes: Capacity Alterations: all categories
Progressive Movement: not present
Sensitive Land Use: not present

ADT Ranges (Thousands)

5-10	
10-15	
15-20	
20-40	

ADT Ranges (Thousands)

	5-10	10-15	15-20	20-40	Total
VMT (24 hours)	18,032	24,161	81,595	33,458	157,246
Emissions (kilo- grams/24-hour period)					
CO	575	839	2,944	1,985	6,343
NO _x	103	135	455	175	868
HC	89	125	430	227	871
Emissions Rates (g/veh.- mile)					
CO	32	35	36	59	
NO _x	6	6	6	5	
HC	5	5	5	7	

TABLE 15

ULTIMATE LINE SOURCE EMISSIONS
(FUNCTIONAL CLASS-MINOR ARTERIALS)

Attributes: Capacity Alterations: all categories
Progressive Movement: not present
Sensitive Land Use: not present

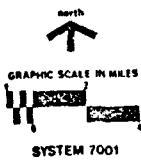
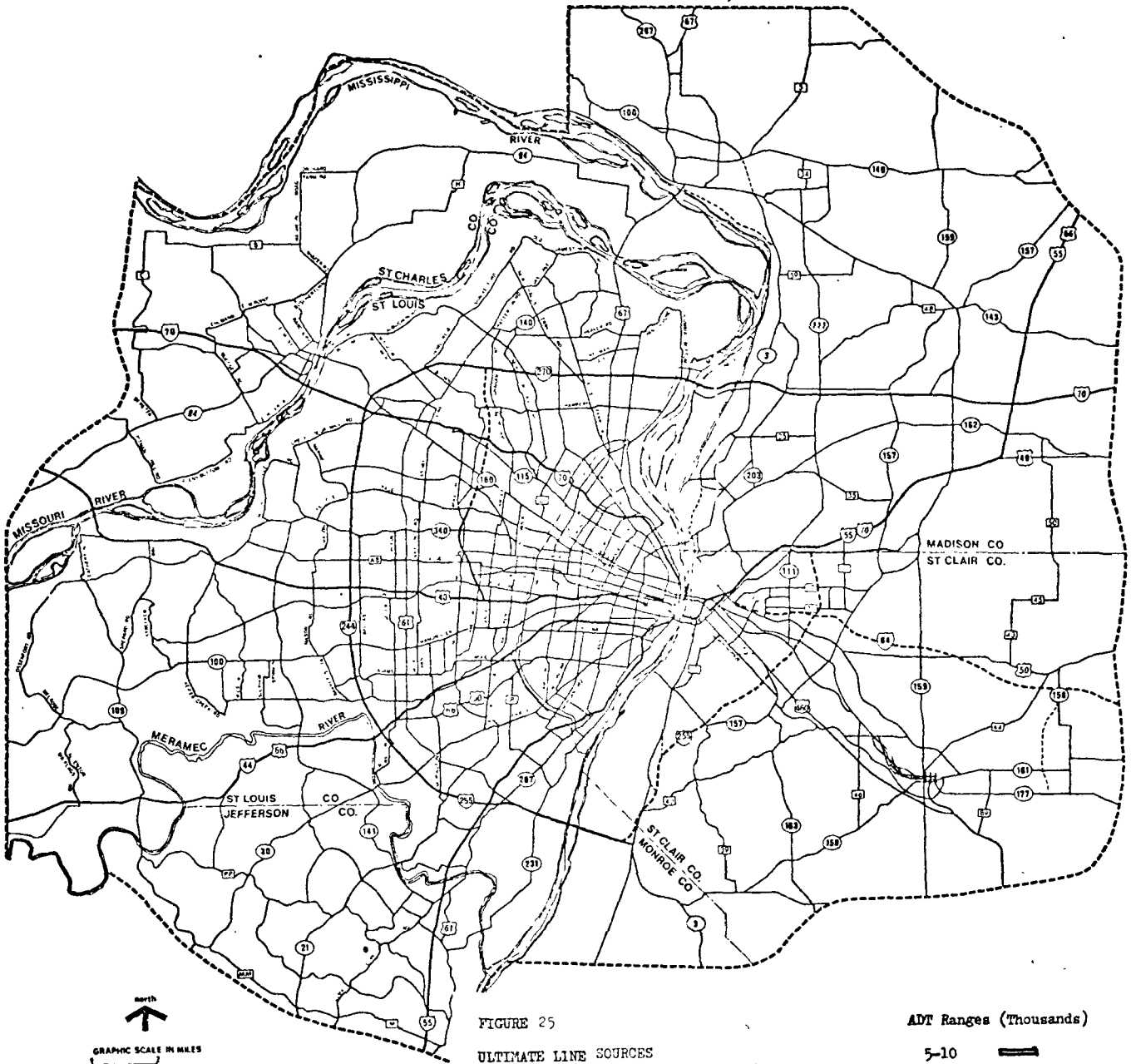


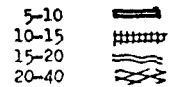
FIGURE 25

ULTIMATE LINE SOURCES

(FUNCTIONAL CLASS-MINOR ARTERIALS)

Attributes: Capacity Alterations: all categories
Progressive Movement: all categories
Sensitive Land Use: not present

ADT Ranges (Thousands)



ADT Ranges (Thousands)

	5-10	10-15	15-20	20-40	Total
VTM (24 hours)	0	16,947	19,080	61,305	97,332
Emissions (kilo- grams/24-hour period)					
CO	0	622	624	2,935	4,181
NO	0	93	108	315	516
HC	0	90	96	373	559
Emissions Rates (g/veh.- mile)					
CO	0	37	33	48	
NO	0	6	6	5	
HC	0	5	5	6	

TABLE 16

ULTIMATE LINE SOURCE EMISSIONS

(FUNCTIONAL CLASS-MINOR ARTERIALS)

Attributes: Capacity Alterations: all categories
Progressive Movement: all categories
Sensitive Land Use: not present

freeway line sources consistently contribute 30-60% to totals in all emission types, with typically 50% of total contribution emanating from arterial sources, and typically near 12% being contributed from minor arterial operations. These percentages correlate closely with the logic of discussion of emission stimuli of average speed and VMT referred to in Chapter I, and component analytic discussions earlier in this immediate chapter. The average rates are aggregates over all ADT ranges considered in each of the specific functional classes under study. They show a disturbing stability across all functional classes, essentially due to the aggregation and averaging of specific V/C, average speed and VMT ranges such as those displayed in Tables 6 through 16. The research team feels that more meaningful and accurate rates exist at the disaggregate levels such as those shown in Tables 6 through 16 where rates specific to ADT ranges for particular components of the line sources containing specific attributes are exhibited.

E. Related Processing Costs

The traffic emissions software system developed herein is a series of eight basic programs coupled to a variable number of utility programs. Two of the eight basic programs are run only once. As such, this discussion will deal only with the remaining six involved in software processing with SAPOLLUT. It is theoretically possible to make 95 separate runs of the system under one batch job, however, only four runs were made in one job for the duration of the project, in order to facilitate turn around time. A threshold fixed cost figure for one run through the system which produced emissions on only line link would be approximately \$3.00. This cost represents the system overhead and individual

Functional Class

	Freeway	Principal Arterials	Minor Arterials	Totals
Total VMT* (24 hours)	7,594,134	7,448,789	1,718,014	16,760,937
Total Emissions (kilograms/24-hour period)				
CO	155,128	264,845	62,349	482,322
NO _x	65,482	41,971	9,656	117,109
HC	29,525	38,245	9,007	76,777
Average Rate of Emissions (g./vehicle- mile)				
CO	20	36	36	
NO _x	9	6	6	
HC	4	5	5	

*For all links with volumes reported.

TABLE 17

SUMMARY OF ULTIMATE LINE
SOURCE EMISSIONS INFORMATION

Percent Contribution	Freeway	Principal Arterials	Minor Arterials	Total
CO	32%	55%	13%	100%
NO _x	56%	36%	8%	100%
HC	38%	50%	12%	100%

TABLE 18

PERCENTAGE OF TOTAL EMISSIONS
CONTRIBUTED BY FUNCTIONAL
CLASS OF LINE SOURCE

program overhead costs. Due to the rather large number of combinations of link attributes which may be tested for, results of using the system on the St. Louis Air Quality Control Region yield a typical maximum cost for one pass of \$8.00, with an average cost of \$5 to \$6. Table 19 illustrates a typical run of the system showing time requirement, percentage of total time, and the amount of main core storage required for each program. It is interesting to note that SAPOLLUT required only 34.5% of all Central Processing Unit (CPU) time. The cost of the run is computed on the rate shown, and charges for lines printed (approximately \$1 per run) should be added to the CPU time cost.

If four or more passes through the system are made, which is typical of the operating rationale used in the performance of the research on the St. Louis Air Quality Control Region, the cost drops to \$6.30 due to the spreading of overhead costs over several runs. It is felt this cost figure is quite tolerable, given the level of detail possible for examining the network, and the nominal number of runs required to synthesize information over all functional highway classes. All figures are for an IBM S/360 Model 65 machine.

F. Limited Sensitivity Analysis

Limited amount of sensitivity analyses were performed subsequent to the definition of line sources, to examine gross changes in the supply of highway facilities and resultant alterations of traffic flow and emissions. Two separate analyses relating to 24-hour periods were performed,

Program	CPU* Time	%	Core Required**
NETSEN	8.59	20.7	60
RUMMY	1.87	4.5	46
BUILDHR	4.25	10.2	82
PRINTHR	7.60	18.3	40
HRMOD	1.82	4.4	42
SAPOLLUT	14.35	34.5	60
MISC. UTILITIES	3.06	7.4	34
TOTALS	41.54	100.0	

*Central Processing Unit, in seconds

**in K's (1024 bytes)

***All Freeways, 145 links

TABLE 19

COST SUMMARY FOR TYPICAL
SOFTWARE SYSTEM RUN***

typical of near-term alteration of emissions estimates which might occur as typical modification of corridor facilities occurs in one case, requiring the placement of total corridor loads onto other corridors in the region during construction alterations. In the second case, a badly needed distributor facility is completed, as highway planning is brought progressively to the implementation and completion phase, yielding resulting diversion of presently congested crosstown flows onto the new high-type design facility.

The first analysis was the examination of emissions performance resulting from the deletion of availability of a freeway corridor and the resultant loading of the displaced traffic onto two adjacent freeways. This was performed through deletion of I-44 from I-55 to I-244. An average ADT was taken for I-44 and half of this was loaded onto each link of I-55 from I-44 to I-244 and the remaining half onto each link of U.S. 40 from I-55 to I-244. Figure 26 shows the location of these three freeways. Table 20 summarizes original VMT's and emissions on each freeway and their aggregate. It should be noted that because of limitations in FHWA Battery program BUILDHR, only a maximum ADT of 99,999 can be used. Therefore, since some links on U.S. 40 are either currently near or over 100,000 ADT, or would exceed 100,000

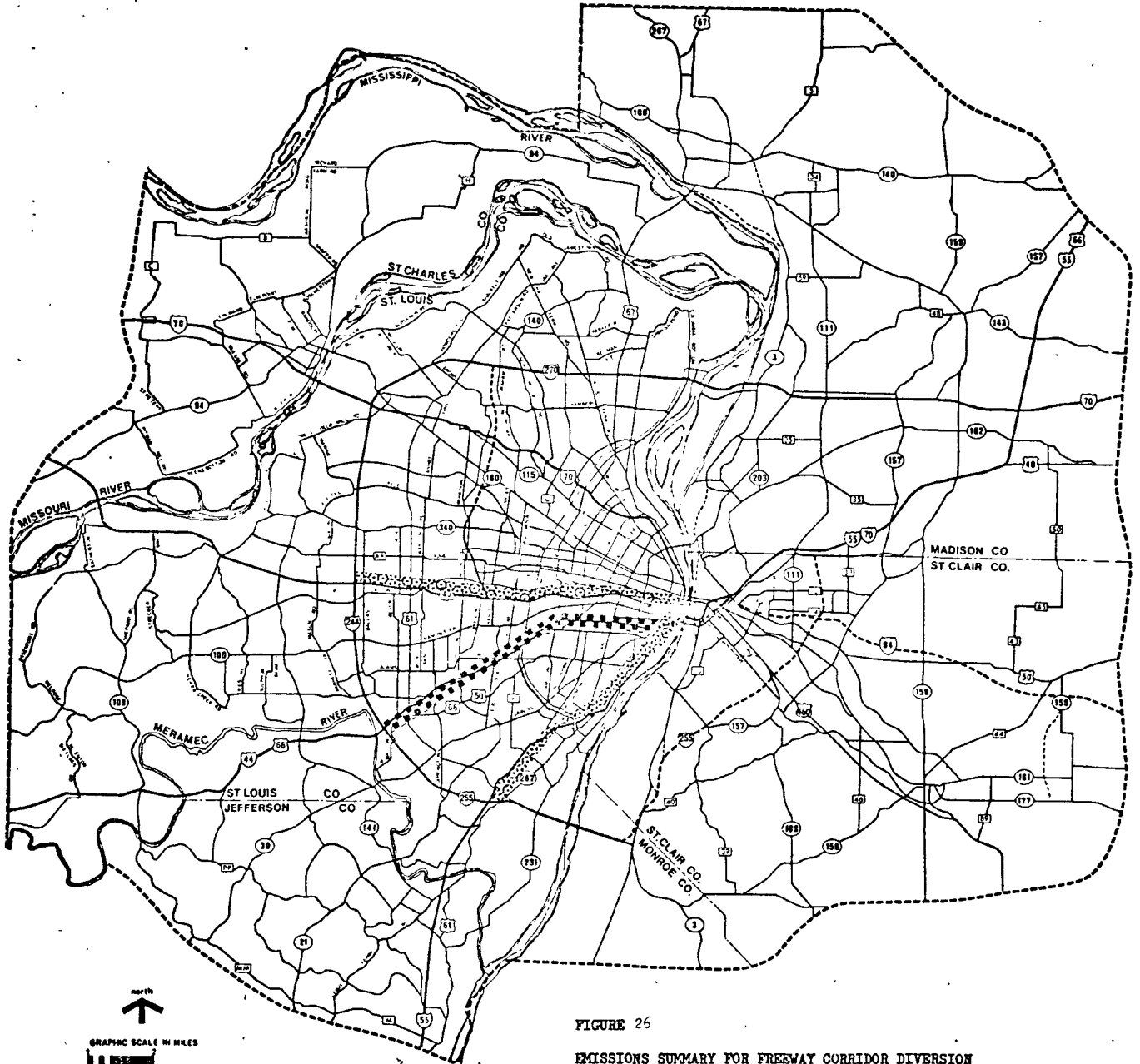


FIGURE 26

EMISSIONS SUMMARY FOR FREEWAY CORRIDOR DIVERSION

I-55, U.S. 40
I-44



Freeway

	I-55 Original	I-44 Original	U.S. 40 Original	Total Original Facilities	I-55, U.S. 40 with Diversion
VTM (24 hours)	789,093	718,290	1,092,597	2,599,980	2,502,875
Emissions (kilograms/24-hour period)					
CO	17,763	15,131	24,473	57,367	59,534
NO _x	6,452	6,070	8,987	21,509	19,982
HC	3,220	2,834	4,446	10,500	10,513
Emissions Rates (g./veh.-mile)					
CO	23	21	22		24
NO _x	8	8	8		8
HC	4	4	4		4

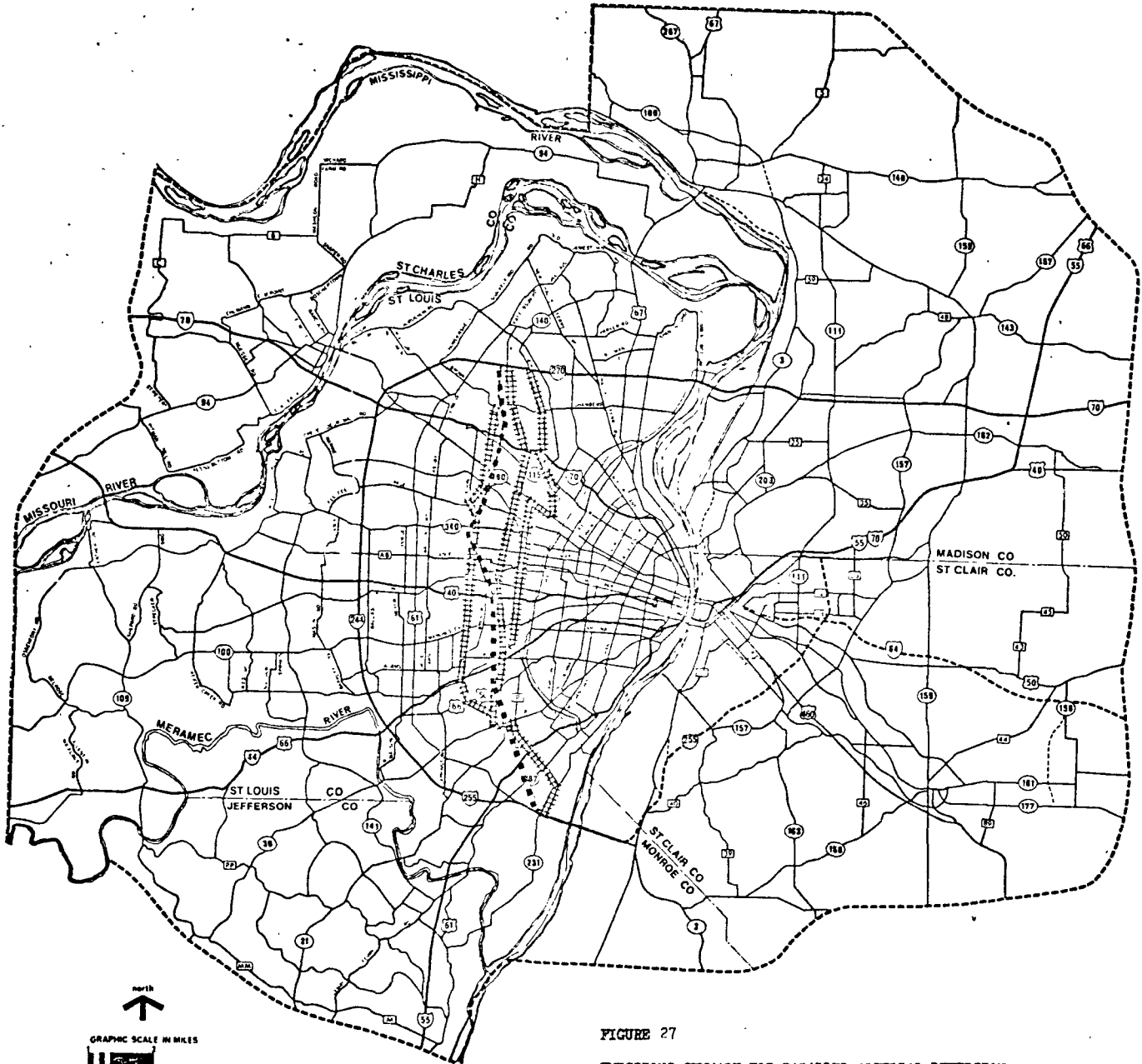
TABLE 20

EMISSIONS SUMMARY FOR FREEWAY CORRIDOR DIVERSION

ADT with diversion, the VMT's for U.S. 40 are underestimates in this sensitivity analysis.

The results reflect the result of eliminating a corridor from use with current traffic loads, or the present impact if I-44 had not been completed. Again, the results are consistent with the literature with respect to impact of increased VMT and lowered average speed as saturation is approached on remaining I-55 and U.S. 40 after diversion. Total CO emissions are higher, total HC emissions are slightly higher, reflecting the above speed and VMT issues, and total NO_x is lower, reflecting impact of lowered operating speeds. Again, the total VMT's shown diverted, and resulting increase in emissions output is understated, due to the FHWA input limitations on ADT discussed above. The aggregate rates have raised slightly for CO, reflecting increased VMT loads on the remaining I-55 and U.S. 40 corridors, however, the lowered average speed component resulting from these flow increases on each corridor have yielded a stable aggregate NO_x rate. The aggregate combinations of altered speeds and changed VMT's over all links of both remaining corridors appeared to have a balancing effect on HC rates, with no apparent aggregate rate change.

The second sensitivity analysis examined the Innerbelt (Mo. 725) North-South corridor. One component section of this route is complete, and the analysis centered around hypothetically extending it North and South to become an effective North-South Freeway Corridor, and diverting traffic onto it from parallel high volume arterials. Figure 27 illustrates the hypothetical Innerbelt Freeway and the parallel arterials under study. The analysis consisted of diverting 50% of the traffic off each arterial and placing it on the Innerbelt. Baseline



north
 ↑
 GRAPHIC SCALE IN MILES
 SYSTEM 7001

FIGURE 27

EMISSIONS SUMMARY FOR PARALLEL ARTERIAL DIVERSION

Parallel Arterials =====
 Hypothetical Innerbelt ■■■■

Routes

	(1) Parallel Arterials before Diversion	(2) Parallel Arterials after Diversion	(3) Hypothetical Innerbelt	(2) + (3)
VMT (24 hours)	451,042	220,896	261,992	482,888
Emissions (kilograms/24-hour period)				
CO	15,513	6,811	5,079	11,890
NO _x	2,565	1,279	2,312	3,591
HC	2,299	1,069	993	2,062
Emissions Rates (g./veh.-mile)				
CO	34	31	19	25
NO _x	6	6	9	7
HC	5	5	4	4

TABLE 21

EMISSIONS SUMMARY FOR
PARALLEL ARTERIAL DIVERSION

runs were made of arterial street emissions before and after diversion, and the hypothetical presently loaded Innerbelt. Table 21 summarizes the results of this sensitivity analysis. Present provision of the new freeway corridor facility, in light of current parallel arterial operations, yields a drop in total emissions of CO and HC, when compared to operation of arterials alone in column 1. Again, this is due to diversion of part of the aggregate traffic load to a facility with higher average speeds. Likewise, this increase in speed yields higher total NO_x emissions. The rates on the Innerbelt, given the constancy of total VMT and provision of higher operating speeds, have dropped as expected for CO and HC, and increased slightly for NO_x , when compared to arterial rates before diversion.

CHAPTER V

CONCLUSION

CHAPTER V

CONCLUSION

In concluding the reported research, it is relevant to point out the capabilities and information which have been provided, comment on further needed research to advance the state of the art, and discuss the general status of line source emissions modelling with respect to current knowledge about related traffic engineering phenomena.

A. Use and Applicability of Present Research and Modelling Results

The data analysis, model development, and integration with SAPOLLUT has yielded several tangible outputs. They are:

1.) A complete quantitative and relevant qualitative data base for freeways, principal arterials and minor arterials in the St. Louis Air Quality Control Region.

2.) A model format - NETSEN - which is capable of sorting and describing any subset of components of the above traffic network, at continually varying levels of detail, from gross geographic description of volumes only, to highly refined geographic locations possessing multiple attributes of traffic, geometric design, topographic, control and land use conditions which are significant in the link's operation and its relationship to emissions and/or air quality.

3.) The interface of the above format with the present operating rationale of SAPOLLUT, thus yielding the capability to model and describe the total emissions of CO, NO_x and HC emanating from a network described at a desired level of attributes, which have been used as input to NETSEN.

4.) Based on the most refined use of the above in the St. Louis Area, an extremely accurate statement of the line sources. This statement

encompasses the sources, descriptions, attributes and total emissions resulting from 1,370 miles of roadway, composed of 195 miles of freeways, and 1,175 miles of principal and minor arterials. The complete description and discussion of these line sources is contained in Chapter IV.

5.) A capability to perform link by link sensitivity analysis on the types of attributes existing on one individual link, a corridor of several links, or an area of several individual street links. Thus, design characteristics and/or traffic loads may be altered or eliminated, for purposes of using SAPOLLUT to yield the resulting changes in aggregate emissions.

B. Recommendations for Further Research

As is expected from intensive research on any problem, the activities of data collection, logic development and model construction of NETSEN, and construction of its interface with SAPOLLUT, have yielded some insights into current gaps in the state of the art of merging information on the traffic and network phenomena with present emissions modelling. As such, several specific items represent areas of new or improved research focus which the research team feels should be pursued in future activity on this topic. They are:

1.) Future use of a model such as SAPOLLUT for basic research on current emissions behavior should be pursued in a highly different software format than SAPOLLUT currently employs. Specifically:

a.) Use of any format requiring a loaded assignment network, including assignment on present networks should not be considered due to:

- 1.) The complexities of intermediate software.
- 2.) The theoretical issues surrounding the validity of assignment model forecast volumes, or assignment model loaded volumes on the present network vs. current ground count data. This is particularly relevant in the St. Louis Area at this time, due to vague relationships of assignment output vs. actual future foreseeable auto and transit networks in the region, as the comprehensive transportation planning begins a period of revision.

2.) The study team further encourages the development of a capability to use a highly detailed network descriptor model such as NETSEN, with an emissions model which can be interfaced directly with one of the output parameters from NETSEN without requiring an intermediate software battery to change input form. Preferably, the variable input from NETSEN to the emissions model would be a traffic flow theoretic variable having significance to both the tagged links in NETSEN and the emissions computation process.

3.) To this immediate end, it is recommended that NETSEN be run in conjunction with the Modal Emissions Model, which employs speed modes as input to emissions computations.¹ The speed mode concept, as part of the traffic flow theoretic envelope of speed and delay studies, and acceleration noise, it is a relevant and meaningful traffic flow parameter, and can be output as another link descriptor in NETSEN.

4.) Further, appropriate development, collection and use of speed mode or speed profile data should be undertaken by interested professional groups. Such activity is currently underway in the St. Louis Area, through contracts to East-West Gateway from the Federal Highway Administration and the Department of Transportation Systems Center. The activity focuses on driving patterns throughout the metropolitan area and the inherent speed profiles, volumes and spot speeds in such driving patterns. Effort should be directed to matching speed mode and profiles to links with specific groups of attributes, thus facilitating the capability of using speed mode as the critical transfer parameter from NETSEN through emission computations in a Modal Emissions Format. Comprehensive results relating research to speed modes should be possible through use of relevant field collection information to date, synthesized with appropriate use of the literature and flow-theoretic computations.

5.) Development and use of the capability to output emissions information on a link by link mapping is necessary. Current SAPOLLUT output is aggregate emissions by area type and functional class, rendering investigation of emissions intensity and sensitivity analysis somewhat cumbersome at the individual link and corridor level. It appears

that employment of the Modal Emissions Model in a manner discussed in the previous paragraphs has the capability of allowing mapping of emissions output at an individual link level over the entire network entered for study.

C. Closing Comments on Status of Line Source-Traffic Attribute Modelling

In final conclusion, effort should be directed toward detailed filtering out of locations of attributes, and measurement of resultant emissions at these link locations, thus cataloging the simultaneous impact of these attributes on emissions. Further, the categorization of traffic operation on facilities should proceed by capturing theoretically sound aspects of flow activity categorized by situation type which are of relevance to emissions, such as queuing and delay descriptions at inter-sections, and shock wave phenomena on uninterrupted flow links and freeway bottlenecks. Thus, a mapping of network description, refined traffic flow parameters, and emissions will ultimately result, yielding a comprehensive format from which to investigate and calculate emissions.

Footnotes Chapter V

- ¹Automotive Exhaust Emissions Modal Analysis Model, EPA No. 460/3-74-005, United States Environmental Protection Agency, Office of Air and Water Control Program, Office of Mobile Source Air Pollution Control, Certification and Surveillance, Ann Arbor, Michigan, January, 1974.

BIBLIOGRAPHY

Selected Research Bibliography

- A Study of Traffic Flow on a Restricted Facility, Interim Report Phase One, Department of Civil Engineering, University of Maryland, College Park, Maryland, June 1973.
- "Air Pollution Controls for Urban Transportation," Highway Research Record 465, Highway Research Board, National Research Council, 1973.
- "Air Quality and Environmental Factors," Transportation Research Record 492, Transportation Research Board, National Research Council, 1974.
- "An Introduction to Traffic Flow Theory," Highway Research Board Special Report 79, Highway Research Board, National Research Council, 1964.
- Automotive Exhaust Emission Modal Analysis Model, EPA No. 460/3-74-005, United States Environmental Protection Agency, Office of Air and Water Control Programs, Office of Mobile Source Air Pollution Control, Certification and Surveillance Division, Ann Arbor, Michigan, January, 1974.
- Design of An Urban Speed Characteristics Study, Research Triangle Institute, Center for Development and Resource Planning, May 1974.
- Drew, Donald R., Traffic Flow Theory and Control, McGraw-Hill, 1968.
- "Highway Capacity Manual," Highway Research Board Special Report 87, National Research Council, 1965.
- "Highways and Air Quality," Highway Research Board Special Report 141, Highway Research Board, National Research Council, 1973.
- Hillier, Fredrick S. and Liebermann, Gerald J., Introduction to Operations Research, Holden-Day, Inc., 1970.
- Littman, Fred E., Semrau, Konrad T., Rubin, Sylvan, Dabberdt, Walter F., A Regional Air Pollution Study (RAPS) Preliminary Emissions Inventory, Stanford Research Institute, Menlo Park, California, January 1974.
- Rossano, A. J. Jr., Ed., Air Pollution Control Guidebook for Management, Environmental Science Services Division, E.R.A. Inc., Stamford, Conn., 1969.
- Scott Research Laboratories, Incorporated; Malcom Smith, Development of Representative Driving Patterns at Various Average Route Speeds; Prepared for the Environmental Protection Agency, Office of Administration, Research Triangle Park, North Carolina, EPA Contract Number 68-C2-1301 (6-73), February 11, 1974, San Bernadino, California.

Selected Research Bibliography (Continued)

"Social, Economic, and Environmental Factors in Transportation," Highway Research Record 356, Highway Research Board, National Research Council, 1971.

Special Area Analysis Final Manual, Federal Highway Administration, Urban Mass Transit Association, Federal Aviation Administration, Office of the Assistant Secretary for Policy, Plans, and International Affairs, August 1973.

"Traffic Engineering..... A Tool to Reduce Air Pollution," Traffic Engineering Magazine, Vol. 44, No. 9, June 1974.

Venezia, Ronald A., "The Impact of Transportation Alternatives on Ambient Air Quality," Unpublished Ph.D. Dissertation, Washington University, January 1972.

St. Louis Area Traffic Data Sources

Peak Hour Travel Analysis, St. Louis Area, East-West Gateway Coordinating Council, February 1974.

Roadway Functional Classification Study for the Saint Louis Area, East-West Gateway Coordinating Council, July 1973.

Status of Missouri State Highways by Routes & Systems, Missouri State Highway Department, December 31, 1973.

St. Louis Area Transportation Study, Streets, Highways and Transit, East-West Gateway Coordinating Council.

St. Louis City Traffic Volume Studies, 1973, St. Louis City Department of Streets, Highway Division.

St. Louis County Traffic Volume Studies, 1973, St. Louis County Department of Highways and Traffic, April 1974.

St. Louis Metropolitan Area Traffic Volume Summary, March 1973-April 1974, Missouri State Highway Department, May 1974.

Traffic Characteristics on Illinois Highways, State of Illinois Department of Transportation, 1972.

Professional Interviews

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James F. Baumann	Deputy Traffic Commissioner, City of St. Louis
Frank Kriz Tom Dollous	Missouri State Highway Department, Division of Traffic, District VI Office, Kirkwood, Mo.
Harold Ruffner Fred Bartlesmeyer Ted Ellicott	Illinois Department of Transportation, Traffic Division, East St. Louis District Office
Richard Wilcox Frank Brown	Illinois Department of Transportation, Planning Division, East St. Louis District Office